26TH ANNUAL NATIONAL CONVENTION

आज़ादी का अमृत महोत्सव

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SCIENTIFIC ABSTRACTS

APTICON PSIT KANPUR 2023

Association of Pharmaceutical Teachers of India

PSIT Kanpur

In Association with
PSIT-Pranveer Singh Institute of Technology (Pharmacy), Kanpur

2nd–3rd September 2023

PREFACE

It is with great pleasure that we present the proceedings of the 26th Annual National Convention of the Association of Pharmaceutical Teachers of India (26th APTICON). This event, held from 2nd to 3rd September 2023, was graciously hosted by PSIT-Pranveer Singh Institute of Technology (Pharmacy) in Kanpur, Uttar Pradesh. The conference revolved around the theme **"Fiesta of Innovation, Research and Collaboration: Thriving towards excellence in Pharmacy Teaching"** bringing together over 2000 pharmacy professionals, students, industrialists, scientists, and pharmaceutical leaders from various corners of the country.

The remarkable success of APTICON-2023 owes itself to the vibrant exchange of ideas, knowledge, and innovations that transpired over these two enriching days. With a dynamic platform for academicians, researchers, and scholars to showcase their pioneering discoveries, the conference ignited fervent discussions and collaborations that are sure to shape the future of pharmacy education and research.

Our sincere gratitude goes out to the 24 industrial sponsors and 42 academic sponsors whose unwavering support contributed to the event's grandeur. The participation of 42 distinguished invitees in conducting scientific sessions, along with the expertise of 84 evaluators who assessed oral and poster presentations, added immense value to the conference's academic discourse.

Reflecting the vitality of the field, the Scientific Committee received a staggering 1126 abstracts, eventually selecting 579 for presentation following a rigorous peer review process. The conference covered seven essential subject areas, including Pharmaceutical Technology and Pharmaceutics, Medicinal Chemistry/Pharmaceutical Analysis, Pharmacognosy, Phytochemistry and Biotechnology, Pharmacology and Toxicology, Pharmacy Practice and Pharmacovigilance, as well as Intellectual Property Right and Pharmacy Education.

Highlighting excellence, the top 15 oral and poster presentations were acknowledged during the APTICON-2023's valedictory ceremony. Notably, the finest abstracts from both oral and poster presentations have been granted the opportunity to publish their full-length manuscripts free of charge in the esteemed Indian Journal of Pharmaceutical Education and Research (IJPER). These dedicated efforts are slated for release in special volumes in December 2023 and February 2024.

None of this would have been possible without the tireless dedication of our scientific team and the oral/poster presentation teams. Their commitment and invaluable time investment have been instrumental in bringing these proceedings to fruition. We extend our heartfelt appreciation to the Patron, Co-patrons, organizing team, and APTI office bearers for their unwavering support and collective efforts in ensuring the triumph of APTICON2023.

Lastly, our sincere gratitude extends to every participant whose contributions have left an indelible mark on this conference and its proceedings. Your commitment to advancing pharmaceutical education and research is what makes events like APTICON-2023 a resounding success.

Regards:

SCIENTIFIC COMMITTEE
26th APTICON 2023

26TH ANNUAL NATIONAL CONVENTION

APTICON PSIT KANPUR 2023

ORAL PRESENTATION

STREAM 1: PHARMACEUTICAL TECHNOLOGY AND PHARMACEUTICS	
Oral ID	**Name of the Presenter**
PSIT/OP01/0001	Prashant Nayak
PSIT/OP01/0002	Shekhar Singh
PSIT/OP01/0004	Himanshu Sharma
PSIT/OP01/0006	Sanjiban U. Sarkar
PSIT/OP01/0008	Yatendra Kumar
PSIT/OP01/0013	Ankit Mishra
PSIT/OP01/0016	Sanjib Bahadur
PSIT/OP01/0017	Pragya Baghel
PSIT/OP01/0019	Md Rehan Alam
PSIT/OP01/0021	Vikas Pandey
PSIT/OP01/0022	Ravi Shankar
PSIT/OP01/0024	Monika Singh
PSIT/OP01/0025	Gireesh Tripathi
PSIT/OP01/0026	Shradha Devi Dwivedi
PSIT/OP01/0028	Neha Dubey
PSIT/OP01/0032	Kaushik Mukherjee
PSIT/OP01/0033	Arvind. S. Parmar
PSIT/OP01/0034	Jatin Prajapat
PSIT/OP01/0035	Pankaj Sharma
PSIT/OP01/0038	Leena Thakare
PSIT/OP01/0039	Vijay Sharma
PSIT/OP01/0040	Abhishek Tiwari
PSIT/OP01/0041	Suddala Shirisha
PSIT/OP01/0042	Natarajan Jawahar
PSIT/OP01/0043	Balak Das Kurmi
PSIT/OP01/0045	Vandana Singh
PSIT/OP01/0048	Himanshu Gogoi
PSIT/OP01/0049	Samsuj Zaman
PSIT/OP01/0051	Sakshi Tiwari
PSIT/OP01/0052	Lahari R
PSIT/OP01/0053	Maithili Sinha

PSIT/OP01/0054	Fernandes Reena Inas
PSIT/OP01/0055	Pal Gogoi
PSIT/OP01/0058	Nasir Vadia
PSIT/OP01/0060	Meenakshi Guptaa
PSIT/OP01/0062	Ramesh Parmar
PSIT/OP01/0064	Amrapali B. Jadhav
PSIT/OP01/0065	Pallavi Yadav
PSIT/OP01/0066	Abhishek Singh
PSIT/OP01/0067	Dr Sandip Zine
PSIT/OP01/0070	Deepti Tripathi
PSIT/OP01/0071	Raushan Kumara
PSIT/OP01/0074	Rashmi Trivedi
PSIT/OP01/0076	Ajeet Kumar
PSIT/OP01/0077	Rakesh Mishra
PSIT/OP01/0079	Suman Jaiswal
PSIT/OP01/0080	Foziyah Zakir
PSIT/OP01/0081	Sarita Garg
PSIT/OP01/0082	Dr. Naveen Gupta
PSIT/OP01/0083	Rajesh Kumar
PSIT/OP01/0086	Damodar Goupale
PSIT/OP01/0087	Noopur Verma
PSIT/OP01/0089	Tanaji Nandgudei
PSIT/OP01/0090	Mr. Harish Sharma
PSIT/OP01/0091	Priyanka Mishra
PSIT/OP01/0100	Pranjal Sachan
PSIT/OP01/0101	Navdeep Kumar
PSIT/OP01/0102	Monisha Gupta
PSIT/OP01/0103	Anjali Paswan
PSIT/OP01/0104	Vishal Singh
PSIT/OP01/0105	Dinesh Bawankar
PSIT/OP01/0106	Seraj Alam Siddique
PSIT/OP01/0107	Hrithik Verma

PSIT/OP01/0108	Kalpana
PSIT/OP01/0109	Princy Yadav
PSIT/OP01/0110	Nisha Sharma
PSIT/OP01/0111	Swarnakshi Upadhyay
PSIT/OP01/0501	Kirteebala Pawar
STREAM 2: MEDICINAL CHEMISTRY AND PHARMACEUTICAL ANALYSIS	
Oral ID	**Name of the Presenter**
PSIT/OP02/0001	Awadhesh Kumar
PSIT/OP02/0002	Rohit Singh
PSIT/OP02/0003	Kamal Shah
PSIT/OP02/0004	Anila Mishra
PSIT/OP02/0005	Sarita
PSIT/OP02/0006	Debanjan Sen
PSIT/OP02/0007	Pradeep Golani
PSIT/OP02/0008	Mohd Haider
PSIT/OP02/0009	Achal Mishra
PSIT/OP02/0010	K.Venkata Ramana
PSIT/OP02/0012	Lakavath Suryanarayana
PSIT/OP02/0013	Samiksha Mhatre
PSIT/OP02/0014	Ravi Rawat
PSIT/OP02/0015	Rizwan Ahmad
PSIT/OP02/0017	Sant Kumar Verma
PSIT/OP02/0018	Vivek Asati
PSIT/OP02/0019	Preeti Patel
PSIT/OP02/0020	S.Jubie
PSIT/OP02/0023	Kishor R. Danao
PSIT/OP02/0026	Anjali Singh
PSIT/OP02/0027	Ruqaiya Jamal
PSIT/OP02/0029	Dr.Rinchi Bora
PSIT/OP02/0030	Prachita Gauns Dessai
PSIT/OP02/0032	PhadteSoniyaa
PSIT/OP02/0035	Divya Sahu

PSIT/OP02/0036	Saloni Yadav
PSIT/OP02/0037	Darshana GohateIswe
PSIT/OP02/0038	Geeta Mishra
PSIT/OP02/0039	Gul Naz Fatima
PSIT/OP02/0040	Vimlesh Kumar
PSIT/OP02/0041	Pravin Onakr Patil
PSIT/OP02/0042	Kuldeep Singh
PSIT/OP02/0046	Saroja Kumar Patro
PSIT/OP02/0048	Sneha Kulkarni
STREAM 3: PHARMACOGNOSY, PHYTOCHEMISTRY AND BIOTECHNOLOGY	
Oral ID	**Name of the Presenter**
PSIT/OP03/0001	Ved Pal
PSIT/OP03/0003	Arindam Maity
PSIT/OP03/0004	Sweta Rai
PSIT/OP03/0005	Ankit Kumar
PSIT/OP03/0007	Rajesh Shukla
PSIT/OP03/0009	Anita Bhoi
PSIT/OP03/0010	Prabhat Kumar Upadhyay
PSIT/OP03/0011	Sandhya S, Sana Tahreen
PSIT/OP03/0014	Rubal Chahal
PSIT/OP03/0017	Dr Rahul Kaushik
PSIT/OP03/0020	Anupam Jaiswal Sil
PSIT/OP03/0022	Namita Singh
PSIT/OP03/0024	Arun K Mishra
PSIT/OP03/0025	Neelima Mishra
PSIT/OP03/0027	Rizwan Ahmad
PSIT/OP03/0030	Pallavi Tiwari
PSIT/OP03/0031	Rakhi Khabiy
PSIT/OP03/0034	Dr. Anju Singh
PSIT/OP03/0050	Shambaditya Goswami
PSIT/OP03/0060	Azhar Rasheed

PSIT/OP03/0061	Ritu Rani Yadav
PSIT/OP03/0101	Arti Prajapati
PSIT/OP03/0502	JeejaPananchery
STREAM 4: PHARMACOLOGY AND TOXICOLOGY	
Oral ID	**Name of the Presenter**
PSIT/OP04/0001	Prasanna Shama Khandige
PSIT/OP04/0002	Manjushree Pawar
PSIT/OP04/0004	Yogesh Chand Yadav
PSIT/OP04/0005	Saket Singh Chandel
PSIT/OP04/0006	G. Sivakumar
PSIT/OP04/0012	Yogesh Murti
PSIT/OP04/0013	Junaid Tantray
PSIT/OP04/0015	Mohammad Kaleem
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PSIT/OP04/0029	Mayur Mali
PSIT/OP04/0031	Ashish kumarKyada
PSIT/OP04/0032	Abhishek Marwari
PSIT/OP04/0034	Anshuman Borkar
PSIT/OP04/0035	Jyoti Nanda
PSIT/OP04/0036	Kislaya Mishra
PSIT/OP04/0037	Jay Kumar
PSIT/OP04/0038	Keshav agrawal
PSIT/OP04/0039	Govind Kale
PSIT/OP04/0040	Anshuman Prajapati

PSIT/OP04/0050	Prachi
PSIT/OP04/0051	Zulfa Nooreen
PSIT/OP04/0052	Madhuri Verma
PSIT/OP04/0053	Yadav Rupali Vinod
PSIT/OP04/0054	Himangi Vig
PSIT/OP04/0055	Nainsee gupta
PSIT/OP04/0056	Dineshkumar Lende
PSIT/OP04/0057	Namra Aziz
PSIT/OP04/0058	Nishant Kumar
PSIT/OP04/0059	Soumyadip Mukherjee
PSIT/OP04/0060	Mamta Tiwari
STREAM 5:PHARMACY PRACTICE AND PHARMACOVIGILANCE	
Oral ID	**Name of the Presenter**
PSIT/OP05/0001	Jaybir Singh
PSIT/OP05/0004	Sivasankar S
PSIT/OP05/0005	Madhaw Dwivedi
PSIT/OP05/0006	Sunil Prajapati
STREAM 6: INTELLECTUAL PROPERTY RIGHTS	
Oral ID	**Name of the Presenter**
PSIT/OP06/0001	Suyesh Pandey
PSIT/OP06/0002	Jyotsana Dwivedi
STREAM 7: PHARMACY EDUCATION	
Oral ID	**Name of the Presenter**
PSIT/OP07/0001	Annamalai Rama
PSIT/OP07/0002	Sanjay Yadav
PSIT/OP07/0003	Neelesh Malviya
PSIT/OP07/0004	Sapna Malviya
PSIT/OP07/0005	Bansod KU
PSIT/OP07/0007	Sumeet Dwivedi

PSIT/OP01/0001

Formulation development of Doxorubicin-Bcl2 siRNA loaded sphingosomes by DOE approach

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Introduction: The Sphingosomes have better drug retention properties and are significantly more resilient to acid hydrolysis. siRNAs are mostly used to silence post-transcriptional gene expression in cancer treatment. Doxorubicin for lung cancer.
Aim & Objectives: Formulation and evaluation of sphingosomes of siRNA and doxorubicin for the treatment of lung cancer.
Method: The study shows how to use a 3^2 complete factorial design to optimize a bcl2 si RNA- doxorubicin-loaded sphiongosomes for the treatment of lung cancer. Nano forms of Sphingosomes were prepared using the thin film hydration process, and optimization was carried out using 3 2 full factorial designs in conjunction with the desirability function. Entrapment effectiveness and vesicle size data were evaluated. TEM predicts the size of the formulation, and DSC and FTIR were to check thermal stability, Serum stability and sterility performed.
Result: The formulation was found to be spherical in shape with an average diameter of 263.4 nm, PDI of 0.198, entrapment efficiency of 69.2 and -33.4 mV zeta potential. Results from TEM demonstrated the 200 nm particle size. DSC and FTIR results of the physical mixture and the formulation were in the range According to serum stability, the formulation was resistant to nuclease digestion for 12 hours. A sterility test proved the formulation was sterile
Summary & Conclusion: The results confirm that the QbD approach in sphingosome development can improve the formulation process. The approach resulted in a decreased number of studies in practice but in adequate product preparation.
Keywords: *Doxorubicin, Sphingosome, Serum stability, Sterility and Zeta potential.*

PSIT/OP01/0002

In-vivo activity of Diflunisal loaded nanostructured lipid carrier for inflammatory bowel disease

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Introduction: The conventional therapies or oral dosage forms suffer from setbacks for delivery of drug to the colon. To overcome these, a site-specific treatment to colon in needed.
Aim & Objectives: To investigate the site-specific activity of nanostructured lipid carrier (NLC), containing Diflunisal coated with Eudragit S-100 in acetic acid -induced ulcerative colitis model on female Wistar rats by oral route (100 mg/kg body weight).
Method: Animals were divided into five groups, each group having five animals. All the animals were kept on fasted condition for 6 hrs. before induction of Ulcerative colitis. The colitis was induced with acetic acid (4%) solution. After induction for 3 days, on the 4th day the animal groups received treatment once a day for three consecutive days. The disease activity index, i.e., change in weight, stool characteristic and rectal bleeding were observed throughout the study. The histopathological changes in colon of all the five groups were also observed.
Result: Treatment with formulation showed decrease in inflammation with overall suppression of the disease. The formulation treated group showed a significant ($P < 0.05$) decrease in disease activity indices. The histological examination of colon among the groups revealed significant results of the developed NLC.
Summary & Conclusion: The experimental study showed that Eudragit S-100 coated Diflunisal loaded nanostructured lipid carrier is

an innovative approach for site specific delivery of drug to the colon.

Keywords: *Diflunisal, Anti-colitis activity, Colon, NLCs*, *Inflammatory Bowel Disease*

PSIT/OP01/0004

A Benefaction of Phytoconstituents on Molecular Targets Related to Alzheimer: Challenges and Future Prospective

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Introduction: Alzheimer's Disease, a kind of dementia, causes intense pain in many brain regions. Many neuropathologies are present, and it disrupts cognitive functions and neuropsychiatric regulation. This persistent deterioration significantly impacts a person's daily activities and social and professional lives.

Aim & Objectives: To understand the benefits and usefulness of phytoconstituents on molecular targets related to Alzheimer's Disease.

Methods: we utilized online publication databases such as PubMed, Science Direct, Google Scholar, and Scopus for writing this review article.

Result: The pharmaceutical approach has long been a mainstay in the treatment of AD. There are a lot of drawbacks to this tactic, though. Now more than ever, you must change the way you approach your treatment. Natural remedies made from plants get more common sight as the outcome of their benefits lower risk and have adverse impacts because of their use. The state of things study focuses on the phytoconstituents' anti-AD properties, illuminates those now conducting clinical trials, and collects evidence on their precise mechanisms of action in contradiction of various neuropathologies connected to AD.

Summary & Conclusion: The phytoconstituents will surely help create novel, less harmful AD treatments that are more effective than the pharmaceutical choices that are currently available, whether used singly or in combination.

Keywords: *Phytoconstituents, Alzheimer's disease, Acetylcholine esterase Tau, Drug development, Clinical trials*

PSIT/OP01/0006

Catla Fish Scale powder as a potential Tablet diluent

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Introduction: Traditionally, excipients were often structurally simple, biologically inert, many more novel and increasingly complex excipients have been developed as novel drug formulation delivery systems emerge and evolve. However, literature survey revealed that excipients might be potential toxicants at high doses in animals, though safe in humans at therapeutic doses.

Aim & Objectives: Our study was conducted at providing few candidates pharmaceutical excipients of natural origin which would be safe and devoid of any undue toxicity when used in optimized quantities in formulations, Catla fish scale powder was included in the study as a possible tablet diluent.

Method: Catla fish scales were collected from local wet markets, washed, cleaned and sun dried for 40 days, they were again washed with purified water and Isopropyl Alcohol till fishy odor had been eliminated. The processed scales were powdered using a laboratory grinder, sieved and subjected to micromeritic studies. Various blends of the same were prepared using other standard available tablet excipients and placebo tablet formulations were prepared by direct compression method using a 8 station tablet rotary press.

Result: Tablet compression was successful withexcellent tableting properties when evaluated for the various official and unofficial tests, suggesting the blend was optimum.

Summary & Conclusion: The study revealed that Catla fish scales have excellent tablet diluent properties and can be a potential tablet diluent which should be relatively safe and might be used in tablet formulations.

Keywords: *Biologically inert, candidate pharmaceutical excipients of natural origin, placebo tablet*

PSIT/OP01/0008

Microneedles: An aspect to enhanced Transdermal Drug Delivery

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Introduction: Biopharmaceutics help us to understand better pathways to safe and effective medication in our living system of the human body. Transdermal drug delivery systems bypass first-pass metabolism and possess a great and easy approach to drug administration. The principal obstacle to delivering the medication into the transdermal area is stratum corneum. Different techniques have been applied to enhance systemic bioavailability of drugs through the transdermal approach. Microneedle formulation is one of them.

Aim & Objectives: To develop the microneedle formulation through several sophisticated techniques like photolithography, Nano laser and Silicone micro molding. To develop and evaluate microneedles of various biodegradable polymers with and without drugs.

Method: The mother silicone micro mould was prepared by pouring method with help of Kostech Adjustable Derma Stamp. Different concentrations of various polymers like trehalose, Poly vinyl pyrrolidone, Poly vinyl alcohol, hyaluronic acid have been used in preparation of dissolved microneedles. Micro centrifugation and vacuum drying have been used for preparation of microneedles. The various evaluation parameters of formulated microneedles of both drugs like physical characterization, drug content, scanning electron microscopy, Optical coherence Tomography, *In vivo* transdermal release studies, *Ex-Vivo* Penetration Studies has been carried out.

Result: The dissolvable polymeric microneedles of Acyclovir and Ketoprofen were formulated and evaluated significantly. These nonconventional and novel TDDS possess the satisfactory attributes of *In-vitro* and *In-vivo* medicament delivery.

Summary & Conclusion: This less invasive and painless drug delivery system can fulfill a promise of a large variety of medication administration in an easy and more compliance manner. Through this technology we can easily permeate the targeted therapeutic drug molecules into our systemic circulation. So before approaching pain receptors in inner layers of skin the microneedle releases the medication in our skin.

Keywords: *TDDS, Microneedles, Silicone micro molding, Acyclovir, Ketoprofen, poly vinyl alcohol, Poly vinyl pyrrolidone, hyaluronic acid.*

PSIT/OP01/0013

Effective Management of Fungal Disease by the development of solid lipid nanoparticles with QBD

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Introduction: The strategy should be multidisciplinary to overcome biological constraints and comprehend the mechanisms involved in drug penetration via the skin. Solid lipid nanoparticles boost the transdermal delivery of various medications with improved drug solubilization, significantly increased flux, and decreased diffusion coefficient compared to conventional topical treatments such as emulsions and gels.

Aim & Objectives: To study the experimental variables in manufacturing of drug loaded solid lipid nanoparticles (SLN). Due to their better skin and fungal cell penetration, drug-loaded SLN demonstrate improved antifungal efficacy.

Because most antifungal medications are lipophilic, SLN are perfect pharmaceutical carriers. A better-quality product can be prepared by emphasizing the QbD concept, which comprehends the crucial steps and product requirements based on risk management. The Design of the Experiment (DoE), a component of QbD, is crucial in determining how many critical process parameters (CPP) have an impact on the product's critical quality attributes (CQA).

Method: Homogenization and ultrasonication method was used to prepare SLN loaded with *Holoptelea Integrifolia* ethanolic extract. Box-Behnken was implemented to assess the drug's effect and the ratio of lipids.

Result: Various batches of SLN were evaluated via particle size analysis, zeta potential, entrapment efficacy, and drug release studies. The release study was continued for 24 hours at 37ºC. Within 24 hours, a drug can release approximately 94% of its total dose.

Summary & Conclusion: This method provides an adequate particle size range, zeta potential, and entrapment efficiency. According to in-vitro antifungal activity, extract-loaded SLN exhibits a greater zone of inhibition, signifying a more potent antifungal response.

Keywords: *Solid Lipid Nanoparticles (SLN), antifungal activities, Box-Behnken Design (BBD), Holoptelea Integrifolia, homogenization, ultrasonication*

PSIT/OP01/0016

Augmenting hypoglycemic potential of metformin tablets through fenugreek seed mucilage as an excipient

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Introduction: Number of people affected by diabetes are increasing at an alarming rate and is expected to cross 366 million in 2030 from 171 million in 2000. Fenugreek seeds (FS) is reported to possess hypoglycemic activity. Metformin is oral hypoglycemic drug usually prescribed for type II diabetic patients

Aim & Objectives: Objective is to use FS mucilage for development of metformin tablets in order to enhance hypoglycemic activity

Method: Mucilage was extracted from FS, dried, triturated to fine powder. Dried mucilage powder was subjected to various studies to assess its suitability to be used as excipient. Metformin tablets were prepared by wet granulation using FS mucilage as binder and matrix forming agent. Another formulation was prepared using HPMC 15cps and starch paste as matrix forming agent and binder respectively. These tablets were subjected to various evaluations like weight variation, hardness, thickness, friability, appearance and *in vitro* drug release. Diabetes was induced in Wistar albino rats by a single intraperitonial injection of streptozotocin at 60mg/kg body weight in freshly prepared citrate buffer pH 4.5.

Result: Tablets were found to be well within the range and accepted limit as prescribed in United States Pharmacopoeia. Tablets prepared with FS mucilage show higher degree of hypoglycemic activity compared to tablets prepared with HPMC.

Summary & Conclusion: FS mucilage powder can be used as excipient in tablet formulation. It also has ability to potentiate hypoglycemic activity of metformin tablets. However, further studies must be carried out to optimize the dose of metformin along with FS mucilage so that one can achieve optimum glucose level.

Keywords: *Fenugreek seed mucilage, antidiabetic activity, potentiating effect, Type 2 diabetes*

PSIT/OP01/0017

Enhancing Paclitaxel Absorption through Systematic Optimization of Self-Micro emulsifying Drug Delivery Systems using Design of Experiments

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Introduction: Many new drugs/active pharmaceutical ingredients currently being developed exhibit low solubility and

bioavailability in water. Lipophilic drugs are notoriously difficult to dissolve and are very poorly bioavailable, making the development of self-micro emulsifying drug delivery systems imperative.

Aim & Objective: To develop an optimized formulation of Paclitaxel loaded SMEDDs using various ratios of Oil and Smix for the solubility enhancement of drug to improve its absorption.

Method: To develop SMEDDS Isopropyl Myristate, Tween 80 and Transcutol were used. A 3^2-factorial design was applied to study the effect of oil and surfactant concentrations on the emulsification process and drug release from formulation. The nine formulations P1-P9 were evaluated for their globule size, zeta potential, and drug content.

Result: A transparent emulsion with a globule size of 143.69 - 202.44 nm is formed, the zeta potential ranges from -26.58 ± -25.29 – -9.47 ± -8.87, showing a stable formulation, and the drug content ranges from 93.55 ± 2.13 – 97.45 ± 2.37. We optimized the P9 formulation to achieve a cumulative drug release of 98%. SEDDS formulation had an AUC of 195.371. This may be due to increased Paclitaxel's solubility and bioavailability in the systemic circulation, which increases AUC.

Summary & Conclusion: The experimental studies showed that, as surfactant levels increased, the viscosity increased significantly based on multiple regression analysis data. A reduction in emulsification time may also decrease Emulsion droplet sizes. As surfactant concentration increased, drug solubility improved, resulting in rapid drug release from the formulation.

Keywords: *Self-emulsification, 3^2 Factorial Design, Bioavailability, Lipophilicity, Solubility*

PSIT/OP01/0019

Utilizing Decision Trees for GMP Implementation and Quality Audit Readiness

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Introduction: Good Manufacturing Practices (GMP) encompass a set of standards and recommendations to produce pharmaceuticals and medical devices. These guidelines, established by regulatory agencies worldwide, including the U.S. Food & Drug Administration, Therapeutic Goods Administration, European Medicines Agency, Medicines and Health products Regulatory Agency, and International Council for Harmonisation, ensure the consistent production of high-quality products for the global population. Any step in the manufacturing process can introduce quality risks to the final product's integrity.

Aim & Objectives: The present review deals with the Problem Associated with the manufacturing of pharmaceutical products. How it is going to be rectify.

Method: The authors conducted an extensive survey and examination of numerous articles, magazines, newspapers, and conference proceedings sourced from various search engines, leading to a successful and comprehensive review.

Result: The Ishikawa diagram, often referred to as the "fishbone" diagram or "cause and effect" diagram, holds significant importance within quality management practices. Serving as a valuable method, this diagram facilitates the analysis of causes and effects pertaining to a specific problem requiring resolution. By systematically identifying and organizing numerous potential causes, the fishbone diagram aids in dissecting complex issues.

Utilizing the Ishikawa diagram can lend structure to brainstorming sessions, effectively categorizing ideas into meaningful groups. Its visual representation offers a clear and intuitive depiction of the root causes behind a given problem.

Summary & Conclusion: In the pharmaceutical field, the quality system carries unique importance, and within the realm of quality, risk management serves as a scientific and practical cornerstone for guiding decision-making. Through the utilization of methodologies like the Ishikawa diagram, risk ranking, and relations diagram, the root causes

of potential errors and risks inherent in pharmaceutical activities were methodically identified.

Keywords: *Good Manufacturing Practice, Quality risk, Quality audit, Training*

PSIT/OP01/0021

Self-Microemulsifying pellets, as a versatile approach in enhancement of solubility and therapeutic potential of Anti-Diabetic agent: formulation design and in vitro/in vivo evaluation

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Introduction: Diabetes is no longer a modern health concern; its well-established risks are globally recognized. Annual survey reports consistently demonstrate a significant rise in the number of individuals with diabetes worldwide.

Aim & Objectives: A novel self microemulsifying pellets (SMEP's) was developed with an aim to enhance the solubility of poorly aqueous soluble anti-diabetic drugs Rosigiltazone (RSG) & Gliclazide (GLZ) in order to acquire enhanced bioavailability.

Method: *In vitro* dissolution studies were conducted using Type II dissolution apparatus (Unites states pharmacopoeia) for comparison of solubility between marketed preparation of RSG and newly developed RSG loaded SMEP. Further, for *in-vivo* studies, Animals (Sprague dawley rats) were divided into 4 groups. Group 1 (non diabetic) and group 2-4 were generated streptozotocin induced diabetic model. Group 2 was administered with pure RSG, group 3 was administered with conventional marketed preparation of RSG and group 4 was administered with RSG loaded SMEP in diluted form. Blood glucose levels were monitored using digital glucometer.

Result: SMEP'S shown significant improvements in in-vitro release profiles of RSG in contrast to selected marketed preparation (tablet). Results of *in-vivo* studies furnished that SMEP's had shown marked decrease in blood glucose level and prolonged duration of action (up to 8hrs) in comparison to conventional marketed tablets and pure drugs.

Summary and Conclusion: Present study furnishes the utility of SMEP's as potential carrier for solubility of poorly aqueous drugs.

Keywords: *Rosiglitazone; chremophor ELP; Capryol 90; Transcutol HP; Bioavailability.*

PSIT/OP01/0022

Formulation and Optimization of Novel Lipidic Vesicles Encapsulating Topical Vasoconstrictor: A Potential Approach for the Prevention of Chemotherapy-Induced Alopecia in Patients of Cancer

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Introduction: Chemotherapy-induced alopecia (CIA) is one of the most frequent and feared adverse effect of cancer chemotherapy often underestimated by physicians which accounts for almost 65% cases for treatment withdrawal. The wide variety of chemotherapeutic drugs is associated with different degrees of alopecia.

Aim & Objective: The goal of the present research was the utilisation of RSM to examine the impact of various formulation variables on the ability of invasomes to enhance the drug permeation and sustained release of phenylephrine to deep dermal layers for management of Chemotherapy Induced Alopecia (CIA).

Methods: Phenylephrine-loaded invasomes were prepared using a rotatable three-level two-factor CCD. Further, invasomal dispersion was incorporated into hydrogel for sustained release for drug to deep dermal layers.

Result: The vesicle size of the prepared invasomes were found to be in range of 172

±3.2 nm to 435 ± 3.5 nm while entrapment efficiency was found to be in range of 52.5 % to 81.67 %. Statistical analysis revealed a significantly higher cumulative percent phenylephrine permeated from the optimized invasomal gel (158.52 ± 10.24 µg) relative to the gel formulation (63.01 ± 7.51 µg) ($p < 0.05$).

Summary & Conclusion: The results revealed that the developed invasomal formulation was able to deliver the drug to target site for a longer period of time at a constant rate fulfilling the aim of experimental study for CIA treatment.

Keywords: *Chemotherapy, adverse effects, Chemotherapy induced alopecia, invasome, permeation*

PSIT/OP01/0024

Hepatoprotective evaluation of *Bixa orellana* L. shells extract against acute ethanol-induced hepatotoxicity in rats

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Introduction: Medicinal herbs and traditional medicines have been used in our country since pre-Hispanic times and are significantly effective against a large variety of liver disorders. *Bixa orellana* is one of the herbal drugs used traditionally for fever, buccal tumors, antiseptic, antibacterial, and different types of hepatic ailments.

Aim & Objectives: To investigate the hepatoprotective activity of *Bixa orellana* L. (BO) shell extract against acute ethanol-induced hepatotoxicity in rats.

Method: The characterization of BO seed extract was performed using standard biochemical analysis. 50% ethanolic extract of *Bixa orellana* (BOE 200 and 400 mg/kg body weight) was administered daily for 8 days in experimental animals for the assessment of hepatoprotective activity. To develop hepatotoxicity, animals were orally administered with alcohol (40%) 12 ml/kg at 2 h after the doses of BOE every day for eight consecutive days except the rats of normal group. The hepatoprotective activity was assessed using various biochemical parameters like aspartate aminotransferase, alanine aminotransferase, alkaline phosphatise, Bilirubin, albumin, Cholesterol and lactate dehydrogenase.

Result: The results demonstrated that the treatment with Bixa orellana seed extract significantly ($P<0.05$-$P<0.001$) and dose-dependently prevented alcohol-induced increase in serum levels of hepatic enzymes such as AST, ALT, ALP, BIL, ALB, CHL and LDH. Histopathological study further attenuated the hepatocellular necrosis and led to reduction in inflammatory cells infiltration.

Summary & Conclusion: The present study concludes and suggests that *Bixa orellana* seed extract significantly protected the liver from alcohol induced toxicity. It also showed that the extract contains numerous antioxidant compounds with hepatoprotective effect.

Keywords: *Antioxidant; Bixa orellana; ethanol; hepatotoxicity; hepatocellular necrosis; inflammation.*

PSIT/OP01/0025

Preparation and Characterization of dithranol loaded solid lipid nanoparticles using various process variables and chemical compositions for optimized drug release.

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Introduction: The aim of the present work is to prepare and characterise dithranol-loaded Solid Lipid Nanoparticles for effective treatment of psoriasis.
Aim & Objectives: For the preparation of solid lipid nanoparticles biocompatible lipid tristearin, cholesterol and soya phosphatidylcholine were used. The SLNs were stabilized by using stearic stabilizer tyloxapol. SLN was prepared using simple melt dispersion technique using self-invented hot lipid injector.
Method: Dithranol is highly lipophilic in nature and more soluble in tristearin than cholesterol and hence SLN were prepared using hot dispersion method. Initial cholesterol inclusion helped filling minute gaps in lipid matrix but further increases in cholesterol ratio resulted in reduction of lipid quantity used for drug dispersion and hence decrease in drug entrapment efficiency.
Result: Highest entrapment efficiency of 88.7±2.3 with 45.2 % drug loading was observed for SLN_{ch7} with lipid cholesterol ratio 9.3:0.7. The % cumulative drug release for initial first hour was 4.86±0.4. A faster release pattern was observed up to 7 hours with 14.84±2.1% cumulative drug release. SLN prepared from simple melt dispersion techniques provided bi-phasic release pattern. After this initial faster release SLN showed a slower release of 24.46±2.3% when studied for 24 hours.
Summary & Conclusion: It can be concluded from the studies that dithranol loaded SLN can be successfully used for the effective treatment of psoriasis. It is highly effective in reducing various demerits of dithranol.
Keywords: *Dithranol, Psoriasis, Solid Lipid Nanoparticles, Topical Drug Delivery System, Drug Efficiency.*

PSIT/OP01/0026

Folic acid conjugated navigated silver nanoparticles for management of Rheumatoid Arthritis

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Introduction: Rheumatoid arthritis (RA) is an autoimmune disease characterized by chronic inflammatory synovitis leading to joint destruction and systemic bone loss. The inflammation-induced bone loss is mediated by increase in secretion of proinflammatory cytokines.
Aim & Objectives: The main aim of the current research was to develop a folic acid (FA) modified silver nanoparticles (AgNPs) to deliver dexamethasone sodium phosphate (DSP) for the treatment of RA. DSP is a glucocorticoid (GC) of choice in RA therapy but limited by the poor pharmacokinetics and dose dependent side effects.
Method: The targetability of DSP was determined by in-silico study with docking scores ≤ 5 for IL-18, COX-2, and MMP-9. DSP loaded folic acid modified AgNPs (FA-DSP-AgNPs) were prepared by chemical reduction method which is further characterized for its size and zeta potential. Arthritic activity has been analyzed in Adjuvant-induced Arthritis (AIA).
Result: The nanoparticles obtained were of less than 200 nm, with higher loading efficacy and excellent stability. The in-vitro drug release from nanoparticles followed non-Fickian diffusion mechanism. The pharmacodynamic studies in the AIA model show a significant reduction in arthritic score paw thickness, and inflammatory cytokines level in the serum.
Summary & Conclusion: Adverse effects evaluation studies demonstrated a significant reduction in the associated undesirable effects on blood glucose level, body weight, renal impairment, and hematological abnormalities compared to DSP and Ag-Nps. These results recommended that FA-DSP-AgNPs can be used as an efficient therapy for RA.

Keywords: *Rheumatoid arthritis, glucocorticoids, silver nanoparticles, Folic acid*

PSIT/OP01/0028

Formulation, Characterization and Optimization of Solid Lipid Nanoparticles Loaded Galantamine

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Introduction: Solid lipid nanoparticles (SLNs) are attracting the importance for drug developers due to their performance. The outcome of this research will lead to improvements in drug release and solubility of Galantamine for better therapeutic effect.
Aim & Objectives: This research aims to optimize the solid lipid nanoparticles using full factorial design to improve the delivery of Galantamine, which is used for the treatment of Alzheimer's disease (AD).
Methods: Four different methods were used to prepare solid lipid nanoparticles of Galantamine. Glyceryl monostearate (GMS) was used as a lipid; Compritol 888, tween 80, and span 40 were used as surfactants, co-surfactants, and stabilizers, respectively.
Result: SLNs were evaluated for zeta potential, particle size, polydispersity index, surface morphology, Fourier Transform Infrared Spectroscopy (FTIR), and another parameter. Entrapment efficiency and drug loading were also estimated. Solubility study of rivastigmine tartrate in different solid lipids as well as the *in-vitro* drug release was studies. The particle size of SLNs was found to range between 138.22± 0.01 nm and 172.79± 0.23 nm. The zeta potential of the optimized formulation was found to be in the -24 ± 0.01mV range, indicating a stable formulation. The Galantamine-SLNs showed significant retention in memory when compared with Galantamine solution (standard formulation) which may be attributed to the lipid nature and nanostructure of the delivery system that may probably result in more accumulation of drug in the brain to show better effect.
Summary & Conclusion: The current study concludes that the micro emulsion cooling technique is the best method for patient compliance and stability with all desired characteristics parameters.
Keywords: *Alzheimer' disease, Galantamine, Solid lipid nanoparticles, Micro emulsion cooling technique.*

PSIT/OP01/0032

Effect of compressional force and drug load on tramadol hydrochloride release from Al^{3+}/Ca^{2+} cross-linked carboxymethyl tara gum hydrogel matrix tablets

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Introduction: Release of drug from matrix tablets is dependent on several parameters. Tablet compressional force and drug load are the crucial factors which influences the drug release from matrix tablets.
Aim & Objectives: To investigate the effect of compressional force and drug load on tramadol hydrochloride release from Al^{3+}/Ca^{2+} cross-linked carboxymethyl tara gum hydrogel matrix tablets.
Method: Hydrogel matrix tablets were prepared by wet granulation method. The tablets were evaluated for its hardness, friability, weight variation, thickness, drug content, diffusion coefficient, mean dissolution times, and water penetration velocity. The swelling, erosion in-vitro drug release study was carried out in USP II dissolution apparatus at 75rpm in pH 1.2 for 2h and then in pH 7.4 till 12h. Swelling and drug release kinetics were also determined.

Result: The developed matrix tablets complied with IP limits for hardness, friability, weight variation, thickness, and drug content. Increase in compressional force of the matrix tablets decreased the diffusion coefficient, water penetration velocity, swelling, erosion and porosity of the matrix, which resulted in slower drug release. Increase in drug load increased the concentration gradient and thus diffusion of drug from the matrix, which resulted in faster drug release. In-vitro drug release kinetics followed fickian diffusion model.

Summary & Conclusion: Compressional force and drug load plays an important role on drug release behaviour from matrix tablets. By optimizing such factors, we can get the desired drug release pattern from the matrix tablets.

Keywords: *Compressional force, drug load, in-vitro drug release, matrix tablets.*

PSIT/OP01/0033

UV Spectrophotometric Method for simultaneous estimation of Lignocaine Hydrochloride, Metronidazole, And Chlorohexidine in Pharmaceutical Dosage Form

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Introduction: The field of pharmaceutical analysis demands precise and reliable methods for the quantitative determination of active ingredients in various formulations. Lignocaine Hydrochloride, Metronidazole, and Chlorohexidine are commonly used drugs, often found in combination in pharmaceutical gel formulations. Developing an accurate and efficient method for their simultaneous estimation is essential for quality control and regulatory compliance.

Aim and Objective: The primary aim of this research is to establish a UV spectrophotometric method for the simultaneous estimation of Lignocaine Hydrochloride, Metronidazole, and Chlorohexidine in a pharmaceutical gel formulation. The objective is to design a robust analytical technique that provides accurate and reproducible results for the quantification of these three drugs.

Method: The developed method employs the simultaneous equation approach, utilizing the UV absorbance properties of Lignocaine (LIG), Metronidazole (MET), and Chlorohexidine (CHL). The UV absorbance maxima for each drug were determined in a 50:50 mixture of acetonitrile and phosphate buffer (pH 6.8) at 242.5nm, 231nm, and 258nm, respectively.

Results: The proposed method demonstrates excellent linearity over the concentration ranges of 5-25 µg/mL for LIG, 6-30 µg/mL for MET, and 10-50 µg/mL for CHL, with correlation coefficients (r^2) of 0.99. The method's sensitivity is confirmed by satisfactory limit of detection (LOD) and limit of quantitation (LOQ) values. Validation of the method, following International Conference on Harmonisation (ICH) guidelines, showcases its precision and accuracy. The %RSD values for all validation parameters are below 2.0%, affirming the method's reliability. Application of the method to a pharmaceutical gel formulation was successful, and recovery studies yielded results within the 98-102% range, validating the accuracy of the method.

Summary & Conclusion: In conclusion, the developed UV spectrophotometric method provides a robust and accurate approach for the simultaneous estimation of Lignocaine Hydrochloride, Metronidazole, and Chlorohexidine in a pharmaceutical gel formulation. Its precision, accuracy, compliance with ICH guidelines, and ability to quantify these drugs make it a valuable analytical tool for quality control and assessment in the pharmaceutical industry. The method's successful application to bulk and combined dosage forms further support its suitability for routine analysis.

Keywords: *Simultaneous equation method, ICH guidelines, validation, LOD, LOQ.*

PSIT/OP01/0034

Formulation and evaluation of topical liposomal gel for Clotrimazole and Clove oil

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Introduction: To assist clotrimazole molecules in the skin layers, liposomal carriers, well known for their potential in topical drug administration, have been chosen. Superficial fungal infections (SFIs) are common cutaneous infections worldwide, affecting about 20% to 25% of the world's population, with an estimated lifetime risk of 10% to 20%.
Aim & Objectives: To investigate the antifungal activities of Clove bud oil by formulating it in liposome gel alone and in combination with Clotrimazole against Candida Species.
Method: The amount of cholesterol and Stearic acid were taken at threedifferent levels and liposomes were prepared using the thin film hydration technique. The formulated liposomes were characterized for Particle Size and Entrapment Efficiency. Gels containing liposomes (optimized batch) were prepared in Carbopol® 934 K and were characterized for rheology, spreadability, and permeation.
Result: The results of regression analysis revealed that Particle size and entrapment efficiency were dependent on the cholesterol and stearic acid concentration. The experimental study showed that a combination of Clotrimazole and Clove oil shows good antifungal activity against Candida Species
Summary & Conclusion: Liposomal dispersion and gels were found to increase skin permeation and deposition compared to control and marketed gel.
Keywords: *Clotrimazole, Clove oil, Liposomes Gel, Central Composite Design, Candida Species.*

PSIT/OP01/0035

Surface modified polymeric nanoparticles for enhancing drug delivery of Methotrexate in the brain by blocking efflux transporters

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Introduction: Methotrexate is a potent anticancer bioactive which is highly efflux-out by efflux transporter of brain. Poloxamer 407 was used as efflux transporter blocker which will results in increase drug concentration in the brain.
Aim & Objectives: The aim of the present study was to develop, optimize, and evaluate methotrexate containing poloxamer 407 coated solid lipid nanoparticles to enhance the concentration of drug in the brain.
Method: In the present work methotrexate loaded nanoparticles were formulated by the emulsification solvent evaporation technique. The full 3^2 factorial designs were employed for the determination of polymer and surfactant concentrations effects on different characters, where polymer and surfactant were two variables at three levels. The prepared nanoparticles were optimized and characterized for particle size, polydispersity, zeta potential, entrapment efficiency, scanning electron microscopy, percentage yield, in vitro drug release studies, and sterilization of solid lipid nanoparticles. For the delivery of a sufficient amount of methotrexate loaded nanoparticles in the brain, these were coated by using poloxamer 407 (1-2% of total suspension volume).
Result: The particle size was observed in the nano range and uniformity of particle size revealed by low PDI value. Thus F5 preparation showed the 192.2 nm particle sizes and its -19.10 mv zeta potential values suggested that it created adequate repulsive forces between the nanoparticles. The percentage entrapment efficiency was observed maximum (72.4%) for the F5 preparation. The

percentage yield of methotrexate loaded solid lipid nanoparticles was from 58.3 to 76.7% for different preparations (F1-F9). Drug content for different solid lipid nanoparticle preparations (F1-F9) was around 72%. The P-values for above-mentioned responses were found ≤ 0.05 which indicated that the model was significant.

Summary & Conclusion: Our primary findings demonstrate that the designed methotrexate containing PLGA solid lipid nanoparticles releasing the methotrexate for a longer period time. The designed preparation could be delivered sufficient amount of methotrexate in the brain. Based on findings, it is possible to exhibit coated solid lipid nanoparticles as a good carrier for the increased delivery of methotrexate.

Keywords: *Methotrexate, Cancer, Solid lipid nanoparticles, Optimization, Poloxamer 407*

PSIT/OP01/0038

Development and evaluation of solid lipid nanoparticles containing Clotrimazole and Eugenol

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Introduction: Clotrimazole (CLZ), an imidazole class of antifungal commonly used in the treatment of topical infections like athlete's foot, jock itch, ringworm, etc. CLZ is available in the form of gel to treat dermatologic conditions caused by fungi. Owing to low aqueous solubility, the theraputic efficacy of clotrimazole is limited and requires repetative topical application. This repetative use can be closlely linked with growing incidence of fungal resistance. The availble antifungal gels comprises of CLZ alone without any herbal antifungal component. It is recorded that Eugenol shows good antifungal actiity and has a great potential as bioactive antifungal compound.

Aim & Objectives: To investigate the antifungal activities of Eugenol by formulating it in SLN gel alone and in combination with CLZ against Candida Spp.

Method: The Hot High Shear Homogenization method was used to formulate CLZ loaded SLNs, which were further optimized by using Box-Behnken design utilizing design expert software. Solid state characterization and insilico molecular modelling studies were performed to examine drug-excipient compatibility. The impact of the CLZ-loaded SLNs and co-loaded SLNs with Eugenol were evaluated for in-vitro drug diffusion, antifungal activity, and rheology.

Result: The results of optimized batch show particle size of 245.4 ± 1.2 nm, Polydispersity Index 0.353 ± 1.4, Zeta Potential – 20 mV, % EE of 96.74 ± 0.5, with prolonged drug release.

Summary & Conclusion: The antifungal study against *C. albicans* revealed that the optimized formulation had better atifungal activity compared to pure drug and marketed gel conatining CLZ alone.

Keywords: *Solid Lipid Nanoparticles, Clotrimazole, Eugenol, Antifungal activity, Candida albicans.*

PSIT/OP01/0039

Systematic Development and Optimization of fast Dissolving Tablets of Antidepressant Drug Using QbD Approach

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Introduction: Tablets and capsules are one of the acceptable dosage forms but the major drawback associated with this dosage form is dysphasia or difficulty in swallowing. This problem led to the development of novel solid dosage forms such as Fast Dissolving Tablets that will disintegrate and dissolve rapidly in saliva without the need for drinking water.

Aim & Objectives: The aim of the work was to develop optimized fast-dissolving tablets of antidepressant drug, using "Quality by

Design".

Method: Central composite design was used to optimize the tablet formulation which was compressed by direct compression followed by sublimation technique with additive effect of super disintegrant. Independent variables i.e., super-disintegrants and sublimating agent effect at different concentrations were determined on various dependent variables like wetting time, disintegration time and drug release. The optimized batch developed after validation using overlay plot technique of design expert, passes all the physical evaluation of tablets, it passes the compatibility studies as shown by FTIR, XRD and DSC TGA.

Result: Tablet also shows 18.18 s wetting time, 19.94 s disintegration time and the drug release were found to be 85.9 % in 5m. The developed optimized formulation shows no significant changes during one month stability studies.

Summary & Conclusion: This present work results in a completion with the development of compressed tablets for vilazodone hydrochloride with high porosity that dissolve rapidly in mouth, and could be industrially feasible.

Keywords: *Antidepressant, Fast Dissolving Tablet, Sodium Starch Glycolate, Camphor, central composite design, Quality by Design.*

PSIT/OP01/0040

Optimization and formulation of nail lacquer containing Amorolfine Hydrochloride for the treatment of Nail Psoriasis

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Introduction: This dreadful disease is found in all parts of the world and is becoming a serious threat to mankind health. Herbal formulations are becoming popular now days particularly in the treatment of Type 2 diabetes.

Aim & Objectives: To optimize and development of a nail lacquer containing Amorolfine hydrochloride using a simple mixing method and the evaluation of several parameters.

Method: The nail polish was prepared by a simple mixing process using amorolfine HCl as an active pharmaceutical ingredient, Eudragit RL-100 as a polymer, salicylic acid as a penetration enhancer, PEG 400 as a film former, ethanol as a solvent system and water as a solvent system. Therefore, various parameters such as non-volatile content, water content, drying time, gloss and colour were evaluated.

Result: According to the data of BIS (Bureau of Indian Standards, IS 9445:1994), the result showed that the non-volatile content was 30%, the weight loss rate of the optimized formulation was less than 10% of the total film weight, the drying time was 120 seconds, which is ideal for the glaze efficiency, and the gloss and colour of the glaze were satisfactory.

Summary & Conclusion: The nail polish was formulated and evaluated based on its physical properties and the various parameters listed above, and formulation #4 gave satisfactory results with a non-volatile content of 30%, which is good by [Bureau of Indian Standard], a water content of 0.61% and a drying time of 120 seconds, which is within the acceptable range.he experimental study showed that a persistent and substantial decrease in the average blood glucose level of diabetic rats was observed for 28 days. PHF demonstrated substantial antidiabetic activity similar to the standard drug. The formulation will emerge as a possible mixture that may challenge the synthetic drug.

Keywords: *Nail Psoriasis, Nail lacquer, Polymer, Permeation enhancer, Bureau of Indian Standards.*

PSIT/OP01/0041

A Comparative Approach to Enhance Transdermal Permeability Of Naproxen Sodium through Physical and Chemical Methods

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Introduction: Naproxen Sodium (NS) is an anti-inflammatory drug. It works by reversibly inhibiting the both COX-I and COX-II enzymes. Oral administration of naproxen sodium is associated with various side effects like epigastric pain, heartburn, diarrhea, peptic ulcers and hepatic impairment. To obviate such problems it can be alternatively administered trhoughtransdemally with better therapeutic efficacy.

Aim & Objectives: To formulate transdermal matrix type patches of Naproxen Sodium (NS) and to evaluate its various charecteristics. Further to make to make a comparative study between the chemical and physical methods of enhancement of permeability.

Method: The matrix type transdermal patches of NS were prepared by solvent casting method. Various formulations using polymer hydroxy propyl methyl cellulose (HPMC E15) in different ratios with drug were prepared. Optimized patch was loaded with 1% v/v emu oil as chemical permeation enhancer and used for ex-vivo permeation study & bioavailability study.

Result: The prepared patches were characterized for various physicochemical parameters.The patch containing chemical enhancer exhibited a flux of 25.11µg/cm^2/h where as a considerable increase in flux (41.8 µg/cm^2/h) was noticed when iontophoretic transdermal transport of drug using acurrent density of 0.5 mA/cm^2 was applied to the same patch.The AUC values of NS transdermal patcheswith emu oil and iontophoresis shows 1.12 and 1.46 folds statistically significant increased in the bioavailability respectivelly as compared to oral route of administration.

Summary & Conclusion: The formulations containing emu oil was found to meet the required flux, but the formulations with iontophoresis were found to be significant with flux and AUC greater than patch containing chemical enhancer. This finding opines the superiority of iontophoretic drug delivery over chemical method.

Keywords: *Naproxen Sodium, iontophoresis, emu oil, Ex-vivo permeation, bioavailability.*

PSIT/OP01/0042

Fabrication and in vitro evaluation of Silk Fibroin-Folic Acid Decorated Paclitaxel and Hydroxyurea Nanostructured Lipid Carriers for Targeting Ovarian Cancer Cells: A double sword approach

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Introduction: Ovarian cancer (OC) is the most fatal gynecologic cancer, accounting for around 4% of cancer incidence globally. The conventional treatment plan for OC is systemic chemotherapy.

Aim and Objectives: In this study, to overcome the drawbacks of conventional chemotherapy, PTX-loaded NLCs (PTX NLCs) and hydroxyurea-loaded NLCs (HU NLCs) were prepared. Silk fibroin-folic acid conjugate was synthesized and decorated over these NLCs (SF-FA NLCs). These SF-FA NLCs were characterized and investigated as targeted drug delivery systems.

Methods: In vitro cell cytotoxicity studies, cell cycle arrest, apoptosis studies, and scratch assay were performed on SKOV-3 cell lines. These NLCs showed smaller particle sizes, with good entrapment efficiency and were spherical in shape. The drug release was in a sustained manner. These NLCs showed better cytotoxicity towards human ovarian cancer SKOV-3 cells when compared to pure paclitaxel. From flow cytometry cell cycle arrest, it was observed that the combination of these two drugs-loaded NLCs (PTX & HU SF-FA NLCs) significantly inhibited SKOV-3 cells at G0/G1 and S phases.

Results: Results from apoptosis studies revealed that these NLCs had better apoptotic

activity when compared to pure paclitaxel. Likewise, the nano-formulation had better inhibition of SKOV-3 cell proliferation compared to pure paclitaxel, which was confirmed from the scratch assay.

Summary and Conclusion: Thus, from these results, we conclude that PTX & HU SF-FA NLCs may be promising drug delivery platforms for delivering PTX and HU to ovarian cancer cells

Keywords: *Nanostructured Lipid Carriers, Silk Fibroin, Paclitaxel, Ovarian cancer, Targeting*

PSIT/OP01/0043

Quality by Design assisted development of Doxorubicin TPGS-Based Liposome(s)

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Introduction: An intriguing approach to enhance cancer treatment is the development of tumor-targeted Doxorubicin (DOX) loaded TPGS-based liposomal delivery systems that have been accomplished. Further, DOX-TPGS can enhance treatment efficacy and averting the emergence of drug resistance.

Aim & Objectives: The present investigation explored the anticancer potential of the DOX-TPGS-LIPO, adopting the quality by design (QbD) Box-Behnken Design (BBD) to optimize the formulation factors for the desired quality parameters.

Method: The liposomal formulations were developed by QbD assisted thin film hydration method. The characterization parameters included %EE, size, PDI, zeta-potential, in vitro MTT cytotoxicity assay, cellular uptake by fluorescence microscopy and FACS, ROS, and NF-κB protein expression on MDA-MB-231, TNBC cells.

Result: Developed liposomal formulations demonstrated nanometric vesicle size with desirable development characteristics, such as PDI and % EE and sustained release behavior. MTT assay investigation demonstrated that targeted DOX-TPGS-LIPO had better cytotoxicity and a clear synergistic impact over free drug and DOX-TPGS-LIPO. Higher cell internalization and ROS level were observed with targeted DOX-TPGS-LIPO Additionally, higher expression of NF-κB protein (a potential alternative mechanism for apoptosis) upon free DOX treatment. In contrast, the targeted DOX-TPGS-LIPO exhibits significantly lower NF-κB protein expression at the same DOX-TPGS-LIPO concentration.

Summary & Conclusion: Targeted TPGS-based DOX liposomes may be a valuable targeted nanocarrier for effective tumor treatment and would be a focal paradigm for upcoming research in cancer drug delivery.

Keywords: *TNBC, Liposome, targeting, Doxorubicin, Box-Behnken design, ROS assay, NF-κb.*

PSIT/OP01/0045

Herbal Topical preparations used for p. acne treatment

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Introduction: There are various infectious diseases in human skin, Acne is one of them. Due to presence of bacteria known as *Propiobacteriumacne* is highly responsible for acne vulgaris and it also produce excess sebum with follicular hyper-keratinization.

Aim and Objectives: According to the data obtained from study of acne patients, various factors are involved in acne production like genetic factors, androgens, inflammatory mediators of stress, hormonal changes and physiological factor.

Method: There are different herbal cosmetics present into market like herbal lotions, gels, creams to cure *p. acne.* These herbal products containing a variety of plant actives/extracts, that are highly effective against *Propionibacterium acne.* The presence of *p. acne* on skin causes redness and inflammation of skin.

Results: There is presence of many herbal products that contains plant extract with anti-

inflammatory and anti-bacterial property with no side effects.

Summary and conclusion: The present abstract provide an overview about the herbal plant with different formulations involved in treatment of acne. These herbal products containing a variety of plant actives/extracts, that are highly effective against Propionibacterium acne. The presence of p. acne on skin causes redness and inflammation of skin.

Keywords: *Acne, Herbal plants and formulations, Treatment of acne, Phytoconstituents*

PSIT/OP01/0048

Development of a novel formulation with an incorporation of *Peperomia pellucida (L.) Kunth* for burn wound healing applications

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Introduction: Burn wound is a type of injury to skin, or other tissue caused by heat, cold, electricity, chemicals, friction, or radiation. Nowadays the herbal formulations are becoming popular particularly in the treatment of burn wound healing in Assam.

Aim & Objectives: Development of a novel formulation from the extract of *Peperomia pellucida (L.) kunth*for burn wound healing applications. To assess the formulations effectiveness, a burn wound model was prepared and further experimentation includes conducting the wound healing study to ensure effectiveness.

Method: The plant was collected, identified, and extracted. Phytochemical, *in vitro,* and GC-MS analysis of the extract was performed. For additional study, a burn wound model was prepared and checked the healing properties.

Result: The macroscopic properties of the hydrogel formulation was evaluated. The pH values of AQ(F3) and Eth(F3) were discovered to be satisfactory. Drug loading was higher in AQ(F3) and Eth(F3), which is crucial for patient adherence to therapy.

Summary & Conclusion: The findings led to the conclusion that the incorporation of plant extract into the formulation to create a hydrogel was successful. In terms of pH, viscosity, spreadability, FT-IR, and drug loading, AQ(F3) and Eth(F3) performed well. Both formulations were therefore determined to be a potentially effective alternative for the treatment of burn wound healing applications.

Keywords: *P. pellucida, burn wound, formulation, wound healing*

PSIT/OP01/0049

A study on improved efficacy of an oral antihyperglycemic agent in presence of Aloe Vera and Green Tea as the Dietary Supplements Against Type 2 Diabetes

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Introduction: According to World Health Organization, Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves. The long-term effects of diabetes include damage to large and small blood vessels, which can lead to heart attack and stroke, and problems with the kidneys, eyes, feet and nerves. This idea is designed to retain the key principles of traditional medicine, thereby minimizing any adverse effects due to the usage of marketed oral antihyperglycemic agents with dietary supplements from natural source. This research aimed to evaluate the effect of antidiabetic activity of AV and GT use as a dietary supplement along with marketed oral antihyperglycemic agents.

Aim and Objectives: To evaluate the synergistic efficacy of dietary supplement as a treatment along with marketed oral

antihyperglycemic agents against type 2 diabetes.
Methods: To study the antidiabetic activity of formulations containing AV and GT against streptozotocin induce in rat's model. Body weight, Fasting Blood glucose level, Triglycerides, Total cholesterol, HDL-cholesterol, LDL-cholesterol, VLDL-cholesterol, SGPT, SGOT and Serum creatinine levels was estimated by the serum biochemical analysis.
Results: We found that AV juice and GT as a dietary supplement along with Metformin as a daily basis showed good efficacy and it will help to escape from Type 2 diabetes.
Summary & Conclusion: We got a more efficacious results in the combinational group (Inducer + AV + GT + Metformin).
Keywords: *Aloe vera, green tea, streptozotocin, Type 2 diabetes*

PSIT/OP01/0051

Development, Characterization, and Assessment of a Polymeric nanocarrier loaded with Ciprofloxacin HCl for the treatment of Biofilm-forming Ocular Infection

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Introduction: Nanotechnology is used in a variety of industries as a possible method to combat the biofilms created by microbes that result in antibiotic resistance. Polymeric nanoparticles, a type of nanocarrier, were also developed to pierce the biofilm and provide antibacterial action.
Aim and Objectives: The purpose of the current work was to create a polymeric nanoparticle (PNP) containing ciprofloxacin hydrochloride (Cip HCl), which can penetrate biofilms and deliver the medicine to the desired site, in order to address the problems with conventional eye drops.
Methods: To synthesize PNP, a modified ionic gelation approach using chitosan as the polymer and sodium tripolyphosphate (STPP) as the cross-linker was employed. The box-Behnken design was then applied to optimize the process. As independent factors, STPP, stirring rate, and chitosan content were all considered. Entrapment efficiency (EE), particle size (PS), and drug release (DR) were the dependent variables. Dynamic light scattering, X-ray diffraction, Fourier transform infrared spectroscopy, transmission electron microscopy, and in vitro drug release were used to evaluate the physical and morphological findings of optimized PNP.
Results: As a result, all of the observed responses were fitted with quadratic models. ANOVA, lack of fit, and R2 testing are used. It was discovered that the PS, EE, and DR of the optimized nanoparticle were 116.2 nm, 74.32%, and 78.28%, respectively. The production of spherical nanoparticles was verified by TEM.
Summary & Conclusion: According to the XRD Diffractogram, the medication is becoming amorphous. There is no interaction between Cip HCl and the formulation carriers, according to the IR Spectra. A sustained discharge is indicated by the release profile and Higuchi release kinetic model pattern.
Keywords: *Ciprofloxacin HCl, polymeric nanoparticles, biofilm, antimicrobial resistance, ocular infection*

PSIT/OP01/0052

Nanocomposite of emtricitabine in hydrophobically modified pullulan - an attempt to reduce the associated hepatotoxicity

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Introduction: Emtricitabine, an anti-HIV drug suffers from severe hepatotoxicity and lactic acidosis due to its high solubility.
Aim & Objectives: This research aims to attenuate the side effects of emtricitabine by modifying its solubility in a biocompatible

nanocomposite using hydrophobically modified pullulan (HMP).

Methods: HMP was synthesized using cholesterol, and succinic anhydride in a controlled chemical environment. FTIR and NMR studies were performed on the polymer. Nanocomposites of emtricitabine were prepared using thin film hydration technique. Six such formulations were prepared varying the drug-polymer ratio from 1:1 to 1:3 and incorporating span 20. Formulations were evaluated for drug entrapment, particle size, surface morphology, *in-vitro* and *ex-vivo* drug release, including liver histopathology andhaematological parameters estimation on mice. The best formulation was subjected to MTT assay on hepatic cell lines (HepG2).

Results: FTIR and NMR studies confirmed the formation of HMP. All formulations were found to be in the nano-size range and were further confirmed with TEM Study. The *in-vitro and ex-vivo* drug release profiles depicted those formulations with high polymer content controlled the release of the drug and followed Higuchi kinetics. Haematological parameters were found to be under control in the animals throughout the experimentation. A comparative histopathology study on the livers and MTT assay on hepatic cell lines revealed the safety of the best formulation over the solution of pure drug.

Summary & Conclusion: Hence it can be concluded that the nanocomposite of emtricitabine can be a promising mode of delivery to control the side effects of the medicine.

Keywords: *Emtricitabine, HIV, Nanocomposite, Modified Pullulan, Hepatotoxicity*

PSIT/OP01/0053

An *In vitro*/*In vivo* study on Polymeric Liposomes of Valsartan to improve its Oral Bioavailability

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Introduction: Valsartan, an antihypertensive agent, exhibits slow onset of action and low oral bioavailability from the usual conventional dosage forms.

Aim & Objectives: The study aimsto develop a biodegradable polymeric liposome of valsartan to formulate a sturdy and stable delivery of the drug and provide protection against chemicals, enzymes, immune systems, and efflux transporters.

Methods: The polymeric liposomes of valsartan were formulated with two polymers Eudragit RL100, and PEG4000, using modified thin film hydration method. Five such formulations were prepared varying the drug-polymer ratio from 8:5 to 8:35. The formulations were characterized for drug entrapment efficiency, particle size, surface morphology, *in vitro* and *ex vivo* diffusion studies, gastric stability studies, and *in vivo* pharmacokinetics on rodents.

Results: All formulations showed a particle size in the range 150 to 200 nm. Entrapment was found to be varied from 64 to 89 % and was affected by PEG concentration in the formulations. TEM study revealed that the vesicles were unilamellar and non-aggregated. The *in vitro* and *ex vivo* drug release studies showed a controlled release of drug over a period of 8 h, followed zero order kinetics and non-Fickian diffusion. The gastric stability study of the best formulation was established in simulated gastric fluid and fasted state simulated intestinal fluid. The *in vivo* pharmacokinetics of the best formulation exhibited improved pharmacokinetic parameters compared to the administration of the pure drug.

Summary & Conclusion: Hence it can be concluded that the polymeric liposomes could enhance the oral bioavailability of valsartan.

Keywords: *Valsartan, antihypertensive, Polymeric liposomes, Gastric stability, Bioavailability*

PSIT/OP01/0054

A study on anticancer activity of mesoporous nanoparticles of

Celecoxib-an In vitro and cytotoxic evaluation

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Introduction: Colorectal cancer is alarming worldwide and studies reported that celecoxib has opened new avenues for the potential efficacy against colorectal cancerous cells.
Aim & Objectives: The aim of the study is to explore mesoporous drug delivery system of celecoxib to improving anticancer activity by increasing its dissolution efficiency.
Methods: The drug loading into mesoporous silica syloid 244FP was carried out by solvent evaporation method taking 3 different ratios of the drug and silica. The formulations were evaluated for drug loading, particle size, SEM, FTIR, DSC, PXRD, BET analysis, and *in vitro* drug release study. The best formulation was subjected to MTT assay and AO/EB Staining studies on HCT 116 cancer cell lines.
Results: The particle size and drug loading of the formulations varied in the range of 250 to 339.5 nm, and 88.99% to 98.74% respectively. Dissolution efficiency of the formulations was improved as the drug loading was increased. The solid-state behaviour studies exhibited the compatibility and amorphization of the drug in the nanopores of silica and the same was further proved by SEM study. BET study manifested the increase in the specific surface area of the drug. The cytotoxicity study with AO/EB staining revealed that the drug-loaded mesoporous carriers resulted in a significant reduction in the number of viable cancer cells in comparison to the pure drug.
Summary & Conclusion: Hence it can be concluded that mesoporous nanoparticles of celecoxib can contribute to a significant increase in dissolution efficiency and hence anticancer activity.
Keywords: *Celecoxib, mesoporous silica, colon cancer, dissolution, nanoparticles*

PSIT/OP01/0055

Preclinical evaluation of wound healing activity of ointment containing leaf extract of Rhynchostylis retusa (L.) Blume

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Introduction: *Rhynchostylis retusa (L.) Blume* of the Orchidaceae family is widely used in North East India for treating wound. To validate the ethno therapeutic claims wound healing activity was studied.
Aim & Objectives: The study aimed to evaluate the wound healing activity of an ointment containing leaf extract of *Rhynchostylis retusa* (L.) Blume in rats. The ointment was formulated using two concentrations of the ethanol extract (5% and 10% w/w).
Methods: The pharmaceutical evaluation of the ointment included tests for viscosity, swelling index, skin permeability, and spreadability etc. Wound healing activity of the ointment was evaluated using a burn wound model.
Results: The results showed that all groups treated with the Rhynchostylis retusa leaf extract exhibited significant wound healing activity compared to the standard group treated with silver sulfadiazine (AgSD) ointment. Both the 5% and 10% ethanol extract-treated groups showed a significant improvement in wound contraction and epithelization time. Moreover, the breaking strength of the wounds was significantly enhanced in these groups.
Summary & Conclusion: Histological examination revealed well-organized epidermal layers and enhanced epithelization in the 5% and 10% (w/w) extract-treated groups, which was comparable to the standard treatment group. These findings underscore the potential efficacy of the *Rhynchostylis retusa* leaf extract ointment in promoting wound healing.
Keywords: *Rhynchostylis retusa, Leaf, Wound healing, Preclinical study*

PSIT/OP01/0058

Development and evaluation of nutraceutical powder for the management of dysmenorrhea

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Introduction: Myometrial contractions generated by prostaglandins cause dysmenorrhea. The uterine ischemia and sensitivity of afferent nerve fibres to painful stimuli are additional effects of prostaglandins. Nonsteroidal anti-inflammatories are useful medications. Prostaglandin synthesis inhibitors, or NSAIDs, work well for treating dysmenorrhea, although they may not be appropriate for people who have stomach ulcers or bronchospastic hypersensitivity to aspirin. Nausea, dyspepsia, diarrhoea, and occasional exhaustion are some of the side effects of these drugs.

Aim & Objectives: To develop and evaluate nutraceutical powder for the management of dysmenorrhea.

Methods: Nutraceutical powder was formulated by foam mat drying method with the use of commonly used fruits and vegetables. The developed powder formulation was evaluated with pre-formulation studies like the angle of repose, bulk density, tapped density, and Carr's index was performed.

Results: An effective formulation was prepared for the management of dysmenorrhea. Formulations were prepared by adding different concentrations of sucrose and salt and sensory analysis was done using a panel of female members. Different parameters like color, taste, odour, appearance, and overall acceptability are evaluated.

Summary & Conclusion: These nutraceuticals help the body fight cramps and pain associated with menstruation and alleviate these issues in the most calming and effective way possible. In this research project, nutraceutical powder having a breadth of micronutrients (magnesium, calcium, Vitamin E, Vitamin D, and Vitamin B6) is developed for managing dysmenorrhea.

Keywords: *Dysmenorrhea, micronutrients, nutraceutical powder, evaluation.*

PSIT/OP01/0060

Soft porous PDMS nanoparticles for shuttling impermeableβ-galactosidaseprotein across the cell membrane

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Introduction: Delivery of impermeable proteins into cells to address several severe disorders is challenging. In this regard, nanoformulations have gained a lot of interest to deliver these fragile cargos to the targeted site.

Aim & Objectives: To prepare the soft-porous- PDMS-NPs that enhance drug-loading, improve penetrability and allow the sustainable release of cargoes for intracellular delivery of Beta-galactosidase.

Methods: Synthesis of PDMS-NPs was done by sacrificial template-based synthesis. PDMS polymer are infiltrated into SCMS-silica-NPs & cross-linked. PDMS-NPs are formed by removal of silica template using HF-buffer & further loading enzyme post-synthesis.

Results: PDMS-NPs showed 3.5mU/µg β-gal loading, no cytotoxicity, efficient intracellular uptake, sustained release and marked decline in enzyme-substrate-level in diseased-cell-line & wild-type-mouse fibroblast. Further, comparative studies of two nanocarriers: β-gal-DS/PA-LBL-capsules and β-gal-PDMS-NPs, show relatively more fold-reduction in enzyme-substrate-level by β-gal-PDMS-NPs in diseased-cell-line as compare to β-gal-DS/PA-LBL-capsule.

Summary & Conclusion: The experimental study showed soft-porous-PDMS-NPs has better accessibility of cargoes into cells due to ultra-small size, the high payload owing to the mesoporous nature and improve pharmacokinetics of proteins by protecting against proteases. The efficiency of β-gal-PDMS-NPs for intracellular delivery of β-gal enzyme is more as compared to β-gal-DS/PA-LBL-capsules.

Keywords: *β-Galactosidase, PDMS, Porous Nanoparticles, soft nanoparticles.*

PSIT/OP01/0062

Double Phase Modified Release Suppository for Relieving Vaginal Pain and Infection: Preparation and In-Vitro Characterization

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Introduction: Majority of the cases of vaginal infection are due to fungal or yeast which is commonly encountered in clinical practices. Clinical manifestation of vaginal infection includes inflammation and associated pain

Aim & Objectives: In the present study, double phase modified release suppository containing sustained release ketorolac tromethamine (KT) matrix tablet and conventional release voriconazole (VCZ) suppository was formulated to complete treatments of infection and associated pain.

Methods: A 3^2 full factorial design was applied for optimization of matrix tablets. Carbopol 971P and HPMC K4M used as adhesive and Matrixing agents. Suppositories were prepared by molding method by using poloxamer 407 and 188 as suppository base. Modified release suppositories were evaluated with the pharma-technological parameter and anti-fungal activity.

Results: The optimized formulation of matrix tablet (batch F4) has shown 98.99% in vitro drug release at end of 12 hr and 1.8 swelling index at end of 6 hr. Adhesion force was found to be 1.0982 N. *Ex-vivo* permeation has revealed the percentage cumulative amount drug permeated for VCZ and KT were found to be 12.57% and 83.56% respective while drug retention was found to be 81.23% (VCZ) and 10.78% (KT). Stability study shows that there was no significant change in appearance and drug content.

Summary & Conclusion: The present research showed that the modified release suppository was considered as suitable formulation for sustained release ketorolac tromethamine and conventional release voriconazole for fast relief of inflammation and associated pain.

Keywords: *Voriconazole, Ketorolac tromethamine, Modified release suppository, Vaginal infection*

PSIT/OP01/0064

Spray drying: A technique to enhance the solubility of Manidipine HCl

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Introduction: Spray-drying is a quick, constant, economical, repeatable, and scalable method for turning fluid materials into dry powders by atomizing them using an atomizer in a hot drying gas medium, often air. Notable benefits of spray drying include improved bioavailability, solubility, stability, taste masking, modified release, cost-effectiveness and aseptic manufacturing.

Aim & Objectives: To formulate the Nano-crystals of the Antihypertensive Drug Manidipine HCl (MNH) to enhance its Solubility using the Spray drying technique.

Methods: Nano-crystals of Manidipine HCl were prepared using Spray Dryer B-90 (Büchi®). Ethanol was used as a solvent for dissolving the drug and excipients and then followed by Spray-drying. Using the design expert software, variables and critical evaluation parameters were

calculated and technical analysis was plotted using the response surface central composite model. With design designation as L9 (3^2), two different categories and three different levels, the central composite model gave a nine-run prototype development formulation (F1 to F9).

Results: Formulations F5, F6 and F8 have mean particle sizes between 180 to 400 nm. The original particle size of MNH before any processing was 14 ± 2 microns in size. The particle has significantly reduced from its original size by using the spray dryer method.

Summary & Conclusion: The experimental study showed that all the formulations had released above 65% implying a reduction in size of drug significantly and enhanced the solubility of MNH when compared to original drug, which had release less than 1% drug release. Prototype F6 has the maximum release within 120 mins 91.62%. It shows spray drying technique is the promising approach to enhance solubility of MNH.

Keywords: *Manidipine HCl (MNH), Spray drying, Solubility.*

PSIT/OP01/0065

Navigating Drug-drug Interaction in a Polypharmacy Era: Unraveling complex Pharmacology and toxicology Interphase

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Introduction: Polypharmacy, the concurrent use of several drugs, has become a popular method for treating difficult-to-treat medical diseases. Toxicological profiles and Pharmacological effects of co-administered medications may still be greatly impacted by their interaction, demanding a thorough study of these interactions.

Aim & Objectives: To thoroughly explore the complex mechanism of drug-drug interaction within the context of polypharmacy, providing light on their impact on pharmacology and toxicology for enhanced patient safety and therapeutic results.

1. Investigate the mechanism underlying drug-drug interaction and its influence on pharmacokinetics and pharmacodynamics.
2. Asses the potential for adverse effects and toxicity arising from drug-drug interaction.

Methods: A comprehensive review of recent drug-drug interaction research was carried out, emphasizing both experimental and clinical trials. The effects of medication combination on cellular pathways and physiological responses were studied using in-vitro and in-vivo models.

Results: The study reveals a complex interplay of pharmacological interactions with the potential for both beneficial synergy and heightened toxicity.

Summary & Conclusion: In an era where polypharmacy is increasingly common, understanding the intricate landscape of drug-drug interaction is paramount. By unravelling the underlying mechanism and assessing the potential for therapeutic synergy and toxicity, this research contributes to the development of safer and more effective regimens. The study emphasizes the necessity for a personalized approach to polypharmacy, taking into account both its possible therapeutic benefits and potential toxicological risks.

Keywords: *Drug-drug interaction, Polypharmacy, Therapeutic outcomes, drug combination, multi-drug regimens.*

PSIT/OP01/0066

Anticancer activities of green synthesized gold & silver nanoparticles using pomegranate and guava extracts

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Introduction: Nanotechnology is a rapidly growing field with diverse applications, especially in the production of nanoparticles. Nanoparticles possess unique properties due to

their small size and high surface-to-volume ratio, making them useful in various areas such as biosensing, catalysts, optics, antimicrobial activity and more. Researchers are exploring the use of natural and artificial methods to create nanoparticles, particularly metallic nanoparticles, for various purposes. Green-produced silver nanoparticles have demonstrated antibacterial, antioxidant, and anticancer capabilities.

Aim & Objectives: To Prepare and evaluate the anticancer efficacies of gold and silver nanoparticles using Pomegranate and Guava Extracts.

1. To prepare the pomegranate and guava extract.
2. To formulate Gold and Silver Nanoparticles using pomegranate and Guava.
3. To evaluate the nanoparticles using different characterization parameters.
4. To evaluate the Anticancer efficacies of the formulation.

Methods: Preparation of Pomegranate and guava extracts. Preparation of Gold and Silver Nanoparticles using hydrochloroauric acid and silver nitrate in different ratios. Evaluation of Gold and Silver Nanoparticles using Ultraviolet-Visible spectroscopy, X-ray diffraction spectroscopy (XRD), Scanning electron microscopy (SEM), Transmission electron microscopy (TEM) and Surface Plasma Resonance (SPR).

Results: The resulting work is proposed and it will be done within 6 months.

Summary & Conclusion: In this work, we addressed a green conflation employing a variety of practical, extensively accessible, and economically profitable factory excerpts. The creation of nanoparticles produced positive results, and the nanoparticles' size was estimable in terms of nano dimensions, which increases their appeal for amazing operations. While some of the synthesised nanoparticles' uses were examined in this work, further of their rates need to be taken advantage of for positive results.

Keywords: *Nanoparticles, Carcinogenic, Green Synthesis*.

PSIT/OP01/0067

Development of Anti-Tobacco Smokeless Product

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Introduction: Tobacco is the measure risk factor for many chronic diseases, including cancer, cardiovascular diseases and stroke. According to the Global Adult Tobacco Survey India 2016-17, nearly 267 million adults (15 years and above) in India (29% of all adult) are users of tobacco and nearly 1.35 million death every year.

Aim and Objectives: The primary objective was to create a product that delivers nicotine in a controlled manner while minimizing harmful chemicals typically associated with traditional smokeless tobacco. To develop a product that is cost-effective and free from carcinogenic agents and other hazardous agents.

Methods: Nicotine polacrilex is used as an alternative to nicotine in the formulation as an Active Pharmaceutical Ingredient (API) with various excipients. The Nicotine polacrilex enables the user to maintain the pleasurable benefits of nicotine so as to avoid withdrawal symptoms. The technology used are sieves, hot air oven, rotatory tablet punching machines, cutter mill.

Results: The formulation, sensory characteristics and safety consideration of medicinal product has been done. Examination is done on the potential impact of this alternative formulation on public health, tobacco cessation efforts and tobacco industry regulations.

Summary and Conclusion: The study shows the development and potential benefits of a

novel medicinal product designed to stimulate the experience of smokeless tobacco use while reducing health risks. Extensive research and testing were conducted to identify and select safe ingredients that could replicate oral sensation and flavours experienced by smokeless tobacco users.

Keywords: *Tobacco, formulation, smokeless, nicotine delivery, nicotine polacrilex*

PSIT/OP01/0070

Formulation and Characterization of Praziquantel-Loaded Ethosomes by Thin Film Hydration Method

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Introduction: Praziquantel is an anthelmintic drug, which has recently been repositioned in treating psoriasis and cancer. The use of Praziquantel is constrained by several drawbacks, including the high therapeutic dose required because of the drug's poor solubility and bioavailability.

Aim and Objectives: The objective of this study was to develop and characterize Praziquantel-loaded ethosomes to overcome the drawbacks associated with Praziquantel.

Methods: The thin film hydration method was used for the preparation of ethosomes. The optimization of the formulation was done using Box Behnken Design, which included three factors and three levels. Fifteen experimental batches were prepared by selecting independent variables like the amount of soya lecithin, cholesterol, and %v/v of ethanol. The prepared batches were characterized for Vesicle size, Polydispersity Index, Zeta potential, % Entrapment efficiency, and % Cumulative drug release.

Results: The optimized ethosomes possessed a vesicle size of 165.3 nm, a zeta potential of -38.5 mV, and an entrapment efficiency of 95.0%. Ethosomal dispersion showed a cumulative *in-vitro* release of 93.19% for 27 h.

Summary and Conclusion: The scanning electron micrographs of optimized ethosomes revealed an almost spherical shape of vesicles with a homogeneous distribution. The optimized formulation showed better stability, good entrapment efficiency, and cumulative *in-vitro* release kinetics followed the Korsmeyer–Peppas model, which showed sustained release. This work successfully formulated and characterized Praziquantel-loaded ethosomes.

Keywords: *Drug Repurposing, Ethosomes, Box Behnken-Design, Thin film Hydration method*

PSIT/OP01/0071

Formulation and evaluation of glimepiride microsphere by using emulsification solvent evaporation method

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Introduction: The use of oral anti-diabetic drugs for the treatment of Type 2 diabetes is increasing rapidly. Glimepiride second generation sulphonyl urea anti-diabetic drug is absorbed from GIT has short half-life and eliminated quickly from circulation of blood, so required frequent dosing. The process micro particulate drug delivery system is to provide the sustained and controlled delivery of drug for a long duration of time.

Aim & Objective: Formulation and evaluation of Glimepiride microsphere by using emulsification solvent evaporation method to develop Glimepiride microspheres for to reduce the dose frequency by developing prolonged drug release.

Methods: The microspheres were prepared by emulsification (o/w) solvent evaporation method using polymers such as ethyl cellulose and combination of ethyl cellulose and HPMC. Microspheres were characterized for the

micromeritic properties, drug entrapment efficiency.

Results: Glimepiride microspheres were successfully prepared by emulsification solvent evaporation method. It shows passable flow properties. The % yield obtained in all the formulation was good and ranges from 75.94 to 97.32%. On the basis of optical microscopy, the particle size ranges from (135±1.00) to (240±1.30) µm. The particle size of microspheres was improved when to improve the concentration of polymer.

Summary & Conclusion: Finally, it was concluded the in-vitro drug release study showed that drug release war more in case of formulation F7 containing both hydrophilic and hydrophobic polymers in ratio 1:1 as compare to other formulation.

Keywords: *Glimepiride, solvent evaporation method, emulsification, drug entrapment, microspheres.*

PSIT/OP01/0074

Pregabalin-Phospholipid Complex Nanoparticles for the Enhanced Treatment of Epilepsy by Intranasal Delivery: Optimization and Pharmacodynamics

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Introduction: Epilepsy is one of the most common neurological diseases, affecting approximately 70 million people worldwide. Nose-to-brain administration is the most effective method of delivering anti-epileptic drug pregabalin to target the brain because it bypasses circulation and overcomes the side effects associated with oral administration of pregabalin.

Aim & Objectives: In this study we investigated the formulation requirements of the pregabalin-phospholipid complex and its nanoparticles to enable its intranasal delivery for the enhanced treatment of epilepsy

Methods: Pregabalin-phospholipid complex nanoparticles (NPs) were developed using an emulsion solvent evaporation technique. The amount of phospholipid and chitosan were chosen as independent variables whereas particle size and entrapment efficiency were dependent variables selected for optimization. The optimized NPs were evaluated by SEM, DSC, XRD, ex-vivo bioadhesion and drug release studies. Antiepileptic studies were performed in Swiss albino mice.

Results: Developed nanoparticles appeared spherical in shape with even surfaces suitable for nasal administration. The release of pregabalin from nanoparticles was immediate, with a burst effect followed by sustained release, which could be due to polymer swelling and drug dissolution in the diffusion medium. It demonstrated 91.02 ± 1.2% bioadhesion potential. When compared to intraperitoneal administration of pregabalin, intranasal administration of pregabalin nanoparticles significantly delayed the onset of myoclonic jerk.

Summary & Conclusion: Pregabalin-phospholipid nanoparticles were successfully obtained with desired performance characteristics and *in vivo* efficacy. Thus, developed pregabalin NPs could be considered promising in the efficient treatment of epilepsy

Keywords: *Nanoparticles, Chitosan, Intranasal Drug Delivery, Epilepsy, Drug-Phospholipid Complex*

PSIT/OP01/0076

Development and characterization of novel drug delivery system for the management of migraine

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Introduction: Drug delivery (DD) can be defined as "the method and route by which an active pharmaceutical ingredient (API) is administered to promote its desired pharmacological effect and/or convenience, and/or to reduce adverse effects." One can

simplify it as "making drugs work better." The drug delivery system (DDS) is a "formulation or device that delivers an API in site-directed applications or provides timely (i.e., immediate, delayed, or sustained) release of the API.

Aim & Objectives: The rationale of this study is to design and evaluate the characteristics of Nanoparticles for intra-nasal delivery containing Frovatriptan Succinate to treat migraine.

In the present research work an attempt is made to develop a novel dosage form of intranasal brain-targeted nanoparticles using a biodegradable polymer have better bioavailability, quick onset of action and prevents first-pass metabolism.

Methods: Frovatriptan succinate, a serotonin 5-HT agonist, commonly used for migraine has erratic absorption. A 3^2factorial design (FD) was employed to formulate a nanoparticulate drug delivery system using PLGA. PLGA nanoparticles (NP) were prepared by the nanoprecipitation technique and characterized for particle size, zeta potential, surface morphology, entrapment efficiency and in vitro drug release.

Results: The particle size of the optimized formulation NPopt was found to be 236.1 nm ± 0.21 nm with an entrapment efficiency of 63.82 ± 0.643%. Zeta potential was found to be -30.3 mV. TEM studies indicated that the NPs were spherical with smooth surfaces.

Summary & Conclusion: It concluded on the basis of the above discussion that the optimized formulation of drug-loaded PLGA nanoparticles can be successfully prepared by the nanoprecipitation technique, and the sets of experiments can be reduced by using factorial design.

Keywords: *Migraine, nasal, triptan, drug delivery, absorption, nanoparticle.*

PSIT/OP01/0077

Catechin loaded pellets with enhanced antioxidant effect: design & characterization

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Introduction: Catechins are the primary natural flavonoids that possess potential therapeutic benefits mainly due to their excellent antioxidant activity. However, solubility and permeability concerns limit its bioavailability resulting in a marked decrease in antioxidant prospective and subsequent therapeutic effects.

Aim & Objectives: The objective of the present investigation was to design and optimize lipid-based floating multi-particulate of catechin, to increase its solubility, and to reduce *P*-Glycoprotein mediated efflux in the intestine hence improving oral bioavailability and its antioxidant effect.

Methods: Hydrophilic carriers Gelucire 44/14 and Gelucire 55/18 were used in different ratios to prepare solid dispersions. The resulting catechin solid dispersion was then transformed into sustain release gastro retentive floating pellets employing sodium bicarbonate and ethyl cellulose as gas former and matrix polymer, respectively, along with hydrophobic lipid carrier compritol 888 ATO as release retardant. Using a 3-level, 2-factor, factorial design, the effect of the amounts of compritol 888 ATO and sodium bicarbonate: ethyl cellulose was investigated.

Results: The aqueous solubility of catechin solid dispersion compared to the pure drug revealed a 5-fold improvement. The optimum system demonstrated 89.64±1.25% drug release in 8 hours and could float for longer than 8 hours. The relative bioavailability according to a pharmacokinetic study done on male Wistar rats of the optimized formulation was 2.5-fold higher than that of the commercial tablet with 2.95-fold enhancement in antioxidant potential.

Summary & Conclusion: The obtained catechin-loaded pellets with enhanced antioxidant effect could be effectively explored for its various potential pharmacological applications.

Keywords: *Catechin, gelucire, compritol 888 ATO, solid dispersion, lipid floating pellets.*

PSIT/OP01/0079

Compounds from *Curcuma longa* on neuroprotection targeting Acetylcholinesterase: An *Insilico* Approach

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Introduction: Neurological disorders, including Alzheimer's disease, Parkinson's disease, and dementia, pose significant challenges to global health. The search for effective therapeutic interventions to alleviate the symptoms and slow the progression of these disorders remains a critical area of research. Acetylcholinesterase (AChE) plays a vital role in the regulation of cholinergic neurotransmission and is a target for the treatment of neurological disorders.

Aim & Objectives: This research aimed to explore the binding affinities and interactions of *Curcuma longa* constituents with AChE using computational docking studies.

Methods: This study employed molecular docking to investigate how constituents in Curcuma longa interact with acetylcholinesterase (AChE). AChE regulates acetylcholine and inhibiting it is a potential strategy for neurodegenerative diseases. Using computational docking, the goal was to assess the binding and interactions between Curcuma longa compounds and AChE.

Results: Computational docking revealed promising interactions between Curcuma longa compounds and AChE. Several compounds showed strong binding affinities, interacting with key AChE residues. This suggests Curcuma longa compounds could inhibit AChE, offering the potential for neurodegenerative disorder treatments.

Summary & Conclusion: In summary, our study suggests that *Curcuma longa* constituents have the potential to inhibit AChE, making them possible candidates for treating neurodegenerative disorders. Further experiments are needed to validate and understand these interactions better, bringing us closer to innovative neurodegenerative disease therapies.

Keywords: *Neurodegenerative disorder, molecular docking, Alzheimer's disease, Therapeutic agents*

PSIT/OP01/0080

Development of Intranasal Nanoformulation of Unani Herb for the management of epilepsy

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Introduction: Epilepsy is a central nervous system disorder affecting nearly 50 million people worldwide. Our study is an effort to provide a cheaper and effective alternative to conventional epileptic medicine.

Aim & Objectives: To investigate the therapeutic efficacy and safety of an intranasal Unani drug formulation for the management of epilepsy

Method: Nanoformulation of Unani drug was prepared by aqueous titration method and characterized. The *in-vitro* drug diffusion and *ex-vivo* permeation study was conducted. The anti-epilepsy potential was evaluated followed by *ex-vivo* nasal mucosal toxicity test. Finally, the formulation was evaluated for stability at different temperature and humidity conditions as per ICH guidelines.

Result: Thenanoformulation with a particle size, PDI and zeta potential of 119.2 nm, 0.299 and -13.38 mV respectively were developed which was confirmed by TEM. The drug release and nasal permeation was 94% and 97% respectively in 240 min. A significant anti-epileptic activity in pentylenetetrazole induced epileptic model showed the effectiveness of the formulation. The

mucosal toxicity test showed that it is safe for use.

Summary & Conclusion: The study provedthat our in-house developed nano-formulation is safe and effective for the treatment of epilepsy.

Keywords: *Anti-epilepsy, drug delivery, intra-nasal, nanoformulation, unani drug*

PSIT/OP01/0081

Approaches in Novel Drug Delivery System (NDDS)

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Introduction: There are several limitations of the Conventional Drug Delivery System. In general, many pharmaceuticals, including peptides, proteins, antibodies, vaccines, and gene-based drugs, may not be given via conventional routes because they may be subject to enzymatic degradation, have low bioavailability, or have limited penetration of the intestinal mucosa.

Aim & Objectives: To investigate the various approaches used in Novel Drug Delivery System (NDDS) and to determine future prospects and applications of NDDS.

Method: Various types of NDDS were studied Microparticles, Nanoparticles, Inhaled Drug Delivery, Implantable Devices, Liposomes, Niosomes, Targeted Drug Delivery, Microneedle Patches, Transdermal drug delivery, Microencapsulation.

Result: The novel drug delivery systems offer unique advantages and challenges, and their applicability depends on factors such as specific drugs, intended therapeutic purposes, and patient preferences. The choice of drug delivery system often requires careful consideration of factors like drug stability, bioavailability, desired release profile, and patient convenience.

Summary & Conclusion: The abstract summarizes how the NDDS contributes to improving drug bioavailability, reducing side effects, and improving therapeutic results. The benefits and drawbacks of a novel drug delivery system are also covered.

Keywords: *Nanoparticles, Novel Drug Delivery System, Drug Delivery Systems, Targeted Drug Delivery.*

PSIT/OP01/0082

Optimization of Lipid Vesicular Systems of Naproxen Sodium through Box Behenken Factorial Design

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Introduction: Rheumatoid arthritis is a major cause of disability in older individuals NSAIDs like Naproxen sodium are an effective drug for treatment. The drawbacks associated with conventional carriers can be overcome by phospholipids-based drug delivery systems with high drug entrapment and penetration ability.

Aim & Objectives: To comparatively develop and statistically optimize lipid vesicles of Naproxen sodium by employing 3^3 factorial designs through the software Design Expert version 12 (Box–Behnken design).

Methods: The levels of the drug Naproxen sodium, Cholesterol and Span 80 (independent variables) were varied to study the influence on vesicle size and % entrapment efficiency (dependent variables) of Niosomes. For Transfersomes drug, phosphatidylcholine & span 80 were optimized and for Transethosomes the levels of phosphatidylcholine, ethanol & span 80 were selected as independent variables. Second-order quadratic polynomial equation, 2D and 3D contour plots represented the relationship between variables and desired response. The optimization process was carried out using desirability plots and Point prediction techniques,

Results: Optimized Niosomes showed vesicle sizes of 105.11 nm with entrapment efficiency of 74.23 %. Transfersomes and transethosomes showed vesicle sizes of 114.338 nm and 103.197

nm. While entrapment efficiency of 79.69 % & 86.62% respectively. High zeta potential values indicate the stability of the optimized formulation. ANOVA statistical results showed a significant difference ($P < 0.05$).

Summary & Conclusion: Optimized deformable vesicular formulations through Box Behenken factorial design can be a potential drug carrier for naproxen sodium dermal delivery with minimum vesicle size and efficient entrapment efficiency.

Keywords: *Naproxen sodium, Niosomes, Transfersomes, Transethosomes, Box Behenken design.*

PSIT/OP01/0083

The comparative study of different disintegrates that are used in orally fast-dissolving tablets of Ranitidine hydrochloride

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Introduction: The orally fast dissolving tablets (OFD) have the advantages, in the case of solid dosage form the stability and in the case of liquid dosage form the handling, ease of swallowing and absorption. Fast-dissolving tablets (FDTs) disintegrate rapidly and release the drug within a short period of time.

Aim & Objectives: To investigate the super disintegrates activities in the different formulations and select the disintegrates that have more fast dissolving activities in the oral frost dissolving tablets.

Methods: Dried fenugreek mucilage was collected, grounded, passed through sieve # 80 and stored at room temperature in desiccators. Each tablet containing 150 mg Ranitidine Hydrochloride were prepared by using the direct compression method.

Results: In the present investigation, Fast dissolving tablets of Ranitidine Hydrochloride were prepared by using natural super disintegrants. For comparison, tablets were also prepared by synthetic super disintegrants.

Summary & Conclusion: The present study was carried out to develop the fast-dissolving tablets of Ranitidine Hydrochloride by using various super disintegrants at different ratios in comparison with a natural disintegrant. It was found that the release rate was influenced by the nature of the super disintegrant and the concentration of the disintegrant employed in the preparation of the tablets. Hence, the in vitro drug release for the prepared formulations was found to be better than the marketed product.

Keywords: *Fast dissolving tablet, superdisintegrating, microcrystalline cellulose*.

PSIT/OP01/0086

Release of Ibuprofen from Stearic Acid Based Fusion Matrix

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Introduction: The number of approaches is being employed to deliver the drug in colon or large intestine by enteric coating and other techniques. The present study aims to develop a simple and practical method to achieve the same.

Aim & Objectives: The aim of the present study was to formulate Ibuprofen (IB) and Stearic Acid (SA) fusion matrix and investigate the release of Ibuprofen from the matrix in different pH environments.

Methods: The drug, Ibuprofen (Melting point 72°C) and Stearic Acid were added and mixed uniformely. The mixture was heated to 75°C to get fusion mass and mixed thoroughly. The molten mixture was poured into a suitable shaped container to get rod like shape after solidification of molten mass. The solidified mass was cutted into small segments to get Ibuprofen as 200mg in each tablet shped segment.

Results: The results showed that the matrix has poor release (1%) in acidic medium (pH 1.3), 3% release in pH 3.6 and 12% release in pH 7.2 after 4 hrs. On other hand in basic medium (at pH 10.2)

the matrix has complete release 99.97% within 30 minutes.

Summary & Conclusion: The stearic acid fusion matrix significantly decreased the rate of drug release as the pH decreases of the dissolution medium. This fact may be implemented to develop colon specific (Basic environmental) drug delivery for drug those are gastric irritant.

Keywords: *Release, fusion matrix, Ibuprofen.*

PSIT/OP01/0087

Contemporary trends and advancement using Electrospun Nanofibers

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Introduction: The primary concern of patient safety could be better achieved by novel drug delivery systems. The pharmacokinetic and bioavailability of therapeutic agent could be easily controlled in the global challenging diseases like neoplastic disease. Electrospun nanofiber is one of the emerging and promising technology for such drug delivery system because of drug-loading capabilities, controllable release, large surface to volume ratio, light weight porous structure, and the ability to manipulate nanofiber component for desired properties and functions. Therefore, electrospun nanofiber are the revolutionary tool for pharmaceutical and pharmacotherapeutics.

Aim and Objectives: To emphasize the ecofriendly and sustainable alternatives of drug delivery system.

Methods: Meta-analysis of literature on advancement and applications of nanofiber has been obtained from database like PubMed, MEDLINE, Science Direct, National library of medicine.

Results: The nanofibers manufacture by electrospinning have strong plasticity, flexible structure, large surface-volume ratio, which enhance the cell binding, proliferation, drug loading capacity and mass transfer processesmake remarkable attention in the field of biomedical application.

Summary & Conclusion: In the scenario of nanotechnology, electrospun nanofibers are present at the leading edge, diverse property establishes many applications in the field of electronics, filters, tissue engineering, wound dressing, and scaffolds. Versatile source of polymer for fabrication creates another opportunity towards green environment and improve biodegradability of pharmaceutical agent.

Keywords: *Electrospun, Nanofiber, Pharmacokinetic, Bioavailability*

PSIT/OP01/0089

Development of Sunscreen Cream Containing Melatonin and Curcumin

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Introduction: The exposure of skin to UV radiation causes erythema, the production of inflammatory mediators, the alteration of vascular response and immuno suppression, sunburn melanoma, cell carcinoma and different skin cancers.

Aim & Objectives: The aim was to prepare and evaluate a sunscreen cream containing curcumin, melatonin and zinc oxide with sun protection factor (SPF) and desired characteristic to protect the skin from the harmful substances arising from endogenous and exogenous sources from the UV radiation.

Method: Optimization done using full factorial design.

Result: As a result, the structural and functional characteristics of the cell is lost due to the oxidation of bio-molecules. The regulation pathway of skin is severely affected by the imbalance in the antioxidant level leading to photo aging and the development of skin cancer.

Summary & Conclusion: The possible strategy for preventing the photo aging and skin cancer is the application of natural photo-protectant with potential UV absorbing and reflecting capacity. In this sunscreen formulation melatonin, curcumin (natural photo protectants) and zinc oxide (physical barrier photo protectant) are used.

Keywords: *UV, Melatonin, Curcumin, Sun Protection Factor, Sunscreen, Cream.*

PSIT/OP01/0090

Formulation and evaluation of *Ficus benghalensis* loaded candy for toothache

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Introduction: People utilise plants regularly all around the world for the treatment and prevention of a wide range of illnesses. One abundant plant found in India is the banyan tree, *Ficus benghalensis* Linn. Dental and Oral hygiene is the primary factor of a human being to lead a healthy life. The aim of this study is to design *ficusbenghalensis* Linn. candy to improve patient oral health, toothache, and acceptability. *ficusbenghalensis* latex was collected from market for preparation of candy for toothache.

Aim & Objectives: The objective of this research is to create and test a toothache for oral uses uses that is comprised of natural ingredients. A local market was the source of the banyan tree(latex) (*ficusbenghalensis*), which wereSucrose, isomalt, glycerin, citric acid, menthol, peppermint, and β-Cyclodextrin were used as an analytical grade. The shape and size of candy can be used to dimensionally represent, monitor, and control candy property

Methods: Laboratory studies to establish the features of active substances and excipients that may influence and process design and performance is thus described as Pre-formulation investigation. Sucrose, isomalt, glycerin, citric acid, menthol, peppermint, and β-Cyclodextrin were used as an analytical grade. The shape and size of candy can be used to dimensionally represent, monitor, and control candy property and Identification of responsible group of analgesic activity in *Ficus benghalensis* latex by HPLC and IR.

Results: The total nine formulation of *Ficus benghalenis* were prepared. The candy prepared mainly consisted *Ficus benghalenis,* Latex, citric acid, methyl cellulose, glycerin, β-cyclodextrin, Isomalt in different ratios. The results were obtained during this project have inspired us to derive the conclusions. All the formulation that was prepared exhibited good physiochemical characteristics such as hardness, friability, weight variation, dissolution. Thus, formulationF1, F3, F6, & F8 depicted better result as compared to other formulation as they were flexible.

Summary & Conclusion: The current study is a great attempt to create a candy utilising readily available ingredients like banyan tree (*ficusbenghalensis*) Sucrose, isomalt, glycerin, citric acid, menthol, peppermint, and β-Cyclodextrin. It was claimed that the developed formulation had the qualities of oral uses and was physico-chemically stable.

Keywords: *Hygiene, Candy, Medicinal plant, Oral and dental diseases, Therapeutic*

PSIT/OP01/0091

Delivery of Combination drugs through nanoformulation for improved therapy against visceral leishmaniasis

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Introduction: Leishmaniasis is an infectious parasitic disease that is caused by protozoa of the genus Leishmania. Leishmaniasis is classified by the World Health Organization as a neglected tropical disease that is responsible for millions of deaths worldwide. Leishmania transmission primarily occurs by the bite of infected female sandflies

Aim and Objectives: The aim of the work was todevelop nanoparticles for effective delivery and selection of suitable drugs and polymers and to carry out compatibility study between drug and polymers. And to find antileishmanial activity of drugs for novel and effective treatment for leishmaniasis.
Methods: Amphotericin B containing nanoparticles (NP-AmB) were prepared by solvent evaporation method. Preparation and optimization of nanotechnology-based drug delivery system bearing AmB for Visceral Leishmaniasis.The optimization of nanoparticles formulation was done. The Entrapment efficiency was investigated in phosphate buffer (ph-7.4).
Results: A need to treat visceral leishmaniasis has led to pragmatic approaches favoring the assessment of combination therapy and repurposing of existing drugs. Nanoparticle was carried particle size 152.4±1.2 nm, polydispersity index 0.241±0.22 and zeta potential (-) 47.3±0.21mv. NP-AmB showed high entrapment efficiency of (79.55±3.41%).
Summary and Conclusion: The results obtained so far seem promising. Nanomedicine has proven effective in the development of various diagnostic tools with outstanding medicated delivery properties. Nanoparticle conjugated medicine have been examined as an alternative therapy with improved efficacy for the treatment of leishmaniasis.
Keywords: *Nanoparticles, leishmaniasis, Amphotericin B, Combination therapy*

PSIT/OP01/0100

Potential Plant-Based Medication Delivery Strategies for Diabetes Wounds: Innovative Approaches

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Introduction: One of the biggest health issues of the twenty-first century, diabetes is now the sixth-greatest cause of death and is projected to affect more than 642 million people by the year 2040. Type 1 (T1DM), Type 2 (T2DM), and gestational diabetes all have different aetiologies. Despite the availability of insulin and oral antidiabetics, all forms have been linked to acute and chronic difficulties as well as unintended side effects brought on by medication therapy.
Aim & Objectives: This study talks about how the phyto-DDS can transport phyto components and help increase the pharmacokinetics, bioavailability, and therapeutic action in the treatment of diabetes wounds.
Methods: Researchers have been compelled to look at a broad range of natural sources in order to uncover new molecules for treating illnesses because of the intense interest in producing novel therapeutics. Ethnopharmacology (i.e., the scientific study of substances used by ethnic and cultural groups as remedies) might be a good place to start. Researching how certain plants have been used traditionally can provide us with clues about their possible therapeutic benefits.
Results: Also, oral administration changes hepatic first-pass metabolism and enzymatic digestion, which reduces their bioavailability and, as a result, their effectiveness as a treatment. Scientists have used phytosomes, liposomes, polymeric nanoparticles, solid lipid nanoparticles (SLNs), nanocrystals, and self-emulsifying drug delivery systems (SEDDS) to make phyto-drug delivery systems (phyto-DDS). These systems help the phytoconstituents' physicochemical properties and offer protection in the gastric environment. In this study, it was shown that phyto-DDS can transport phyto-components and significantly improve pharmacokinetics, bioavailability, and therapeutic efficacy in the treatment of diabetes.
Summary & Conclusion: The collected information intends to update the researchers and scientists, which will be useful in giving them a perspective on how to comprehend the function and significance of plant-based ingredients for the management and treatment of wounds.

Keywords: *Phytosomes, Phyto-DDS, Bioavailability, Diabetes Wounds, Pharmacokinetics.*

PSIT/OP01/0101

Formulation and characterisation of gel containing antifungal drug for Onychomycosis

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Introduction: Onychomycosis is the medical term for nail infections brought on by any type of fungal infection, comprising yeasts, as well dermatophytes (such as Microsporum, Trichophyton, or various species), and non-dermatophyte moulds. Toenails grow more slowly than fingernails and are more susceptible to injury and infectious agents.
Aim & Objectives: Formulation and characterisation of gel containing antifungal drug for onychomycosis. Reducing the gastrointestinal side effects and to increase the permeability of the skin membrane.
Methods: Gels were prepared by using Voriconazole (%w/v) along with formulation additivesto attain the desirable quantities of the topical dosage forms. The optimisation of the formulations was done by using "Design Expert Software.
Results: The kinetics of the gel release follows zero order model. The pH of the gel was found to be in the range of 5.2-5.7. Spreadability of the gel was found to be 5.6g.cm/sec respectively. Consistency was found to be 5.4 mm. The formulation was found to be stable for nearly 90 days at 25°C. No significant changes were found and the predicted shelf life was found to be 357 days.
Summary & Conclusion: Present work was a satisfactory preliminary study in developing the topical gel of voriconazole for the treatment and management of onychomycosis. Further detailed investigations needed towards the clinical point to formulate the topical gel of voriconazole.

Keywords: *Onychomycosis, Optimisation, Spreadability, Dermatophytes, Permeability, Stability*

PSIT/OP01/0102

Formulation and evaluation of transdermal patches of *Nigella sativa* for the treatment of rheumatoid arthritis

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Introduction: Rheumatoid arthritis is a chronic, systemic, inflammatory autoimmune disorder causing symmetrical polyarthritis of large - small joints, typically presenting around the ages of 30-50 years.
Aim & Objectives: The Present research focused on the formulation and Evaluation of Transdermal Patches by using the herbal extract of *Nigella Sativa* for the treatment of Rheumatoid Arthritis.
Methods: Using the solvent casting method, transdermal patches were formulated by combining *Nigella sativa* extract with the same ratios of ethyl cellulose and Polyvinyl pyrrolidone.
Results: FT-IR data revealed no chemical and physical interaction between both the drug and excipients. Scanning electron microscopic images indicates agglomeration and accumulation in the matrices of transdermal patches caused by the extract of *Nigella sativa.* Ex-vivo permeation data confirmed that the percentage of drug release was in the range of between 70.67-and 98.19 respectively during the 6h study using skin tissue. Further, the skin irritation test on rat skin confirms that the transdermal patch of the extract was safe for application with no sign of redness and irritation. Finally, 90-day stability study confirmed the formulation's chemical and physical stability remained unchanged.
Summary & Conclusion: The research concludes that a formulated transdermal patch of *Nigella sativa* extract provided sustained transdermal delivery for prolonged periods,

hence appropriate for the treatment of Rheumatoid Arthritis.

Keywords: *Rheumatoid Arthritis, Nigella sativa extract, Transdermal patch, polymer, Transdermal delivery*

PSIT/OP01/0103

Formulation and development approaches using nano gel as a drug delivery system for the treatment of Tinea cruris

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Introduction: Tinea infections are among the most common dermatologic conditions throughout the world.

Aim & Objectives: The present research focused on the development and assessment of nanogel with the combination of Terbinafine and Hydrocortisone for the treatment of Tinea Cruris.

Methods: Method of preparation of Terbinafine and Hydrocortisone loaded Nanogel by Emulsion solvent diffusion method and incorporation of gelling agent to produce nanogel.

Results: The thermogram and FT-IR data revealed no chemical and physical interaction in between both the drug and excipients. Scanning electron microscopic images indicates the smooth surface morphology of the prepared nanogel structure. The ex-vivo permeation data confirmed that the percentage of drug release was in the range in between 81.77 to 97.40 and 60.75 to 85.67 for hydrocortisone and terbinafine respectively during 4 h time course study using skin tissue. Further, the skin irritation test on rat skin confirmed that the drug-loaded nanogel formulation was safe for application with no sign of toxicity. Finally, the 90-day stability study confirmed that nanogel formulations remained stable during the course of the study.

Summary & Conclusion: The research concludes that a developed drug-loaded nano gel formulation can be a good choice as a therapeutic and preventive application against tinea cruris.

Keywords: *Tinea Cruris, Terbinafine, Hydrocortisone, Nanogel, Formulation, Antifungal*

PSIT/OP01/0104

Chondroitin Sulphate Modified Silver Nanoparticle for the Delivery of Usnic Acid for Site Specific Targeting towards Breast Cancer Cells

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Introduction: The development of innovative nanomedicine platforms holds immense potential for enhancing cancer treatment efficacy while minimizing off-target effects.

Aim and Objectives: In the pursuit of enhanced breast cancer treatment strategies, this study presents a novel approach involving chondroitin sulfate-modified silver nanoparticles (CS-AgNPs) for the site-specific delivery of Usnic Acid (UA). By combining the unique properties of silver nanoparticles and the specificity of chondroitin sulfate, a sophisticated delivery system is engineered.

Methods: For this firstly, the 0.01 M silver nitrate ($AgNO_3$) solution was prepared. After that, the CS dispersion (5mg/mL) was prepared by dissolving 50 mg of CS in 10 mL of double distilled water. Subsequently, the CS–Ag NPs were synthesized by the reduction of Ag+ ions in an aqueous medium using CS as both a reducing and stabilizing agent. The CS was incubated with $AgNO_3$ to allow Ag+ to bind to the carboxyl group of the CS backbone, which is resulted in the solution immediately changing from colourless to yellowish brown, which indiacted the formation of CS-Ag NPs. Furthermore, 10 mL of UA dispersion(3mg/mL) was added for loading the UA in CS-Ag NPs and then centrifuged at 10000 rpm for 30 min to the synthesis of CS-Ag NPs-UA conjugate. which further measure

the FTIR, NMR, particles size and zeta potential, drug release, drug loading, MTT assay.

Results: The synthesized CS–AgNPs-UA nano-system possesses potent anticancer activity against breast cancer cells with all concentrations i.e., 20ug, 40ug, 80ug and 160ug. It also suggested being that the particles have a nanometric size range (82nm) with zeta potential (-13.2mV), and round/globular in shape as per AFM analysis. The system was also hemocompatible, and released the drug in a sustained manner with 97.87% for a prolonged time duration (96 hrs).

Summary & Conclusion: The overall findings suggested that the system could be a potent candidate for breast cancer targeting.

Keywords: *Chondroitin Sulphate, Usnic Acid, Silver Nanoparticles, Breast Cancer, Targeting, Drug Delivery*

PSIT/OP01/0105

Design and characterization of extended-release Ranolazine matrix Tablet

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Introduction: Approximately one quarter of the total global population is affected by at least any one form of the cardiovascular disease. Need to formulate ranolazine as extended-release dosage form for once or twice daily administration and maintained effective plasma concentration in blood.

Aim & Objectives: To formulate ranolazine ER tablets using various grades of eudragit in combination with HPMC and EC with various viscosity grades and to elucidate the release kinetics of ranolazine ER tablets from polymers.

Methods: Matrix tablet were prepared by wet granulation technique. Micromeritic studies performed. Conducting drug-excipient compatibility studies by physical observation Evaluation of developed formulations for various pre-compression and post-compression parameters. Determining *in vitro* drug release from the various formulations being developed as well as the optimized batch. Application of different drug release kinetic models to the different formulation. Stability studies performed.

Results: Compatibility study of ranolazine was studied by taking drug and all excipient. The tablets of different formulations & reference standard were evaluated. Similarity factor was calculated by comparison of optimized batch. In-vitro release with marketed product release profile. All the formulations were subjected to in-vitro dissolution studies.

Summary & Conclusion: In conclusion, a stable extended-release swellable matrix tablet formulation of Ranolazine was successfully developed. Developed product is less complex with regards to formulation components and processing aspects.

Keywords: *Extended release, matrix tablet, ranolazine, and Angina pectoris.*

PSIT/OP01/0106

Development and Characterization of Nano-fiber Patch for the Treatment of Glaucoma

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Introduction: Effective ocular drug delivery has remained an unmet challenge to date. Rapid elimination of conventional liquid eye drops is still an unsolved problem in ophthalmic drug delivery. Rapid and high tear turnover due to irritation caused by the drug itself, by the excipients may further elevate the precorneal losses. Administration of larger volume conventional eye drops also remains helpless to improve the drug bioavailability.

Aim & Objectives: The aim and objective of this study was to prepare a polymeric nano-fibre patch for the effective treatment of glaucoma using Timolol maleate and Dorzolamide hydrochloride as model drugs.

Methods: PVA and PCL (10% w/v) solutions were prepared in deionized water and a mixture of DMF and acetone (1:1 ratio) respectively. Timolol maleate (0.5% w/v) and dorzolamide hydrochloride (2% w/v) solutions were added to the homogeneous polymeric solution with constant stirring.

Results: The diameter of all nano-fibers was found to be in the range of 200–400 nm. The peaks were found to be concordant with functional groups present in the structure of respective polymers and drugs. We observed that the entrapment efficiency was found to be around 100% w/w (96.4 w/w for PVA nano-fiber and 95.2% w/ w PCL nano-fiber). The degree of swelling was found to be higher in the case of PVA nano-fibers compared to the PCL nano-fibers. In vitro release studies showed that the developed nano-fibres are capable of controlled drug delivery up to 24 h. There was an initial burst release of the drug followed by a controlled release.

Summary & Conclusion: In the present work biodegradable polymeric nano-fibers were successfully developed by using the electrospinning technique. The microscopic study indicated that the nano-fibres were uniform in diameter with smooth surfaces. We achieved very high (100%) entrapment efficiency. The developed formulation possesses very high mucoadhesive strength and thus can be retained for a longer period in the eyes. Moreover, the formulation is capable of maintaining the intraocular pressure for up to 72 h.

Keywords: *Nano-fiber patch, Intraocular pressure, Mucoadhesive strength, Draize test.*

PSIT/OP01/0107

In silico docking and toxicological studies of newer isoxazole derivative as metabotropic glutamate agonist

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Introduction: Neurodegenerative diseases are characterized by the progressive degeneration of neurons in the central nervous system (CNS). Alzheimer's disease, depression and Parkinson's disease are examples of common neurological diseases. Along with the mGlu1 receptor, the type 5 metabotropic glutamate receptor (mGlu5) is a member of the group 1 mGlu receptors. Even though mGlu1 and mGlu5 have been linked to neurodegenerative conditions

Aim & Objectives: To determine the Agonist activity of some novel isoxazole analogues against the Metabotropic Glutamate receptor 5 by *In Silico* docking and toxicological evaluation of the compounds.

Methods: The *in-silico* docking studies were performed by using various sites and software to predict bioactivity, binding affinity, ADME properties, Targeting and toxicological studies.

Results: Data obtained from the Docking and toxicity studies were compared with the data of the reference compound 2-Chloro-5-hydroxyphenylglycine which have been used as a standard compound showing anti-depressant action, as per the analysed data we found that the synthesised compound has more potential than the standard and the binding of compounds with receptor shows more affinity than the standard. The binding affinity of the newly synthesised compound was in the range of -6.1 to -7.7.

Summary & Conclusion: All the synthesised compounds were following Lipinski's rule of five. Docking studies reveal that novel synthesised compounds are better than standard drugs, toxicity studies were also predicted. 4f compound was found to have a therapeutic potential as compared to the standard drug and had low toxicity potential.

Keywords: *Isoxazole, Molecular Docking, Molecular modelling, Toxicity Prediction, Anti-depressant.*

PSIT/OP01/0108

Botanical poly essential oil-based cream development and evaluation of its repellant activity against mosquito bites

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Introduction: Recently the majority of commercially available insect repellents are synthetic, non-biodegradable compounds such as N, N-diethyl-3-methylbenzmide (DEET), di-methyl phthalate (DMP), and allethrin. The use of this synthetic repellant on a large scale may result in increased environmental exposure and unfavourable health effects. Therefore, natural products of plant origin are gaining popularity in response to growing public safety concerns.
Aim & Objectives: To develop mosquito-repellant botanical cream (o/w) using various combinations of essential oils such as Citronella oil, Neem oil, and eucalyptus oil.
Methods: The Ingredients were selected depending on how well they were getting emulsified. Initially prototype formulation of cream was prepared using different oil and water phases. Thereafter final components at different concentrations were selected and formulations were prepared to get the optimal consistency and characteristics
Results: A total of 7 batches (F1-F7) were prepared and evaluated for various parameters such as FTIR study, Physical properties of cream (Appearance, pH, Viscosity), Extrudability, Spreadability, Skin irritation study, Stability studies and Mosquito repellant activity. The FTIR study revealed that essential oils were compatible with other excipients used in cream formulation. All creams were white, smooth and soft in consistency; pH and viscosity were in acceptable range. Spreadability range was between 4.7±0.12-15.65±0.16, Extrudability ranged from 25±0.5 to 37±0.2, and none of the formulations showed skin irritation with specified area of application. The mosquito repellant potency of formulated batches was calculated on a percentage basis (61.66%-89%). On the basis of various evaluation parameters, F7 came forward as the best formulation with 89% mosquito repellant activity and good stability at room temperature
Summary & Conclusion: Essential oils have better repellent efficacy rather than other plant materials. However, single Oil contributes to poor longevity as mosquito repellents. Therefore, a combination of oils Citronella oil, Neem Oil and Eucalyptus oil are suitable to be used as a botanical mosquito repellent for protection against biting.
Keywords: *Repellant efficacy, non-biodegradable compounds, essential oil, cream, FTIR, public safety, stability.*

PSIT/OP01/0109

Development of floating drug delivery system of glibenclamide for type 2 diabetes mellitus

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Introduction: The sulphonyl urea glibenclamide inhibits ATP-sensitive K+ channels, which results in cell depolarization and insulin release. It is available in the form of tablet which is a conventional form of delivery and pass through first-past metabolism process, release the half drug from tablet does not fulfill the task to minimize the level of glucose in blood. Convectional dosage form shows several disadvantages and low bioavailability is one of them, so there is a need of novel delivery system which improves the bioavailability.
Aim & Objectives: The aim of this investigation is to develop, optimize, characterize, and evaluate glibenclamide loaded floating microsphere for type 2 diabetes.
Method: Floating microsphere develop by solvent evaporation method. Eudragit RS 100 is used as polymer which improves the release of drug, delivery system float on gastric fluid. Developed formulation evaluated by the following parameters such as micrometric properties, drug entrapment efficiency, particle size, zeta potential, surface morphology, differential scanning calorimetry, thermogravimetric analysis, in vitro buoyancy study, in vitro drug release and kinetic models.

Result: Glibenclamide was fabricated into the floating microsphere which improves the release the drug from delivery system. Developed formulations showed sustained release of glibenclamide from delivery system for 7hr, about 49.45% drug were released from the system.

Summary & Conclusion: Floating microsphere improves the delivery of drug with sustain drug release. It floats over the gastric fluid which prevent the hepatic metabolism and polymer controls the release of drug from the system.

Keywords: *Floating microsphere, glibenclamide, type 2 diabetes mellitus.*

PSIT/OP01/0110

Formulation and Evaluation of Polyherbal Oral Gel for Treatment of Mouth Ulcer using *Mimusops elengi L.* and *Acacia nilotica*

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Introduction: One of the most prevalent illnesses is a mouth ulcer, which can be caused by a number of etiological reasons. Mouth ulcers are painful, round or oval lesions that typically appear on the inner surfaces of one's cheeks or lips. The safest and less problematic treatments than synthetic drugs are natural ones, which are more widely accepted. Plants utilized for their therapeutic properties in herbal medicine that are frequently used to treat skin conditions are also known to have wound-healing, antifungal, antiviral, and antibacterial properties.

Aim & Objective: The purpose of the study was to create and assess a polyherbal oral gel for treatment of mouth ulcer using *Mimusops elengi* L. and *Acacia nilotica.*

Method: In the present study, plant extracts of *Acacia nilotica* leaves and *Mimusops elengi L.* bark was extracted using a hot extraction procedure, and phytochemicals screening was carried out. The hydroalcoholic extracts of *Acacia nilotica* leaves and *Mimusops elengi* L. bark was used in the formulation of polyherbal oral gel for the treatment of mouth ulcer using carbopol 934 as the gelling agent. Seven batches were formulated (F1 to F7). The produced formulations were evaluated for a number of variables.

Results: All formulations were subjected for evaluation of appearance, pH, spreadability, extrudability, viscosity, percentage of yield, homogeneity, gel strength, in-vitro antioxidant activity, in-vitro drug release and in vitro antifungal and antibacterial activity showed satisfactory results. The formulation F7, which contained both herbal extracts, had the best spreadability and most promising antibacterial efficacy equivalent to commercial gels.

Summary & Conclusion: It has been demonstrated that the formulated polyherbal gel formulations of *Mimusops elengi* L. and *Acacia nilotica* have significant therapeutic efficacy. The findings indicated that a new polyherbal gel formulation with good mucoadhesion activity was created using a combination dosage form, making it safe, stable, and effective for treating mouth ulcers.

Keywords: *Mouth Ulcer, polyherbal gel, Mimusops elengi L., Acacia nilotica, Carbopol 934, Mucoadhesion*

PSIT/OP01/0111

Formulation and Characterization of Gelatin Microsphere of Modafinil for Treatment of Narcolepsy

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Introduction: Modafinil is the Class II drug which is used for the treatment of narcolepsy. Excessive daytime sleepiness is a symptom of the sleep disorder narcolepsy. It results from a malfunction of the brain system that regulates waking and sleeping. Amphetamines have been replaced as the initial treatment for EDS with the novel drug modafinil. Modafinil is associated with poor aqueous solubility and

high hepatic first pass metabolism (i.e., 90%). In addition to this, high dose of modafinil is associated with many side effects such as headache, drowsiness, nausea, diarrhea, anxiety, etc.

Aim & Objectives: The goal of the current study was to create and evaluate microspheres that contained modafinil. As modafinil has many side effects and aqueous solubility is also very less, microsphere was formed to overcome these problems.

Method: Gelatin microspheres containing modafinil were created in the current investigation using an emulsification cross-linking process. Microspheres (FM-1, FM-2, FM-3, and FM-4) were created in four batches with varying medication and polymer concentrations. The prepared microspheres were evaluated for surface morphology, particle size, polydispersity index, entrapment efficiency and in-vitro drug release.

Result: Gelatin microsphere formulation containing 5% w/v gelatin concentration, cyclohexane and petroleum ether as an external phase, IP/EP ratio of 1:10, stirring time of 4 hours, alcohol concentration at 5% and stirring speed of 1000 rpm was concluded to be the optimized formulation, as it showed maximum drug entrapment and minimum cumulative percent drug release among all formulations. Drug release in formulations obeyed the Korsmeyer Peppas model which indicates that drug release is controlled by both drug diffusions and the dissolution or abrasion of the polymer matrix. i.e., a slow release in a controlled manner.

Summary & Conclusion: In the current work, an effort was made to create and evaluate gelatin microspheres containing modafinil in order to achieve controlled release at a specific location with the right duration of action. These microspheres of modafinil have great future prospects which show that it will reduce the side effects associated with modafinil and will also bypass the first pass metabolism of drug due to which more drug reaches to the target site. It will also reduce the dosing frequency of the drug due to its slow release of drug in controlled manner. Due to these benefits, it will increase the patient compliance.

Keywords: *Modafinil, Excessive Daytime Sleepiness, microspheres, emulsification cross-linking technique, In-vitro release*

PSIT/OP01/0501

Design and Delivery of Polyherbal Nano gel Formulation for treatment of Atopic dermatitis: A prevalent skin disease in children

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Introduction: Atopic dermatitis (AD), is a persistent, very itchy, inflammatory skin disease which significantly lowers quality of life and causes considerable morbidity. Various treatments are available in the global market, but it is the need of the hour to have an herbal formulation that can provide a good and sustainable solution to skin diseases.

Aim & Objectives: To formulate, optimize and evaluate polyherbal Nano gel containing *Allium sativum L* extract alone and in combination with *Aloe barbadensis M* for the treatment of Atopic dermatitis

Methods: Extracts from both the key components of the plants were made into the Nano gel using pluronic F- 127 polymers and evaluated for their actions in atopic dermatitis treatment. A complete formulation development has been done to produce the optimized Nano gel formulation using 3^2 factorial designs. The anti-dermatitis activity of optimized formulations was checked via in-vivo studies using DNFB induced Atopic dermatitis albino mice model.

Results: It was observed that developed formulations showed a significant reduction in ear inflammation and ear thickness after treatment for 7 days. The results were confirmed by histological examination of the ear samples.

Summary & Conclusion: It was concluded that results are encouraging which substantiate that optimized Nano gel formulations of *Allium*

sativum L in combination with *Aloe barbadensis M* showed better anti-atopic dermatitis, therefore it was safe, effective, and showed the potential way of formulating topical Nano gel for the treatment of Acne and Atopic dermatitis.

Keywords: *Polyherbal, Nano gel, atopic dermatitis, optimized formulations, Pleuronics, anti-dermatitis.*

PSIT/OP02/0001

Combinations of medicinal plants have antioxidant, anti-inflammatory, and anti-cancer effects in vitro.

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Introduction: The study of the phytochemistry of medicinal plants is rapidly gaining interest due to its numerous pharmacologic effects.

Aim & Objectives: To examine the antioxidant and anticancer characteristics of Clear Belong Plus extract (CBL-P), a combination of five traditional Chinese medicines (*Alpinia galanga*, *Piper nigrum, Citrus aurantifolia, Tiliacoratriandra*, and *Cannabis sativa*), is the aim of this study.

Methods: In this work, 90% ethanol was used to extract the dried-plant powder. Additionally, the antioxidative and anti-inflammatory properties of CBL-P were investigated utilizing DPPH and ABTS assays as well as Griess reaction-based nitric oxide assays.

Results: The findings showed that CBL-P demonstrated antimigration activity on four different cancer cell types (A549), NCI-H460, HCT116, and SW620) after 48 hours of incubation. The greatest effect was observed in A549 cells (10.23% of wound closure) and NCI-H460 cells (9.16% of wound closure) at the highest concentration tested (15 g/mL). The IC50 values for the DPPH and ABTS assays for CBL-P's antioxidant activity were 8.549 0.241 mg/mL and 2.673 0.437 mg/mL, respectively.

Summary & Conclusion: In conclusion, the mixture extract possessed antioxidant and anti-inflammatory activity. Furthermore, the mixture plant extract significantly exhibited antiproliferative and antimigration activities on SW620, HCT116, A549, and NCI-H460 cells ($P \leq 0.05$).

Keywords: *Antiproliferative activity, Antimigration, Alpinia galanga, Piper nigrum, Citrus aurantifolia, Tiliacoratriandra, Cannabis sativa*

PSIT/OP02/0002

Chalcones as Potential Antileishmanial Agents: Synthesis and Biological Evaluation

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Introduction: Leishmaniasis is a disease transmitted by the bite of *Leishmania*-infected female sand flies. This disease has been recognized as an increasing health problem worldwide by WHOan estimated 700000 to 1 million new cases occur annually. The discovery of new lead compounds for this disease is a pressing concern for global health programs.

Aim & Objectives: A series of chalcones with various structural features were synthesized and evaluated for their *in vitro* antileishmanial activity. Several of these compounds were found active in *in vitro* screening; a few of them were further evaluated for *in vivo* antileishmanial efficacy in *L. donovani*/hamster model.

Methods: The *in vivo* antileishmanial activity was determined in golden hamsters infected with MHOM/IN/80/Dd8 strain of *L. donovani*. Golden hamsters of both sexes were infected intracardially with $1x10^7$ amastigotes per animal. The intensity of infection in both, treated and untreated animals, and also the initial parasite count in treated animals was compared and the efficacy was expressed in terms of percentage inhibition.

Results: Many compounds exhibited potent *in vitro* activity (IC_{50} range from 1.70 to 8 µM) against extracellular promastigotes and intracellular amastigotes form of *L. donovani*. A few promising compounds were tested *in vivo* in a hamster model and showed exceptional

parasite inhibition at a dose of 50 mg/kg and 100 mg/kg dose.

Summary & Conclusion: A series of chalcone analogs with various structuralcharacteristics were prepared and tested for their antileishmanial activity. Among all, few derivatives were found to be significantly more active than the standard antileishmanial drugs, in *in vitro* evaluation. The *in vivo* studies of promising compounds were performed in a hamster model, in which the compound showed 83.32% parasite inhibition at a dose of 50 mg/kg for 10 days.

Keywords: *Chromenochalcones, Chromenodihydrochalcones, Antileishmanial, Leishmania donovani, Hamster model*

PSIT/OP02/0003

Computational Screening of Herbal Aphrodisiac Agent Targeting PDE5 Receptor

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Introduction: Venereal desire, less sexual potency, libido and dysfunction hinder healthy sexual life. The phosphodiesterase 5 (PDE5) receptor pathway in humans is responsible for the reduction of stress and to increase the libido, which directly regulates the sexual phenomena in humans.

Aim & Objectives: To screen the herbal agents for aphrodisiac activity and to target the PDE5 receptor to reduce or overcome the associated challenges with existing drugs.

Methods: Our work on this approach is to decipher the nature of herbal leads by targeting the concerned receptor through their computational screening. Although the screened leads or ligand, quercetin, catechin, ellagic acid, vanillin etc showed constant association in the active site of the PDE5 receptor as an aphrodisiac activity with fewer side effects. Further, the elected ligand was evaluated for compatibility by molecular dynamic simulation, pharmacokinetics profile, and toxicity profile.

Results: As a result, the in-silico molecular docking technique is a highly high-end advanced method for screening a prospective ligand molecule with respect to the specific bind target in the exploration of the drug development field.

Summary & Conclusion: By leveraging the power of computational design, we can accelerate the discovery and development of effective treatments for individuals experiencing sexual dysfunction.

Keywords: *Phosphodiesterase 5, Molecular docking, Stress, Libido, quercetin, herbal drugs*

PSIT/OP02/0004

In silico studies of some novel Imidazole Derivatives as α-glucosidase inhibition

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Introduction: Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Decreased glucose tolerance and diabetes are related to insulin resistance. Evaluation of **α** -glucosidase inhibitory activity of these imidazole derivatives revealed that most of them presented good **α** -glucosidase inhibition in-silico.

Aim & Objectives: In silico studies of some novel Imidazole Derivatives as α-glucosidase inhibition.

Methods: Molecular docking is an effective tool for investigating ligand-receptor interactions and for virtual screening, which plays a key role in rational drug design. Here, we describe the design of a new series of

Imidazole derivatives using molecular docking studies with the help of some software.
Results: Our efforts are dedicated to obtaining imidazole-containing analogues having the affinity for**α** -glucosidase as antidiabetics.
Summary & Conclusion: In this study, we described the design of a new series of Imidazole derivatives using molecular docking studies with the help of some software. Our efforts are dedicated to obtaining imidazole-containing analogues having an affinity for**α** -glucosidase as antidiabetics.

Keywords: *α-glucosidase, Imidazole derivatives, Diabetes, Insulin resistance, modern drug technology*

PSIT/OP02/0005

Evaluation of the antifungal potential of antiepileptic drugs: a repurposing approach

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Introduction: The available pharmacotherapy for the treatment of fungal infections is limited to drugs belonging to the category of azoles, allylamines, echinocandins etc. the fungal strain develops resistance towards these classes of drugs therefore here we have used a drug repurposing strategy by exploring available approved drugs and for validating new therapeutic benefits by using computational method.
Aim & Objectives: To validate the new antifungal drug potential we have used antiepileptic drugs in the present study to validate the new therapeutic potential using *insilico*tools and protein of interest.
Methods: The docking was done by the PRinS3 (Prescience *in silico* Solution Suite) version V 2.1.0. The application X-ESS used to run MD simulations was performed against humans lanosterol 14-alpha demethylase PDB ID:3LD6 and fungal protein lanosterol 14-alpha-demethylase PDB ID:5V5Z Further *in vitro* studies were performed by using fungal strains *Trichophyton rubrum*, *Microsporumcanis & Epidermophyton floccosum* and standard drugs Ketoconazole & Itraconazole used for comparative studies.
Results: The docking and MD simulations studies showed significant binding energy and stable ligand-protein complexes against both proteins. The MIC values are determined for the selected drug & standard drugs against desired fungal strains and results was compared with standard drugs.
Summary & Conclusion: *In-silico* & *In-vitro* studies showed that Phenytoin emerges as a potential antifungal drug and is used as an alternative drug against the common fungal strain.

Keywords: *Docking, Drug repurposing, Resistance, Minimum inhibitory concentration.*

PSIT/OP02/0006

Unleashing the Potential: Targeting PLK-1 as a Therapeutic Strategy for Triple-Negative Breast Cancer

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Introduction: Polo-like kinase 1 (PLK-1) member of serine/threonine kinases family is a crucial enzyme involved in the regulation of cell division and cell cycle progression. Triple-negative breast cancer (TNBC) is an aggressive subtype of breast cancer. Emerging research suggests that Polo-like kinase 1 (PLK-1) may serve as a potential therapeutic target for TNBC.

Aim & Objectives: Considering the emergence of new therapeutics against breast cancer, computational experiments were considered to design and develop new small molecule binders against PLK-1 enzyme.
Methods: The co-crystalline structure of PLK-1 was retrieved from the Protein Data Bank. After subsequent refinement, it was subjected to GIST calculation to identify thermodynamically stable waters present in the binding site. A pharmacophore model was developed to screen a large-scale chemical library and shortlist 2K ligands, which were then subjected to virtual screening using a validated docking protocol. Ligands with acceptable docking score and orientation were further studied through molecular dynamics analysis. The ligands with acceptable dynamic profiles, binding energy and 3D-RISM profile were then subjected to ADME screening and MPO processes.
Results: The shortlisted ligands that showed clashes with stable water were discarded. The top 5 ligands exhibited docking scores ranging from -11.0 to -8.6 KJ/Mol, with a crucial interaction profile, and were selected for molecular dynamics study. Each system demonstrated an average RMSD profile lower than that of the apo protein. A comparison of the RMSF, Rg, and SASA profiles with the dynamic profile of the apo protein, along with MMGBSA and 3D-RISM properties, strongly supports the acceptable PLK-1 binding profile of the identified hits. Based on the ADME profile, structural modifications were conducted using MPO to enhance drug-like properties.
Summary & Conclusion: Structure based drug design, thermodynamically stable water mapping and MPO approaches were implemented for the identification and validation of selective PLK-1 enzyme binders.
Keywords: *PLK-1, Triple-negative breast cancer, Targeted therapy, Mitotic catastrophe, Cheminformatics, Molecular modelling, Selective binders*

PSIT/OP02/0007

Synthesis, Characterization, Docking and Evaluation of *in vitro* Antitumor Activity of Novel 5-(4-bromophenyl)-1,3-oxazole derivatives

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Introduction: Breast cancer is one of the most common types of cancer in females. Aromatase is one of the important targets for drugs that interfere with production of estrogen in the treatment of estrogen receptor positive breast cancer.
Aim & Objectives: Novel aromatase inhibitors that can kill the growth of cancer cells selectively with minimal toxic effects on normal healthy cells is desirable.
Methods: Novel 5-(4-bromophenyl)-1,3-oxazole derivatives were synthesised, characterized and screened for biological effects in this study. The Auto Dock technique was used to dock a series of new 5-(4-bromophenyl)-1, 3-oxazole derivatives, OXL-1 to 6, to assess their aromatase inhibition. All of the derivatives were made using a flexible and convenient technique. The synthesised compounds were analysed using spectroscopic methods in order to establish their structures.
Results: A total of six compounds were produced and analysed in vitro for aromatase inhibitory action, with all derivatives investigated for cytotoxicity against breast cancer cell lines (MCF-7). Docking parameters showed that polar (M303, P429) and non-polar (A306, M311, F430, A443 and A307) residues were essential for interaction with the aromatase inhibitors.
Summary & Conclusion: Aromatase inhibitory activity of produced compounds was assessed with reference to the vehicle-treated control Letrozole (IC50 15.83µM). With an IC50 value of 16.8µM at 50% maximal inhibitory concentration, OXL-2 showed good inhibition. The in vitro cytotoxicity of oxazole derivatives was tested against MCF7 cell lines using Cisplatin (IC50 12.46µM) as a control. The compounds OXL-2, OXL-6, and OXL-3 showed significant

cytotoxic action, with IC50 values of 15.6, 18.43, and 21.4µM, respectively.

Keywords: *Aromatase, drug design, Auto Dock, Breast cancer, molecular docking, Cytotoxic activity, aromatase inhibitors.*

PSIT/OP02/0008

Computational studies, Synthesis and Biological Evaluation of Sulphamethoxazole Schiff Bases as Antimicrobial Agents

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Introduction: Schiff bases are considered to be versatile pharmacophores that can be utilized for designing and developing numerous bioactive lead compounds. These compounds are expected to possess antimicrobial activity, making them potentially useful for treating microbial infections.

Aim & Objective: In lighting of the issue of drug resistance, we have conducted computational studies, as well as synthesis and assessed the activity of sulphamethoxazole Schiff bases as possible antimicrobial agents

Methods: New Schiff bases were synthesized by condensing sulphamethoxazole and substituted acetophenones, and their antimicrobial activity was evaluated. The synthesis involved reacting sulphamethoxazole with substituted acetophenones in methanol in the presence of glacial acetic acid (Scheme 1). The synthesized compounds were characterized using various techniques such as TLC, melting point analysis, IR, NMR, and mass spectrometry. The computational properties of the compound were also assessed using online software programs. The antimicrobial activity of the target compound was tested against *Bacillus subtilis* (Gram-positive), *Escherichia coli* (Gram-negative), and *Candida albicans.*

Results: The sulphamethoxazole Schiff bases showed antimicrobial potential in *Bacillus Subtilis, E. Coli* and *Candida albicans.*

Summary & Conclusion: Among the tested compounds, the one containing the chloro group demonstrated the highest potency in comparison to the standard drugs.

Keywords: *Schiff Base; Sulphamethoxazole; Acetophenones; Antimicrobial Activity.*

PSIT/OP02/0009

Molecular Docking of Various Chalcone Analogus for their Antihyperlipidemic Activity Using MolegrowA Free Avilable Tool

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Introduction: A high quantity of fat particles (lipids) in the blood is a disorder known as hyperlipidemia. Antihyperlipidemic drugs work to enhance HDL cholesterol, while others work to lower triglyceride levels and low-density lipoprotein cholesterol levels.

Aim & Objectives: In the current work, molecular docking was performed over many substituted chalcone analogues as the anti-hyperlipidemic drug in this study using the Molegro virtual docker program, to analyse the binding pattern and affinity towards the selected proteins responsible for the lipid metabolism/ lipid utilization for selected analogues.

Method: The Protein Data Bank database was used to download and verify the protein structures of the chosen targets. Using Molegro virtual docker 6.0, the target was optimized and prepared. ChemDraw 8.0 was used to create the two-dimensional (2D) and (3D) structures of the ligands. All receptors' protein structures were retrieved from the RCSB Protein Data Bank.

Result: The re-rank score was suggested to compare binding affinities, according to the literature. The cutoff score for this software was set at -60 AU.

Summary & Conclusion: The 650 ligands of chalcone derivatives successfully demonstrated high binding affinity towards the selected protein, Squalene synthase catalyzes, farnesoid X receptor, (PPARs) alpha, (PPARs) delta, and lanosterol 14alpha-demethylase. These ligands exhibited strong affinities for the target: 444, 419, 380, 366, and 234. In future we can design and synthesis some new and less toxic molecules using this docking results.

Keywords: *Molegro Virtual Docker, RCSB, HDL, 3D structure*

PSIT/OP02/0010

HPLC Method Development & Validation for Estimation of Bisoprolol &Hydrochlorthiazide

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Introduction: Bisoprolol &Hydrochlorthiazide are antihypertensive drugs. They act by reduction of heart rate, cardiac output, systolic & diastolic blood pressure. The goal of present work was planned to develop accurate, precise specific & reproducible.

Aim & Objectives: To develop a simple, accurate and economical RP-HPLC method for the estimation of Bisoprolol &Hydrochlorthiazide and to validate the proposed method in accordance with ICH guidelines.

Methods: Mobile Phase: It was prepared by mixing Acetonitrile: Phosphate buffer PH3 (60:40 v/v) flow rate was 1.5 min/ml. The HPLC analysis used a reversed phase C_{18} (250mm x 4.5mm) column a reverse phase high performance liquid chromatography method has been developed and validated by Bisoprolol & Hydrochlorthiazide.

Results: The method was validated according to the regulatory guidelines with respect to precision, accurate, linearity & limit of detection (LOD) & limit of quantification (LOQ). The percentage RSD for precision & accuracy of the method was found to be less than 2%. The method was found to be linear.

Summary & Conclusion: The proposed RP-HPLC method was simple, sensitive and reliable with good precision and accuracy. This method was specific by estimating the commercial and other additives. Hence this method can be used for the estimation of Bisoprolol &Hydrochlorthiazide in bulk samples and their pharmaceutical formulations, individually and in combination by simultaneously estimation method.

Keywords: *Bisoprolol, Hydrochlorthiazide, HPLC validated.*

PSIT/OP02/0012

Phytochemical investigation of Dikamli gum-resin

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Introduction: The gum resin obtained from the leaf buds of *Gardenia gummifera* is called Dikamali gum. The resin exudes from the leaf buds in the form of yellow-coloured tears. The resin obtained from *G. gummifera* and *G. lucida* is called by the same vernacular name 'Dikamali'. The genus *Gardenia* belongs to the family Rubiaceae and consists of 80 species. Gardenia gummifera gum resin is obtained from the leaf buds of *Gardenia gummifera,* belonging to the family Rubiaceae. It has an offensive odour and a sharp pungent taste. Both the plants, G. *lucida and G. gummifera*, as well as their gum resins are called by the common name Dikamali.

Aim & Objective: Source of "Dikamali" is from *Gardenia lucida* or *Gardenia gummifera*, and confirmed by using thorough studies with Thin Layer Chromatography (TLC), Colum Chromatography, HPLC, UV, IR and NMR study.

Method: The Dikamali market sample were purchased from different part of India, i.e., Delhi, Kolkata, Bangalore, Chennai, Hyderabad and Warangal. *Gardenia lucida* and *Gardenia gummifera* plants were collected from Eturunagaram forest. The plants were authenticated by Prof.V.S. Raju Department of Botany, Kakatiya University, Warangal, Telangana. Chemicals were procured from Aldrich, TLC from Merck, HPLC is Shimadzu etc.

Results: In the investigations on the Dikamali market sample in our laboratory led to the isolation of some novel cycloartanes. TLC study of Dikamali market sample, *G. lucida*, *G. gummifera* resin revealed that Dikamali market sample is closely related to *G. lucida* and it is (Dikamali market sample) showing difference with G. *gummifera* resin.

Summary & Conclusion: Present study is extraction of the *G. gummifera* resin with benzene yielded the maximum extractive (78.3% w/w), the acetone (3.66% w/w) and alcohol (3.5% w/w) extracts are not much in quantity. All the three extracts gave a pink colour in shinoda test and a blue colour with ferric chloride indicating the presence of flavonoids in them. However, all these three extracts gave a red colour in the Liebermann Burchard test indicating the presence of steroids/triterpenoids. This indicated the presence of flavonoids and steroids/triterpenoids in these extracts. This was further substantiated by a thorough TLC, UV, IR and NMR study of the benzene extract results were observed clearly gave the clue that the *G. gummifera* resin contains compounds belonging to the class steroids/triterpenoids apart from flavonoids.

Keywords: *Dikamli, Gum-resins, G. gummifera*, *G. lucida*

PSIT/OP02/0013

Chromatographic Methods for Estimation of Biomarkers in Polyherbal Formulation

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Introduction: Phytochemical profiling is crucial for quality control and standardisation of Polyherbal Formulations (PHF), as it indicates efficacy and integrity. PHF complexity and chemical constituent variability challenge quality control parameters; modern analytical techniques help estimate biomarkers.

Aim & Objectives: The study's primary goal was to establish and validate an effective and reliable HPTLC and RP-HPLC method for the standardisation of PHF.

Methods: Gallic acid (GA), Sennoside-A (SA), Sennoside-B (SB), Glycyrrhizin acid (GLA), Ellagic acid (EA) and Rhein (RH), were concurrently identified in PHF utilising HPTLC and HPLC. A preliminary phytochemical screening of PHF was conducted to estimate the phytoconstituents. TLC solvent systems were optimized for optimal resolution of marker compounds before applying well-developed TLC systems in HPTLC. Later, HPLC A gradient mobile phase of Phosphate buffer and Acetonitrile was used to quantify the markers with a C18 analytical column and a UV detector wavelength of 254 nm.

Results: The study revealed the presence of all five bioactive chemical constituents, GA, SB, SA, GlA, EA, and RH. Similarly, the sample PHF was satisfactorily resolved with Rf 0.45±0.01, 0.80±0.01, 1.09±0.01, 0.94±0.01, 0.42±0.01 and 1.56±0.01 for GA, SA, SB, GlA, EA and RH respectively. The retention time of GA, SB, and SA in HPLC was 5.967, 14.708 and 15.017 in min, respectively.

Summary & Conclusion: The methods used were precise, repeatable, and cost-effective, which can be used as a pharmacogenetic tool to authenticate and quantify important biomarkers in PHF. This study provides

scientific evidence for the therapeutic benefits of PHF.

Keywords: *Standardisation, Biomarkers, HPTLC, RP- HPLC*

PSIT/OP02/0014

HeroMDAnalysis: Facilitating GROMACS-based Molecular Dynamics Simulation Analysis

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Introduction: Molecular dynamics simulations (MD simulations) are computational techniques that are being extensively utilized in molecular biology and drug discovery. One of the most popular and freely available programs used to perform MD simulations is GROMACS which is based on command-line interface. However, chemists or pharmacologists with no background of command-line usage often find its usage difficult, laborious, and error-prone.

Aim & Objectives: Our aim was to create a tool that is user-friendly, even to individuals with no prior experience with command-line interface. This project introduces a remarkable tool named, HeroMDAnalysis that provides simple and fast framework to analyze GROMACS-based MD trajectories.

Methods: The tool was written with more than 2300 lines of code in bash shell programming, incorporating a graphical interface powered by the Zenity engine and the code was compiled using Shell Script Compiler. The project is being managed through the web-portal www.heromdanalysis.wordpress.com

Results: HeroMDAnalysis simplifies a previously intricate task and presents a valuable approach to analyze GROMACS based MD simulation data and generate high-quality image plots. Over the past two years, HeroMDAnalysis has played a pivotal role in assisting numerous researchers across a wide spectrum of projects (freely distributed to 250+ researchers, utilized in 50+ projects and 20+ citations). One of the key features of this project is the convenience it offers through the option to outsource the work.

Summary & Conclusion: HeroMDAnalysis is a user-friendly tool developed to simplify the analysis of GROMACS-based molecular dynamics simulations. Over the past two years, Project HeroMDAnalysis has played a crucial role in assisting numerous researchers, becoming an indispensable asset in the scientific community.

Keywords: *GROMACS, molecular dynamic simulation, HeroMDAnalysis, bash shell programming, drug discovery*

PSIT/OP02/0015

HPTLC method to quantify sennocide-B in leaf extract of *Senna alexandrina*Mill. and its commercial formulation

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Introduction: The bioactive anthraquinone sennocide-B present in leaf extract of *Senna alexandrina*Mill. is traditionally used to treat various ailments. Pharmacologically, this plant has been reported to have laxative, cathartic, anthelmintic, blood purifier, spasmodic, anti-emetic, anti-inflammatory and immunobooster properties.

Aim & Objectives: The present study was aimed at qualitative and quantitative estimation of sennocide-B in the methanolic extract of *Senna alexandrina*leaves and its commercial product by HPTLC densitometric analysis.
Methods: The separation and quantification of sennocide-B was carried out on silica gel 60F254 aluminum plates using butanol: water: glacial acetic acid (6:3.5:0.5; v/v/v) as the mobile phase, and 254 nm and 366nm as detection wavelengths. Scanning was carried out on both the wavelengths, but 254 nm was chosen as a estimation wavelength, because peak abundance of plant extract and formulations was found to be better at wavelength 254 nm.
Results: The developed method produced compact spots of sennocide-B at Rf 0.37 ± 0.01. The method was validated using International Council of Hormonization guidelines: Q2(R1) for precision, accuracy, robustness, limit of detection (LOD), and quantitation (LOQ) in the linear working concentration range of 100-2000 ng/mL, which showed regression equation y = 2.8416x + 31.59 and regression coefficient R^2 = 0.9971± 0.0005 at 254 nm for sennocide-B. The LOD and LOQ were found to be 22.84 ± 0.554 and 69.22 ± 0.859 ng/spot, respectively. The sennocide-B content was found to be 8.168 ± 0.24 7 and 16.698 ± 0.894 µg/mg in plant leaf extract and marketed formulation Softovac TM Lupin Ltd respectively.
Summary & Conclusion: Due to the lack of standardization for *Senna alexandrina*and its derived commercial herbal products, their quality control remains a challenging task. The developed method was found simple, precise, accurate, economical and convenient for rapid screening of bioactive marker sennocide-B present in methanolic extracts of *Senna alexandrina*and its marketed product.
Keywords: *Senna alexandrina* Mill., anthraquinone, sennocide-B, densitometry, validation

PSIT/OP02/0017

Development of radical-based advanced oxidation process for the remediation of polystyrene from water

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Introduction: Among various plastic used daily, polystyrene is not easily degraded and is the major contributor to white pollution. Polystyrene, a plastic made up of styrene (a monomer unit of polystyrene), is commonly used to manufacture refrigeration equipment, plastic packaging, and thermal insulation in building construction. The number of households are made up of polystyrene, such as plastic utensils, disposable cups and plates, coffee cup lids, egg cartons, cafeteria trays, video cassettes and cases take-out containers, desk accessories, clamshell containers, packaging peanuts, toys, and insulation board and other expanded polystyrene products (*e.g.*, Styrofoam). Household plastic leaches styrene, a human carcinogen, into food when they get into contact with heat and fatty or acidic foods. Polystyrene is reaching water bodies through plastic manufacturers, distributors, and handlers, including from household wastes.
Aim & Objectives: Development of degradation method for the remediation of polystyrene using advanced oxidation method.
Methods: UV/sulfate radical-based advanced oxidative degradationmethod was usedfor the remediation of polystyrene from water with the optimization of various degradation conditions, like radical concentration, pH of matrix, temperature, presence of inorganic ions, transition metal ions, natural organic matter, and polystyrene concentration.
Results: Complete polystyrene (1 mg/mL) remediation was achieved within 120 min at 50°C, pH 10, with 20 mg/mL persulfate concentration in sample matrix (THF+water, 60: 40, 50 mL).
Summary & Conclusion: The developed photocatalytic degradation method for

polystyrene remediation is cost and time-effective, and environmentally friendly.

Keywords: *Advanced oxidation process, Polystyrene, Remediation, UV/sulfate radical, White pollution.*

PSIT/OP02/0018

Design and click chemistry-based synthesis of triazole clubbed indole derivatives as α-glucosidase inhibitors

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Introduction: Diabetes is a chronic (long-lasting) health condition that affects how your body turns food into energy. α-Glucosidase is an important enzyme responsible for the conversion of carbohydrates into glucose. Inhibitors of α-Glucosidase may be responsible for depletion of the amount of glucose and further used for the treatment of diabetes.

Aim & Objectives: The present work include the design and synthesis of novel triazole based indole derivatives.

Methods: The present research includes the screening of novel triazole based indole derivatives on the basis of their docking scores. The screened compounds further synthesized through click chemistry approach and evaluated for antidiabetic activity.

Results: The compounds R1 was the most potent derivative from the series for *in vitro* study with IC_{50} values of10.1 µM. Furthermore, R2 and R3 showed the good inhibitory potency with IC_{50} values 12.95 µM, 11.35 µM, respectively when compared to the standard drug acarbose having IC_{50} value of 13.5µM. Docking study showed good binding interactions with the receptor of α-glucosidase (PDB ID:3WY1) with docking score-6.734 kcal/mol. Compound R1 showed the similar interaction with amino acid PHE166, GLU271, comparison with standard drug Acarbose.

Summary & Conclusion: In *in vivo* studies showed body weight of the mice was increased when compared to standard drug acarbose; the blood glucose level of the mice was decreased, same as the total cholesterol level, LDL, and triglycerides level decreased in comparison to standard drug. The synthesized compounds have been confirmed for antidiabetic activity and may be used for further development of potent compounds.

Keywords: *Triazole-based indole derivatives, α-Glucosidase, T2DM, Docking, Synthesis*

PSIT/OP02/0019

Design, synthesis and anticancer evaluation of novel hydroxamic acid analogues

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Introduction: Histone deacetylase (HDAC) inhibitors have been established as a novel class of anticancer agents. The HDAC enzyme plays an important role in gene transcription for regulation of cell proliferation, migration and apoptosis, immune pathways and angiogenesis.

Aim & Objectives: To design and synthesize novel hydroxamic acid analogues as anticancer agents.

Methods: A series of novel phenyl substituted oxoquinazoline based hydroxamic acid analogues were synthesized for their anticancer evaluation using cell line studies. The synthesized compounds were evaluated for anticancer activity by *in-vitro* method using sulfordamine assay against cervix (HeLa) cell and breast (MCF-7) of human cancer cell lines. Molecular modelling studies were also performed to investigate the binding mode of compounds between synthesized oxoquinazoline based hydroxamic acid analogues and protein (PDB ID: 1T69) for antitumor activity.

Results: All the synthesized compounds showed varying degree of anticancer activity in the range of 1721 to ≥10 µg/ml. Few

compounds showed significant activity against HeLa and MCF-7 cell lines with cytotoxicity activity less than 10 µg/ml. The synthesized compounds showed similar structural alignment as HDACs in protein (PDB ID:1T69).

Summary & Conclusion: A comparison of structures of the synthesized analogues with their anticancer potential, it was noticed that analogues possessing the groups like methoxy, ethoxy and 3,4,5-trimethoxy on phenyl ring attached to oxaquinazoline nucleus possess high potency in *in-vitro* anticancer evaluation. The present studies might be helpful for design of novel hydroxamic acid-based analogues as anticancer agent.

Keywords: *Histone deacetylase (HDAC) inhibitors, oxoquinazoline, anticancer agents, hydroxamic acid analogues*

PSIT/OP02/0020

Reactivation of mutated p53 protein through zinc/tin metal coordinates bearing BRCA-1 mimetics for breast cancer therapy

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Introduction: The wild type (WT) TP53 is a tumor suppressor gene that produces p53 protein in response to DNA damage. In mutated condition p53 loses its tumor suppression activity.

Aim: To design a new class of metal co-ordinates effect on WTp53 and mutated type (MT) p53 proteins.

Methods: The known p53 activators established a three-featured (2RA, 1HBA) pharmacophore on PharmaGist tool. Based on the *in-silico* results, synthesised six metal coordinates namely TSCO5-Zn, TSCO6-Zn, TSCO13-Zn, TSCO6-Sn, TSCO9-Sn, and TSCO13-Sn. *In-vitro* MTT-Assay was performed with WTp53 (MCF-7) and R273H-MTp53 (MDA-MB-468) cell lines, and the results were compared with standard PRIMA-1 which is a known p53 activator.

Results: Molecular docking XP (extra precision) predicted the binding affinity values for WTp53 and MTp53. The compounds had better Glide scores with R175H-MTp53 and R273H-MTp53 than with WTp53, and better than the standard compounds PRIMA-1, PRIMA-1MET/Tamoxifen. MM-GBSA results showed binding free energies of selected compounds with R175H-MTp53 (-22.24 to -76.9 kcal/mol) and R273H-MTp53 (-22.8 to -38.0 kcal/mol) is better than with WTp53 (-26.45 to -50.3 kcal/mol). The molecular dynamics simulation of TSCO5/3KMD-MT in 100 ns indicated stable complex when compared to TSCO5/3KMD-WT.

Summary & Conclusion: Based on the *in-vitro* results, TSCO5 metal coordinates TSCO5-Zn (IC_{50} for WTp53 is 0.089µM while IC_{50} for MTp53 is 0.074µM) and TSCO5-Sn (IC_{50} for WTp53 is 0.092µM while IC_{50} for MTp53 is 0.073µM) have shown significant cytotoxicity and all the synthesized compounds can be utilised further for p53 reactivation studies.

Keywords: *Cancer, p53 protein, Pharmacophore, MM-GBSA, MDA-MB-468*

PSIT/OP02/0023

Bioactivity-guided isolation of memory-enhancing compound from chloroform extract of roots and rhizomes of *Acorus calamus*linn

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Introduction: Alzheimer's disease [AD] is a long-term neurological illness characterized by the progressive onset of dementia. It's characterized by a gradual loss of cognitive function, as well as difficulties, particularly in memory recovery.

Aim & Objectives: The main aim of study was to isolate the active compound from roots

and rhizomes of *Acorus calamus* Linn by bioactivity-guided isolation and evaluate its memory-enhancing effect by Morris water maze.

Methods: Plant parts were extracted utilizing petroleum ether, chloroform, methanol, butanol, and lastly water as solvents. The chloroform extract was employed for isolation, and α-Amyrin was extracted using a solvent solution of Petroleum ether: dichloromethane. The Morris water test was used to analyze the α-Amyrin, and the level of brain acetylcholine esterase was determined.

Results: In the Morris water maze, mice treated with α-Amyrin demonstrated a significant reduction in escape latency and an increase in time spent in the target quadrant, indicating improved learning and memory. It also lowers the amount of cholinesterase in the brain. Also, Molecular docking study was performed on α-Amyrin and physostigmine as standard drugusing AChE enzyme receptor binding pocket.

Summary & Conclusion: The embarrassment of brain acetylcholinesterase activity and participation in the GABA-benzodiazepine pathway are likely to play a role in rodents learning and memory. Furthermore, a forward-thinking strategy is required to uncover the far more promising processes for the treatment of cognitive diseases.

Keywords: *Memory, Nootropics, Acorus calamus, α-Amyrin, Neurodegenerative, Cholinesterase, Learning.*

PSIT/OP02/0026

Bio-analytical Method Development and It's Validation of Esomeprazole in Human Plasma by LC-MS/MS

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Introduction: Esomeprazole, the active ingredient is delayed-release Capsule, a compound that inhibits gastric acid secretion. Esomeprazole is the S-isomer of omeprazole. A simple, rapid, sensitive and specific liquid chromatography-tandem mass spectrometry method was developed for the estimation of Esomeprazole in human plasma.

Aim & Objectives: To develop and validate selective and sensitive analytical method (LC-MS/MS) for quantitative determination of Esomeprazole in biological fluids K_2EDTA using esomeprazole D_3 as an internal standard according to the USFDA Guidelines.

Methods: Sample preparation involved simple liquid-liquid extraction of esomeprazole and internal standard. The samples were analysed using a reversed phase column and detected by applying positive mode ESI tandem mass spectrometry. The LLOQ was 10.036 ng/mL and the assay was linear over the range of 10.036 - 3001.191 ng/mL using a sample volume of 300µL.

Results: The method was validated successfully over a concentration range of 10.036 ng/mL to 3001.191 ng/mL for Drug esomeprazole and the method was successfully validated for selectivity, linearity, precision, accuracy, matrix effect and stability parameters.

Summary & Conclusion: This method validation report provides the results of selectivity, matrix effect, sensitivity, linearity, calibration curve standards and quality control samples data, precision and accuracy data, the results of various stabilities (bench top stability, freeze thaw stability) and along with all pertinent supporting documentation. All the experiments were carried out as per US FDA & ICH guidelines 'Bioanalytical Method Development' & Validation.

Keywords: *LC-MS/MS, Esomeprazole, Bioanalytical method development and validation.*

PSIT/OP02/0027

A Comprehensive QSAR and Molecular Docking Analysis of Alpha Conformationally Restricted Chalcone Derivatives for Potential Anticancer Activity

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Introduction: This study aimed to explore the anticancer potential of Alpha conformationally restricted chalcone derivatives.
Aim & Objectives: A quantitative structure-activity relationship (QSAR) analysis was performed, encompassing 2D and 3D QSAR, along with molecular docking studies.
Methods: For the 2D-QSAR analysis, Multiple Linear Regression (MLR), Principal Component Regression (PCR), and Partial Least Squares Regression (PLS) methods were employed. Among these, MLR emerged as the most promising approach. The DU-145 cell line was utilized to evaluate the anticancer activity of Chalcone derivatives, with Model-1 and MLR utilized for in-depth investigation. Docking study was performed on newly designed molecules using maestro software
Results: The study emphasized the crucial role of individual descriptors, such as H-donor count and XlogP, along with alignment-independent descriptors like DistTopo, T_T_N_5, Most-vePotential, SA Most Hydrophobic, and T_C_O_7, in comprehending the distinct effects of substituents at various positions of chalcone derivatives. A 3D-QSAR analysis based on molecular field analysis generated steric and electrostatic descriptors, and the contribution plot provided intriguing insights with robust internal validation (q2 = 0.8125) and external predictability (predictive r2 = 0.4371). Moreover, chalcone derivatives with improved activities were designed and their predicted activity determined with the help of best models and molecular docking studies revealed favorable dock scores for all newly designed molecules compared to reference molecule
Summary & Conclusion: The newly designed molecules hold promise as potential anti-cancer agents, warranting further investigation for their therapeutic applications in cancer treatment.
Keywords: *QSAR, Chalcone, MLR, kNN, Docking, cancer*

PSIT/OP02/0029

Analytical method development, validation, Synthesis, Characterization and Forced degradation study of Tenofovir Disoproxil Fumarate and its impurities

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Introduction: Tenofovir disoproxil fumarate (TDF) is a prodrug of antiretroviral class of drugs belonging to NRTIs. There are several simultaneous estimations reported for the drug tenofovir disoproxil fumarate (TDF) and different synthetic routes for synthesizing its impurity is also available. Due to cost effective method we chose to synthesize the impurity.
Aim & Objectives: To develop an analytical method for tenofovir disoproxil fumarate and one of its impurities. Synthesis and characterization of the impurity has to be performed.
Methods: RP-HPLC with Shimpack C_{18} column (4.6 x 50 mm, i.d. 3µm) is used. A combination of methanol- acetonitrile (50:50) and ammonium acetate (pH 4.19) in the ratio of 50:50 V/V is used as the mobile phase. The flowrate is set at 1 mL/min. The absorbance was finalized using a UV-Vis spectrophotometer. LC-MS was used to obtain the mass spectra. IR was used for determining the functional group and NMR was used for the proton number.
Results: The absorbance was set at 260nm. From the analytical method development, LC showed drug peak at 6.103 and 8.621mins for the synthesized impurity. For the LC-MS, the impurity peak is seen at 1051.55. The developed method is found to be 98.85% accurate and precision obtained is 0.55%. It was found to be linear in the range of 10-60 µg/ml and passed Beer's law with a correlation coefficient of 0.999. LOD and LOQ is found to be 0.514 and 1.713 µg/ml respectively.

Summary & Conclusion: We can conclude from the performed experiment that a novel, simple and precise analytical method has been developed and validated for tenofovir disoproxil fumarate and for one of its impurities.
Keywords: *Tenofovir disoproxil fumarate, Method development, Validation, Liquid chromatography, Mass spectrometry, Synthesis.*

PSIT/OP02/0030

Design, synthesis, characterisation and evaluation of substituted quinolin-2-one derivatives as possible anticancer agents against Hop-62 human lung cancer cell line

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Introduction: According to year 2022, the estimated number of cancer cases in India was found to be 14,61,427. Research on cancer has been conducted to develop safe and effective treatment. It is found that quinolin-2-one possess anticancer activity, with this background we thought of synthesizing substituted quinolin-2-one derivatives which can provide a longer future to cancer patients and decrease the risk of dying from cancer.
Aim & Objectives: To carry out design, synthesis, characterisation and evaluation of novel substituted quinolin-2-one analogues as possible anticancer agents against Hop-62 human lung cancer cell line.
Methods: Compound (III a)/ (III b) on reaction with acid; sodium acetate and ethylchloroacetate; ethylchloroacetate and substituted benzaldehyde; phthalic anhydride; 2N sodium hydroxide yields (IV a)/ (IV b); (V a)/ (V b); (VI a)/ (VI b), (VI c)/ (VI d), (VI e)/ (VI f); (VII a)/ (VII b); (VIII a)/ (VIII b) respectively.
Results: Among all the synthesised derivatives, compound (VII a) was found to be most potent with MolDock score of -132.78 as compared to standard drug imatinib (-114.37) and active ligand 4- anilinoquinazoline (-126.71). All the synthesized compounds showed moderate ADME profile, but compound (VII a), showed best ADME data among all the synthesised derivatives.
All the synthesised compounds were tested for their *in vitro* anticancer activity against Hop-62 (human lung cancer) cell line out of which compound, (VII a) was found to be most potent, with percent control growth of -51.7% at concentration of 80µg/ml which is in comparable to the positive control, Adriamycin (-70.5%) and standard Imatinib (-84.0%).
Summary & Conclusion: Compound (VII a) showed highest MolDock score and was also found to be most potent against human lung cancer cell line Hop-62.
Keywords: *Quinolin-2-one, Anticancer, Molecular docking, Lung cancer, ADMET profile.*

PSIT/OP02/0032

Design, *In-silico* studies and synthesis of novel azetidinylquinolin-2(1*H*)-one as potential agents in the treatment of glioblastoma

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Introduction: Glioblastoma, the second leading cause of death worldwide, accounting for about 10 million deaths per year. Several advancements in treatment are available but

show limitations such as resistance, damage to brain cells, non-permeable through BBB and side-effects involved. Since, none marketed drugs improve patient survival rates, synthesis of novel compounds with high potency and low toxicity is needed.

Aim & Objectives: Design and synthesis of novel quinolin-2-one derivatives coupled with azetidin-2-one scaffold as potential antitumor agents.

Methods: Azetidinylquinolin-2-one derivatives were designed and evaluated as antiproliferative drugs with the goal of inhibiting the TGF-β receptor I (PDB: 1py5). Further, the *in-silico* prediction of drug likeness, pre-ADME and *in-silico* toxicity studies were carried out and the best ten derivatives were synthesized and evaluated for *in vitro* anticancer activity against human U373-MG Glioblastoma cell line.

Results: The title compounds showed MolDock scores ranging from -138.23 to -108.29 indicating that the quinolin-2-one ring and acetyl carbonyl is essential in the binding process and may be crucial sites for pharmacological activity. The *in-silico* studies indicated that, the compounds can serve as prospective candidates for the treatment of brain tumour. The biological activity stated that derivative IV I and IV J exhibited good inhibitory effect with GI_{50}< 10 µg/ml in comparison to Adriamycin.

Summary & Conclusion: The work carried out suggests that the derivatives IV I and IV J demonstrated good antiproliferative efficacy and can serve as improved therapeutic agents against brain cancer, thus positing a starting point for building more potent analogues.

Keywords: *Antitumour, quinolin-2-one, azetidin-2-one, ADMET, docking*

PSIT/OP02/0035

Molecular investigation of isosakuratenin derivatives for multitargeted wound healing activity

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Introduction: Wounds are discontinuity in the integrity of an organism's tissues, arising from physical trauma, surgical incisions, or pathological processes involved disruption of various layers of the body, such as skin, mucous membranes, subcutaneous tissues, muscles, and internal organs. It triggers a complex series of physiological responses, including inflammation, hemostasis, cell proliferation, and tissue remodeling.

Aim & Objectives: The main aim is toaddressed the potential interaction between protein-ligand (IL, TNF-α, VEGF, PDGF-isosakuratenin derivatives) which contributing towards wound healing activity. It promotes to prohibit the effect of isosakuratenin towards the wound therapy.

Methods: The structures of compounds were prepared using Ultra/Chem 3D software and then the structures were subjected for energy minimization using LigPrep module (Schrodinger). Protein is taken from the protein data bank (PDB). Ligand-protein studies were carried out using Schrodinger.

Results: In-silico study obtained theexcellent interaction of ligand and receptor. In this result isosakuratenin derivatives interact with several protein molecule and shows the significant G Score at active wound site.

Summary & Conclusion: In silico study were presented the identification of potential drug candidates, ligand-protein interactions, protein-protein interactions of compounds in promoting enhanced wound healing. The findings from this research may provide valuable insights into the design and development of novel therapeutic agents for wound management.

Keywords: *Wound healing, Flavone derivatives, Multitargeted, Prediction, In-silico study*

PSIT/OP02/0036

In silico design, synthesis, and biological assessment of trifluoromethyl containing quinolones as DprE1 inhibitors

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Introduction: Tuberculosis (TB) is an airborne contagious disease and is one of the major causes of ill health, making it one of the top 10 causes of death worldwide. Different treatment regimens are available but due to the emergence of Multi-Drug Resistance (MDR) and Extensively Drug Resistance (XDR) strains of TB, drugs are becoming ineffective and the need for novel therapeutics has become increasingly urgent. So, one of the promiscuous drug targets is DprE1, which is involved in mycobacterium cell wall synthesis.

Aim & Objectives:

- To design and develop new anti-tubercular agents by rational drug design
- To synthesize the best computationally active designed molecules and characterize the synthesized compound
- To perform the DprE1 *In-vitro* assay of synthesized molecule

Methods: The presented work focuses on structure-based design of quinolone derivatives. Ligands were designed based on the literature data available and molecular modelling studies against the DprE1. Designed ligands were subjected to docking study using GLIDE module, Schrodinger. Docking studies have shown promising interaction with amino acid residues with better glide score. The best computationally active compounds were synthesized by the microwave-assisted method and the conventional method. All synthesized compounds were characterized by IR, NMR, and Mass spectroscopy. Whole cell-based assay studies and *In-vitro* assay against the DprE1 enzyme for the synthesized compound was performed.

Results: Whole cell-based assay studies and *In-vitro* DprE1 assay studies suggested that compounds were able to inhibit the DprE1 enzyme, and one of compounds SAL-FQ-P-08 showed promising inhibition**.**

Summary & Conclusion: The main aim of the present study was to set up a trifluoromethyl quinolone scaffold as anti-tubercular inhibitor. All 21 designed compounds were docked against the target. Out of 21, 14 compounds were synthesized and characterized. Best compound were evaluated for biological activity. Primary screening for antitubercular activity revealed three compounds showed prominent inhibition against *Mycobacterium Tuberculi*. Then, Whole cell-based assay studies and *In-vitro* DprE1 assay studies suggested that compounds were able to inhibit the DprE1 enzyme. Among five compounds, one of compound SAL-FQ-P-08 showed IC_{50} value of around 13.5µM.

Keywords*: Tuberculosis, DprE1, Quinolones, Docking, Whole cell-based assay and DprE1 assay*.

PSIT/OP02/0037

Preliminary phytochemical analysis of leaves of *Pyrostegiavenusta*

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Introduction: *Pyrostegiavenusta* or orange trumpet or flame vine is a creeper, belonging to family Bignoniaceae. The plant is known to produce antibacterial & wound healing, antiviral, antitussive, anthelminthic, anti-inflammatory and antioxidative action.

Aim & Objectives: The present study was aimed to investigate the preliminary phytochemical analysis of leaves of *Pyrostegiavenusta* by preparing extract with different solvents like chloroform, ethyl acetate, methanol and water (non-polar to polar).

Methods: The leaves collected were defatted with petroleum ether by maceration followed by successive solvent extraction using chloroform, ethyl acetate, methanol and water. The extracts were dried and used for phytochemical tests for saponin, phenol, tannin, protein, diterpenes, flavonoid, carbohydrate and alkaloids.

Results: The methanolic and water extract showed the presence of saponin, phenol, protein and flavonoid and absence of tannin, carbohydrate and alkaloid while the Chloroform and ethyl acetate showed positive test for phenol and produced negative results for saponin tannin, protein, diterpenes, flavonoid, carbohydrate and alkaloids.

Summary & Conclusion: Thepreliminary phytochemical analysis helps us to investigate the different phytoconstituents present in the plant for further findings like analytical, biological and pharmacological evaluation.

Keywords: *Phytochemical, maceration, successive extraction, phytoconstituents.*

PSIT/OP02/0038

Synthesis, Molecular Docking of Thiadiazole Derivatives and Their Potential as Antimicrobial Agents

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Introduction: The pathogenic microorganisms are causative agents for various serious and lethal infectious diseases. Development of resistance to antibiotics has resulted in need of development of new molecules with antimicrobial potential.

Aim & Objectives: The present study aimed to develop some novel antimicrobial agents to overcome bacterial resistance with decreased toxicity and side effects.

Methods: A new series of thiadiazole derivatives were designed and synthesized using $FeCl_3$ mediated cyclization of thiosemicarbazone into thiadiazoles, which were subsequently reacted with suitable aromatic aldehyde to obtain the respective thiadiazole derivatives. *In-silico* study was conducted for prediction of the binding affinity with the target protein (PDB ID: 3UDI). The synthesized compounds were screened for their *in-vitro* antibacterial activity against Gram-positive bacterial strains *Bacillus subtilis* and *Staphylococcus aureus,* and the Gram-negative bacteria *Klebsiella pneumoniae* and *Escherichia coli*, using Ciprofloxacin as the standard drug.

Results: The synthesised compounds were characterized by physiochemical and spectral techniques namely IR, MS, and NMR. The compounds (A2 & A4) having hydroxyphenyl substituents were potentially effective to inhibit *P. aeruginosa* and *E. coli* with MIC value 25.0µg/mL and 37.5µg/mL, respectively. The binding energies of the designed molecules were obtained against the target protein. The preliminary screening revealed that these compounds possess promising antibacterial activity with binding energy in the range of -8.17 & -9.75 Kcal/mol.

Summary & Conclusion: The experimental results explore the potential of the synthesized compounds to effectively inhibit β-lactamase and suggest that thiadiazole derivatives could become good antimicrobials.

Keywords: *Thiadiazoles, Antimicrobials, Thiosemicarbazone, Molecular Docking*

PSIT/OP02/0039

Design and Synthesis of Novel Aminoquinoline-Thiazolidinone Hybrids as Anti-Cancer agent

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Introduction: Quinoline containing compounds have been found to display a wide range of biological activities, including anti-cancer. Camptothecin is an important quinoline compound, and its derivatives namely, Irinotecan and Topotecan, are well-established anti-cancer drugs.

Aim & Objectives: Introduction of heterocyclic ring systems containing nitrogen have been found to play a vital role in development of anticancer agents. Therefore, the study aimed to design, and synthesize novel 4-aminoquinoline-thiazolidinone hybrid molecules, and study their effect on human lung cancer cell-line, A-549.
Method: Molecular docking study was performed using AutoDock Tools 1.4.6. to predict structural interactions, using multiple target proteins with PDB ID: 2BMC, 2WD1, and 1YCR. The molecules with high binding affinity were selected for synthesis through a three-step reaction scheme. The compounds were evaluated (*in-vitro*) against A-549 cancer cell line, with Adriamycin as the standard drug, using SRB assay.
Result: The *in-silico* study predicted binding energy in the range of -7.45 to -11.18 Kcal/mol. The synthesized compounds were physico-chemically and spectrally characterized in order to establish their structures. The results of *in-vitro* activity showed the most promising compound to possess TGI value of 13μM.
Summary & Conclusion: The study concludes that 4-aminoquinoline-thiazolidinone hybrids may act as promising anti-lung cancer agents.
Keywords: *Aminoquinoline, Thiazolidinone, In-silico, In-vitro, Lung cancer, A-549*

PSIT/OP02/0040

MAO-B Inhibitory Activity of Some Novel Acetyl Pyridine Pyrazolyl Derivatives: Syntheses, Docking and *In-silico* studies

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Introduction: Parkinson's disease is a common neuro-degenerative disorder that originates in the substantia nigra. It alters the motor system and is characterized by slow and selective neuronal failure.
Aim and Objectives: The present study aimed at developing some novel anti-Parkinson's agents through structural modifications at 2nd and 3rd position of the pyrazoline nucleus.
Method: The synthesis was carried out in a two-step reaction. The first step involved synthesizing acetyl pyridine chalcones from 2-acetyl pyridine and aromatic aldehydes. In the second step, the title compounds, acetyl pyridine pyrazolines were synthesized by reacting chalcones with hydrazine hydrate/phenyl hydrazine in basic medium. All the synthesized compounds were characterized by UV, FTIR, MS, and NMR. *In-silico* ADMET prediction was carried out using Swiss ADME and LAZAR software.
Result: The synthesized compounds were screened for their anti-Parkinson's potential using Reserpine-induced mice model. The compounds, **6** and **10** were found to be the most potent. The *in-silico* predictions related to pharmacokinetic, metabolic and toxicity concluded that the synthesized compounds are safe and non-toxic.
Summary and Conclusion: The data obtained from docking studies were found to be in sync with the *in-vivo* results.
Keywords: *Chalcones, Acetyl pyridine pyrazoline, in-vivo, anti-Parkinson's, molecular docking, in-silico ADMET.*

PSIT/OP02/0041

Design of nanoniosensor for label free prognosis of Alzheimer's disease

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Introduction: The prevalence of Alzheimer's disease (AD) is growing rapidly in India. Early diagnosis and treatment are always advantageous for the effective management of AD. Hence, AD and its consequent effect currently bring potential avenues for diagnosis centered on the identification of beta-amyloid$_{1-42}$ (Aβ_{1-42}). Unfortunately, conventional diagnostic

methods are expensive, painful, less sensitive, non-selective, AND complicated.

Aim & Objectives: Thus, we designed graphene oxide (GO) surface decorated layer-by-layer (LbL) assembly-based surface plasmon resonance (SPR) biosensors for highly sensitive and selective recognition of $A\beta_{1-42}$ in preclinical and clinical samples.

Method: Herein, LbL assembly was designed using chitosan and polystyrene sulphonate on the surface of AgNPs (AgNPs-CS-PSS-CS) and then antibodies of Aβ (anti-Aβ) were fixed on LbL assembly. For biosensor fabrication, synthesized GO was immobilized on an amine-modified gold-coated sensor chip via carbodiimide chemistry followed by AgNPs-CS-PSS-CS@anti-Aβ immobilization on an activated GO surface.

Results: Consequently, the linearity range and lowest limit of detection (LOD) of $A\beta_{1-42}$ antigens were found to be 2 fg/mL to 400 ng/mL and 1.21 fg/mL, respectively. Analysis of $A\beta_{1-42}$ in AD-induced rats and human clinical samples such as saliva, and blood confirmed the real-time applicability of the designed SPR biosensor.

Summary & Conclusion: Thus, the developed biosensor will directly benefit society in AD management due to its cost-effectiveness, rapid, simple, non-invasive, label-free, highly sensitive, selective, early detection ability, and small sample requirement.

Keywords: *Alzheimer's disease prognosis; graphene oxide, surface plasmon resonance; biosensor*

PSIT/OP02/0042

Design Synthesis and Antibacterial evaluation of novel N-(2-Oxo-2H-chromen-6-yl)-2-piperazin-1-yl-acetamide derivatives

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Introduction: The coumarin (benzopyran-2-one, or chromen-2-one) ring system has attracted the attention of medicinal chemists for decades due to its wide range of pharmacological activities. Derivatization of coumarin ring with different pharmacophores could serve as lead for the development of novel antibacterial agents and to overcome from life threatening problem "antimicrobial resistance".

Aim & Objectives: To synthesize the series of title compounds in pure form and in good yield followed by the characterization using different spectroscopic techniques and to evaluate their antibacterial activity against proposed bacterial strains.

Methods: Docking was performed by Auto dock 4.2 software on DNA gyrase subunit b receptor (PDB: 2xct) and *in vitro* antibacterial screening was done byagar well diffusion method. Characterization of synthesized compopunds was done with different spectroscopic techniques such as: ^{1}H-NMR, ^{13}C-NMR, FTIR, Mass Spectroscopy.

Results: The docking score of compounds SM6 (-13.9 kcal/mol) and compound SM5 (-10.8) found to be good docking affinity to the standard drug Norfloxacin -10.4 kcal/mol. Compound SM5 showed zone of inhibition 27, 29, and 30 mm against *Pseudomonas aeruginosa,* 27, 27, 30 mm against *Bacillus subtilis,* 17, 18, 13 mm against *Escherichia coli,* 19, 21, 23 mm against *Klebsiella pneumonia,* and 22, 20, 18 mm against *Staphylococcus epidermidis.*

Summary & Conclusion: Docking and *in vitro* study revealed that compound SM5 showed best activity in both *in silico* and *in vitro*. Presence of 2-methoxy phenyl group in the SM5 compound may be responsible for good antibacterial activity. Structural modification of compound SM5 could serve as a lead for the development of other novel antibacterial agents.

Keywords: *Coumarin, Chromene, Piperazine, Molecular Docking, Antibacterial activity.*

PSIT/OP02/0046

AQbD approach to RP-HPLC method development and validation of Gemifloxacin Mesylate

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Introduction: AQbD is an approach to method development that regulates all phases of the life cycle of an analytical procedure. Understanding dependent variables, independent variables, various factors, and their interactions and effects on the responses to be analysed is an integral element of the AQbD.

Aims and Objectives: AQbD is used to establish a method-operable, robust design region within meaningful system suitability criteria and continuous life-cycle management. The proposed method describes the development and validation of a risk-based RP-HPLC method for Gemifloxacin mesylate in pharmaceutical dosage form.

Methods: An experimental design based on the central composite design of two key components of the RP-HPLC method (mobile phase and pH) was used. The chromatographic conditions were optimised with the Design Expert software 13.0 version, i.e., Phenomenex Gemini column C18; the mobile phase used 0.1 M Ammonium dihydrogen orthophosphate buffer and acetonitrile (pH 3.0) (50:50, v/v), and the flow rate was 1 ml/min with a retention time of 4.367 min.

Results: At a detection wavelength of 267 nm, the developed method was found to be linear with r2 = 0.9999 over a range of concentrations of 25–175 g/ml. The system suitability test parameters like asymmetric factor and theoretical plates were 1.53 and 2179 respectively. In the recovery, tablet assay, and robustness studies, % RSD was less than 1.5, indicating that the proposed method is simple, economical, accurate, robust, and precise.

Summary and Conclusion: The QbD approach to analytical method development was used for a better understanding of method variables at different levels. So, the proposed method can be used in the quality control lab for the analysis of the drug.

Keywords: *Analytical Quality by Design, RP-HPLC, Design-Expert* -13

PSIT/OP02/0048

Extractive Spectrophotometric Method for the Determination of Clopidogrel Present in Bulk and Tablet Dosage form

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Introduction: The method is based on the reaction between the Clopidogrel (CLP) and Bromocresol green (BCG) producing ion-pair complex in acidic medium which are suitable for chloroform extraction. The maximum absorbance of these complexes was measured at 412 nm in chloroform.

Aim & Objectives: The present study was aimed to develop specific, rapid and cost-effective method for the determination of Clopidogrel (CLP) in pure form and tablet formulation by UV- Visible Spectrophotometry. An anionic dye is used to from ion pair complex in acidic medium. The method gave accurate and precise result with speedy recovery.

Methods: To the series of 10 mL volumetric flasks a Clopidogrel (CLP) standard d solution 100 µg mL^{-1} ranging from 1 to 5 mL was transferred and volume of each flask was adjusted with 0.1 M HCl up to the mark. Then 1 mL of indicator in each flask followed by extraction with 3 mL of chloroform and absorbance was measured at 412 nm.

Results: Validation of developed method was undertaken by measuring the absorbance of solutions containing 10 to 50 µg mL^{-1} drug together with solvent and chloroform may be used as most convenient solvent found to produce the highest absorbance, extraction power and stability of color of the formed ion-associates.

Summary & Conclusion: The developed and validated method is selective, rapid, and economical and the results obtained showed acceptable precision and accuracy, and recovery of Clopidogrel (CLP). Additionally, this drug was successfully estimated in their pure form as well as in their respective formulations without any interference from the commonly used additives and excipients.

Keywords: *Extractive, validated, interference, absorbance and additives.*

PSIT/OP03/0001

Hydro-alcoholic extract and a newly discovered pyrimidine alkaloid have inhibited ovalbumin-induced airway hyperresponsiveness in mice model

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Introduction: *Tadehagi triquetrum (L.) H. Ohashi* (Fabaceae) is used in Indian traditional medicine as an antiallergic drug. The prevalence of asthma is increasing globally with an estimated 300 million people's deaths, which may rise up to 400 million by 2025.
Aim & Objectives: Based on literature miming, we supposed to know that alkaloids are useful to treat asthma; the present research focuses on newly reported pyrimidine alkaloid, Docosenamide and hydroalcoholic extract to treat asthma.
Method: The alkaloids administered p.o. before challenge with aerosolized 2.5% w/v ovalbumin and total differential leukocyte, Nitrite, Nitrate, TNF α, IL-4, and IL-13 are estimated from bronchoalveolar lavage fluid. Similarly, Myloperoxidase and Malandialdehyde are evaluated in the lungs.
Result: The results reveal a significant increase in pro-inflammatory cytokine Ova-induced airway hyperresponsiveness. However, the alkaloids significantly decrease the severity of airway inflammation. Histopathology justifies the effectiveness.
Summary & Conclusion: Findings suggest that molecules may be a complementary and alternative medicine for asthma through the pro-inflammatory inhibitory pathway.
Keywords: *Alkaloids, Inflammation, Asthma, Malendialdehyde, Ovalbumin*

PSIT/OP03/0003

Journey of naturally occurring isolated active compound to semi synthetic derivatives via azomethine ylide or 1, 3 Dipolar Cycloaddition for better pharmacological activity

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Introduction: Development of a Lead bioactive natural compound/s to an effective and new bioactive one by semi-synthetic approach with incorporating of heteroatom's (O, N, S etc) was become more popular for drug discovery research. Several popular natural products like artemether, artesunate, docetaxel, paclitaxel, flavopiridol, ixabepilone etc was evolved as major drug candidate via semi-synthetic modification of lead bioactive natural products. This is popular now a day due to less possible side effects of natural product or its derivatives and available known application areas with less toxicity.
Aim & Objectives: Cycloaddition approach has emerged as one of the most effective strategies for developments of modification of natural products. One of the important methods is dipolar cycloaddition or azomethine ylide cycloaddition. The process generates new stereocenters which allowed it to contribute very much to the development of stereo structure-activity relationships during screening campaigns. This triggers us to study with natural compounds having a free double bond-like in andrographolide, curcumin, withaferin etc.
Methods: We started our journey of preparing diversely functionalized heterocycles via azomethine ylide cycloaddition or dipolar cycloaddition using simple commercially available or synthetic dipolarophiles and extended it to a new dimension by employing dipolarophiles available from nature like andrographolide, withaferin A, curcumin etc.

Results: Several compounds have been prepared and biological activity evaluation revealed some very promising increase in activity in compare to the natural moieties.
Summary & Conclusion: These results of biological evaluation encouraged us to construct a better diversified library and applying it for different pharmacological activity.
Keywords: *Dispiroheterocycles, dipolar cycloaddition, azomethine ylide, Anticancer, Antimicrobial*

PSIT/OP03/0004

Phase Assisted Pharmacophore Model Development of Pyridopyramide Derivatives of Acetyl Cholinesterase Inhibitors For Treatment of Alzheimer's Disease

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Introduction: Acetylcholinesterase (AChE) hydrolyzes Ach, converting it into choline and acetate. Measurement of AChE's activity is crucial for disease diagnosis, including organophosphate and carbamate toxicity, and CNS agents.
Aim and Objective: The objective of the presentation is to development of Pharmacophore model of a series of pyrido – pyrimidine- 2-one/pyrimidine -2-thiones targeted for acetyl cholein esterase using PHASE. The study was aimed for the development of potent acetylcholein esterase inhibitors for the treatment of Alzeimer's disease on the basis of pharmacophoric model developed by phase.
Methods: The 3D QSAR model was generated by preparing ligands and creating pharmacophore sites between ligands and target receptors. 24 inhibitors were divided into a training set (20 compounds) and a test set (4 compounds). The resulting pharmacophores were scored and ranked, with the best hypothesis selected based on the highest survival score. QSAR modeling was conducted using the selected hypothesis, with used.
Results: The 3D computational model proposed in this study has been generated taking into account a number of structurally diverse compounds provide information about correlation between pharmacophoic model biological activity.
Summary and Conclusion: Our computational strategy identifies three effective regions in the structure series: hydroxylic/non-polar, negative ionic, and positive ionic regions, which are favorable for further preparation of potential derivative compounds.
Keywords: *Acetylcholinesterase (AChE), organophosphate, Pharmacophore model, Partial Least Square PLS analysis, hypothesis, computational model.*

PSIT/OP03/0005

Comparative study of native remedies from the Kumaun Himalayas for Hepatic Issues

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Introduction: The use of medicinal plants in the treatment and management of various problems in human life is crucial. Around 80% of population worldwide use conventional healing, which are largely based on natural sources. Now days, there is increased focus on herbal medications. There is a lot of potential in using natural sources and their metabolites as hepatoprotective agents. In alternative medicine, many natural phytoconstituents extracted from leaves, bark,

stems, roots, seeds, fruits and flowers been used.

Aim & Objectives: The primary objective of this study was to assess the antioxidant composition and hepatoprotective effects of two frequently employed extracts from Himalayan plants, specifically *Fraxinus micrantha* and *Cirsium wallichii.*

Methods: Animals were divided into seven groups. Group I (Normal control), Group II Positive control, Group III and IV with doses of (250mg/kg and 500mg/kg), Group V and VI with doses of (200mg/kg and 400mg/kg) and Group VII (Negative control) respectively. Following the administration of CCl_4, a sample of blood was obtained and subsequently processed to isolate the serum for further biochemical analysis. The liver was excised for the purpose of conducting investigations as well as examining any potential histopathological alterations.

Results: The serum enzyme levels of glutamate oxaloacetate transaminase (AST), glutamate pyruvate transaminase (ALT), serum alkaline phosphatase (SALP), and total bilirubin were markedly elevated and were greatly reduced by the extracts toward normality. Silymarin, which was used as the standard reference, shielded rats from haptotoxicity caused by carbon tetrachloride. The results of the study show that both of the chosen plant species are quite successful at preventing carbon tetrachloride damage to rat's livers.

Summary & Conclusion: The administration of plant extracts effectively restored the levels of these parameters to their control (untreated) levels subsequent to the insult caused by CCl_4. The results of this study indicate that the extracts obtained from *F. micrantha* or *C. wallichii*exhibit hepatoprotective effects against hepatotoxicity induced by CCl_4

Keywords: *Hepatoprotective, Histopathologically, Antioxidant*

PSIT/OP03/0007

Hydrogels as Carrier: Significance for tissue engineering in wounds

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Introduction: Hydrogels have become extremely accepted due to their exclusive assets such as high-water content, softness, flexibility and biocompatibility. Hydrogels are crosslinked hydrophilic polymer structures that can swallow huge quantity of water or biological fluids.

Aim & Objective: Hydrogels are one of the imminent classes of polymer-based systems that hold frequent biomedical and pharmaceutical relevances. Hydrogels are intended to hydrate wounds, re-hydrate eschar and aid in autolytic epithelialisation.

Methods: Polymers employed in naturally derived hydrogels are frequently used in tissue engineering as they are either components of natural extracellular matrix or have similar properties. Frequently used polymers in hydrogels are collagen, hyaluronic acid, alginate, chitosan, etc. They are used as scaffolds that confer structural veracity to tissue constructs, control drug and protein delivery to tissues, and are used as adhesives between tissue and material surfaces.

Results: Based on this ability, they found a wide variety of applications, and because of the possibility to modify the polymeric structure to obtain desired functionality, the areas of applications are rapidly expanding. They can be designed in such a way that they can respond to a specific stimulus including pH, temperature, light, etc. at a predefined level and thus be stimuli responsive.

Summary & Conclusion: Among their astounding distinctiveness, the biocompatibility and biodegradability make them a powerful candidate to use in biological and environmental applications as implants or materials for removal of toxic pollutants.

Keywords: *Hydrogel, Biomedical, Tissue engineering, Natural polymer*

PSIT/OP03/0009

Functionalized Metallic-Nanocarrier for Site directed Delivery of

Bioactives for the Management of Rheumatoid Arthritis

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Introduction: Chemotherapeutic drugs are continuously used to treat inflammatory autoimmune disorders, like rheumatoid arthritis; however, these drugs have a number of side effects and systemic toxicity.
Aim & objectives: To address this crucial issue, we have prepared bioactive [Quercetin (Que)] loaded functionalized nanomaterial (FA-Que-Pn-AgNPs) tailored to infection site *via* nano-based drug delivery with a view to improving the drug effectiveness.
Methods: The parameters were optimized using Box-Behnken tool to formulate FA-Que-Pn-AgNPs with maximum efficiency. The prepared FA-Que-Pn-AgNPs was characterized through UV-Vis's spectroscopy, FTIR, XRD, SEM and EDS analysis. The *in vitro* analyses such as antioxidant, anti-inflammatory, cytotoxicity and cellular uptake study were performed. Drug release study was also executed to assess the release pattern of Que in *in vitro* environment.
Results: The results of *in vitro* study revealed the proficiency of FA-Que-Pn-AgNPs over free form of drug. Following that, the cytotoxicity and cellular uptake test evidenced the non-toxic nature as well as significant uptake of prepared formulation by cells. The release pattern of Que was estimated under two different pH conditions, and noted that the release was maximum in low pH condition.
Summary and Conclusion: The present work unveiled the excellent efficacy of FA-Que-Pn-AgNPs in *in vitro* conditions. Furthermore, this technique can overcome the drawbacks associated with plant-based drugs, such as insufficient water solubility and biocompatibility.

Keywords: *Antioxidant; FA-Que-Pn-AgNPs; Inflammatory disorders; Oxidative stress; Quercetin.*

PSIT/OP03/0010

Microwave Assisted Extraction of *Moringa* Leaves and Antioxidant Evaluation of Extract

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Introduction: The microwave-assisted extraction (MAE) of plant materialswas significant when ethanol used to obtain bio-active extracts. Antioxidant activity of extracts indicated to protect them from free radicals and oxidative stress.
Aim & Objectives: To investigate the microwave-assisted extraction (MAE) of *Moringa concanensis* leaves and antioxidant activity screened by ABTS and DPPH methods.
Methods: The microwave-assisted extraction (MAE) of *Moringa concanensis* (Nimmo leaf) was done in ethanol to obtain bio-actives. The phytochemical examination of ethanolic extract were carried out using standard analytical methods which confirmed the presence of glycosides, steroids, terpenoids, saponins, tannins, alkaloids, phenols, and flavonoids excluding anthraquinones. Moreover, antioxidant evaluation of extract was done using ABTS and DPPH methods.
Results: The antioxidant abilities were determined using IC_{50} value of extract. The total flavonoid contents, total phenolic contents, and antioxidant abilities of these extracts were successfully correlated.
Summary & Conclusion: This study recommends that microwave-assisted

extraction (MAE) of *Moringa concanensis* (Nimmo leaf) produced a significant amount of phenolic compounds. The antioxidant action may be due to the phenolic compounds.

Keywords: *Microwave-assisted extraction Moringa concanensis, phenolic compounds, ABTS assay, DPPH assay.*

PSIT/OP03/0011

Development of a Novel Nutraceutical Dispersible Tablet Loaded with *Beta vulgaris* Extract for Intestinal Parasitic Worm Infestation

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Introduction: Intestinal parasitic worm infestation is one of the neglected tropical diseases of India and as per WHO estimates, approximately 21 percent of India's population is infected with intestinal parasite helminths. This encouraged us to develop a nutraceutical dispersible tablet incorporated with the extracts of *Beta vulgaris* anthelmintic activity.

Aim & Objectives: To develop dispersible tablet with beetroot extract for intestinal parasitic worm infestation primarily on *Pheretima posthuman* (Indian earthworm) and then on *Paramphistomumcervi* (Rumen flukes). Evaluation of the dispersible tablet for various quality control parameters.

Method: *B. vulgaris* root was extracted by cold percolation method and was subjected to chemical tests and TLC analysis. It was then formulated to dispersible tablets and evaluated as per IP standards, followed by anthelmintic activity which included parameters- time of paralysis and death, histopathology and SEM studies.

Result: *B. vulgaris* revealed the presence of flavonoids, amino acids, alkaloids, carotenoids. The results of quality control were within the IP limits. The time of paralysis and death of Indian earthworm was found to be 72.84±10.4**minutes and 80±15.5** minutes, respectively and that of rumen flukes was found to be 35.5± 3.93**minutesand 38.16±4.16** minutes, respectively. The histopathological parameters depicted that the formulation was effective in distorting the vital organs of Indian earthworm and the rumen flukes. The SEM studies revealed the site of action since several wounds and fissures were observed on the surface of rumen flukes.

Summary & Conclusion: Indian earthworm resembles human parasitic round worm and rumen flukes resemble human hepatic worms, thereby considering the formulated tablets to be an effective remedy for helminthiasis. Since it is dispersible nutraceutical tablet any age group can effectively consume it on a regular basis as a preventive measure against helminthiasis.

Keywords: *Intestinal parasitic worm, Paramphistomumcervi, dispersible nutraceutical tablet, Beta vulgaris, helminthiasis.*

PSIT/OP03/0014

GC-MS analysis of Bioactives of Ageratum conyzoides leaves

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Introduction: In the realm of diverse and captivating plant species, *Ageratum conyzoides* stands high as a symbol of pharmacological and ecological significance. Its leaves, roots, and flowers are commonly used to treat a broad spectrum of ailments such as antipyretic, analgesic, anti-inflammatory, wounds, burns, insecticidal, antimicrobial, gastrointestinal, and skin disorders.

Aim & Objectives: The primary aim of the current research was to conduct a phytochemical screening and Gas Chromatography-Mass Spectrometry (GC-MS) analysis of Ageratum conyzoides leaves extract, to assess its diverse bioactive constituents.

Methods: The quantitative analysis of the bioactive constituents present in the extract of A.

conyzoides leaves was performed by following standard procedures. The extraction of constituents from the leaves was carried out through maceration, using n-hexane as the solvent. Subsequently, the bioactives were analyzed using the GC-MS method, utilizing the Shimadzu QP 2010 Ultra GC MS Spectrometer, Shimadzu Japan.

Results: GC-MS analysis separated and recognized the occurrence of seventy-two phytocomponents ranging from high and low molecular weight entities with varying quantities and properties. In the n-hexane leaf extract of *A. conyzoides* leaves, the major phytoconstituents identified were 2H-1-Benzopyran, 6,7-dimethoxy-2,2-dimethyl, Precocene II (27.32%); n-Hexadecanoic acid (7.85%); Silane (7.66%); Squalene (5.71%); 6,9-Octadecadienoic acid, methyl ester (5.71%); 2H-1-Benzopyran-2-one, 3,4,7-trimethoxy, coumarin (3.60%); Methyl diphenylphosphinite (1.90%); Tetra decanoic acid (1.63%); Dibutyl phthalate (1.49%) and. alpha-Terpineol (1.32%).

Summary & Conclusion: The outcomes of the GC-MS analysis provided compelling evidence that supports the ethnomedicinal significance of *Ageratum conyzoides* leaves. This is primarily attributed to the presence of a wide range of bioactive components belonging to various classes.

Keywords: *Ageratum conyzoides*, *GC-MS analysis, bioactive compounds*

PSIT/OP03/0017

Current trends in Herbal Drug Research

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Introduction: There has been a tremendous demand for herbal products in last decade. An escalation has been observed in the demand of quality herbal products after Covid-19 pandemic. During and after COVID a number of new startups have emerged to cater the increasing need of the herbal drug market. But this huge requirement for herbal drugs has also resulted in various malpractices associated with quality of herbs and herbal products like adulteration, substitution and sub-standard products. Herb or herbal product must pass the quality control parameters prescribed by various regulatory bodies and pharmacopoeias. Traditional methods of quality control have limited scope in differentiating between genuine and sub-standard herb and herbal products.

Aim & Objectives: The study aim to review the current trends in herbal drug research

Methods: The content in this study have been obtained by an extensive literature survey, performed using various search engines like Google Scholar, Scopus, Sci Finder, ScienceDirect, Science gate, Scilit, PubMed, NINDS database of NIH, Bentham Sciences, and other online and print journals and scientific databases.

Results: Now a days, with the latest advancements in the field of analytical chemistry and biotechnology the traditional methods of standardization have been replaced with modern methods like metabolomics for chemical fingerprinting using various modern analytical techniques like HPLC, UVS, HPTLC, NMR, IR etc. DNA bar coding has replaced the traditional botanical authentication practices that were based on manual observation and comparison of morphological features of the drugs.

Summary & Conclusion: For minimizing toxicity and ensuring the safety of crude and finished herb or herbal products the traditional animal dependent acute and chronic toxicity studies have been replaced with modern 2D-3D cell cultures, chip on organ, body on chip, zebra fish models etc. Omics based approaches for intrinsic toxicity evaluation techniques have been advanced enough to identify the Genotoxicity and carcinogenicity of the herbs and herbal products. The use of various microbiological, immunological, analytical and spectral techniques is being used to determine the extrinsic toxicological sources in herbal drugs. In a nut shell the use of modern techniques have not only saved the

time consumed for quality control or standardization of herb but also emerged as reliable methods to ensure the optimum quality, safety and efficacy of the herbal products.

Keywords: *Metabolomics, Proteomics, DNA bar coding, Genotoxicity, Carcinogenicity, Herbal Products.*

PSIT/OP03/0020

Phytochemical and Anti-inflammatory activity of leaves of *Aegle marmelos* and *Azadirachta indica*

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Introduction: In the past, infections and the immune system have been linked to inflammation. Yet, more recent research indicates that a much wider range of disorders may exhibit telltale signs of inflammation. The primary mechanism for tissue repair following an injury is inflammation.

Aim & Objectives: To investigate the phytochemical and anti- inflammation activity of extract of *Aegle marmelos* and *Azadirachta indica* was evaluated.

Methods: 1 kilogramme of the plants' leaf powder was macerated at room temperate for 48 hrs then filtered and concentred filtrate was used for evaluation. *Aegle marmelos* and *Azadirachta indica* extract was used for Phytochemical screening and evaluated different parameters. Extract was used for evaluation of anti-inflammatory activity determined by protein denaturation, membrane stabilization, protease inhibition assay.

Results: In the present study, it is found that the aqueous extract of leaves of *Aegle marmelos*and *Azadirachta indica* contains a substantial amount of phenolics and flavonoids. These are responsible for anti-inflammatory activity. The study clearly exhibits the comparative study of Aeglemarmelos and Azadirachta-indica have anti-inflammatory potential.

Summary & Conclusion: Antioxidant potentials of aqueous extract obtained from leaves of *Aegle marmelo*s and *Azadirachta indica* were evaluated. The extracts were found to possess screening method to asses anti-inflammatory, protein denaturation, membrane stabilization, and protease inhibition assay. The experimental study showed that a persistent and substantial inhibit the inflammation.

Keywords: *Inflammation, protein denaturation, Phytochemical screening, Aegle marmelos, Azadirachta indica.*

PSIT/OP03/0022

Preventive and Therapeutic Role of Dairy Products as Nutraceuticals

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Introduction: Nutraceutical comprises everyday foods like probiotics, processed dairy foods, beverages, dietary supplements, herbal and genetic engineered products with various medical health benefits. *Bacteriocin* is one of emerging names in the field of dietary supplements which helps in prevention of various diseases.

Aim & Objectives: Bacterial strains from dairy products including kefir grains, capable of producing bacteriocin-like inhibitory substances (BLIS) were isolated and tested for antimicrobial activity against various pathogenic microorganisms.

Methods: Dairysamples and kefir grains were collected and cultivated in MRS media, commonly used for lactic acid bacteria (LAB). Several dilutions and platting were done to get

a colony of isolates and screening was done by agar well diffusion method. A list of indicator strains was used for the antimicrobial assay.

Result: Biochemical characterization of isolates related them with LAB and the antibacterial activity was found to be significant in goat milk and kefir isolates showing clear and remarkable zones of inhibition (in the range of 12-30 mm) on agar plates. Isolates showing prominent antibacterial activity underwent the media optimization studies to enhance the production of BLIS.

Summary and Conclusion: Antimicrobial compounds from natural dairy sources and fermented milk products have gained immense importance in controlling various food-borne pathogens and their regular consumption is proven good for human gut health.

Keywords: *Probiotics, bacteriocin, lactic acid bacteria, nutraceuticals, kefir, pathogenic*

PSIT/OP03/0024

Advances on Therapeutic Strategies involving Medicinal Plants for Alzheimer's Disease

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Introduction: Alzheimer's disease (AD) is a chronic dysfunction of neurons in the brain leading to dementia. It is caused by neuronal injury in the cerebral cortex and hippocampal area of the brain. The number of individuals with AD is growing at a quick rate. The pathology behind AD is the progress of intraneuronal fibrillary tangles, accumulation of amyloid plaque, and decrease in choline acetyltransferase. Unfortunately, AD cannot be cured, but its progression can be delayed.

Aim and Objective: Aim of this presentation is to showcase the recent advances on therapeutic strategies involving medicinal plants for AD. In the context of the present scenario, several strategies are being tried including the clinical trials of herbal formulations for the treatment of AD. This study aims to light on phytopharmaceuticals, nanomedicines, nutraceuticals, and gene therapy related advances and treatments.

Methods: An exhaustive literature survey was carried out using SciFinder's reports, PubMed, and other online resources to obtain information on the various available herbal strategies to prevent AD.

Results: In the context of the present scenario, Galantamine has been announced as first nutraceutical to be licensed by the FDA for reversible AChE inhibitory activity and can be derived from *Leucojum atrium* and *Galanthus nivalis*. It has revived interest in plant therapies for AD

Summary & Conclusion: Grape Seed Extract, Green Synthesized Nanoparticles, Amylolipid Nanovesicles, Nanoemulsion, Solid Lipid NPs, coupling of low-generation dendrimers and lactoferrin are the contemporary strategies on which researchers are working to find out effective solution of treatment for AD. Despite recent advances in herbal therapy and nanotechnology for AD treatment, cost can be a barrier to acceptance.

Keywords: *Phytopharmaceuticals, Alzheimer's disease, dysfunction of neurons*

PSIT/OP03/0025

Trillium Govanianum Rhizome Extract Against Various Carcinoma Cell line: A Review

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Introduction: Trillium govanianum Wall. (Melanthiaceae alt. Trilliaceae), which is locally named as 'nag chhatri' is basically a native species commonly found in Himalaya region on the top of mountains or in deep forest. The plant is a small herb preferring shady areas with stocky 15 g-25 cm purple-red stem carrying plain broadly ovate green leaves, powerfully deflexed, green flower at the apex. The rhizome contains trillarin which on hydrolysis yield diosgenin and used in

preparation of steroidal and sex hormones It is very common medicine which is used traditionally by native of the region. various parts of the plant are used in treatment of dysentery, inflammation, menstrual and sexual disorders, as an antiseptic and in wound healing and currently also been found as an antifungal. A new report on the isolation of a new steroidal saponin has been studied recently. This article reports on the cytotoxicity of the extract of the roots and rhizomes of T. govanianum against various carcinoma cell lines.

Aim & Objectives: To briefly study the phytochemical investigations of genus *Trillium which* have reported the identification of fatty acid esters, saponins, phenolics, terpenoids, flavonoids and steroids and to find the major bioactive compounds.

Methods: The Shade dried rhizomes of *Trillium govanianum* were grinded into powder and sequentially extracted the extracts that were filtered separately and concentrated to obtain a crude chloroform and hydroalcoholic extract. Various compounds were isolated along with the saponin responsible for anticancerous activity.

Results: The anti-cancer potential of crude extracts (CHCl3, 20% aq. MeOH and one sub-fraction of 20% aq. MeOH) and isolated compounds were evaluated for their *in-vitro* cytotoxic potential, which
was expressed in percentage of inhibition and IC50 values respectively against a panel of human cancer cell lines namely lung cancer and colon cancer and revealed significant results.

Summary & Conclusion: Over the past years, *Trillium govanianum*has an appealing usage among researchers because of its lesser availability, phytochemistry and pharmacological studies, especially in the area of cancer research. In this review, the isolation and characterization of two new steroidal saponins from the rhizomes of *Trillium govanianum*. Compounds (1) and (2) exhibited significant cytotoxic activity against human lung and colon cancer cell lines in a considerable micromolar range laying the foundation of one of the compounds as a lead molecule in anticancer drug discovery.

Keywords: *Trillium govanianum, anticancerous activity, cell line, saponin*

PSIT/OP03/0027

Phytochemical and Pharmacological activity of Kasni seed against Cisplatin-induced toxicity with specific reference to their Nephroprotective Activity

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Introduction: *Cichorium intybus*is is commonly used medicinal plant for the treatment of wide range of ailments like wounds, Liver disorders, spasm, malaria, hypercholesteremia, gallstones, gastroenteritis, pulmonary cancer, diabetes etc. The phytochemical constituents and their pharmacological potential have not been fully explored till date.

Aim & Objectives: To carry out the phytochemicals and pharmacological evaluation of Kasni seeds extract to screen the therapeutic effects.

Methods: Many standardization parameters of Kasni were analyzed. Standard method was adopted for the preliminary phytochemicals screening. The pharmacological studies were carried out and methanolic extract of kasni seeds were found to be non toxic and non lethalupto 3000mg/kg b.w

Results: The IC50 value of methanolic extract Kasni was found to be 4.54µg/ml against standard ascorbic acid (IC50 2.50µg/ml) respectively. The total content 57.2 mg GAE/100 g & 5.61 mg QE/100 g phenolic

compounds & flavonoids were found in methanolic extract of Kasni. Heavy metal residue, pesticide residue & aflatoxin residue were totally absent in Kasni.The HPTLC method give good resolution for quercetin acid and rutin. Kasni seeds extracts (300 and 600mg/kg) revealed more nephroprotective action against Cisplatin treated acute nephrotoxicity.

Summary & Conclusion: The outcome of this study might prove beneficial in herbal industries for identification, purification, standardization and nephroprotective activity of Kasni seeds with specific reference to their theirNephroprotective activity.

Keywords.: *Kasni, Nephroprotective, DPPH, Cisplatin*.

PSIT/OP03/0030

Phytochemical Analysis of Essential Oils Used for Development of Formulation with Mosquito Larvicidal Activity

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Introduction: Aedes aegypti, which transmits Dangue fever, is found in a number of tropical and subtropical nations. Disease is mostly spread by female mosquitoes in underdeveloped nations. The essential oil proved positive for significant larvicidal action against Ae. aegypti larval activity.

Aim & Objectives: The purpose of this study is to look at the phytochemicals found in essential oils that will be used to create a formulation with larvicidal action against mosquito larvae.

Methods: By using GCMS analysis, the phytochemical examination was carried out. This involves assessing the essential oil's physicochemical qualities as well as its organoleptic evaluation. The elements of a certain essential oil were all detected by GCMS, and the report also included a percentage of each constituent's presence. We may draw conclusions about the essential oil's quality, safety, and prospective applications based on this information.

Results: Our findings indicated that the six chemical groups of piperitone oxide, carvone, epithio-menthene, beta cariophyline, cis carviol, and carvon oxide made up the majority of the oil.

Summary and Conclusion: Gas chromatography-mass spectrophotometry (GCMS) was used to examine the phytochemicals in the essential oil. It was discovered that the primary active ingredient in essential oils may have mosquito larvacidal capability.

Keywords: *Phytochemical, essential Olis, organoleptic assessment, Physicochemical properties, gas chromatography- mass spectrophotometry*.

PSIT/OP03/0031

Molecular characterization and phytochemical analysis amongst commercial varieties of *Withaniasomnifera*

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Introduction: *Withaniasomnifera* (Linn.) Dunal (Ashwagandha) is a prominent Indian medicinal plant owing to its immense therapeutic potential with extensive genetic diversity and availability of chemotypes.

Aim and Objectives: The aim of the present study is to unveil the genetic diversity in five commercial cultivars of *W. somnifera*cultivars and its correlation with phytochemical.

Methods: The molecular characterization of five commercial varieties of *W. somnifera* was

performed using RAPD and ISSR primers. The total withanolides, total flavanoid content and total phenolic content was determined in aqueous extract of roots using HPLC, aluminium chloride and Folin ciocalteu methods, respectively.

Results: The UPGMA cluster analysis with RAPD and ISSR primers divided the five varieties into two majors. Among all the commercially released variety JA-20 formed a separate subcluster with both RAPD and ISSR primers. The withanolides (Withaferin A, Withanoside IV, Withanoside V, Withanolide A and 12- Deoxystramonolide) content were present in all the varieties and present in the highest amount in JA-20. The total phenolic content ranged from 322.941± 11.811 to 121.22.675 mg gallic acid/g extract. The total flavonoid content ranged from 143.916±12.006 to 50.789 mg Catechin/g.

Summary and Conclusion: The results of this study demonstrated that both RAPD-PCR and ISSR-PCR molecular marker techniques are suitable for studying genetic diversity in WS varieties. Among all the commercially released variety, JA-20 formed a separate subcluster with both RAPD and ISSR primers which was further correlated phytochemically and secondary metabolites were present in highest amount in JA-20, making it the most diverse and elite variety.

Keywords: *Ashwagandha, Molecular markers, RAPD, ISSR, Withaniasomnifera, cultivars*

PSIT/OP03/0034

The Sunscreen Revolution: How Natural Ingredients are Redefining Sun Protection in Modern Cosmetics

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Introduction: The increasing apprehension surrounding the ecological and health repercussions associated with conventional chemical sunscreens has prompted a redirection of attention towards alternatives that are not only more environmentally sustainable but also gentler on the skin. Natural sunscreen formulations combined with botanical compounds are gaining popularity due to their ability to deliver good sun protection while minimising side effects. This study delves into how natural ingredients are shaping and revolutionizing contemporary sunscreen formulations, influencing the way sun protection is redefined within the domain of cosmetics.

Aim and Objective: This study's main objective is to look into how the use of natural chemicals is changing how sun protection is provided in modern cosmetics. The aim of this study is to assess the effectiveness, safety, and environmental ramifications of natural sunscreen formulations in contrast to traditional chemical-based alternatives.

Method: A comprehensive strategy involving a thorough examination of existing literature, careful analysis of formulations, and controlled laboratory experiments was utilized. Various natural elements known for their sun-protective attributes, including zinc oxide, titanium dioxide, and diverse plant extracts, were studied to assess their efficacy in safeguarding the skin against detrimental ultraviolet (UV) rays.

Results: The examination unveiled that contemporary natural sunscreen formulations adeptly utilize the potency of plant-derived components to deliver comprehensive protection against a wide range of ultraviolet rays. The combination of mineral filters and organic compounds yielded favourable outcomes in preserving skin well-being and mitigating the potential hazards linked to the absorption of chemicals.

Summary and Conclusion: To summarize, this study underscores the significant progress achieved in enhancing sun protection by integrating natural components into contemporary cosmetic formulations. The research emphasizes that these formulations have the capacity to present a practical substitute for traditional sunscreens, effectively addressing the requirements of

health-conscious individuals and those committed to eco-conscious beauty routines.

Keywords: *Natural sunscreens, botanical ingredients, sun protection, modern cosmetics, formulation analysis, UV radiation, mineral filters.*

PSIT/OP03/0050

Anthelmintic potency of *Tagetes erecta* Linnon *Perionyx excavates*

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Introduction: In developing countries lack of knowledge and poor sanitation promote Soil Transmitted helminthiasis (STH) more. Trichuriasis, hookworms and roundworms are common in STH. 150 crores population are presently affected by STH and the situation are worst as per WHO. The use of medicinal herbs for the treatment of different ailments is long practice in Asia especially in India. *Tagetes erecta* Linn. (Asteraceae) is an ornamental plant and has versatile medicinal importance. The use of herbal plants to treat ailments like helminthiasis is a long practice for their safe use.

Aim & Objectives: The present study investigated the anthelmintic potency of the chloroform extract of dried leaf of *Tagetes erecta* Linn on *Perionyx excavates* (Megascolecidae).

Methods: The chloroform extracts were subjected for preliminary phytochemical screening and quantitative estimations for total tannins and total flavonoids. Different concentrations of the extracts (25,50 and 100 mg/ml) were used for the activity against *Perionyx excavates.* Albendazole and 3% Tween 80 in normal solution were taken as standard and control respectively.

Results: Significant amount of tannins and flavonoids were tabulated in chloroform extract. All the extracts of different concentrations exhibited potent anthelmintic potency in dose dependent manner and the extract of 100 mg/ml concentration were proved as more potent candidature having anthelmintic potency.

Summary & Conclusion: The text mentioned in Ayurveda for *Tagetes erecta*as an anti-helminthic hence has been proved in the present research. Chromatographic estimations, isolation of active constituents to understand the mechanism should be the future interest.

Keywords: *Soil-Transmitted helminthiasis, Tagetes erecta Linn. Perionyx excavate, chloroform extract.*

PSIT/OP03/0060

Exploring Cardioprotective dynamics of Giloy (*Tinospora cordifolia*)

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Introduction: It has become evident that Mitochondrial dysfunction in cardiac muscles is one of the prime factors that causes heart failure in humans due to cardiac myopathy. Oxidative stress is one of major predisposing factor that triggers mitochondrial dysfunction in the first place which in turn can be attributed to mental stress and environmental pollution. A number of Anti-Oxidative agents have been identified to counter oxidative stress such as CoEnzymeQ10, MitoQ and Mito-Tempoand they provide considerable cardio protection. *Tinospora cordifolia* which is also known as Giloy or Guduchi is a member of *Menispermaceae* family and indigenous to the tropical habitats of the Indian sub-continent. It grows as a climber herb with heart-shaped leaves. It contains multiple phyto-compounds, such as, Alkaloids, Glycosides, Polysaccharides, Terpenes, Flavonoids and Terpenoids with reported anti-oxidant, anti-diabetic, anti-inflammatory and immuno-modulatory activity. As it is reported to possess strong

anti-oxidant activity, it holds the potential to be useful in providing cardio protection against oxidative stress preventing mitochondrial dysfunction and subsequent heart failure.

Aim and Objectives: In this study, we explored the possibility of potent cardio-protective activity of *Tinospora cordifolia*.

Methods: We did literature review using keywords such as Cardio-protective, Anti-oxidant, Oxidative stress.

Results: We found that *Tinospora cordifolia* contains anti-oxidants like Di-terpenoids lactones, Isoquinoline, Cordioside, Tinocordiside, 18-norclerodane and several other glycosides which can potentially provide cardio-protection.

Summary & Conclusion: *Tinospora cordifolia* possess strong anti-oxidant activity and can prevent mitochondrial dysfunction in cardiac muscle and provide cardio-protection.

Keywords: *Cardio-protective, anti-oxidant, oxidative stress, mitochondrial dysfunction, Tinospora cordifolia, Giloy*

PSIT/OP03/0061

In vitro antioxidant activity of 50% ethanolic extracts of *Morus alba* L. leaves

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Introduction: The parts of this plant have been traditionally used for various diseases keeping in mind of their traditional value our present study was to explore *Morus alba* L. leaves for its antioxidant potential.

Aim & Objectives: The aim of our study was to evaluate in vitro antioxidant potential of 50 % ethanolic extracts of *Morus alba*L.leaves.

Methods: The 50% ethanolic leaf extract's phytochemical analysis reveals triterpenoids, sterols, alkaloids, flavonoids, tannins, and glycosides to be present. Antioxidant activity of the *Morus alba* L.50% ethanolic leaves extract was measured by DPPH Method (Hydrogen-Donating Activity), Superoxide and Hydrogen peroxide radical scavenging method.

Results: The extract showed maximum scavenging activity i.e., 91.28 ± 0.18 at 250 µg/ml by 2,2-Diphenyl-1-picryl-hydrazyl, 91.69±0.017 at 500 µg/ml by superoxide method and 82.06±0.072 at 500 µg/ml by Hydrogen peroxide respectively as compared to the standard (ascorbic acid).

Summary & Conclusion: The present study concludes that *Morus alba* L.50% ethanolic leaves extract possesses significant antioxidant activities**.**

Keywords*: Morus alba L., antioxidant activity, 2,2-Diphenyl-1-picryl-hydrazyl, phytochemical screening.*

PSIT/OP03/0101

Treatment of rickets in ancient times by the use of *Euphorbia prostrata* Ait

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Introduction: *Euphorbia prostrata* Ait. (Euphorbiaceae) is among those categories of plants mentioned in Ayurveda and traditionally known to use in several types of disease and disorders. *E. prostrata* is traditionally used as Antihemorrhoidal, anti-inflammatory, analgesic, hypolipidemic, antidiabetic, antidirroheal, and antiasthmatic and for various skin diseases, wound healing, antioxidant, antibacterial, leishmanicidal, antitumor Anthelmintic, activity, antibacterial activity. Preliminary phytochemicals studies revealed the presence of flavonoids, tannins, glycosides, saponins, phytosterols, polyphenols and anthraquinones. *Euphorbia prostrata* was found active against 36 types of bacterial stains. Medicinal plants are widely used by all sections of community, whether directly as folk remedies of the different indigenous systems as well as in modern medicine. In the rickets the bones of children are soft and weak, because of lack of vitamin D. When rickets is due to another medical problem, the child may need other

medications. The common symptoms of rickets can include: delayed in growth, delayed motor skills, spine pain, pain in pelvis and legs, muscle weakness.

Aim & Objectives: The objective of the present work was to investigate the *Euphorbia prostrata* Ait. This is used for the treatment of rickets.

Methods: Several databases were systematically searched including Elsevier, PubMed, Science direct, Chinese scientific journal database and Wang Fang database.

Results: On the basis of traditional evidence the *Euphorbia prostrata* Ait. (Euphorbiaceae) was used in the treatment of rickets and osteomalacia also.

Summary & Conclusion: The conclusion revealed that the *Euphorbia prostrata* Ait. (Euphorbiaceae) has been used in the treatment of rickets and osteomalacia.

Keywords: *Rickets, Traditional uses, Euphorbia prostrata Ait , Phytochemical.*

PSIT/OP03/0502

Quality by design-driven development of berberine HCl and thymoquinone loaded microemulsion based gel for improved antimicrobial benefits.

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Introduction: *Berberine HCl* (BER) is a yellow bioactive component and thymoquinone (TQ) a major bioactive component of *Nigella sativa* has a broad spectrum of antimicrobial activity.

Aim & Objectives: To design, formulate and evaluate microemulsion-based gel containing a combination of Berberine HCl and Thymoquinone with synergistic antimicrobial potential.

Methods: The pseudo-ternary phase diagram for the microemulsion region was constructed with Chemix. To optimize the chosen Critical Material Attributes, a 2^2 D-optimal design was used with Design Expert software. Optimized microemulgel were evaluated for in-vitro antimicrobial study using agar well method. The formulation was compared against standard drugs. Stability study of the optimized formulation was studied as per ICH Q1.

Results: The optimized microemulsion has globule size (115nm), zeta potential (30.5 mv) and drug content (95.89 % of berberine HCl and 94.34 % of thymoquinone) by HPTLC. The optimized microemulsion-based gel has 86.4% of berberine HCl and 98.03% of thymoquinone. In-vitro antimicrobial efficacy study, the optimized microemulgel with BER and TQ demonstrated synergistic effect.

Summary & Conclusion: The optimized microemulgel formulation containing Thymoquinone and Berberine HCl was stable and gave promising antimicrobial activity with synergistic effect.

Keywords: *Thymoquinone, Berberine HCl, Quality by Design*

PSIT/OP04/0001

Evaluation of antidepressant activity of leaf extract of *Tectona grandis* in experimental animals

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Introduction: Depression is mood disturbances that causes a continuous feeling of unhappiness, changes in behavior, unable to concentrate and loss of interest. The traditional medicinal system is effective in treating depressive illness.
Aim & Objectives: The present study was undertaken to evaluate the antidepressant activity of the *Tectona grandis* leaf extract using in- vivo models like forced swimming test, tail suspension test, 5-HTP induced head twitches and estimation of brain lipid peroxidation.
Method: The ethanolic extract was examined orally at the dose of 100, 200 and 400mg/kg on experimental animal. The standard drug used for the study was Imipramine (10mg/kg) and the results were compared with standard drug.
Result: The parameters observed in the 5-HTP induced head twitches is number of head twitches, it was observed that extract increased the effect as compared to control group. The extract showed significant reduction in immobility time as compared to control group. Significant antidepressant activity was shown by the plant extract.
Summary & Conclusion: the study of *Tectona grandis* leaves on anti-depressant activity using forced swimming test, Tail suspension test, 5 HTP induced head twitches and invitro brain lipid peroxidation test. Exhibited significant activity in a dose dependent manner.
Keywords: *Antidepressant activity, forced swimming test, tail suspension test,5-HTP induced head twitches, immobility time*

PSIT/OP04/0002

Evaluation of Immunomodulatory and Anticancer Activity of Selected Medicinal Plants

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Introduction: Immunology is a diverse and growing area in the field of biomedical research promising great scope regarding the prevention and treatment of plethora of diseases, cancer being the leading cause of death worldwide. Thus, searching for immunomodulatory materials from natural herbs and characterizing the immune enhancement affects may have great potential in cancer treatment.
Aim & Objectives: The present study aims ethanolic extract of three medicinal plants at two dose levels 100 and 200 mg/kg body weight by using *in-vivo* immunomodulatory models and *in-vitro* cell lines.
Method: The extracts were subjected to carbon clearance test (CCT) and delayed type hypersensitivity (DTH) reaction based on acute toxicity results. The extracts were further screened for breast and colon cancer cell lines such as MCF-7 and HT-29 by Sulforhodamine B Assay Method.
Result: CCT at both the dose levels showed significant increase in the phagocytic index when compared to control. Significant activity for DTH model was noticed at both the dose levels which showed decrease in paw volume in case of Sheep Red Blood Cells (0.5×10^9) used as antigens. The extracts screened for MCF-7 and HT-29 were found to be unsatisfactory at final concentrations of 10 µg/ml, 20 µg/ml, 40 µg/ml, 80 µg/ml.
Summary & Conclusion: The paper suggests that extracts has served as a promising immunomodulator by cellular mediated mechanisms for immune system disorders due to presence of many important phytoconstituents especially phenolic compounds elucidated by analytical studies.
Keywords: *Immunomodulatory, anti-cancer, extracts, medicinal plants, phytoconstituents*

PSIT/OP04/0004

Effects of hesperetin on dimethylsulphoxide induced cognitive dysfunction in Wistar Rats

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Introduction: Hesperetin is a natural flavonoid belonging to the flavanone category obtained from citrus plant like lemons and oranges.

Aim & Objectives: To investigate effect of hesperetin on dimethyl sulfoxide (DMSO) induced cognitive dysfunction in Wistar rats.

Methods: The experiment was conducted by using 5 groups (n=6). Group 1 (control) received 1 ml/kg, ip., normal saline for 14 days. Group 2 received 1 ml/kg DMSO per oral for 14 days. Group 3 received donepezil (3 mg/kg p.o) and DMSO (1 ml/kg p.o.) per day for 14 days. Group 4 and 5 received 25 mg /kg of hesperetin (H1) and 50 mg/kg hesperetin (H2) per oral per day for 14 days, respectively. Hesperetin was dissolved in DMSO to get 25 mg/ml solution. On 14th day, rats' memory was evaluated by Cook's pole climbing apparatus and Morris water maze test. On 15th day, all rats were sacrificed and the isolated brain tissues for the estimation of biochemical parameters.

Results: The DMSO treated rats showed significantly enhanced escape latency time ($P < 0.0001$) acetylcholinesterase (AchE) activity ($P < 0.0001$), lipid peroxidation ($P < 0.0001$), TNF-α leveland decreased reduced glutathione levels ($p< 0.001$), attenuated beta actin blot density, degradation and inflammation in the hippocampus region as compared to the control group. These parameters were significantly recovered in the rats pretreated with donepezil and hesperetin.

Summary & Conclusion: The findings of this study demonstrated that DMSO-induced cognitive dysfunction in rats and hesperetin has the potential to improve the cognitive performance against DMSO.

Key Words: *Hesperetin, dimethylsulphoxide, cognitive dysfunction*

PSIT/OP04/0005

Appraisement For Transmogrification Efficacy of Dietary Inclusion of *Aegle Marmelos*Fruits Against Cisplatin–Induced Nephrotoxicity In Wistar Rats

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Introduction: A few years agone, a flavourer healthful plant *Aegle marmelos* was historically employed in India. For its purpose aren't any early analysis works found with dietary inclusion of this plant for the nephrotoxicity.

Aim & Objectives: The target of this study was to analysis of the modulatory effectiveness of dietary inclusion of *Aegle marmelos* against Cisplatin-induced nephrotoxicity in Wistar albino rats.

Methods: Wistar albino rats of cluster I and II were fed basal diets whereas cluster III and IV were administered diets containing 2% and 4% *Aegle marmelos* respectively for 7 days before to Cisplatin administration. Cisplatin was administered to rats for 7 days leads to a diminution in the natural processes of the antioxidant activities in the rat kidney homogenate were assayed for superoxide dismutase (SOD), Catalase (CAT) and Glutathione (GSH) and activity lipid peroxidation (LPO). The activity of SOD was evaluated by Nitro blue tetrazolium (NBT) reduction process.

Results: After administration of diets containing *Aegle marmelos* fruit showed a substantial decrease in the elevated Lipid peroxidation and superoxide dismutase, Glutathione and Catalase concentration**.**

Summary & Conclusions: In closing, the nephroprotective activity of *Aegle marmelos* can be because of the inhibitor impact on these plant components as proved by increasing activity of inhibitor enzymes and considerably modified the physiological parameter.

Keywords: *Aegle marmelos, Antioxidant effect, Cisplatin, Dietary Inclusion, Nephrotoxicity.*

PSIT/OP04/0006

Neuro-Protective effect of *Petroselinum crispum*ethanolic extract against D-Galactose and Aluminium chloride-induced Alzheimer's disease in rats: A behavioral and biochemical approach

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Introduction: Alzheimer's Disease is one of the progressive neurodegenerative disorders affecting elderly population without clear etiology, accounting more than 80 % dementia worldwide.

Aim & Objectives: We found D-Gal and $AlCl_3$ induced model was economical, promising and convenient among the other models for AD induction. *Pseudomonascrispum* (Parsley) with established ethno-medicinal value mainly by its antioxidant and neuroprotective activity made us to select as relevant choice for anti-AD activity.

Methods: D-gal 60 (mg/kg/day, *i.p.*) and $AlCl_3$ 200 (mg/kg/day, *p.o.*) were exposed all group except control, additionally Donepezil (1mg/kg/day, *p.o.*) and Ethanolic extract of *Pseudomonas crispum* (100mg/day, *p.o.*) as well as (200mg/day, *p.o.*) were administered for Standard, Test-Low dose and Test-High dose group respectively for 70 days to rats. Behavioral parameters of the animals, Antioxidant activity and lipid peroxidation parameters were measured. In addition to that histopathology of hippocampus andcortex was done on all groups of rat brain.

Results: Potent anti-AD activity was emerged with reference to behavioralactivity, AchE inhibitory activity and lipid peroxidation inhibitory effect as well as moderate free radicals scavenging activity was observed for EPC group. The histopathology of EPC group demonstrates almost complete reversal of AD pathology.

Summary & Conclusion: The results emphasis, that EPC might be a good alternative for the treatment of AD as compare to standard treatment of Donepezil.

Keywords: *Alzheimer's Disease, Ethanolic extract of Leaf Extract Pseudomonas crispum, Elevated Plus Maze, Morris Water Maze Test and Open Field Apparatus*

PSIT/OP04/0012

Calotropis procera Extract/Fractions Ameliorate Paracetamol Induced Liver Injury in Rats *via* Regulating JNK/ASK-1 Signaling Pathway

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Introduction: Many nations have a significant health burden from liver disease, and this burden has risen, owing in part to population expansion and ageing. Many medicinal plants are used in liver disease treatment due to their nontoxic and efficacious properties, and *Calotropis procera* is one of those plants that commonly used in ayurvedic medicine.

Aim and Objectives: The goal of the study was to assess the hepatoprotective efficacy of young *Calotropis procera* leaves.

Methods: The young leaves of *Calotropis procera* were extracted by cold maceration with ultra-sonication using chloroform, ethyl

acetate and distilled water. Male Wistar rats were used for hepatoprotective evaluation and the body weight, liver weight, serum biomarkers and anti-oxidant markers were measured during study.

Results: The extract/fractions significantly ($P<0.05$) increased the absolute and relative weight of the liver of rats at the dose of 200 mg/kg. It also suppressed the serum biomarkers ($P<0.05$) in the aforementioned doses. Oral administration of extract/fractions significantly increases the oxidative marker and decreased the progression of paracetamol induced hepatotoxicity.

Summary & Conclusion: The result of the study suggested that *Calotropis procera* leaf extract/fractions can reduce hepatotoxicity caused by paracetamol. Furthermore, clinical trials should be taken into consideration before they can be utilized as hepatoprotective agent.

Keywords: *Calotropis procera, hepatoprotective, paracetamol, oxidative marker, cold maceration*

PSIT/OP04/0013

Comprehensive Review of Advancement in Breast Cancer Using Different Approaches

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Introduction: Breast cancer is a common and complex disease that affects a large population of women worldwide. In the past few years, there has been an increase in studies to find new and more effective ways to treat breast cancer. The drug-designing approach has emerged as a promising strategy for developing novel drugs that can target specific molecular targets and pathways involved in breast cancer.

Aim & Objectives: To investigate the novel drugs that can target specific molecular targets and pathways involved in breast cancer. In this review, different molecular targets and pathways that have been found to be possible therapeutic targets in breast cancer are discussed. It also provides an overview of various computational techniques and tools used in drug designing, such as molecular docking, virtual screening, and pharmacophore modeling

Method: Using defined inclusion and exclusion criteria, we selected the publications identified for the study. Preclinical studies, clinical studies and meta-analyses can be included in studies that focus on current developments in breast cancer research using different methods. Authors extract relevant information from the studies they selected, such as B. Study design, sample size, patient characteristics, treatments, or methods used, results evaluated and significant results. Researchers were divided into groups based on the many techniques they were studying (eg, immunotherapy, targeted treatments, etc.

Summary & Conclusion: Drug-designing approaches have revolutionized the way we approach breast cancer treatment. The developments of targeted therapies, immunotherapies, and drugs that target specific mutations or signalling pathways have shown significant promise in treating breast cancer. Patients with breast cancer, specifically those with certain genetic subtypes, are more likely to live longer and have a better quality of life because of these drugs.

Keywords: *Breast cancer, Drug designing, Molecular targets, Computational techniques, Molecular docking, Virtual screening, Pharmacophore modelling*

PSIT/OP04/0015

Thymoquinone exerts inhibitory activities on breast cancer cell lines and protective effects against DMBA-induced breast cancer in female rats

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Introduction: Breast cancer is the most common type of cancer and a leading cause of

mortality among women. The antitumoral drug thymoquinone (TQ), found in black seed oil, has multitargeting properties on several signalling pathways.

Aim & Objective: This study evaluated the *in vitro* and *in vivo* antitumor activity of TQ on breast cancer. The *in vitro* antitumor activity of TQ inhibits the growth of breast cancer cell lines (MCF-7 & and T47D).

Methods: TQ inhibited cell proliferation and induced apoptosis of MCF7 and T47D in a dose-dependent manner. The *in vivo* antitumor activity of TQ was evaluated in 7,12-dimethylbenzanthracene (DMBA)-induced animal model of breast cancer. Thirty-four female Wistar albino rats at the age of 50 days were divided into three groups: control group; MBA group (65 mg/kg); preventive group [(DMBA (65 mg/kg) + TQ 50 mg/kg)] times weekly for 50 days.

Results: TQ-induced cell proliferation inhibition and apoptosis induction were associated with the downregulation of several epigenetic markers including UHRF1 and DNMT1 and the upregulation of several pro-apoptotic genes. In rats, TQ inhibited tumour growth and reduced tumour vascularization and the number of liver and lung metastases. While DMBA led to neoplasia and hyperplasia in breast tissues, administration of TQ to rats improved histological alterations in breast tissues and reduced DMBA carcinogenicity in rats.

Summary & Conclusion: These results showed that TQ exerts protective effects on breast cancer risk and reduces the development of metastatic tumours in vivo through inhibition of proliferation and the induction of apoptosis of tumour cells.

Keywords: *MCF-& and T47D cells; Rats; Breast cancer; Thymoquinone; Gene expression.*

PSIT/OP04/0016

Phytochemical and Neuropharmacological Evaluation of *Elytraria acaulis* and *Callistemon viminalis*

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Introduction: *Callistemon viminalis* is a small tree or shrub (Family Myrtaceae) and *Elytraria acaulis* Stem less perennial herb (Family Acanthaceae) that has been well studied for its antioxidant and anti-inflammatory effects. Nevertheless, scientific information the neuropharmacological effect is limited.

Aim & Objectives: The present study was performed to investigate the phytochemical nature and neuropharmacological activities of hydroalcoholic extract of the *Callistemon viminalis* (HECV) and *Elytraria acaulis* (HEEA).

Method: The antinociceptive activity of extract was evaluated by acetic acid-induced writhing. The neuropharmacological activity was determined by elevated plus maze test and open field test using Swiss albino mice as experimental animal at the doses of 200 and 400 mg/kg body weight. Diclofenac sodium at the dose of 10 mg/kg and Diazepam at the dose of 1 mg/kg body weight was used as a reference drug in all the experiments.

Result: HECV and HEEA produced a significant dose-dependent antinociceptive activity in chemical-induced pain models and showed reduced locomotor activity in open field tests. The anxiolytic activity of extract was characterized by increased time spent and number of entries in open arms in the elevated plus maze. The phytochemical screening revealed the presence of flavonoids, β-sitosterol and steroids.

Summary & Conclusion: The results of the study for the first time show that the plant possesses neuropharmacological activity, confirming the traditional claims. Future research should focus on the identification and the neurobehavioral activity this plant.

Keywords: *Elevated plus maze, Neuropharmacological activity,*

Phytochemical analysis, Open field test, Swiss albino mice.

PSIT/OP04/0017

Design, Optimization and Characterization of Herbal Gel for Facial Application

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Introduction: Cosmetics are over-the-counter items that are aimed to enhance the look of the skin by washing, beautifying, and enhancing attractiveness. Herbs have been utilised for cleansing, rejuvenating, and managing them since ancient times.

Aim & Objectives: The objective of this research is to create and test an herbal face gel for cosmetic uses that is comprised of natural ingredients. A local market was the source of the amla (*Emblicaofficinalis*), masoor daal (*Lens culinaris*), and rose petals, which were then dried, powdered, geometrically mixed, and chemically evaluated as well as for organoleptic and physico-chemical evaluation.

Method: Amla (*Emblicaofficinalis*) a member of the *Euphorbiaceae*family, is a popular herbaceous remedy used in a range of medicinal formulations for a variety of ailments. Amla (*Emblica officinalis*), a member of the *Euphorbiaceae*family, is a popular herbaceous remedy used in a range of medicinal formulations for a variety of ailments.

Result: Four separate mixtures, designated F1 to F4, were created using different ratios of components such *Emblica officinalis*, *Lens culinaris*, rose petal powder, and polymers. All of the produced compositions were evaluated using a variety of metrics, including preformulation studies, pH, viscosity, spreadability, drying time, stability, statistical analysis, and an irritancy test.

Summary & Conclusion: The current study is a great attempt to create a herbal face pack utilising readily available ingredients like rose petal (*Rosa canina*) powder, masoor daal (*Lens culinaris*), and amla (*Emblica officinalis*). It was claimed that the developed formulation had the qualities of a typical cosmeceutical skincare composition and was physico-chemically stable.

Keywords: *Facial gel, Carbopol, PVA, PVP, Emblica officinalis, Lens culinaris, Rose petals*

PSIT/OP04/0019

Umbelliferone alleviates symptoms of chronic fatigue syndrome in mice

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Introduction: Chronic Fatigue Syndrome (CFS) is a debilitating medical condition characterized by profound fatigue, cognitive impairments, and other physical and mental abnormalities. Although the underlying etiology of CFS remains poorly understood, multiple multifactorial processes, including mitochondrial dysfunction, HPA axis dysregulation, immunological hyperactivation, oxidative stress, pathogen infections, and central neurohumoral aberrations, have been implicated in its pathogenesis. Umbelliferone, a naturally occurring 7-hydroxycoumarin, possesses diverse pharmacological properties and has shown promising therapeutic effects in various disease models.

Aim & Objectives: In this study, we investigated the potential of umbelliferone as a therapeutic intervention for CFS using a mouse model.

Method: CFS was induced by a combination of lipopolysaccharide (LPS) administration (1mg/kg, i.p.) followed by repeated forced swim sessions (10 minutes each) for 21 consecutive days. Umbelliferone was administered orally at two different doses (20mg/kg and 60mg/kg) from day 1 to day 21, with dexamethasone (0.5mg/kg, i.p.) serving as the standard drug comparator. Behavioral assessments were conducted using the Forced Swim Test (FST), Elevated Plus Maze (EPM),

and Open Field Test (OFT) to evaluate depressive-like behaviors, anxiety-like behaviors, and locomotor activity, respectively. Additionally, plasma glucose and cortisol levels were measured, and brain tissue was analyzed for lipid peroxidation, glutathione (GSH) levels, and nitrite concentration.

Result: Our results revealed that umbelliferone treatment significantly reduced immobility time in the FST, indicating an antidepressant-like effect. Furthermore, umbelliferone administration improved ambulatory behavior and cognition, as evidenced by enhanced performance in the EPM and OFT. Notably, umbelliferone demonstrated anxiolytic effects, attenuating anxiety-like symptoms in the CFS mouse model. Moreover, umbelliferone exhibited a modulatory effect on the HPA axis, as evidenced by decreased blood cortisol levels. Additionally, umbelliferone administration increased brain GSH levels while reducing brain thiobarbituric acid reactive substances (TBARS), suggesting antioxidant and neuroprotective potential.

Summary & Conclusion: Collectively, our findings suggest that umbelliferone may hold promise as a therapeutic intervention for CFS and its associated behavioral anomalies. The observed antidepressant, anxiolytic, and cognitive-enhancing effects, along with its ability to modulate the HPA axis and attenuate oxidative stress, highlight the multifaceted benefits of umbelliferone in ameliorating CFS symptoms. Nonetheless, further research is warranted to elucidate its precise molecular mechanisms and to ascertain its safety and efficacy in clinical settings.

Keywords: *Umbelliferone, chronic fatigue syndrome, Lipopolysaccharide*

PSIT/OP04/0023

Drug-Induced Gastrointestinal Problems

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Introduction: Drug-induced gastrointestinal (GI) problems represent a substantial challenge in modern pharmacotherapy, often leading to discomfort, decreased medication adherence, and potential serious complications.

Aim and Objective: The primary aim of this review is to understand the underlying mechanisms by which drugs cause GI problems and to identify key risk factors that predispose individuals to such adverse effects. Additionally, the objective is to discuss effective management strategies to mitigate the occurrence and severity of these complications.

Methods: We reviewed relevant literature from medical databases, focusing on studies that elucidate the mechanisms of drug-induced GI problems, identify associated risk factors, and propose management approaches. We analyzed findings from a wide range of medications, with a particular emphasis on common culprits such as non-steroidal anti-inflammatory drugs (NSAIDs), proton pump inhibitors (PPIs), and chemotherapeutic agents.

Summary & Conclusion: Our study revealed that drug-induced GI problems arise through multiple mechanisms, including direct mucosal irritation, alterations in gut motility, microbiota disruption, histamine release, and immune-mediated responses. We identified several risk factors that contribute to susceptibility, including age, polypharmacy, genetic predisposition, pre-existing GI conditions, and dosing patterns. Importantly, the discussion emphasizes the significance of patient education in recognizing potential GI side effects and

promoting timely reporting. A comprehensive understanding of the mechanisms, risk factors, and appropriate management strategies is essential for healthcare providers, researchers, and patients to optimize therapeutic outcomes while minimizing GI complications.

Keywords: *Adverse effects, Ulcers, NSAIDs, PPIs, Acid reflux, esophagitis, oxidative stress*

PSIT/OP04/0024

c-di-AMP signaling pathway – A critical biosensor in the regulation of bacterial infections

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Introduction: A unicellular micro-organism like bacteria integrate signals from various environmental factors and quorum sensing autoinducers. They regulate the metabolism of various nucleotide secondary messengers c-di-GMP, c-di-AMP, cGMP and cAMP. These secondary messengers critically regulate several key processes required for bacterial adaptations.

Aim & Objectives: In this study we first aimed to clone and isolate the cyclic di nucleotide synthase gene (disA) from *Mycobacteriumsmegmatis*. On overexpression of the gene, we further isolated and purified the cyclic di nucleotide synthase protein DisA, and evaluated the activity profile by different assay techniques to identify the regulatory parameters.

Method: The unicellular bacterial model *Mycobacteriumsmegmatis* is selected, and by the PCR technique amplified the gene disA and further cloned into a prokaryotic expression vector and the protein was overexpressed in the *E. coli* Rosetta cells. Using the SDS PAGE the DisAprotein was observed and following steps were performed for the protein purification. Finally, DisA activity assay were performed and analysed through HPLC.

Result: *Mycobacterium smegmatis*disA gene was amplified from the genomic DNA of M. smegmatis MC2 155, which corresponded to the actual size of *M. smegmatis*disA gene MSMEG_6080 of 1119 bp. The plasmid vector was successfully isolated. Distinct, round, smooth colonies of E. coli DE3 (Rosetta, DE3* and BL21) were observed on the transformed plates. The soluble fractions of BL21(DE3) cells overexpressing *M. smegmatis*DisA Protein were subjected to purification by affinity chromatography, and further studied for the activity assay using ATP as a substrate.

Summary & Conclusion: c-di-AMP is synthesised by di adenylate cyclase domain containing protein DisA in mycobacterial system. The in-vitro assay of DisA activity can be a useful regulatory tool to identify critical modulators of c-di-AMP synthase in the mycobacterial system. Here in future, we suppose that the c-di-AMP synthase pathway would have immense therapeutic application as a bio-regulator in the control of the bacterial infections.

Keywords: *c-di-AMP, Mycobacterium smegmatis, DisA protein, SDS-PAGE, RT-PCR, Affinity Chromatography*

PSIT/OP04/0027

Evaluation of Cytoprotective Potential of Curcumin against Mechlorethamine – An Alkylating Anticancer Agent

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Introduction: Mechlorethamine is an analog of mustard gas and an excellent anticancer agent. Successful clinical use of mechlorethamine gave birth to the field of anticancer chemotherapy, but the limitation is that it is highly toxic to normal cells also. There is no effective and specific antidote for the local and systemic toxicity of

Mechlorethamine, despite scientific research for more than 70 years.

Aim & Objectives: The present study aims to evaluate the cytoprotective potential of Curcumin against Mechlorethamine induced toxicity.

Method: Amifostine and Curcumin were administered 30 min before Mechlorethamine on the first day and followed by up to 4 days. On day 5th animals were sacrificed, and tissue homogenate makes and cytoprotective potential was measured followed by lipid peroxidation (LPO) assay, and antioxidant markers such as GSH, and GSSG. Body weight changes estimation and hematological variables were examined daily.

Results: Administration of a single dose of Mechlorethamine (10 mg/kg) percutaneously, decreased WBC count from 24 h onwards, GSH level decreased prominently, and GSSG level increased significantly at 24 h post-administration and subsequently showed a progressive decrease. LPO level increased progressively following mechlorethamine administration. The mechlorethamine-induced hepatotoxicity has been reduced by curcumin administration which was observed in the results of antioxidant markers such as GSH, GSSG, and LPO. Curcumin increased the levels of antioxidant markers and reduced the level of LPO & WBC count increased slightly.

Summary and Conclusion: Our study indicates that Curcumin reduces the toxic effect of Mechlorethamine and showed better antioxidant properties. This compound may serve as a safe medicinal supplement during Mechlorethamine chemotherapy in cancer treatment.

Keywords: *Mechlorethamine, Curcumin, Cytoprotectants, Antioxidants*

PSIT/OP04/0028

Evaluation of Hypoglycemic activity of Acacia Nilotica leaves on Streptozotocin induced Diabetic wistar rats

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Introduction: Diabetes mellitus is a heterogeneous primary disorder of carbohydrate metabolism with multiple etiological factors; it generally involves absolute or insulin resistance, or both. Plant medications and herbal preparations are generally thought to be less toxic and free from side effects than synthetic medications, and they are presently seen as having more therapeutic significance.

Aim & Objectives: The present study aims to evaluate the Hypoglycemic activity of the ethanolic extract of acacia nilotica on streptozotocin-induced diabetic wistar rats.

Method: Animals were fasted overnight before induction of Diabetes. A single I.P. injection of streptozotocin (40 mg/kg) was used to induce Diabetes. On day 5th, post administration of streptozotocin, diabetes was confirmed in animals by measuring fasting glucose level. The diabetic animals were divided into 4 groups, each consisting of 6 animals. Glibenclamide (0.25 mg/kg Oral), and Acacia Nilotica Extract (50 mg/kg and 100 mg/kg Oral) was administered. The standard drug and extract were given daily till day 14th. On days 3,7, and 14 post-administration of treatment, blood glucose levels and lipid profile (TC, TG) were measured. The Hypoglycaemic activity of Acacia Nilotica Leaves ethanolic extract was compared with Glibenclamide.

Result: At the end of the treatment period (the 14th day), both groups of extract (200 & 400 mg/kg) significantly ($p<0.001$) decreased blood glucose levels and lipid profile levels.

Summary & Conclusion: The experimental study showed a decrease in the average blood glucose level of diabetic rats was observed. The extract's anti-diabetic properties increased when the dose was increased, and blood glucose levels gradually decreased. Also, a gradual decrease was seen in the lipid profiles of animals.

Keywords: *Diabetes Mellitus, Streptozotocin, Acacia Nilotica, Hypoglycemic, Insulin*

PSIT/OP04/0029

Evaluation of *Bacopa monnier i*Nanoemulsion (BMNE) against Scopolamine induced Alzheimer disease in Wistar rats

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Introduction: Alzheimer's is one of the neurodegenerative disorders in which impairment of cognition is a hallmark and is characterized by cognitive loss due to neurodegeneration particularly in the hippocampus. *Bacopa monnieri* is reported as herbal neuroprotective having memory-enhancing properties. In this project effect of novel *Bacopa monnieri.* Nanoemulsion is evaluated against Scopolamine-induced Alzheimer's Disease in Wistar rats.
Aim & Objectives: To evaluate the effect of *Bacopa monnieri*Nanoemulsion (BMNE) against Scopolamine induced Alzheimer Disease in Wistar rats.
Method: The study was conducted in Scopolamine (5 mg/kg i.p.) induced Alzheimer's Disease in Wistar rats treated with BMNE. (2.5, 5, 10 mg/kg, p.o.), BM tablet (103mg/kg, p.o.) and Rivastigmine (1.5mg/kg, p.o.) for 28 days. *In-vitro* AchE activity, and *In-vivo*behavioral characteristics (MWM, Y Maze, EPM), nitrite level, oxidative stress, brain bioavailability parameters and mitochondrial complex activity in the brain was evaluated.
Result: Based on the findings; *In- vitro*AchE-assay BMNE showed an IC50 value of 6.97µg/m and 10-fold increase in BA. BMNE (10 mg/kg) showed characteristic improvement in behavioral activities, lowered AchE, nitrite levels, and improved oxidative / antioxidant status, and mitochondrial complex activity in Wistar rats.
Summary & Conclusion: BMNE showed increased brain bioavailability of Bacoside A and thereby may enhance the anti-Alzheimer's potential of *Bacopa Monnieri*.
Keywords*: Alzheimer disease, Scopolamine, Bacopa monnieri, Nanoemulsion*

PSIT/OP04/0031

In Silico Screening of Phytochemicals for Dipeptidyl Peptidase (DPP)-IV Inhibitory Potential

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Introduction: Although dipeptidyl peptidase-4 (DPP-IV) inhibitors are well-tolerated oral anti-diabetic drugs and even safe in renal compromised patients, they are associated with increased risk of arthralgia and warrants for finding better plant-based alternatives.
Aim & Objectives: *In silico* screening of phytochemicals from the plants having known anti-hyperglycaemic action.
Method: The crystallographic structure of DPP-IV was retrieved from the Protein Data Bank (PDB ID: 4A5S). The 3D structures of the reference standards (sitagliptin, vildagliptin, anagliptin and alogliptin) and phytochemicals were obtained from PubChem. Molecular docking, pharmacokinetics and toxicity prediction were performedusing Autodock Vina 1.1.2 in PyRx 0.8 software, SwissADME and ProTox-II web servers respectively.
Result: Out of 36 plant phytochemicals screened for DPP-IV inhibitory activity, chiisanoside (-10.2 kcal/mol), oleanolic acid (-9.5 kcal/mol), fenugreekine (-9 kcal/mol), lupeol acetate (-8.9 kcal/mol) and daucosterol (-8.2 kcal/mol) showed interactions with target amino acids in the intended docking pocket with low binding energy. However, their pharmacokinetic profile was unfavourable and lacked drug-likeness according to Lipinski's rule of five and Veber's criteria. Quercetin (-8.6 kcal/mol)

and isoreserpiline (-8.0 kcal/mol) demonstrated favourable pharmacokinetics and drug-likeness properties but lacked safety aspects. On the other hand, epicatechin (-8.1 kcal/mol), lycopodine (-7.9 kcal/mol), akuammidine (-7.6 kcal/mol), pterostilbene (-7.4 kcal/mol) and precatorine (-7.3 kcal/mol) exhibited not only optimal pharmacokinetics and drug-likeness attributes but also favourable toxicological profile.

Summary & Conclusion: Epicatechin, lycopodine, akuammidine, pterostilbene and precatorineare promising DPP-IV inhibitors. Further *in vitro* and *in vivo* studies are required to ascertain their biological activity.

Keywords: *DPP-IV inhibitors, Phytochemicals, In silico ADMET, Molecular docking*

PSIT/OP04/0032

Pharmacological Screening of *Sanseveria Cylindrica* in Management of Obesity

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Introduction: Obesity is a heterogeneous complex disorder of multiple etiologies characterized by excess body fat. The genera *Dracaena* and *Sansevieria* (*Asparagaceae*) are still poorly resolved phylogenetically. These investigations have been accompanied by the isolation and identification of hundreds of phytochemical constituents, especially flavonoids for management of Obesity.

Aim & Objectives: To investigate the Anti-obesity activity of *Sansevieria cylindrica* (*Asparagaceae*) in management of obesity. Identification, collection and authentication of leaves of *Sansevieria cylindrica,* Preparation of extract of leaves and Pharmacological evaluation of *Sansevieria cylindrica* in management of obesity.

Method: Animals were divided into control and obese groups. Rats were fed with a high-fat diet (HFD) and induced with a single low dose of orlistat (35 mg/kg) i.p. obese rats were treated with formulation (200 and 400 mg/kg). Blood glucose levels, Lipid profile were determined. Histopathological changes in obese rat organs (pancreas, liver, and kidney) were also observed.

Result: Treatment of obese rats with plant extract and orlistat decreased plasma glucose and lipid profile levels. Formulation treated rats showed significant ($P < 0.001$) decrease in the activities of gluconeogenic enzymes. Histological examination of various organ tissues of normal control, obese control, and drug-treated rats revealed significant results.

Summary & Conclusion: The experimental study showed that a persistent and substantial decrease in the average blood glucose level and Lipid profile of obese rats was observed for 4 weeks. Plant extract demonstrated substantial antiobesity activity similar to the standard drug. The formulation will emerge as a possible mixture that may challenge the synthetic drug.

Keywords: *Orlistat, antiobesity activity, medicinal plants, leaf extract*, *lipid profile.*

PSIT/OP04/0034

Antimicrobial Activity of Gir and Jersey Cow Urine: A Comparative Study

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Introduction: With the growing resistance of majority of the pathogenic bacteria to most of the antibiotic medicines used[1], a grim scenario is witnessed wherein need for alternative treatment modes is strongly felt. Some traditional means are available as per ancient Indian texts[2]. One such way is use of cow urine as antimicrobial agent. Taking a cue from this a comparative antimicrobial study was carried out using cow urine of indigenous and exotic cows – Gir and Jersy respectively – and the findings were compared with standard antibiotic Ofloxacin.

Aim & Objectives: The present study was aimed at verifying the antimicrobial activity of cow urine against pathogen *Escherichia coli* and evaluating the comparative efficacy of urines of indigenous & exotic cows. The objective is to propose an alternative antimicrobial medicinal substance after experimentally confirming its potential and comparing it with conventional standard antimicrobial medicine.
Method: Fresh cow urine samples of indigenous Gir variety of Bos indicus and exotic Jersy variety of Bos taurus were collected in separate clean, sterile containers from a local cattle yard. The antimicrobial assay of these two different samples was carried out against the Gram-negative pathogenic bacteria *Escherichia coli* by using Agar Cup Plate method[3]. Ofloxacin was used as standard antibiotic for comparison.
Result: The cow urine of Gir variety showed promising antimicrobial activity against *E coli* which was comparable with Ofloxacin. Urine sample of Jersey cow, however, did not exhibit any substantial antimicrobial activity.
Summary & Conclusion: The reported claim that indigenous cow urine has antimicrobial property was established with actual antimicrobial assay. The product can be suitably converted into a formulation (as availability of fresh cow urine may not be always possible) to serve as alternative antimicrobial medicine.
Keywords: *Antimicrobial activity, Gir cow, Jersy cow, Agar cup plate method, Ofloxacin, E coli*

PSIT/OP04/0035

Comparative study between ethanolic and aqueous extracts of *Micheliachampaca*for Type II Diabetes

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Introduction: Type II diabetes affects the vast majority of diabetic people. According to the WHO Global Report on Diabetes 2016, no. of individuals residing with hyperglycemia has been nearly elevated to 422 million. Plants are one of the richest sources of natural antioxidants such as flavonoid, phenolic, glycosides, and alkaloid compounds; the usage of natural antioxidants derived from plants has received a lot of attention recently. High levels of flavonoids in the diet may also help to lower the prevalence of Type II diabetes.
Aim & Objectives: The present investigation is an endeavor to validate the scientific use of ethanolic and aqueous extract of *M. champaca* leaves, against Streptozotocin-nicotinamide induced diabetes in experimental animals.
Method: In a Type II diabetes model generated by Streptozotocin and nicotinamide, the antidiabetic potential of ethanolic and aqueous leaf extracts of *Micheliachampaca* (Magnoliaceae) was compared to a control group of diabetes. The anti-diabetic activity was tested on Wistar rats. The effective antihyperglycemic ethanolic and aqueous leaf extracts were tested at 500 $mgkg^{-1}$b.w. for 21 days. After the trial, the blood sample was drawn from all animals for biochemical analysis. In extract-treated diabetic rats, the serum lipid profile was calculated.
Results: The biochemical investigation, serum cholesterol, serum triglyceride, high-density lipoprotein (HDL), and low-density lipoprotein (LDL) support the ethanolic extract's highly significant anti-diabetic activity in comparison to aqueous extract of *Micheliachampaca*. Compared to the diabetic control group, the ethanolic extract at a dose of 500 $mgkg^{-1}$b.w. exhibits a highly significant ($p<0.001$) reduction in fasting blood glucose

levels in comparison to aqueous extract of *Micheliachampaca.*

Summary & Conclusion: The leaves, stems, and roots of *Micheliachampaca* comprise a variety of phytoconstituents, including alkaloids, sugars, glycosides, tannins, proteins, amino acids, and flavonoids *M. champaca* L. has traditionally been used to treat cough, diarrhea, hypertension, rheumatism, dysmenorrhea and inflammation. The ethanolic extract exhibit highly significant antidiabetic activity in comparison to aqueous extract of *Micheliachampaca.*

Keywords: *Streptozotocin-nicotinamide, Type 2 diabetes, Micheliachampaca, HDL, LDL.*

PSIT/OP04/0036

Pharmacological evaluation of *Tradescantia Zebrina* for nootropic activity in albino mice

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Introduction: Medicinal plants have been crucial in the treatment of many diseases of humans from the beginning of civilization. In the present study the selected medicinal plant, is *Tradescantia zebrina*, of family *Commelinaceae.* The plant contains various chemical groups, including Flavonoids, alkaloids, tannins, phenols and steroids. The plant is rich in beta sitosterol which prevents the pathogenesis of Alzheimer's disease. It also inhibits acetylcholinesterase & prevents the breakdown of acetylcholine, which is responsible for learning & memory.

Aim & Objective: Millions of peoples worldwide are affected with neurodegenerative diseases. The objective of present study is to prepare an effective & safe drug formulation to treat memory related disorders.

Methods: Ethanolic extract of *Tradescantia zebrina* (200 & 400mg/kg) is used to treat the scopolamine (1mg/kg) & stress induced amnesia in Swiss albino mice. The nootropic efficacy of plant extract was measured by various behavioral models, with the help of histopathological studies & antioxidant assay like GSH, SOD, CAT, and LPO.

Results: *Tradescantia zebrina* is effective to treat scopolamine & stress induced memory loss which can be seen in various behavioral models. Histopathological evidences also suggest the significance of plant extract.

Summary & Conclusion: The findings of present research work revealed the nootropic effect of *Tradescantia zebrina.*

Keywords: *Nootropic, Tradescantia, scopolamine, Alzheimer's.*

PSIT/OP04/0037

Evaluation of Antiurolithiatic Activity of *Enhydrafluctuans* Lour on Ethylene Glycol and Ammonium Chloride Induced Rat Model

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Introduction: As there is no effective cure for kidney stones, despite the advancements in modern medicine, the growth and development of calculi continues to be a problem for humanity. *Enhydrafluctuans* Lour's antiurolithiatic action was examined in the current investigation against a rat model of ethylene glycol and ammonium chloride induction.

Aim & Objective: The objective of presentation is Evaluation of Antiurolithiatic Activity of *Enhydra fluctuans* Louron Ethylene Glycol and Ammonium Chloride Induced Rat Model by administering oral dose (200, 300, 400mg/kg body weight).

Methods: Rats were induced with renal calculi by supplementing with ethylene glycol and ammonium chloride for 28 days, and their antiurolithiatic activity was measured through biochemical parameters and serum analysis.

Result: The study found that lithiatic control animals had higher levels of oxalate and calcium excretion in urine compared to the normal control group. Treatment with aqueous or ethanol extract

significantly reduced these levels. Additionally, treatment with ethanol extract restored serum
creatinine excretion to normal levels, similar to the standard drug cystone.

Summary & Conclusion: Current studies show that *Enhydra fluctuans* aerial parts extract reduces creatinine, calcium, uric acid, and urea levels in urine and serum, restores normal urine volume, and prevents kidney stone formation. It also shows potent antiurolithiatic activity against calcium oxalate urolithiasis.

Keywords: *Antiurolithiatic activity, Urine parameter analysis, Serum analysis, Renal Calculi, Urolithiasis Rat Model.*

PSIT/OP04/0038

Treatment of cancer at metaphase stage of cell division

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Introduction: As we know that cancer is a stage of metastasis, pleumorphism, anaplesia, angiogenesis. The term cancer is also termed as neoplasm due to its characterstics properties. Cancer is widely spread and death causing disease which is occur due to some basic changes in cell.

Aim and Objective: Treatment of cancer in prenatal stage is a very effective and long-lasting idea as we see. However, there will be ethical issues but its a best option to avoid cancer throughout the life and for the upcoming progenies too.

Method: We are going to use Astatine-211 isotope for the alpha waves which act as a mutagen and cause muation of protooncogen genes like jun, fos, myc, ras, rat, abl. These genes are present in the chromosome 9 and 22.

Result: Alpha particles released by delocalisation of electrons from one shell to other in the form of EM waves cause mutation protooncogen which never converted into the ooncogen. This process occur in the metaphase stage of cell division during gestation and the first trimester is very crucial for the genetic makeup. In this metaphase stage chromosomes are clearly visible so it will be easy to demonstarte radiotherapy .

Summary and Conclusion: Mutation of protooncogen will result in inhibition of ooncogen and thus their will be not a chance of getting into the cancer like disease in throughtout the life.

Keywords: *Neoplasm, Prenatal, Mutagens, Radioactivity, Astatine-211*

PSIT/OP04/0039

Metformin preconditioned Buccal fat pad derived Mesenchymal stem cells for management of STZ induced diabetes mellitus in Wistar rats

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Introduction: Type-1 diabetes mellitus is a condition caused by deficiency of insulin or less insulin due to damage to insulin-producing ß cells. Stem cells have the ability to regenerate and differentiation. This study evaluates the effect of metformin preconditioned buccal fat pad (BFP) derived Mesenchymal stem cells in STZ-induced diabetes mellitus in Wistar rats

Aim & Objectives: To study the effect of metformin preconditioned Buccal fat pad derived Mesenchymal stem cells to manage diabetes mellitus. To evaluate the anti-diabetic activity of buccal fat pad-derived mesenchymal stem cells preconditioned with metformin. To determine the ability of buccal fat pad-derived mesenchymal stem cells for regeneration of pancreatic ß cells

Method: The animals were divided into blank, disease control and test group and test cells administered with multiple doses. The blood glucose, body weight, food water intake, serum and pancreatic insulin levels were measured for three groups and compared with each group.

Results: The blood glucose level, pancreatic and serum insulin levels were reduced significantly in test group compared to disease control group but the body weight was also reduced in test group.
Summary & Conclusion: The results suggest that, metformin preconditioned cells have the ability to regenerate the insulin producing pancreatic ß cells and reverse the hyperglycemic condition
Keywords: *Streptozotocin, mesenchymal stem cell, Insulin, Type 1DM*

PSIT/OP04/0040

Antidiabetic potential of Indian traditional fruit's seeds

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Introduction: Diabetes is a solemn and ubiquitous disease that are increasing rapidly worldwide. Across the globe, the number of people with diabetes was 422 million in 2014 and according to a recent study it is projected to increase up to 592 million by the year 2035.
Aim & Objectives: To investigate the antidiabetic potential of Indian traditional fruit's seeds.
Method: Masiello et al. (1998) developed a rat model of diabetes induced by administration of streptozotocin and Nicotinamide. STZ selectively destroys pancreatic β-cells, while Nicotinamide decreases the damage caused by STZ, creating a state of partial insulin deficiency, similar to what occurs in type 2 diabetes.
Result: Some previous studies suggest, ethyl acetate and methanolic extract of *S. cumini* seeds have tendency to reduce the blood glucose level in streptozotocin-induced diabetic rat model. Crude extract of the seed of *L. chinensis* display antidiabetic potential by impeding α-glucosidase activity and the ethyl acetate extract of Carica papaya L. seeds tend to produce antidiabetic action by impeding α-glucosidase and α-amylase enzymes activity.
Summary and Conclusion: The percentage of research on seeds of fruits is very limited. Extended research with the cultivation of these Indian traditional fruit plants may propagate the chances of household remedies for antidiabetic activity.
Keywords: *Antidiabetic, Streptozotocin, Diabetes Mellitus.*

PSIT/OP04/0050

Pharmacological Evaluation of the leaves of *Murrayakoenigii*and *Gymnemasylvestre*in mitigating diabetic cardiomyopathy

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Introduction: Diabetic cardiomyopathy is defined by the existence of abnormal myocardial structure and performance in the absence of other cardiac risk factors, such as coronary artery disease, hypertension, and significant valvular disease, in individuals with diabetes mellitus.
Aim & Objectives: To perform the pharmacological evaluation of the leaves of *Murrayakoenigii*and *Gymnemasylvestre*in mitigating Diabetic Cardiomyopathy.
Methods: *Murrayakoenigii* and *Gymnemasylvestre*combined extract were tested for their ability to treat diabetic cardiomyopathy brought on by STZ. Further, blood glucose level and *in vivo* cardioprotective studies in a diabetic rat model were also carried out. The data were analysed using Graph Pad Prism software version 8.0.2.
Results: The results of investigations showed decreases in blood glucose level of experimental rats and no obvious clinical signs of haematological parameter, and there were no gross lesions found in the experimental rats excised organs (Lungs, Liver, heart, stomach, and kidney). *Murrayakoenigii* and *Gymnemasylvestre* combined extract was

show more effective for treating myocardial necrosis in diabetic rats compared to control group with the help of histopathological reports. The experimental rats showed positive responses compared to the control group over the course of the investigation.

Summary & Conclusion: The use of herbal medicine in Diabetic cardiomyopathy is a common phenomenon. The outcomes of this study showed that *Murrayakoenigii*and *Gymnemasylvestre* are known to have numerous advantages that can be helpful in diabetic complications.

Keywords: *Diabetes mellitus, Diabetic cardiomyopathy, Murraya koenigii, Gymnema sylvestre.*

PSIT/OP04/0051

Anticancer, antiparkinson and antimicrobial activity of *Cuscutareflexa* seed

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Introduction: *Cuscutareflexa* Roxb. is usually known as Akashabela, Amarabela, dodder plant, devil's hair of Convolvulaceae. It is a perennial, parasitic, rootless, chlorophyll free parasite plant fully depends on a host plant commonly found in India.

Aim & Objectives: The present study is planned to evaluate for anticancer, antiparkinson and antimicrobial activity of *Cuscutareflexa* seed.

Methods: Extraction of the plant material (seed) was done with successive solvent extraction technique by hexane, ethyl acetate, butanol, and water ext. All the extract were evaluated for the anticancer activity on human colon cancer cell lines (HT-29) and human lung cancer cell lines (A-549), antimicrobial by disc diffusion assay and antiparkinson on *C. elegance.*

Results: Hexane and ethylacetate extract of the plant showed good anticancer activity against human colon cancer cell line (HT-29) cell lines in dose dependant manner while did not active against human lung cancer cells lines (A-549) and ethylacetate fraction also possess antiparkinson at the dose of 60 µg/ml.Minimum inhibitory concentration of ethylacetate extract was showed good result for MRSA-Resistant Strain (MRSA) on another hand the hexane extract of the parasitic plant also showed some antimicrobial activity.

Summary & Conclusion: In the present study the antimicrobial, anticancer and antiparkinson study of four extract was done and found that ethyl acetate extract was found active in almost all the activities as compare to others.

Keywords: *Cuscutareflexa, Phytochemistry, Antimicrobial, Anticancer, Antiparkinson*

PSIT/OP04/0052

Diabetic Pneumopathy: a systemic literature review

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Introduction: Diabetes Mellitus (DM) have various complications, it has seen that diabetic patient have tendency to develop Lung ailment with the progression of this metabolic disorder.

Aim & Objectives: This study explores the intricate relationship between Diabetes Mellitus and lung diseases, focusing on mechanisms, pathways, and potential therapeutic interventions.

Methods: To establish a link between glycemic management and lung function in diabetic people, a bibliographic study using an integrated literature review was conducted. By looking up manuscript research/review in the

Science direct, Pubmed, Google scholar, an integrative review was conducted. Since each of these databases covers a wide variety of publications, we chose them with the intention of giving you a broad overview of the body of research that has been done on the subject throughout the period under study.

Results: A total of 17 scientific papers were selected, which contain information regarding the interconnection between diabetes and lung disease.

Summary & Conclusion: Growing data support the link between DM and a number of lung conditions, including lung cancer, fibrosis, and chronic obstructive pulmonary disease (COPD).

Keywords: *Diabetes Mellitus, Lung diseases, Lung cancer*

PSIT/OP04/0053

Acute and Sub-acute toxicity studies of the combination of *Urtica dioica* and *Taraxacum officinale* in for the management of Diabetic Cardiomyopathy

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Introduction: The term "diabetic cardiomyopathy" refers to the existence of myocardial ischemia in individuals with diabetes mellitus despite the lack of overt clinical cardiovascular disease. These patients are at a substantially elevated risk of developing cardiovascular disease, with heart failure (HF) being a leading cause of morbidity and mortality.

Aim and Objectives: To perform the Acute and Sub-acute toxicity studies of the ethyl-acetate extract of *Urtica dioica* and *Taraxacum officinale* in rats.

Methods: Acute toxicity was conducted for 14 days and sub-acute toxicity for 28 days, as per OECD guidelines 423 and 407, respectively. Acute toxicity was evaluated *in vivo* with single-dose oral administration of 500 mg/kg, 1000 mg/kg, and 1500 mg/kg for two weeks. Sub-acute toxicity was investigated with repeated doses of the same doses for 28 days. The data was analysed using the software GraphPad Prism version 4.2.3, followed by a Tukey test.

Results: The acute toxicity study results showed no toxic symptoms, behavioural changes, or deaths in rats. The LD_{50} of the oral toxic dose calculated was 1500 mg/kg. Similarly, sub-acute toxicity studies confirmed the safety of the extract and showed no clinical symptoms nor biochemical or histological variation in rats treated with 500 mg/kg, 1000 mg/kg, or 1500 mg/kg compared to the control group ($p < 0.0001$).

Summary & Conclusion: From the result it is concluded that the ethyl-acetate extract of the herbs is safe for oral administration and showed substantial effect in the management of Diabetic Cardiomyopathy in rats with no toxicity.

Keywords: *Diabetes mellitus, diabetic cardiomyopathy, Urtica dioica, Taraxacum officinale, hyperglycemia.*

PSIT-OP04-0054

Apprehension of the neuroprotective role of Juglans regia on microglia stimulated Parkinson's disease.

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Introduction: Parkinson's disease (PD) is an incurable condition whose onset is influenced by both heredity and environment. Parkinson's disease commonly causes cognitive

deterioration, which significantly lowers the standard of life for patients. A major pathogenic characteristic of PD is neurological inflammation, which is mediated by activated microglia. The generation of several pro-inflammatory cytokines, such as tumour necrosis factor-alpha (TNF-α), interleukin-1 beta (IL-1β), and IL-6, in addition to superoxide, and nitric oxide (NO), is a hallmark of the activate microglia, also known as M1 microglia.

Aim & Objectives: To summarize the Neuroprotective effect of *Juglans regia* on microglia induced inflammation proving its possible beneficial role in prevention and management of parkinson's disease.

Methods: This topic's literature was investigated using PubMed and Google Scholar as a search engine. Several research and review articles from various publishers, including Taylor & Francis, MDPI, Nature, Frontiers, and Elsevier, were studied.

Results: According to studies, *Juglans regia* oil reduced the generation of reactive oxygen species (ROS) and pro-inflammatory cytokines, decreased the expression of associated proteins and genes of the NLRP3/ASC/Caspase-1 inflammatory pathway, and prevented apoptosis. Another study found that pre-treating BV-2 microglia with *Juglans regia*extract prevented the activation of the microglia caused by lipopolysaccharide.

Summary & Conclusion: The reviewed literature indicates that *Juglans regia* has been shown to inhibit microglia activation and hence prevent a number of inflammatory processes, which also suggests that *Juglans regia* may have neuroprotective effects in Parkinson's disease.

Keywords: *Parkinson's disease, Juglans regia, microglia, neuroinflammation, neuroprotection*

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PSIT/OP04/0055

Gastroprotective effect of *Lagenaria siceraria* peel on hyperacidity caused gastric ulcers in rats

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Introduction: *Lagenaria siceraria* (Bottle gourd), is an herbaceous plant. The plant has a great deal of folkloric appeal as the movement towards herbal remedies spreads around the globe. It is a well-liked vegetable with numerous uses like hypertension, diabetes, congestive cardiac failure (CCF), ulcers, piles, other conditions that are treated with *L. siceraria*.

Aim & Objectives: The study aimed to determine the ulcerogenic potential of the ethanolic extract by gastroprotective effect of *Lagenaria siceraria* peel on hyperacidity caused gastric ulcers in rats.

Methods: The preparation of *L. siceraria* extract was done with ethanol using a Soxhlet apparatus. Acute-oral toxicity (14 days) and subacute oral toxicity (28 days) were performed according to the OECD guidelines. The study was carried out by pylorus ligation, ethanol induced ulcer models in Wistar rats.

Results: The Pharmacognostic analysis was performed according to the literature review and the preliminary phytochemical test showed the presence of carbohydrates, amino acids, flavonoids, and alkaloids in the ethanolic extract. Acute-oral toxicity (14 days) and sub-acute oral toxicity (28 days) did not show any effect on body weight and organ weight, and it was non-toxic. In the Pylorus ligation-induced gastric ulcer model, 400mg/kg LSE was significant as compared to standard. In ethanol induced gastric ulcer model, LSE extract at a dose of 400 mg/kg compared to the standard showed the effectiveness and a significantly decreased incidence of ulcers. Significant lessening in the ulcer index at a dose of 400 mg/kg was observed in comparison to the standard.

Summary & Conclusion: *Lagenaria siceraria* extract (LSE) effectively prevents the gastric mucosa from the threat of ulcers caused by pylorus ligation and ethanol induced gastric ulcers.

Keywords: *Gastric ulcer, Pylorus ligation, Toxicity, Ulcer index.*

PSIT/OP04/0056

Influence of repeated stress on nicotine-induced behavioural Effects in mice

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Introduction: The stressful condition is found in all parts of the world and is becoming a serious threat to mankind's health. Nicotine consumption is becoming popular nowadays, particularly in all stress-related conditions.
Aim & Objectives: To investigate the stress relieving effects of nicotine in repeated stress mice induced by Restraint stress, Cold stress, and lit open field stress by administrating s.c. injections doses (0.25-0.1 mg/kg).
Methods: Animals were divided into stress and non-stress group mice. Application of different types of repeated stress for 6 days on alternate days. Administration of nicotine on day 6 after administration of last stress and assessment of behaviour such as locomotor activity, motor coordination and investigatory parameters. Stress mice were treated with nicotine (0.25,0.5&1 mg/kg). Nonstress mice were treated with 9 % w/v saline solution at the dose of 1ml/kg.
Results: Treatment with nicotine groups improves behavioural effects. The nicotine-treated group showed significant (P<0.001) improvements in all behavioural activities.
Summary & Conclusion: The experimental study showed that persistent and substantial improvement in the behavioural effects in mice. Thus, in conclusion the behavioral effects affected by stress are reversed by nicotine in animals, indicating the reinforcing tendency in stressful situations that abuse of nicotine is expected to be greater.
Keywords: *Nicotine, repeated stress, behavioural effects.*

PSIT/OP04/0057

Pathogenesis and molecular targets of diabetic wounds

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Introduction: The potential mechanisms underlying wound healing in diabetic patients have been increasingly investigated. Wound management in diabetic patient is of an extreme clinical and social concern. The delayed and impaired healing makes it more critical for research focus.
Aim & Objectives: We aim to mainly focus on the molecular cascades of cytokines (with growth factors) and other factors responsible for delayed wound healing, molecular targets and recent advancements in complete healing and its management.
Methods: An extensive literature survey was done using keywords “molecular targets”, “diabetic wounds”, “wound healing”, “pathogenesis” from the standard databases; Google Scholar, Scopus, Pubmed-Medline and Elsevier.
Results: The research on impaired healing process is proceeding hastily evident by new therapeutic approaches other than conventional such as single growth factor, dual growth factor, skin substitutes, cytokine stimulators, cytokine inhibitors, matrix metalloproteinase inhibitors, gene and stem cell therapy, extracellular matrix and angiogenesis stimulators. Although numerous studies are available that support delayed wound healing in diabetes but detailed mechanistic insight including factors involved and their role still needs to be revealed.
Summary & Conclusion: This review briefed recent pioneering information on possible molecular targets and treatment strategies.

Keywords: *Diabetic wounds, Wound healing, Molecular targets, Molecular pathways*

PSIT/OP04/0058

Evaluation of *Ficus palmata*leaves extract on experimentally induced gastric ulcer in rats

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Introduction: India has an ancient heritage of traditional medicine. The material medica of India provides a great deal of information on the folklore practices and traditional aspects of therapeutically important natural products. With the emerging worldwide interest in adopting and studying traditional systems and exploiting their potential based on different healthcare systems, the evaluation of the rich heritage of traditional medicine is essential.
Aim & Objectives: The aim of the present study was to evaluate the anti-ulcer activity of *Ficus palmate* (Family: Moreaceae). The literature survey provides us with the background to evaluate the anti-ulcer activity.
Methods: The ethanolic extract of the leaves of the *Ficus palmata*was extracted by the soxhlet extraction method. The extract was subjected to phytochemical tests and the flavonoids, steroids, alkaloids, tannins, phenols and triterpenoids were found. Then extract was evaluated for the anti-ulcer activity on ethanol-induced gastric ulcers in rats' experimental model. Percentage inhibition of gastric ulceration was calculated.
Results: The ethanolic extract of leaves of *Ficus palmata*produced a dose-dependent activity in ethanol-induced gastric ulcer model in rats. The anti-ulcer efficacy was comparable to standard (Ranitidine 50 mg/kg) drug and was found significant. The treated group at doses 100 mg/kg and 200 mg/kg showed 8.55 ± 1.20 & 4.4 ± 0.21 respectively percentage gastric ulcer inhibition, and Ranitidine 50 mg/kg showed 1.76 ± 0.07 inhibition of gastric ulcer.
Summary & Conclusions: Results of the present study suggested the anti-ulcer activity of the ethanolic extract of *Ficus palmata*leaves was due to the presence of phytoconstituents like tannins, flavonoids, and terpinoids are have curative activities for gastric ulcer, and these phytoconstituents are supporting therapeutically.

Keywords: *Ficus palmata, antiulcer, ethanol, phytochemical screening, Percentage inhibition, ranitidine.*

PSIT/OP04/0059

Evaluation of Bombax ceiba l. flower in hypothyroidism-induced erectile dysfunction in rats

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Introduction: Erectile dysfunction is a condition characterized by the inability to maintain a rigid, and persistent penile erection during copulation. It alters biochemical, hormonal and physiological parameters related to erection. Thyroid imbalance is known to be associated with sexual impairment. Both hypothyroidism and hyperthyroidism are responsible for erectile dysfunction. A literature survey reveals the effectiveness of various plant extracts and phytoconstituents in the treatment of sexual dysfunction. The root extracts of *Bombax ceiba* L. is known to improve sexual impairment in animal models without having any side effect. Traditional literature indicates that flowers of *Bombax ceiba* L. are useful in thyroid disorders related to hypothyroidism and also possess aphrodisiac activity with a high amount of β-sitosterol but to date, no work has been done on the flowers, though it is used in herbal medicine.

Aim & Objectives: To evaluate the aphrodisiac effect of different doses of ethanolic and petroleum ether flower extract of *Bombax Ceiba* L. by administering through oral route in propylthiouracil-induced erectile dysfunction in rats.

Methods: Animals were divided into seven different groups. Hypothyroidism induced by propylthiouracil (1ml/kg p.o.). The hypothyroidic rats that cause erectile dysfunction were treated with different doses of ethanolic extract (200mg/kg and 400mg/kg body weight) and also petroleum ether extract (200 and 400mg/kg body weight) of flower. Physical parameters were checked to confirm the dysfunction and other parameters like biochemical parameters, oxidative stress parameters, relative organ weight and histopathological analysis were observed to conform to the study objectives.

Results: Propylthiouracil significantly ($P<0.001$) decreased the level of T_3, T_4. Petroleum ether at 400mg/kg and the ethanolic extract at 400mg/kg significantly ($P<0.001$) increased the level of T3 and T4, and decreased the level of TSH in hypothyroid rats. Pet ether extract at the dose of 400mg/kg showed a significant ($P<0.001$) increase in physical parameters along with biochemical parameters followed by ethanolic extract at 400mg/kg ($P<0.01$) showed a significant increase in biochemical parameters. Testis was isolated for organ weight. Ethanolic extract 400mg/kg and pet ether 400 mg/kg showed significant improvement ($P<0.001$) and ($P<0.01$) in oxidative stress parameters respectively. The histopathological evaluation of pet ether 400 mg/kg and ethanolic extract 400 mg/kg showed significant improvement in seminiferous tubules.

Summary & Conclusion: The result of the study concludes that pet ether and ethanolic extract caused significant improvement in treating sexual impairment and can be explored as a potential pharmacological strategy for the management of sexual impairment.

Keywords: *Hypothyroidism, Sexual impairment, Bombax ceiba*

PSIT/OP04/0060

Evaluation of wound healing potential of *Cissus quadrangularis* in excision wound model

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Introduction: Wounds are a very common, oldest and unavoidable incidence of daily life. There are various treatment options available in the pharma sector to take care of wounds but they also possess some kind of unwanted effects. So, researchers are continuously exploring the potential of plants for wound healing.

Aim & Objectives: To investigate the wound healing activity of ethyl acetate extract of *Cissus quadrangularis* (CQ)in the Excision wound model.

Methods: Animals were distributed in different groupsAll animals were made unconscious by administering 1ml of ketamine hydrochloride (10 mg/kg b.w.i.p.). With a razor blade, their dorsal hairs were shaved. To create an excision wound an area of 500 mm2 in length and 0.2 cm in depth was induced on the shaved region. The wound was left exposed to the environment. Treatment groups received plant extract in two concentrations 5% and 10% (in ointment form) for 15 days. The percentage of wound contraction and epithelization time were calculated. Histopathological changes in granulated tissue were observed.

Results: Both 5% & 10% concentrations were effective in wound healing but the 10% concentration showed significant ($p<0.001$) wound closure and a decrease in epithelization time which was almost similar to the standard drug.

Summary & Conclusion: The study suggested that plants may be valuable wound healing agents with minimum side effects and may be one better option for wound treatment.

Keywords: *Excision wound model, ethyl acetate, Cissus quadrangularis, epithelization, granulated tissue*

PSIT/OP05/0001

Antimicrobial Resistance: An Update Review

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Introduction: Antimicrobial resistance (AMR) is not a recent phenomenon, but it is a critical health issue today. Over several decades, to varying degrees, bacteria causing common infections have developed resistance to each new antibiotic, and AMR has evolved to become a worldwide health threat.
Aim and Objectives: The aim should be to contain resistance, and to optimize the balance between the effective use of antimicrobials against infections, thus reducing morbidity, mortality and further spread of infection. Effective antibiotic stewardship is required to ensure that antibiotics are prescribed and used responsibly.
Methods: Methods routinely used for testing of antibiotic susceptibility of bacteria include the Disk diffusion method, Stokes method, E-test, agar and broth dilution method for the determination of minimum inhibitory concentration (MIC).
Result: The main cause of antibiotic resistance is overuse, abuse or misuse, due to incorrect diagnosis. Another cause is the use of counterfeit drugs. Increased globalization also causes the spread of drug resistance.
Summary & Conclusion: It is profound that antimicrobial resistance will continue to develop to the currently available antimicrobials by either new mutations or the exchange of genetic information. The obstacle of a few new antimicrobials on the horizon and the increasing frequency of AMR means that we must redouble our efforts to preserve the agents at hand, while intensifying the search for new therapeutics.
Keywords: *Antimicrobial resistance, Antibiotics, WHO*

PSIT/OP05/0004

Effectiveness of Prophylactic Antiemetic Regimen to Anthracycline Chemotherapy

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Introduction: Anthracycline-based chemotherapy is classified as "Highly Emetogenic Chemotherapy". As per National Comprehensive Cancer Center Guidelines, the recommended prophylactic antiemetic includes a combination of steroids with palonosetron, steroids with NK-1_{RA} (Neurokinin1-receptor antagonist), and palonosetron, or steroids with NK-1_{RA}, palonosetron, and olanzapine.
Aim & Objectives: To assess the effectiveness of a prophylactic antiemetic regimen to anthracycline chemotherapy.
To monitor the toxicity of antiemetics in patients receiving anthracycline-based chemotherapy.
To assess the patient's quality of life after receiving prophylactic treatment.
Method: A total of 59 patients were included in the study. Effectiveness was assessed using the Chemotherapy-induced nausea and vomiting (CINV) Diary and FLIE (Functional living index emesis) Questionnaire. P-value < 0.05 was considered statistically significant.
Results: There was no statistically significant difference (P-value = 0.99 and 0.31 for nausea and vomiting) between the antiemetic regimens obtained. Attributable adverse events such as somnolence (3.3%), constipation (5.0%), and headache (10.1%) were observed.
Summary & Conclusion: In this observational study, all regimens were equally effective and safer safety-wise for the control of nausea and vomiting in patients receiving

anthracycline-based chemotherapy. Antiemetic regimens were well tolerated by the patients with minimal impact on their Quality of life and mildly attributable adverse events.

Keywords: *Anthracycline, chemotherapy-induced nausea and vomiting, prophylactic antiemetic, attributable adverse events*

PSIT/OP05/0005

Assessment of Quality of life in the patients who underwent PTCA surgery with the help of validated CROQ-H

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Introduction: The Coronary Revascularization Outcome Questionnaire in Hindi (CROQ-H) is a patient-reported outcome measure (questionnaire) that has recently been validated in Hindi. This questionnaire is used to assess the quality of life of the patient who has undergone PTCA surgery.

Aim & Objectives: To assess quality of life in patients who underwent PTCA surgery with the help of CROQ-H

Method: The CROQ-H is a 32-item questionnaire divided into four domains: (A) Symptoms (7 items), (B) Physical functioning (8 items), (C) Psychological functioning (14 items), and (D) Cognitive functioning (3 items), with an additional 6 items of adverse effects in the post-PTCA version. This is a time-bound observational study conducted between February 1, 2019 and November 21, 2021, with ethical approval. A total of 178 patients were enrolled and administered the post-PTCA questionnaire. Scores of each domain were compared for PTCA treatment modalities: (a) number of blocked coronary arteries; (b) stages of Left ventricular dysfunction before procedure; (c) categories of BMI of patients during admission; (d) number of stents used; (e) puncture sites. Various parametric and nonparametric statistical tests were used for the comparison of the data.

Results: In comparisons between the treatment modalities only radial and femoral penetration site's domain scores differ significantly in three ways: (1) PTCA-Symptom score [p-value: 0.031]; (2) PTCA-Psychosocial score [p-value: 0.031] .011] and (3) PTCA-ADR score for the [p-value: 0.024].

Summary and Conclusion: The data in this study were not normally distributed, hence non-parametric tests were used. The study concluded that improvement in symptoms, psychosocial functioning, and constructs with radial puncture sites is greater than that with femoral sites.

Keywords: *Percutaneous transluminal coronary angioplasty (PTCA)*

PSIT/OP05/0006

Willingness to participate in clinical trial

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Introduction: This observational study was conducted to assess the knowledge, attitudes, and perceptions (KAP) of Malaysians toward participating in clinical trials. We planned and developed future outreach, education tools, and recruitment strategies to increase clinical trial enrolment.

Aim & Objectives: It also aimed to look for factors that will influence people's willingness to participate in trials.

Methods: A cross-sectional study was carried out on a randomly selected national sample of 398 Malaysians. An online questionnaire was created and distributed to the respondents. Descriptive statistics were presented in the form of frequency and percentages. The chi-

square test was employed to find the association between independent variables.

Results: The majority had good knowledge (61.3%) and high awareness (88.7) of clinical trials. However, most of them were not willing to take part in a clinical trial if they were assigned to a group of unlicensed drugs (90.2%) or randomly assigned (66.1%). The main reasons for participating in trials were recommendations from doctors (46.5%) and the potential for their own benefit (45.7%). Younger age was positively associated with the necessity and confidentiality of clinical trials. Most respondents indicated negative perceptions.

Summary & Conclusion: Most participants remained speculative about the safety of clinical trials. We found a better understanding of Malaysian people who are potential participants in a future clinical trial. It would likely improve recruitment. These findings could help clinical researchers establish a more thorough understanding of the participants and develop effective outreach strategies for clinical trial recruitment and retention.

Keywords: *Clinical trial, knowledge, attitudes, perception, Malaysia*

PSIT/OP06/0001

A comprehensive overview of Intellectual Property Rights (IPR)

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Introduction: In the recent advancements in the field of medicine and pharmacy, Intellectual property rights (IPR) are playing a pivotal role in giving credit and ownership to the innovator. Before going to claim any research or invention, one should have sound knowledge of aspects related to intellectual property rights.

Aim & Objectives: To understand the basic principle and driving force behind Intellectual property and invention credits. Also, to understand the lethal and legal perspectives attached to the ownership of a particular innovation.

Methods: Different past incidences and parallel comparison has been drawn to understand the basic clashes among innovator, the one who is using is unethically and the legal committees. For example- Novartis v/s Union of India (2013), F. Hoffman-La Roche Ltd. v. Cipla Ltd. (2012) Delhi HC, Bayer Corporation vs Union of India (2014) Bombay high court etc.

Results: Different parameters and features have been discussed for a better understanding of Intellectual property rights.

Summary & Conclusion: Intellectual property rights which can be legally lethal when not taken into consideration properly related to any innovation, copyright or any ethical confirmation of reuse of the credits.

Keywords: *Intellectual property rights, IPR, Case studies, comparison studies*

PSIT/OP06/0002

Expanding Horizon of IPR by intersecting AI with Medical Devices

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Introduction: A medical device generally can be described as any device intended to be used for health care purpose like patients' analysis or lifestyle management. One working definition for artificial intelligence (AI) is "a machine's ability to make decisions and perform tasks that simulate human intelligence and behaviour."

Aim & Objectives: At the intersection of the two fields, AI-based medical devices can do amazing things for us, with one goal being to improve decision-making at the point of care.

Methods: Data for this study were gathered from a variety of sources, including reviews

published between 1995 and 2023 in Science Direct, Elsevier, NCBI, and Web of Science.
Results: The availability of patent protection and many other factors continue to motivate development in this sector. In October 2020, the U.S. Patent and Trademark Office released a report, *Inventing AI*, that recognized the importance of patent protection for AI across several disciplines, including medical devices. From 2002 to 2018, U.S. patent applications directed to AI more than doubled from 30,000 to more than 60,000, and the percentage of all patent applications containing AI increased to nearly 16%. The first U.S. patent officially classified as being directed to an AI-based medical device (No. 4,465,077 in class 706/924) was directed to an apparatus for determining female fertility. Its application was filed in 1981.
Summary & Conclusion: Since that time, number of medical device AI patents have been granted for inventions related to medical imaging, patient health monitoring, cancer and other disciplines.
Keywords: *Artificial Intelligence, Patent, Trademark, Innovation, Trade, Foreign direct investment, Imitation, Patent protection*

PSIT/OP07/0001

Social Research in Indian Pharmaceutical Research: The Imperative for a Paradigm Shift

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Introduction: Pharmaceutical research in India has witnessed significant advancements in drug discovery and development. However, there is a pressing need to prioritize social research within PhD programs to address real-world problems that impact society.
Aim & Objective: To emphasize the necessity of shifting the focus in pharmaceutical science PhD programs from solely pursuing publications and patents to prioritizing the impact and relevance of research. It calls for a change in mindset among supervisors and emphasizes the importance of developing the competency of PhD candidates and guiding them towards meaningful contributions.
Methods: Draws upon the author's experiences as a doctoral candidate in pharmaceutical science and observations of the prevalent trend in the field. It reflects on the challenges faced by PhD candidates and the factors that contribute to the current approach of repeating existing research or pursuing publications and patents without grasping the fundamentals.
Results: The pressure from supervisors, who prioritize their own growth, grants, and promotions, often leads to a neglect of the educational and personal growth of PhD candidates. Consequently, this trend hinders the candidate's development and diminishes the potential for scientific breakthroughs.
Summary & Conclusion: To foster meaningful impact in the field of pharmaceutical science, there needs to be a shift in mindset. PhD supervisors should prioritize the development of their students' competency and guide them towards research that addresses real-world problems. This necessitates a more generous approach to publications and patent. By prioritizing social research, pharmaceutical science PhD programs can contribute significantly to the betterment of society.
Keywords: *Social research, pharmaceutical sciences, Meaningful impact, Publications and patents, Candidate development, Research relevance*

PSIT/OP07/0002

Secret of Beauty

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Introduction: The secret to being beautiful is definitely to be content and happy in your own

soul. It is two types, outer beauty and inner beauty.

Aim & Objectives: How to maintain our beautyin this busy life and chemical era.

Methods: Antioxidant plays an important role in beauty. The antioxidants are part of the defence system of the body protecting against free radical damage. Antioxidants are substances that help maintain health and repair cellular damage. They do not remove free radicals completely but they keep them at an optimum level. The free radicals are unstable and highly reactive molecules due to unpaired electrons. Consumption of antioxidants is thought to provide protection against oxidative stress and facilitate a positive impact on health.

Results: The minimisation of free radicals in the body occurred by the use of antioxidants-rich food.

Summary & Conclusion: Today everyone wants to maintain a happy life. A happy life is maintained by the use of proper antioxidants which neutralise the free radicals produced in the body. The free radicals are unstable and highly reactive molecules due to unpaired electrons. Oxygen is are required for life but it is highly reactive and during metabolism, reactive oxygen species are formed known as free radicals. These free radicals affect our beauty as well as a happy life. So, the use of antioxidant-rich food is responsible for beauty life.

Keywords: *Beauty, antioxidants, free radicals.*

PSIT/OP07/0003

Pharma Academicians Influencing Academia-Industry Collaboration to Foster Pharmaceutical Research: A Descriptive Qualitative & Quantitative Survey Study

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Introduction: Academia-industry collaboration has persistently been a matter of debate in academia and industry. The research was done in academia and its translation into marketable products certainly is not new. High-quality academic research can assist the industry in producing economic products for society.

Aim & Objectives: The aim of the present project is to compile and analyse the database of pharma academicians comprised of academician details along with their research expertise.

Method: With this aim, an attempt has been made to compile and analyse the database of pharma academicians based on personal details, academic details, and professional details including designation, Qualification, Specialization, Expertise, Interest vs. engaged in academia-industry collaborations, Projects handled, Publications, Interest areas of Academic- industry collaborative that can be utilized by Pharma Industries.

Result: In total 2401 pharma academicians participated and responded to the prepared project questionnaire. Based on participation an analysis report has been prepared comprising a participation distribution graphical presentation with respect questionnaire. Through this interpretation, one can understand the potential of academicians which helps to shorten the academicians as per their requirements, as well as by seeing the profile of interested academicians they will contact them for their work.

Summary & Conclusion: The significant database will be useful to foster academia-industry collaboration, help to prove the potential of academicians as innovative researchers to fulfil the requirements of Pharma Industries.

Keywords: *Pharma academicians, Academia-industry collaboration, pharmaceutical research*

PSIT/OP07/0004

Transition To Pharma 4.0+: A Study of Challenges and Solutions for the Indian Pharmaceutical Industry

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Introduction: The Indian pharmaceutical industry is the third largest in terms of volume; it ranks at just fourteenth in terms of value. It is evident that India needs to undergo a significant transition from a generic drug producer to a producer of novel molecules and biosimilars through rigorous R&D initiatives. With the encouragement of the Food and Drug Administration, the pharma industry is now on the track of catching up with other industries and is heading towards adopting more and more Industry 4.0 technologies and continuous manufacturing.

Aim & Objectives: Modern pharmaceutical production systems have emerged to convert ambition to excellence; the future has now emerged to define the Indian Pharmaceutical Industry to set new imperatives for all stakeholders.

Methods: The forthcoming progression of Pharmaceutical Industries needs the amalgamation of Pharma 4.0+ which accumulates all evolving technologies such as the Internet of things (IoT), artificial intelligence (AI), robotics, and advanced computing to intensely modify all processes of pharma manufacturing.

Results: The journey of transformation from data collection to the remarkable digital maturity of Pharma 4.0 will determine the next generation of pharmaceutical production. Industry 1.0 is the starting point of the modern pharmaceutical industry transition from manual processing from simple hand-operated tools to commercial-scale machinery. Industry 2.0 was enabled by electricity and early electronic machines. The automated and digital environment of Pharma 3.0 empowers the widespread transformation into Pharma 4.0 in pharmaceutical production. The latest developments are the industrial revolution of Pharma 4.0, which in particular has shown great potential for transforming the production base with advanced analytics tools for processing large quantities of production data. Hence, Smart Pharmaceutical Factory Automation is revolutionizing pharma manufacturing, creating an ecosystem of medical devices and applications that enables to increase the visibility of processes, machines, and products, thereby increasing productivity, reducing errors, and maximizing profitability.

Summary & Conclusion: The key to this paper is to summarize India can provide cutting-edge technology, communications, and solutions, which enable enterprises in the pharma industrial sectors to migrate seamlessly to Industry 4.0+ through the adoption of IoT, AI, and other robotic technology. The advancements in all technology with digitization, automation, and real-time data integration will produce better results.

Keywords: *Pharma 4.0+, internet of things, Artificial intelligence, Robotics, Smart Factory*.

PSIT/OP07/0005

Use of Student Teams-Achievement Divisions (STAD) to bridge the gap of slow learners (SL) and fast learners (FL)

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Introduction: The research has shown that the effectiveness of teaching practices in science, technology, engineering, and mathematics, is enhanced through the practices like collaborative learning, inclusion of critical thinking, and use of ICT tools. STAD is one of the simplest cooperative learning and has gone through under a lot of research by previous scholars. STAD is also commonly used to teach a wide range of subjects and grades. The five basic key components of STAD are the class presentation, teams, quizzes, individual improvement scores, and team recognition.

Aim and Objectives: We have implemented the STAD for the diploma students to bridge the gap between SL and FL.

Method: To achieve the objective slight modification is done. Generally, STAD has six stages presentation by the teacher, teams, brainstorming, quiz, assigning individual scores, and recognition. We have added one more quiz and STAD contains a presentation by the teacher, quiz, team assimilation, brainstorming, quiz, assign individual scores, and recognition.

Results: The incorporation of the quiz after the presentation has a great impact on the grades of the students. We found that the grades have increased. In addition, this small change increased the performance of the slow learners. Moreover, students found themselves very free in the team and discussed the problems freely.

Summary and Conclusion: In addition, the implementation of these activities increased the interest of the students in the teaching-learning activities. We highly recommend implementing the STAD at the institute to inculcate to increase student performance as well as life skills like communication, collaboration, critical thinking, etc.

Keywords: *STAD, slow learners, quiz, teaching-learning practices, TLP*

PSIT/OP07/0007

Role of Herbs in the Health care and Rural economy of Madhya Pradesh: An Overview

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Introduction: Traditional medicine remains an integral part of the health system in this area. Herbal drugs of forest origin hold great promise to enhance the health and livelihoods of forest dwellers. The natural products once served humankind as the source of all drugs and still represent over 50% of all drugs in clinical use and also the natural products are increasing day by day because of its lesser cost with lesser side effects. The World Health Organization estimates that 80% of the people living in developing countries of the world rely on traditional medicine for primary healthcare. Hence, this means that about 3.5 to 4 billion people in the world rely on plants as sources of drugs.

Aim and Objectives: Madhya Pradesh, the central part of India, is a hotspot area for medicinal plants. From the ancient days, People of Madhya Pradesh have been practising folklore medicine for many ailments like diabetes, pain, inflammation, cough, fever, sore throat, hypertension, paralysis, etc. The agro-climatic conditions prevailing in the region provide an ideal habitat for the natural growth of a variety of plants and herbs, which provide raw materials for pharmaceutical, phytochemical, food, flavouring and cosmetic industries.

Methods: Ethnomedicinal survey was made to various remote places of Madhya Pradesh to gather the information about usage of the plants.

Results: The paper provides information on 205 herbs and their products used by the tribes of Madhya Pradesh, India, for the treatment of various diseases. The paper also enumerates the part used, the method of preparation and conservational strategies of these plants.

Summary & Conclusion: The data obtained reveal that plants like *Andrographis paniculata*L., *Centella asiatica* L., *Calonyctionmuricatum* G. Don., *Dioscoreabulbifera* L., *Gloriosa superba* L., *Martynia annua* L., *Strychnus nux vomica* L., *Vanda tessellate L*. are at verge of extinction and need precautionary measure to prevent them from extinction.

Keywords: *Medicinal Plants, Health care, Tribes*

26TH ANNUAL NATIONAL CONVENTION

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STREAM 5: PHARMACY PRACTICE AND PHARMACOVIGILANCE	
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PSIT/PP05/0010	Prabhakar Shakya
PSIT/PP05/0011	Kirti Kukreja
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STREAM 6: INTELLECTUAL PROPERTY RIGHTS	
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PSIT/PP06/0004	Arunima Gupta
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PSIT/PP06/0007	Vaishnavi Chauhan
STREAM 7: PHARMACY EDUCATION	
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PSIT/PP07/0001	Anup Naha
PSIT/PP07/0002	Dr. Priya Jain
PSIT/PP07/0003	Aayush Raj Dubey
PSIT/PP07/0004	Sowmya Pujari
PSIT/PP07/0005	Prof. Rama Rao Nadendla
PSIT/PP07/0008	Prof. Rama Rao Nadendla
PSIT/PP07/0009	Vrushabh Hete
PSIT/PP07/0010	Chetan Choudhary
PSIT/PP07/0013	Nikhil Kumar
PSIT/PP07/0014	Pearl Dighe

PSIT/PP01/0001

Silver nanoparticles: A synthesis approaches, mechanism and pharmaceutical applications

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Introduction: Silver Nanoparticles with a width of less than 100 nm have had a significant impact on specific biomedical activities, such as diagnostic and clinical devices, for personalized medical services practice, over the last many years. The most extreme of nanoparticles unique qualities ensure that not only the Nano-sized, but that the particles are also disseminated without aggregation.

Aim & Objectives: This survey provides a comprehensive overview of the activity's course, synthesis, pharmacokinetics, mode of action, and application.

Methods: Physical and synthetic habits are the two most common methods for combining AgNPs, with the drawback that they're both precious and potentially poisonous. Therefore, the organic methodology is being used as a viable option because it is environment friendly and less hazardous, and it contains plant extracts, bacteria, parasites, and so on.

Result: As a result, great care must be made to use this marvel properly, in a respectable, appropriate, and capable manner, while also understanding its limitations and exercising the utmost caution to ensure that it does not hurt anyone or the environment.

Summary & Conclusion: The silver nanoparticles attach to the cell membrane and enter the bacteria and obstructing the microbial respiratory chain system. When silver particles enter into the bacterial cells, their bactericidal activity is enhanced because AgNPs can encourage the entrance of Ag+, which can create free radicals and activate oxidative stress, further increasing their bactericidal effect.

Keywords: *Nanoparticles, Silver-NPs, synthesis, mechanism, application.*

PSIT/PP01/0002

Development, evaluation, and *in silico* screening of diosmin incorporated ultra-flexible topical lipid gel system for the treatment of varicose vein

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Introduction: The topical ultra-flexible lipid gel system contains flexible bilayer membranes which are highly elastic and deformable vesicles. Varicose veins are abnormal, dilated blood vessels. Diosmin, commonly present in citrus fruits is used to alleviate circulatory issues by altering blood veins' elasticity and suppleness.

Aim & Objectives: To formulate a topically applicable diosmin-incorporated ultra-flexible lipid gel system (DUFLGS) that is then evaluated *in vitro* in comparison to a diosmin-loaded conventional gel system (DCGS).

Method: Schrodinger 2023-1 suite device was used for molecular docking study. Ultra-flexible lipid nanosuspension (UFLNS) was developed and optimized. It was then characterized and incorporated into the poly aqueous gelling agent Carbopol 934, to form DUFLGS and compared with the DCGS for its physicochemical properties.

Results: The docking score of the diosmin was found to be -8.507 representing good interaction and binding affinity for NF-kappaB inducing kinase. The particle size, PDI and surface charge of optimized DUFLNS were found to be 144.56 nm, 0.397, -24 mV, respectively with an entrapment efficiency of 84.09 ±0.4 %. The results of

DUFLNS, DUFLGS, and DCGS showed skin retention values of 75.5±13 %, 83.44±12 % and 66.39±14 %, respectively. *In vitro,* DUFLGS was reported to have better skin permeation and release reports than DCGS.

Summary & Conclusion: The sustained release of the DUFLGS is due to the elasticity of the ultra-flexible liposomes, thereby the penetration enhanced compared to DCGS. The developed formulation can improve topical drug penetration thereby uplifting the therapy efficiency.

Key words: *Diosmin; ultra-flexible lipid nano gel; Carbopol; Varicose veins*

PSIT/PP01/0003

Development of cellulose nano fibrils/polymer nanocomposite for transdermal drug delivery system for ketorolac tromethamine

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Introduction: Cellulose nanofibrils (CNFs) are having paramount importance as a promising material in the biomedical field due to their outstanding properties such as hydrophilicity, biocompatibility, biodegradability, and large surface area.

Aim & Objectives: In the present work, an attempt has been made to develop a matrix-type transdermal drug delivery system comprising of Ketorolac tromethamine with different concentration of CNF extracted from waste cotton with respect to Methyl Cellulose concentration using solvent evaporation technique.

Method: Cellulose nanofibrils (CNF) was extracted from waste cotton. Ketorolac tromethamine (KT) loaded CNF/MC (Methyl Cellulose) transdermal film was developed in which CNFs act as nanocarrier. The characterization of KT-loaded CNF/MC transdermal film matrices were done by Attenuated total reflection (ATR)-IR, Field emission scanning electron microscopy FE SEM analysis method. The patches were further subjected to various physical evaluations along with the in-vitro diffusion studies with the help of Franz Diffusion Cell.

Result: The results of ATR IR studies indicate no physical-chemical incompatibility amongst the drug, polymer, and CNFs. ATR-IR spectra indicates successful KT loading into the CNF/MC transdermal film. The FESEM results showed that waste cotton was successfully defibrillated via chemical process from dimensions of 2–4mm in length to 100 nm. The morphology of the CNF is a network of needle-shaped fibres crossing each other in nano-dimensions.

Summary & Conclusion: The experimental study showed that Release profiles from the CNF/MC matrices indicate that the drug release rate is sustained up to 30.79% for 8hrs with the increase in concentration of CNFs. Hence CNF is having a considerably good control on drug release rate in CNF based nanocomposite.

Keywords: *Transdermal drug delivery, Cellulose nanofibrils (extracted from waste cotton)/MC Nanocomposite, Ketorolac Tromethamine.*

PSIT/PP01/0004

Formulation of laxative polyherbal suspension and its analytical method development

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Introduction: Constipation has a very large impact in 20% humans and also largely affects quality of living. Many polyherbal formulations were prepared in recent times. The major advantage of the plants as laxative over synthetic agents is that they are cheap,

available easily and have minimum side effects.

Aim & Objectives: To formulate and evaluate a polyherbal suspension containing dry extracts of Cassia Fistula, Terminalia Bellerica, Terminalia Chebula, Operculina Turpethum and Baliospermum Montanum for laxative use and develop a validated analytical method by HPLC.

Method: The excipients employed in the formulation were Sucrose, Xanthan gum, Tween 80, Sodium methyl paraben, Sodium propyl paraben and water. Evaluation of the suspension was done by Organoleptic properties, Sedimentation volume, Redispersibility, Flow rate, Viscosity and pH. Analytical method was developed for assay of Rhein in formulated polyherbal suspension and validated by HPLC.

Result: The results obtained revealed that increase in concentration of suspending agent increased viscosity thus reducing the sedimentation and improving the stability of suspension. The results of validation parameters performed indicated that developed method is simple, reproducible, accurate, robust, precise and specific.

Summary & Conclusion: Polyherbal suspension was successfully formulated. The validation results obtained for assay of rhein in polyherbal formulation showed that developed HPLC method was precise, accurate.

Keywords: *Polyherbal, Suspension, HPLC, Method development, Luxative*, *Rhein*

PSIT/PP01/0005

Nutraceutical formulation of oats containing rosuvastatin for the prevention of cardio vascular diseases

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Introduction: The oral route represents a convenient and safe way of drug administration. Compared to liquid dosage forms tablets have advantages in terms of the chemical and physical stability of the dosage form.

Aim & Objectives: The present investigation was undertaken with the objective to prepare Rosuvastatin calcium tablets with Oats powder as novel nutraceutical diluent to be used once a day.

Method: Rosuvastatin calcium tablet containing 10 mg drug was prepared by wet granulation method according to the formula. A batch size of 100 tablets was planned for each formulation based on trial-error method.

Results: The formulated tablets possessed diameter of 1.4±0.02cm, thickness of 0.34±0.02) cm, hardness 0.5±0.02kg/cm^2, friability 0.8±0.02% and showed weight variation within the range 200±7.5%. All the batches fulfilled the pharmacopeial requirements of tablets. In-vitro dissolution of tablet was studied employing a paddle stirrer using 900 ml of phosphate buffer of pH 7.4 as dissolution medium at 50 rpm and 37±0.5 °C. The optimized batch F4 exhibited 98.95±0.6% drug release compared to 95.86±0.7% of the marketed tablet.

Summary & Conclusion: The formulated batch F4 showed good drug release profile and was found to be stable as compared with Marketed Tablet and other batches. Thus, stable tablets with Oats powder as nutraceutical diluent containing Rosuvastatin calcium was successfully prepared for the reduction of serum cholesterol levels.

Keywords: *Rosuvastatin, Nutraceutical, Formulation, Diluent, Dissolution.*

PSIT/PP01/ 0006

Formulation and evaluation of essential oil containing in- situ gel for treating oral candidiasis

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Introduction: A wide spread of superficial fungal infections deals with concerns related to current therapeutic regimen such as drug resistance and adverse events associated with rashes, pruritis, burns, allergic skin hypersensitization, etc. leads an urge exploration of renewable, biofriendly and effective source of antifungal agents such as natural oils with wide complexity of chemical constituents possessing fungicidal properties with minimum adverse events.

Aim and Objectives: The aim of present work is to develop a microemulsion based topical formulations for treatment of superficial fungal infections containing essential oils of lemongrass and thyme as an active at its safe, effective and stable dose evaluating its *In-vitro* and *Ex-vivo*.

Method: The minimum inhibitory concentration and minimum fungicidal concentration was obtained using micro-broth dilution method.

Result: All the three micro-emulsions formulated using the pseudo-ternary phase diagram were optimized using D-optimal design considering zeta-potential, globule size, percentage drug permeation and percentage drug retention as a critical quality attribute. It also characterized for its aesthetics, texture properties, drug content, drug release, skin permeation study and antifungal efficacy study against *candida albicans*. All the three gel formulations were safe, effective, stable and superior compared to the marketed formulation i.e., Clobet gel containing 1% clotrimazole. All three formulations, thyme oil loaded microemulsion was the most effective microemulsion based gel on *In-vitro* skin permeation study hence, characterized for *Ex-vivo* skin permeation study using confocal microscopy.

Summary and Conclusion: It can be concluded that essential oils can be a suitable active ingredient that are safe and effective for the treatment of superficial fungal infections.

Keywords: *Microemulsion based gel, Candidaalbicans, Essential oils*

PSIT/PP01/0010

Intranasal delivery of carotenoid embedded chitosan nanoparticles for reducing oxidative stress in alzheimer's disease

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Introduction: Alzheimer's Disease (AD) is one of the major leading problems with old age patients. However, acetylcholinesterase inhibitors are only available FDA approved drugs in the market. Naturally occurring drugs like antioxidants plays significant role in the preventing and treating AD.

Aim & Objectives: The present research explores cationic nanoparticles made of low molecular weight chitosan for delivering carotenoids to brain via intranasal route for suppressing oxidative stress in AD.

Method: QbD approach was followed for optimization of nanoparticles. Nanoparticles were extensively characterized. The cell lines studies were performed to assess biocompatibility,
cellular uptake, uptake mechanism, ROS scavenging activity and BBB permeation study and in-vivo studies.

Result: Nanoparticles exhibited narrow size in the range of 200 nm with 90% entrapment efficiency. The TEM suggested spherical nanoparticles. In-vitro release demonstrated sustained release of lutein for more than 96h while less than 50% lutein was released after 24h. The cytotoxicity assay demonstrated absence of significant toxicity. The uptake study results revealed enhanced internalization of nanoparticles via caveolae-mediated endocytosis pathway. ROS generation confirmed absence of any significant ROS generation nanoparticles. The antioxidant assay demonstrated significant ROS scavenging activity of L-CNPs. In-vitro BBB permeation performed through co-culture

model of BBB demonstrated efficient passage of L-CNPs to through BBB compared to pure lutein. This was further supported by in-vivo bio-distribution demonstrating deposition of nanoparticles in brain via intranasal administration.

Summary & Conclusion: The obtained results demonstrate the potential application of cationic L-CNPs for attenuating oxidative stress in brain for effective Alzheimer therapy.

Keywords: *Lutein, Carotenoid, Chitosan Nanoparticles, cell-uptake mechanism, In-vivo studies*

PSIT/PP01/0012

Novel Strategies for ocular drug delivery with nano-medicines and nano-formulations

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Introduction: Ocular disorders have the potential to cause permanent vision loss and blindness. As a result, they have a significant influence on a person's everyday life. Conventional medications cannot provide complete therapy for all ocular illnesses due to a variety of limitations during pharmaceutical transport through the blood-retinal barrier, creating a considerable therapeutic hurdle.

Aim & Objectives: The aim of this review is to investigate the strategies for ocular drug delivery with nano-medicines and nano-formulations.

Method: Numerous publications published recently show the necessity for medication delivery systems based on nanotechnology for the treatment of eye illnesses. All the data were collected from various published articles.

Result: The nanotechnology device has several helpful characteristics, including prolonged medication release and tailored tissue delivery. Furthermore, multiple in vitro and in vivo investigations have shown that nanoparticles are more effectively digested across ocular barriers.

Summary & Conclusion: The blood-retinal barrier may be broken by nanoparticles, improving medication absorption and ocular penetration. An overview of the synthesis of organic and inorganic nanoparticles for ophthalmic applications is the aim of this paper. We highlight the commercially existing products as well as the potential nano formulations undergoing ongoing clinical studies

Keywords: *Organic and inorganic nanoparticles; ophthalmic applications; clinical trials*

PSIT/PP01/0014

Metallic Nanoparticles Loaded In-Situ Gels for Targeting Bacterial Biofilms: A Novel Strategies for the management of Bacterial Keratitis

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Introduction: Bacterial keratitis is an infection and inflammatory condition of the corneal part of eye that produces pain, reduced vision, light sensitivity and tearing from the eye. Biofilm development by bacterial species and their subsequent resistance to antibiotic is a slow but serious risk to community as well as domestic health.

Aim & Objectives: In this work we have tried to provide new strategies to eradicate bacterial biofilm for effective treatment of antibiotic resistant bacterial keratitis.

Method: Antibacterial metals like copper, gold, silver, titanium, and zinc are recognised to have bactericidal and antibiofilm properties, which provide substitutes to antibiotics without considerably growing the possibility of resistance development. It has

been recognised that metal-based NPs have much better antimicrobial activities than their micro-sized counterparts. Exposure to a combination of metallic NPs with numerous antibiotics upsurges the drug susceptibility. In situ drug delivery system gives benefits such as decrease frequency of administration and increase patient compliance and comfort.

Result: An in-situ gel formulation is a remarkable substitute to gain effective plasma drug concentration, a benefited over conventional delivery systems. In situ gelling system delivers precise dose as well as extends residence time of drug in contact with mucosal membrane, thus overwhelms the difficulties usually met in semisolid dosage forms.

Summary & Conclusion: Existing treatments for inhibition of biofilms is limited to use of antimicrobial agents and post infection medication lies in surgical removal of the biofilm followed by continued antibiotic administration. However innovative approaches are also being used to battle the problem. Current developments in nanotechnology have recognised new approaches for effective biofilm control and management. Various surface-engineered NPs comprising with metal NPs, polymer NPs, metal-polymer composites, biologically active NPs, and stimuli-responsive smart NPs that are deliberated to offer the opportunity of either inhibiting or controlling biofilm associated infections with their relevant mechanisms of actions.

Keywords: *Bacterial keratitis, Nanotechnology, Metallic Nanoparticles, Antimicrobial, Biofilm, In - Situ Gel.*

PSIT/PP01/0015

An *In-vivo* herb drug interaction study of some anticancer drugs with herbal extract in albino rats

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Introduction: Colorectal cancer is one of the leading cancers in India. The possible treatment given depends on the stage of cancer. Chemotherapeutic agents are administered as a first line drugs to prevent the severity of cancer. Generally, 5 fluorouracil, methotrexate, cisplatin is used for chemotherapy. But it has been observed that due to unavoidable side effects of chemotherapeutic agents' patients tend to take alternative medicines for getting faster relief from cancer without knowing the possible interaction that could occur and give rise to many unwanted effects.

Aim & Objectives: We selected anticancer drug 5- Fluorouracil and methotrexate and herb the novel solvent free phytochemical from turmeric (*Curcuma longa*) named turmacin to study its pharmacokinetic drug interaction with the said two drugs.

Method: To study pharmacokinetic herb drug interaction of 5 FU and MTX with turmacin in healthy albino rats of either sex. Animals were divided into 8 groups. Group I was given 5 FU alone (100mg/kg, intravenously), Group II was given turamcin (600 mg/kg/day) Group III was given turmacin (1200 mg/kg/day) and Group IV was given turmacin (2400 mg/kg/day) for 7 consecutive days in combination with 5 FU. Group V was given MTX alone (100mg/kg, intravenously), Group II was given turamcin (600 mg/kg/day) Group III was given turmacin (1200 mg/kg/day) and Group IV was given turmacin (2400 mg/kg/day) for 7 consecutive days in combination with MTX. After this blood intervals were taken at regular intervals 15 min, 30 min, 1 hr, 4 hr, 12 hr, 24 hr. The samples were centrifuged at 3000 rpm for isolating plasma then concentration of drug in

the plasma samples were estimated by HPLC estimation.

Results: The results clearly showed that 5 FU and MTX blood levels showed slight variation in terms of increased volume of distribution with high dose of turmacin (2400mg/kg/day). However, no significant changes were observed in blood levels with low dose of turmacin (600 mg/kg/day & 1200 mg/kg/day). The mean residence time was also increased in the samples of 5 FU & MTX along with high dose of turmacin (2400mg/kg/day).

Summary & Conclusion: Overall pharmacokinetic study confirms the safety of turmacin with 5 FU & MTX only at low dose and high doses should not be used for safety concern of patients.

Keywords: *5 Fluorouracil (5FU), Methotrexate (MTX), turmeric (Curcuma longa) named turmacin, alternative herbal medicines, and herb-drug interactions.*

PSIT/PP01/0016

Cubosomes; An emerging novel drug delivery system

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Introduction: Among various innovative approaches, Cubosomes have emerged as a promising drug delivery platform. Comparable to well-known vesicular systems like liposomes and niosomes, Cubosomes are innovative lipid-based nanosystems.

Aim & Objectives: To study several advantageous features of Cubosomes that make them attractive for drug delivery applications.

Method: Cubosomes are self-assembled lipid-based nanoparticles composed of a bi-continuous cubic liquid crystalline phase. Firstly, their cubic structure provides a large surface area and an interconnected network of channels, allowing for high drug-loading capacity and efficient encapsulation of hydrophobic and hydrophilic drugs alike. The composition and arrangement of lipids in Cubosomes can be tailored to modulate drug release kinetics, offering controlled and sustained drug delivery profiles. Additionally, Cubosomes possess inherent stability and biocompatibility, minimizing the risk of toxicity and enabling their use in various administration routes. The preparation methods of Cubosomes involve several techniques, including the solvent dispersion method, high-pressure homogenization, and controlled cooling crystallization.

Result: These have been explored for the delivery of anticancer drugs, antibiotics, anti-inflammatory agents, and peptides, among others. They are extensively utilised in a variety of drug delivery applications, including transdermal, oral, and ocular as well as chemotherapeutic medication administration.

Summary & Conclusion: Overall, Cubosomes present a novel drug delivery system that holds significant promise for overcoming limitations associated with conventional formulations. They have cavernous (honeycomb) structures that are tightly packed and twisted into three-dimensional bilayers, and they are thermodynamically stable. Their unique structure, high drug-loading capacity, controlled release properties, and biocompatibility make them an attractive option for pharmaceutical research and development. With continued advancements and refinements, Cubosomes have the potential to revolutionize drug delivery and improve patient outcomes in the near future.

Keywords: *Cubosomes, crystalline phase, nanosomes, lipid-based nanoparticles, biocompatibility*.

PSIT/PP01/0018

Dynamics and computational insights on the mechanism of polyphenol complex urolithins against colorectal cancer

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Introduction: Colorectal cancer (CRC) is a significant global health concern, and there is growing interest in exploring natural compounds for its prevention and treatment. Urolithins, derived from ellagitannins found in pomegranate, have shown potential health benefits, including anticancer properties.
Aim and Objectives: This study aimed to investigate the potential of urolithins in colorectal cells and explore their mechanisms of action.
Method: Docking simulations employed the PDB files 3lmg (HER3), 3pp0 (HER2), and 4ag8 (HER1) for the EGFR protein.
Results: Docking simulations were performed using protein-ligand complexes, and stable interactions between urolithin A (UA) and target proteins were observed. DFT analysis confirmed the stability of UA. In vitro experiments using HT 29 colorectal cancer cells showed an IC50 value of 120.04 micromolar for UA, indicating its efficacy in inhibiting cell proliferation. The mechanisms by which UA may exert its effects in CRC were explored. UA was found to induce apoptosis in CRC cells by upregulating pro-apoptotic proteins p53 and p21, downregulating the anti-apoptotic protein Bcl-2, activating caspases, releasing cytochrome c, and generating reactive oxygen species (ROS).
Summary & Conclusion: These findings highlight the potential of urolithins, specifically UA, as a promising natural compound for CRC prevention and treatment. The ability of UA to induce apoptosis and modulate key cellular pathways involved in CRC progression suggests its potential therapeutic value. Further studies are warranted to explore the efficacy of UA in preclinical models and its potential synergistic effects with existing CRC treatments.

Keywords: *Colorectal cancer; urolithin A; DFT analysis; EHOMO; ROS*

PSIT/PP01/0020

Computational design of siRNAs against human HIF1A and investigation of their interaction with human argonaute 2

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Introduction: Hypoxia-Inducible Factor (HIF)-1 is a transcription factor that orchestrates the body's response to low oxygen levels by regulating gene expression. In solid tumors, hypoxia is a common feature, triggering the activation of HIF-1 subtypes.
Aim & Objectives: To screen and design of target specific (HIF-1α) siRNA by using computational tools and algorithms.
Method: Sequence of mature mRNA of HIF1A was retrieved from GeneBank1. siDirect tool was used to predict potential siRNA against HIF1A2. RNA fold web server was used secondary structure prediction. Crystal structure of human argonaute 2 with miR-122 (PDB ID: 6N40) was considered as template for the generation of four HIF1A siRNA-human argonaute 2 complexes.
Result: Analysis of Root Mean Square Deviation (RMSD) plots revealed minimal conformational changes in hAgo2. S2 displayed the lowest average backbone RMSD (2.62Å), indicating a stable hAgo2 interaction. The other three complexes exhibited average RMSD values between 3.5 and 4.5 Å. Additionally, a flexible region (820-837) previously modeled as a loop showed high Root Mean Square Fluctuation (RMSF). Analysis of siRNA RMSD plots suggested stable binding for S2 and S5, except for S1and S3.
Summary & Conclusion: Overall out of five, 2 siRNAs (S2 and S5) appear promising. This knowledge may lead to the development of

innovative therapeutic approaches targeting HIF-1α in solid tumors.

Keywords: *Hypoxia, RNAi, siRNA, MD simulation*

PSIT/PP01/0021

An overview on methods of generating iPSCs: a promising tool of disease modelling and drug discovery

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Introduction: Recapitulation of fully differentiated somatic cell to undifferentiated pluripotent stem cell can be done by ectopic expression of certain factors. These recapitulated cells are known as induced pluripotent stem cells (iPSCs).

Aim & Objectives: iPSCs can be used for various objectives like disease modelling, regenerative medicine, drug discovery and other basic cell-based research.

Method: Now a day's various methods are being utilized to reprogram differentiated cell into undifferentiated cell. Methods of reprogramming are integrating viral vector system & integration independent methods like non-integrating virus-based gene delivery, Non-viral DNA vectors, methods involving excision after integration & DNA independent reprogramming.

Result: Various improvements in methods of reprogramming have been adopted to increase the robustness and efficiency and to reduce gene alterations required to accomplish the process. However, depending upon the requirement certain methods of reprogramming have edge over others.

Summary & Conclusion: In this review we discussed comparative study of various existing methods of developing iPSCs that can lead the readers to choose suitable method to achieve goal of reprogramming depending on their feasibility and requirements.

Keywords: *Recapitulation, Somatic cell, Induced pluripotent stem cell, Regenerative medicine, Drug discovery.*

PSIT/PP01/0022

An insight full account on colon drug delivery system

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Introduction: Targeted drug delivery into the colon is highly desirable for various bowel diseases and the systemic transportation of peptides and protein drugs. Osmotic drug delivery system is one of the suitable approaches among various approaches of colon targeted drug delivery system. These devices are constructed up of an osmotic pressure active drug core and a membrane which is just relatively permeable.

Aim & Objectives: Drug needs to be first protected towards degradation, release, and absorption in the upper section of the GI tract before ensuring an abrupt or controlled release in the proximal colon in order to accomplish effective colon targeted drug delivery.

Method: There are various methods to develop colon targeted drug delivery systems including prodrug approach, covalent linkages of a drug with carrier, coating with pH sensitive & biodegradable polymers, embedding in pH sensitive and biodegradable matrices, time dependent release system, Redox sensitive, osmotic controlled tablets.

Result: Comparative study of various existing colon targeted drug delivery system gives insight about robustness and efficiencies which will help to choose suitable method for futuristic research on colon targeted drug delivery system.

Summary & Conclusion: The overview of stimuli-responsive polymers and multiple nano drug delivery systems that have found application in colon-specific drug delivery is the main topic of the article as it focuses on the relationship between therapeutic need and drug delivery. It concluded the study's modules, ideal drug attributes, different types of osmotically regulated pumps and their functions, advantages, and disadvantages.

Keywords: *Osmotic drug delivery system, Osmotic pump, Osmotic pressure, drug controlled by osmotic.*

PSIT/PP01/0023

To Design, Identify, Molecular docking and cytotoxic studies of some novel medicinally active Quinoline derivatives compounds against antitubercular agents targeting ATP synthase.

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Introduction: Tuberculosis (TB) continues to be a major global health concern in recent years, necessitating the development of novel antitubercular agents. It originates mainly from various strains of *Mycobacterium tuberculosis*, a highly infectious and chronic disease with high infection rate since ancient times.

Aim & Objectives: To Design, Identify, Molecular docking and cytotoxic studies of some novel medicinally active Quinoline derivatives compounds against antitubercular agents targeting ATP synthase.

Method: Some novel quinoline-based derivatives have been designed as potential anti-tubercular agents using in-silico enzymes inhibition activity by molecular docking against ATP synthase (PDB ID: 7JG5) and their in-silico acute toxicity have been studied.

Results: Molecular docking calculations gives 5 molecules with good docking score and interactions were taken against ATP synthase.

Summary & Conclusion: It suggests critical hydrogen bonding and electrostatic interactions between polar functional groups (such as quinoline derivatives) of anti-mycobacterial (anti-TB) compounds and amino- acids of ATP- synthase of M. Tuberculosis, could be probable reason for observed anti-mycobacterial action.

Keywords: *Molecular docking, antitubercular agents, Quinoline derivatives, ATP Synthase*

PSIT/PP01/0027

Formulation, development and evaluation of econazole hydrogel by using Solid-dispersion method.

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Introduction: Topical gel formulations are meant to be applied to the skin or to specific mucosal surfaces for a medication's local or transdermal effect, or for their moisturizing or protective function. Topical medication delivery can be attained by integrating the medication into the gel matrix for efficient drug delivery, avoiding first pass metabolism, and increasing local action for treating skin conditions and discomfort. Antifungal drugs provide great Antifungal activity; nevertheless, when used topically.

Aim & Objectives: The aim of this study to prepare a formulation, development, and evaluation of Econazole topical hydrogel by using solid dispersion method.

Method: In the present study, an attempt has been made to formulate the topical drug delivery system of Econazole in the form of hydrogel by using solid dispersion method. There are 9 batches

were prepared.

Result: All the prepared hydrogel formulation showed acceptable physical properties, consistency, spreadability, viscosity and pH of hydrogel. The best optimized formulation F5 compared with marketed Econazole Cream.

Summary & Conclusion: The *in-vitro* release rate of hydrogel was evaluated using Franz diffusion cell with phosphate buffer pH 7.4. As the receptor medium, the release rate of the optimized F5 formulation was found to follow Higuchi Model. The hydrogel was found to be stable with respect to color, pH and drug content at room temperature and conditions for three months.

Keywords: *Lipophilic, Hydrophilic, Polymeric network, Solid dispersion*

PSIT/PP01/0028

Formulation and evaluation of clotrimazole topical emulgel

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Introduction: Skin is one of the most extensive and readily accessible organs of the human body. The skin of an average adult body covers a surface area of approximately 2 m^2 (or 3000-$inch^2$) and receives about one-third of the blood circulating through the body.

Aim & Objectives: Fungal infection of skin is now-a-days one of the often-faced dermatological problem in worldwide. There are following 4 types of fungal infection on the basis of site. They are Athlete's foot, Yeast infection, Ringworm and jock itch. Emulgels have emerged as one of the most interesting topical delivery systems as it has dual release control system i.e., gel and emulsion. Emulgel was prepared by emulsification method.

Method: Clotrimazole emulgels was then optimized for various formulation and process variables. The optimized formulation was characterized for pH, rheological property, spreading coefficient, extrudability, drug content and *in vitro* release study. pH value of the obtained emulgel was found to 5.56±0.19, spreading coefficient was found to be 18.58±0.78 gm cm/sec and viscosity 1700±55 cp. The extrudability was found to be 88% and *in vitro* release was found to be 88.68%±0.69 after 24hrs of period. The *in vivo* study performed were skin irritation test and drug release study using modified franz diffusion cell. The prepared gel showed no edema and erythma when compared with drug solution. The drug release study was performed for 6 hrs and showed a release of 49.25±1.2% and 47.48±0.24% from prepared emulgel and marketed gel respectively.

Result: Gels were evaluated for their clarity, pH, viscosity, spread ability, skin irritation test, in vitro diffusion studies using standard procedure. All studies were carried out in triplicate and average values were reported.

Summary & Conclusion: Many advantages of gels a major limitation is in the delivery of hydrophobic drugs. So to overcome this limitation an emulsion based approach is being used so that even a hydrophobic therapeutic moiety can enjoy the unique properties of gels. When gels and emulsions are used in combined form the dosage form is referred as Emulgel in recent years, there has been great interest in the use of novel polymers.

Emulgel were found to have good antifungal activity comparable with marketed gel.

Keywords: *Fungal infection, Emulgel, Clotrimazole, Skin irritation test, Modified franz diffusion cell.*

PSIT/PP01/0030

Investigation of ethnopharamcaological characteristics of *Cissampelos pareira*

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Introduction: *Cissampelos pareira*, most relevant, medicinal climber plant in Menispermaceae family. In ancient times, it was used as traditional medicinal system for the treatment of various diseases such as ulcer, wound, fever, asthma, cholera, diarrhea, inflammation, snakebite, malaria, rabies and also recommended for blood purification.

Aim and objective: The purpose of this review is to provide information regarding phytochemistry, chromatographic and spectroscopic analysis, pharmacology, and toxicology of Cissampelos pareira along with possible future research. Foundation for plant- based drug discovery is possible in future by this information. Online databases like sciFinder, Web of Science, PubMed, and Google Scholar collect literature on Cissampelos pareira. Searched published books for information on this plant. Our study uses botany, chemistry, and phytochemistry with Cissampelos Pareira as the keyword. 54 Phyto molecules identified, including iso-quinoline alkaloids, flavonoids, flavonoid glycoside, and fatty acids.

Method: Cissampelos pareira crude extract contains various pharmacological activities such as antipyretic, antiulcer, antidiabetic, antiarthritic, anti-inflammatory, anticancer, antifertility, antimicrobial, antioxidant, antivenom, antimalarial, immune-dilator etc. Chemical fingerprinting of Cissampelos pareira using HPTLC, HPLC, UPLC, LC-MS, and GC-MS revealed alkaloids' pressure, fatty acids, and flavonoid glycosides.

Result: A literature survey shows significant growth in phytochemistry and pharmacology of this plant, highlighting its medicinal potential. While some traditional uses have been clarified through modern analysis, the correlation between pharmacological activities and specific phytoconstituents remains to be validated. Partial data on pharmacological studies and toxicological screening is available.

Summary and Conclusion: Most pharmacological studies on Cissampelos pareira have partial data and incomplete toxicological screening. Future research should focus on pharmacology through pre-clinical and clinical trials, ensuring safety, efficacy, and mechanism of action before clinical trials.

Keywords: *Cissampelos pareira, Menispermaceae, immune-dilator, Anti-fertility, Anti-asthmatic, Analgesic and anti-inflammatory activities.*

PSIT/PP01/0033

Enhancing the bioavailability of class IV drug by incorporation in colloidal drug delivery and novel drug delivery system.

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Introduction: BCS Class IV drugs display low solubility, low intestinal permeability, and low oral bioavailability. Colloidal drug delivery systems have various advantages, such as prolonged drug circulation, reducing toxicity, targeting drug delivery, and improving the bioavailability of poorly soluble drugs whereas Transdermal drug delivery are dosage forms designed to deliver a therapeutically effective amount of drug topically.

Aim & Objectives:

1. Development and evaluation of liposomes of antihypertensive drugs.
2. Development and Evaluation of a transdermal patch incorporating liposomes.

Method: The liposomes of selected drug were prepared by Ethanol injection method and thin film hydration method by using Quality by design approach. The optimised liposomes were evaluated for particle size and drug release. The formulated liposomes were incorporated in Transdermal Patch prepared by solvent casting method and evaluated for Physicochemical characteristics including in vitro drug release and in vitro and ex vivo permeation studies.

Results: The particle size of liposomes is 55 nm with 0.385 PDI. The in vitro dissolution studies showed 91 % drug release after 8 hours. The In-Vitro Permeability studies showed 53% permeability from the liposomal transdermal patch whereas 16% from the transdermal patch of pure drug. Ex-Vivo permeability study shows 45% permeability within 6 hours and 16.5% permeability from transdermal patch of pure drug.

Summary & Conclusion: The colloidal drug loaded transdermal patch provided the benefits such as enhanced permeability, avoided the first-pass metabolism, avoided the side effects associated with the orally-administered dosage form, Improved solubility of the drug. The formulation exhibited good stability as per ICH Guidelines.

Key words: *Transdermal Patch, Liposomes, BCS Class IV*

PSIT/PP01/0036

Radiation synthesis of mesquite gum grafted with acrylamide copolymer as drug release retardant

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Introduction: Grafting is a preferred approach for attaching functional groups to polymers, and it also helps delay the release of drugs by creating a matrix that gradually expands and erodes to allow for drug release.

Aim & Objectives: To prepare and evaluate the pH responsive interpenetrating network hydrogel beads of acrylamide grafted onto mesquite gum with polyvinyl alcohol for the purpose of delivering budesonide to the intestine.

Method: We synthesized pH-responsive interpenetrating hydrogel beads of acrylamide grafted to mesquite gum with polyvinyl alcohol and sodium alginate. Using ammonium persulfate as an initiator and the free radical polymerization method for synthesizing the graft copolymer.

Result: The MQ-PVA-g-AM graft copolymer having broad peaks than native MQ, according to X-ray data. Introduction of 3615 and 1645 peaks, in FTIR and introduction of 179 shift in NMR which is a sign of polymer grafting. The hydrogel beads showed less than 15 % swelling in acidic pH whereas 90% swelling in case of alkaline pH. Hydrogel beads made using improved polymeric structure showed 99.43% of budesonide release at 10 hrs.

Summary & Conclusion: The grafted copolymer was successfully synthesized and confirmed the reaction by the FTIR and the NMR studies. The grafting was also confirmed by the shift of melting in DSC graphs. The swelling and deswelling of hydrogel beads confirm the pH responsive behaviour of the hydrogel beads. The hydrogel beads showed the controlled release behaviour with change in the properties of the grafted copolymer than the native gum.

Keywords: *Polymer grafting, Controlled release, Budesonide, Mesquite gum, Interpenetrating polymer network.*

PSIT/PP01/0038

Nanoparticles in drug delivery: Enhancing efficacy while minimizing toxicity

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Introduction: Nanoparticles have gained substantial attention in recent years as promising drug delivery vehicles due to their unique properties. This study investigates the utilization of nanoparticles to enhance drug efficacy while minimizing toxicity, addressing a critical challenge in pharmacology and toxicology.

Aim & Objectives: Aim of this study is to assess the potential of nanoparticles in

improving drug delivery, increasing therapeutic efficacy, and reducing adverse effects. Specific objectives include synthesizing drug-loaded nanoparticles, evaluating drug release kinetics, assessing cellular uptake, and in vivo toxicity profiles.

Methods: Nanoparticles were synthesized using a modified emulsion-solvent evaporation technique. Drug release kinetics were studied using in vitro dissolution experiments. Cellular uptake was investigated via confocal microscopy. In vivo toxicity was assessed in a murine model through histopathological analysis and serum biomarker measurements.

Results: Our findings indicate that drug-loaded nanoparticles exhibited controlled release kinetics, prolonging therapeutic drug levels in vitro. Confocal microscopy revealed enhanced cellular uptake of drug-loaded nanoparticles compared to free drug. In vivo studies showed a significant reduction in toxicity markers in nanoparticle-treated groups, highlighting the potential for minimizing adverse effects.

Summary & Conclusion: This study showcases the potential of nanoparticles as efficient drug carriers, enhancing drug delivery and reducing toxicity. These findings hold great promise for improving therapeutic outcomes and patient safety in pharmaceutical applications. The successful translation of nanoparticles into clinical practice could revolutionize drug delivery strategies, leading to more effective and safer treatments.

Keywords: *Nanoparticle, biomarker, drug kinetics, drug efficacy, pharmacology and toxicology.*

PSIT/PP01/0040

Intertwined quantification-Pioneering methods for concurrent estimation of sitagliptin phosphate and empagliflozin

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Introduction: Two novel modest, exact, precise, sensitive and inexpensive UV spectrophotometric methods were established and simultaneously authenticated for the concurrent assessment of sitagliptin phosphate and empagliflozin in bulk form.

Aim & Objectives: The captivating objective of this study is to achieve two precise and simultaneous quantitative estimation methods for both drugs in their bulk form.

Method: The technique involves intricate Q-absorbance ratio study using two wavelengths, the isobestic point of both drugs (274.5 nm) and the λmax of sitagliptin phosphate (267 nm) and the other being 274.5 nm and other technique involves simultaneous equation method. Methanol:Water (5:5) has been employed as common solvent for the proposed methods. The standardization plot was ranked to be linear between 50-250 µg/ml for sitagliptin phosphate and empagliflozin with R^2= 0.9957 and 0.9981 respectively. Process validation was accomplished as per ICH requirement for linearity, correctness, meticulousness, system appropriateness, sturdiness, sensitivity and specificity.

Result: The linearity of both the methods showed R2 value close to 1 and % RSD values (for intra-day and interday precision) were found < 2 for both the methods indicating that both the methods are precise. The percent recovery for the combination was found in the range of 102.87% to 108.35%, which is in accordance with ICH guideline as according to the guideline the acceptance range for % recovery is 70-120%. Through simultaneous equation and Q absorbance technique, the LOD values of SP and EMP were 4.57 µg/ml and 0.9075 µg/ml, 0.68 µg/ml and 1.06 µg/ml respectively and LOQ values were found as 13.87 µg/ml and 2.75 µg/ml, and 2.08 µg/ml and 3.21 µg/ml for SP and EMP, which proves the sensitivity of the developed method.

Summary and Conclusion: The proposed approaches were modest, exact, delicate, precise, rapid and appropriate for repetitive

quality scrutiny of sitagliptin phosphate and empagliflozin in bulk and commercial formulations encompassing combination of these two drugs in the future.

Keywords: *Sitagliptin phosphate, Empagliflozin, Q-absorbance ratio method, Simultaneous equation method, Isobestic point, ICH guidelines.*

PSIT/PP01/0041

Spirulina platensis extract containing eudragit coated vitamin B12 granules: Formulation and evaluation

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Introduction: Nutraceuticals are nutritionally beneficial substances with minimal side effects. Vegans experience a lack of vitamin B12 due to which they suffer from health problems, as majorly it is obtained from animal sources. However, there are a number of herbal sources from which vitamin B12 can be obtained, such as *Spirulina platensis, Hippophae rhamnoides, Hordeum vulgare,* etc.

Aim & Objectives: This research aimed to develop *Spirulina platensis* extract containing Eudragit-coated vitamin B12 granules.

Method: *Spirulina platensis* was authenticated by CSIR NBRI with Herbarium number (LWG) 118183. Aqueous extract of *Spirulina platensis* was analyzed for various physio-chemical parameters for the presence of alkaloids, flavonoids. *Spirulina platensis* extract rich in vitamin B12 granules were prepared using aqueous extract of *Spirulina platensis* with CMC, lactose, starch, saccharin and optimization was done by factorial design. The prepared batches of granules were evaluated for various parameters such as flow properties and *in vitro* drug release. Pharmacological activity of optimized batch was performed on Wistar rats in different groups such as control (Normal saline), standard (Vitamin B12) and test (Granules).

Result: As observed the granules had good flow property, with a 90% cumulative drug release. The *in vivo* study showed the concentration of vitamin B12 was comparatively much higher in test group (626 pg/mL) as compared to standard (445 pg/mL) and control group (359 pg/mL).

Summary & Conclusion: *Spirulina platensis* extract containing Eudragit-coated vitamin B12 granules were formulated. Pharmacological studies revealed increased vitamin B12 levels in test as compared to standard. Thus, this could be a better source of vitamin B12 for vegans.

Keywords: *Spirulina platensis, vitamin B12 granules, Eudragit*

PSIT/PP01/0042

Pharmacological characterization of mucoadhesive loxapine succinate nanosuspension for intranasal delivery

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Introduction: Loxapine Succinate is an antipsychotic drug acting on D2 and serotonin 5-HT2A receptors. Presently, available dosage forms in the market have limitations, such as first pass metabolism and low bioavailability. Thus, to overcome these problems, a better dosage form is required.

Aim & Objectives: The objective was to study the pharmacological parameters of mucoadhesive nanosuspension of Loxapine succinate through intranasal delivery.

Method: Mucoadhesive nanosuspension of Loxapine succinate for intranasal delivery was formulated using PLGA by nanoprecipitation method, and optimized by BBD design. Pharmacological activity was performed on Swiss albino mice in different

groups, where Group I (negative control) and Group II (positive control) were treated with normal saline, Group III (standard) was treated with standard drug suspension and Group IV (test) with Loxapine loaded mucoadhesive nano suspension through intranasal administration. Then, nasal ciliotoxicity and histopathological studies on the above groups of mice were performed.

Result: After *in vivo* study, the homogenized brain samples of the Swiss albino mice showed higher concentration of 18.7µg of drug in the brain as compared to the standard, which was 7.30µg by HPLC analysis.

Summary & Conclusion: It was concluded that the formulated mucoadhesive nanosuspension is more therapeutically effective than the existing dosage form and could be a more effective alternative for the antipsychotic effect.

Keywords: *Loxapine Succinate, PLGA, Nanoprecipitation method, Mucoadhesive Nanosuspension BBD.*

PSIT/PP01/0043

Development and characterization of rifaximin-loaded bilosomes for the management of inflammatory bowel disease

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Introduction: Rifaximin is an antibiotic drug to treat inflammatory bowel disease (IBD), but shows less effectiveness due to its poor oral absorption and low site-specificity as it degrades in the gastrointestinal tract. To overcome this problem, elastomeric nano-vesicular Bilosomes were formulated, with Eudragit S100 coating, for site-specific drug delivery to the large intestine (colon) and rectum.

Aim & Objectives: To develop surface-modified Rifaximin-loaded Bilosomes by using Box Behnken-Design (BBD), and characterize prepared batches for different selected dependent variables to enhance oral absorption and site-specific drug delivery.

Method: A thin film hydration method was used for the preparation, and by using BBD for four center points, sixteen distinct Bilosomes batches were prepared to achieve nanocarriers with maximum entrapment efficiency, and minimum particle size. Further, the surface modification of the optimized formulation was done with Eudragit S100.

Result: The Eudragit-coated Rifaximin-loaded Bilosomes were analyzed for vesicle size, polydispersity index, zeta potential, entrapment efficiency, and cumulative drug release and were found to be 143.2 nm, 0.225, -29.8 mV, 89.6%, and 77.44% respectively.

Summary & Conclusion: The Surface-Modified Bilosomes were spherical in shape with stable zeta potential, and homogeneous distribution with no aggregation. The optimized formulation showed good entrapment efficiency and desired release profile, which may contribute to the treatment of IBD via the oral route.

Keywords: *Bilosomes, Box Behnken-Design, Surface Modification*

PSIT/PP01/0044

Formulation development and evaluation of phytosomes of herbal extract for effective treatment of hepatic disease

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Introduction: There are many kinds of liver diseases like hepatitis is caused by viruses, also can be the result of drugs or drinking too much alcohol. Herbal products are effective in liver diseases by carefully synergizing the

strengths of the traditional systems. The medicines with the modern concept like phytosomes have a therapeutic activity against the hepatic diseases based on medicinal evaluation.

Aim & Objectives: To perform the Formulation development and evaluation of Phytosomes of herbal extract for effective treatment of hepatic disease.

Method: Hepatitis was induced in rats by injecting the viruse (hepatitis A). Phytosome are formulated by the processes in which the standardized extract of active ingredients of herb (Bombax ceiba) by reacting 3-2 moles of a natural or synthetic phospholipid with one mole of herbal extract. Evaluation techniques like (visualization, entrapment efficiency, transition temperature, drug content & spectroscopic evaluation, etc).

Result: Treatment of hepatitis in the rats with the herb (Bombax ceiba) significantly shows the therapeutic efficacy as well as anti-oxidant properties. Treatment of rats with hepatitis using the phytosomes results in the decrease in liver inflammation.

Summary & Conclusion: The leaves of Bombax ceiba extract have liver protecting activity. Phytosomes study can increase therapeutic efficacy and decreases the frequency of administration.

Keywords: *Bombax ceiba, Phospholipid, Herbal extract, Therapeutic efficacy, Solvent Evaporation.*

PSIT/PP01/0045

Formulation and assessment of nanolipid carrier loaded phytoconstituent ursolic acid for the treatment of non-melanoma

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Introduction: Dermatological cancer remains the leading cause of mortality due to early diagnosis challenges and limited curative treatment options. Ursolic acid (UA) is gaining scientific interest for its biological functions. Ursolic acid's bioavailability is limited due to low solubility and absorption, thus requiring the development of innovative drug delivery formulations using nanolipid carrier mechanisms for enhanced therapeutic efficacy.

Aim & Objectives: The primary objective of the study was to create and assess nanostructured lipid delivery systems (NLCs) that incorporate natural triterpenoids for the purpose of treating non-melanoma.

Method: The preparation of NLCs was conducted using a modified micro-emulsion method. Response surface methodology (RSM), specifically the Box-Behnken design with a total of 17 experimental trials, was utilised in the process of optimising NLCs. NLCs were assessed using Scanning electron microscopy (SEM), Transmission election microscope (TEM) and *in vitro* release studies

Results: The prepared NLCs particle sizes were found to be (110 nm±1.04), entrapping effectiveness (98±1.25) were found. In the context of in-vitro investigations, it was observed that the drug encapsulated within nanostructured lipid carriers (NLCs) exhibited a consistent release profile over duration of 24 hours, in comparison to the unformulated drug.

Summary & Conclusion: The utilisation of nanotechnology lipids carrier strategies has been shown to effectively extend the release of ursolic acid.

Keywords: *Skin cancer, Triterpenoid, Ursolic acid, Nanostructured lipid carrier, Optimization, modified micro-emulsion method*

PSIT/PP01/0046

Pharmacological characterization of *Momordica dioica* leaves extract-loaded topical microemulsion for the anti-ageing activity

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Introduction: Ageing is a complex, unavoidable process that involves numerous physiological changes. *Momordica dioica* plant belongs to the Cucurbitaceae family and has various biological activities due to the presence of alkaloids, triterpenoids, flavonoids, glycosides, and phenolic compounds.
Aim and Objectives: The present study aimed to assess the anti-ageing potential of *Momordica dioica* leaves extract-loaded topical microemulsion.
Method: The antioxidant properties of aqueous extract of *Momordica dioica* leaves were assessed by 1,1-diphenyl-2-picryl-hydrazyl (DPPH)-radical scavenging activity. Microemulsions were formed by the aqueous phase titration method, using Isopropyl myristate, Span 80, and PEG 400. The pharmacological study of the optimized batch was performed, for which Swiss Albino mice were divided into four groups. The ageing was induced by subcutaneous injection of D-galactose. The Positive control animals received a topical application of microemulsion base, whereas the Negative control group received no treatment. The Marketed and Test groups were treated via marketed anti-ageing nanogel and *Momordica dioica* leaf extract-loaded topical microemulsion respectively. At the end of the treatment, mice were sacrificed and skin was utilized for histological studies.
Result: The *Momordica dioica* leaves extract showed significant free radicals scavenging activity, confirming its antioxidant potential. The histological images of the Test group revealed less damaged epidermal structures, and a significantly thick dermal layer as compared to the Marketed group.
Summary and Conclusion: According to the findings, *Momordica dioica* leaves extract has effective antioxidant potential, and it could be a better formulation for anti-ageing process in the microemulsion form.
Keywords: *Microemulsion, Anti-ageing, DPPH activity*

PSIT/PP01/0047

Development and characterization of diflunisal loaded nanostructured lipid carrier for inflammatory bowel disease.

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Introduction: Inflammatory bowel disease (IBD) represents a group of intestinal disorders that cause prolonged inflammation of the lower digestive tract. Diflunisal is a NSAID used for treatment of inflammation, tenderness, pain and stiffness.
Aim and Objective: To formulate and characterize Diflunisal loaded Nanostructured Lipid Carrier (NLCs), using pH dependent polymer for localized delivery to colon.
Method: Hot Homogenization method followed by Probe sonication method was used to developed Diflunisal loaded NLCs. Stearic acid was melted 2-5ºC above its melting point and oleic acid was added. After mixing, the drug was also added to the mixture. Aqueous phase was prepared by mixing co-surfactant and surfactant and heated at same temperature as the lipid phase. Aqueous phase was added drop wise to lipid phase to form an emulsion. The Emulsion was homogenized and then Probe sonicated for 60 min to obtain NLCs. 1% Eudragit S-100 was used to coat the optimized batch by solvent evaporation method. NLCs were characterized for various parameters such as particle size, zeta potential, entrapment efficiency and *in-vitro* release.
Result: The formulated optimized batch had a particle size of 311.8nm, PDI of 0.283, zeta

potential of 24.6mV, % entrapment of 97.44% and %cumulative release of 76.45%. Eudragit S-100 coated Diflunisal NLCs had a particle size of 342.3nm, PDI of 0.240, zeta potential of -27.2mV, %entrapment efficiency of 97.45% and %cumulative release of 52.38%.

Summary and Conclusion: Diflunisal loaded NLCs were successfully developed and characterized. Eudragit S-100 coating avoided the early drug release in the upper part of the gastrointestinal tract. Thus, it is concluded that Eudragit S-100 coated NLCs were suitable for the site-specific delivery of diflunisal to treat colon diseases.

Keyword: *Diflunisal, Inflammation Bowel Disease, Nanostructured Lipid Carrier, Eudragit S-100.*

PSIT/PP01/0048

Development and characterization of pH-Sensitive liposomes of binimetinib for colon-targeted cancer therapy

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Introduction: Abnormal growth of cells in the colon or rectum is known as colorectal cancer. Binimetinib is an antineoplastic drug of BCS Class II, having poor water solubility and low bioavailability.

Aim and Objectives: To formulate and characterize pH-sensitive liposomes of Binimetinib for colon-targeted cancer therapy and to overcome the setbacks of the conventional therapy, as coated liposomes increase the solubility and targeting of the drug.

Method: Liposomes were prepared by ethanol injection method. Phospholipids, lipids, surfactant and Binimetinib were added in ethanol, and added to preheated 7.4 pH phosphate buffer. The mixture was mechanically stirred for 90min to obtain the liposomes. Coating of liposomes was done by Eudragit S-100, which prevents the drug from gastric degradation at lower pH and dissolves above pH 7. Liposomes were characterized for various parameters such as particle size, polydispersity index (PDI), zeta potential, entrapment efficiency and in-vitro drug release studies. Optimization of the formulated liposomes was done using the Box Behnken design.

Result: pH-sensitive liposomes were formulated and characterized. The optimized batch showed particle size (104.17nm), PDI (0.289), zeta potential (-25mV), entrapment efficiency (95%) and in-vitro drug release (83.24%) in 24 hours and Eudragit S-100 coated batch showed particle size (123.6nm), PDI (0.384), zeta potential (-29.6mV), entrapment efficiency (91%), and in-vitro drug release (54.15%) in 24 hours.

Summary and Conclusion: Binimetinib-loaded pH-sensitive liposomes were successfully formulated and could be an effective approach for the treatment of colon cancer.

Keywords: *Binimetinib, liposomes, colon targeting, Box Behnken design, Eudragit S-100.*

PSIT/PP01/0049

Formulation of hydrogel network-based microbeads of antiviral drug

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Introduction: Microbeads are solid spherical particles prepared with polymer, wax and some protective materials (like starch, gum, protein, fat and wax). This is a reliable mean of delivering drug to target specific site and prolong release.

Aim and Objective: The aim and objective of the study was to formulate hydrogel network-based microbeads of antiviral drug.
Method: Formulation of antiviral drug loaded trivalent ion Al^{+3} cross-linked and gellan gum microspheres was developed. The antiviral drug loaded microspheres were prepared taking sodium alginate, gellan gum as excipients along with maleic anhydride, aluminium chloride as cross-linking agents. In the present investigation drug-excepient compatibility study of was conducted for antiviral drug with ethyl excipients to formulate microbeads by using different ratio of drug: polymer.
Results: The evaluation processes of prepared antiviral microbeads were done by *in-vitro* release study, microscopic analysis and swelling index.
Summary and Conclusion: To achieve the proper release delivery pattern of antiviral drug, microbeads formulations were prepared from where rate of release was reduced by incorporating sodium alginate and gellan gum as polymer and maleic anhydride or aluminium chloride as counterion solutions for cross-linking of the drug. Cross linking occurs by formation of covalent bonds among two or additional molecules. After preparing the microspheres, they were evaluated to estimate their entrapment, microscopy, release and swelling.
Keywords: *Microbeads, antiviral drug, Gellan gum, Aluminium chloride.*

PSIT/PP01/0054

Role of H- bonding in co-crystal development

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Introduction: Supramolecular chemistry is the chemistry beyond the molecule, involves the study of the mechanisms underlying the development of molecular assemblies that are driven by intermolecular interactions as well as the physical, chemical and biological characteristics of such assemblies. The process of self assembly is governed by non-covalent intermolecular interactions.
Aim & Objectives: The aim of the present study to provide the brief overview of the role of hydrogen bonds in co-crystal design.
Methods: In the context of relative interaction strength, a brief overview of hydrogen bond classification is provided. This is followed by an overview of the development of hydrogen bond-based co-crystal design, highlighting the following: Etter's early contributions; Desiraju's development of the concept of hydrogen bonded supramolecular synthons; and supramolecular synthon hierarchy studies. The article finishes with case studies that illustrate the features and potential utility of hydrogen-bonded co-crystals.
Result: Significant understanding has been acquired in co-crystal synthesis and crystal engineering in terms of how to develop materials with desirable compositions, structures, and useful characteristics.
Summary & Conclusion: Systematic investigations would allow informatics to promote more efficient crystal structure prediction of co-crystal structures and, more importantly, their characteristics with a higher level of accuracy.
Keywords: *Crystal engineering, Supramolecular synthone, MCCs, ICCs, CSP, H-bonds*

PSIT/PP01/0055

Enhancement of oral bioavailability of clozapine through nanocrystal approach

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Introduction: Psychosis is characterized by an impaired relationship with reality,

often including confusion, hallucinations, and delusions. Clozapine is therapeutically effective in both, the positive and negative, symptoms of schizophrenia. Clozapine is a second-generation atypical antipsychotic drug, of BCS Class II drug having high permeability, low solubility, and oral bioavailability of less than 27%. Due to its first pass metabolism, it fails to reach the systemic circulation in the required concentration.

Aim and Objectives: To develop stable nanocrystals of Clozapine. The nanocrystalline formulation, due to its smaller sizes, and greater surface volume-ratio, drastically improves drug dissolution rate and saturation solubility.

Method: Clozapine nanocrystals were prepared by precipitation-ultrasonication method. The drug and polymer were dissolved in the organic phase and aqueous phase respectively. The drug solution was added to the aqueous phase under homogenization, followed by ultrasonication and centrifugation. 3^2 full factorial design was used to optimize the nanocrystals.

Result: The water solubility of clozapine is improved in the nanocrystal form, which eventually leads to improved targeting, bioavailability, and absorption. The optimized batch had a particle size of 123.2 nm, polydispersity index (PDI) of 0.332, zeta potential of -21.8, and a saturation solubility of 0.72 mg/ml.

Summary and Conclusion: Nanocrystal technology is a promising tool for the formulation of poorly soluble drugs. Clozapine nanocrystals are an ideal oral delivery candidate, as they improve formulation performance in oral absorption.

Keywords: N*anocrystals, Clozapine, Ultrasonication, Psychosis, Bioavailability.*

PSIT/PP01/0056

Formulation and evaluation of cetirizine hydrochloride *In-situ* ocular gel

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Introduction: Ophthalmic in-situ gelling is made up of environmentally sensitive polymers that will have their structural makeup changed by even little variations in the environment's pH, temperature, and ionic strength. When instilled into the eye, in-situ forming gels are liquids that quickly gel in the eye's cul-de-sac in reaction to environmental changes to generate viscoelastic gels.

Aim and Objective: In the present research work, the aim was to prepare pH triggered and temperature triggered *in-situ* ocular gel of Cetirizine Hydrochloride (CTZ) to improve its local bioavailability at eye surface.

Methods: *In-situ* ocular gel was prepared by pH-sensitive gelling agent and temperature triggered with a one viscosity builder polymer. The amounts of polymers were selected on the basis of optimum quantity required for sustained release of drug from preparation and as reported in literature and performed ranging study.

Results and discussion: Carbomer 974P and HPMC E4M polymer were used to prepare pH trigged *in-situ* ocular gel. Poloxamer 407 and HPMC E50 were used to prepare temperature trigged *in-situ* ocular gel. All formulation was evaluated for Appearance, pH, viscosity at different pH, gelling capacity, % drug content and release study. Nine formulations for each approach were prepared and optimized successfully using 3^2 factorial designs. Optimization was done by DoE software version Version 13.0.10.064.

Conclusion: CTZ was successfully formulated in pH triggered and temperature trigged *in-situ* gelling system using Carbomer 974P in combination with HPMC E4M and Poloxamer 407 and HPMC E50, respectively. It was seen that HPMC is important for *in-situ* gel behaviour along with Carbomer 974P/ Poloxamer 407 on the basis of main effect of concentration of HPMC and Carbomer

974P/Poloxamer 407. *In-vitro* results indicated that the *in-situ* gel system is a viable alternative to conventional ocular drops by virtue of its ability to sustain drug release.

Keywords: *Carbomer, HPMC, pH triggered in-situ ocular gel, temperature triggered in-situ ocular gel and bioavailability.*

PSIT/PP01/0057

Formulation and evaluation of self-emulsifying drug delivery system (SEDDS) of etoricoxib

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Introduction: Self-emulsifying drug delivery systems (SEDDS) are a tried-and-true technique for making poorly soluble compounds more soluble and bioavailable. Oils, surfactants, and sometimes cosolvents make up SEDDS and isotropic mixes.

Aim and objective: In the present dissertation work, aim was to prepare self-emulsifying drug delivery system of etoricoxib to improve its solubility with a view to enhance its oral bioavailability.

Materials and methods: Soyabean oil, Span 80, Tween 80, Glycerol, Sodium lauryal sulphate, Methanol, Whatman filter paper-42, De-ionized water was used with Pseudoternary phase diagram study method.

Results: SEDDS of etoricoxib were prepared after pseudoternary phase diagram study and evaluate for release study.

Summary and Conclusion: Six formulations were prepared successfully from the solubility studies the selected oil, surfactant and co-surfactant was soyabean oil; Tween 80, Span 80, and glycerol. One blend of smix i.e (Tween 80+ Span 80+ Glycerol) was prepared. Three ratios of smix 1:0.5:1, 1:1:1, and 2:2:1 was used to construct pseudoternary phase diagram to select six formulation composition. Six self-emulsifying formulations of etoricoxib were prepared and evaluated.

Keywords: *Self-emulsifying drug delivery system, Soyabean oil, Span 80 and Tween 80.*

PSIT/PP01/0058

Computer simulation of pharmacokinetics and pharmacodynamics

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Introduction: Computer-based modeling and simulation is emerging as a useful tool to complement the analysis and interpretation of biological data. The large volume, scale, and complexity of data generated from in vitro, in vivo.

Aim and objectives: the purpose of this study is to characterize the pharmacokinetics (PKs) and pharmacodynamics (PDs) of population by modeling analysis and to predict proper dosages regimens.

Method: The lumped element model described the behavior of spatially distributed physical system. Plasma concentration over time were best described by a two-compartment linear model and body weight associated with central volume of distribution. The computation of the heart and liver were carried out with distribution blood tissue exchange (BTEX) models.

Result*:* As a result, numerous in silico computational e-resources, databases, and simulation software are employed to determine pharmacokinetic (PK) and pharmacodynamics (PD) parameters for illness management. These techniques aid in the provision of multi scale representations of biological processes.

Summary & Conclusion: More number of research and experts are required in the field of in silico computer simulation field to

improve the product trails and replacement of animals and human during clinical trails.

Keywords: *Biomolecular simulation, In silico modeling, Pharmacodynamic simulation*

PSIT/PP01/0062

Computational approach for designing, Swiss ADME, molecular docking and biological implication of zinc-based transition metal complex

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Introduction: Transition metal (Zn) complex are important in catalysis material synthesis, catalysis material, photo chemistry and biological system. Metal complex possesses the ability to co-ordinate with ligand in 3D dimensional configuration. Example- Zinc metal can be used to heal wound tropically. Zn + 2 can be used to treat herpes viruses.

Aim & objectives: To study computational approach for drug design, predicting Swiss ADME, DFT calculation and biological implication of transitional metal complex.

Method: metal complex structure was designed by chemdraw software and its physiochemical property was studied using Swiss ADME.Molecular docking approach were obtained by using discovery studio visualizer software and the receptor was taken online from protein data bank.

Result: Various properties including physical property, lipophilicity, hydrophilicity, pharmacokinetics, drug likeness, medicinal chemistry etc. of the Zinc metal complex was studied.

Summary & conclusion: The zinc metal complex with sulpha drug was prepared and study of various computational approach Using different software were observed.

Keywords: *Metal complex, transitional metal, computational approach.*

PSIT/PP01/0063

Formulation and evaluation of cold cream

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Introduction: Creams are semisolid dosage forms containing more than 20% water or volatile components and typically less than 50% hydrocarbons, waxes, or polyols as vehicles. They may also contain one or more drug substances dissolved or dispersed in a suitable cream base.

Aim and objectives: To study the formulation and evaluation of cold cream.

Method: Used for finely divided insoluble power particles or liqids insoluble power are added by geometric dilution liqids are added by making well in center. Air pocket formation avoided involved the use of glass slab when small quantities are used mortar an pestle used when we have large quanitities.

Result: After formulation and evaluation of herbal moisturizing cream, we observed various types of results with the help of various methods or techniques like physical evaluation, irritancy, phase separation, greasiness, viscosity, pH, washability and stability.

Summary & Conclusion: The formulated cream showed good consistency and spread ability homogeneity, pH, non-greasy and there is no phase separation during study period of research. Cream which is non- toxic, safe, effective and improves patient compliance.

Keywords: *Semisolid, vehicle, geometric dilution, evaluation, separation*.

PSIT/PP01/0064

Formulation and evaluation of spherules

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Introduction: Spherules are the form that the fungus takes in tissue. In nature, the fungus grows in soil and appears in the mycelial form similar to bread mold. Portions of the hair-like mycelia break off into arthroconidia ("spores") and become airborne when the soil is disturbed.
Aim and Objectives: To study the formulation and evaluation of spherules.
Method: Spheronization is generally done with fluidized bed drying (FBD), where the droplets are dried in air under circulation produce spherules with irregular shape and surface roughness due to rapid drying. Thus, alternative methods are required that can be adopted in small and large process to produce uniform spherules**.**
Result: Spherules of prepared by using extraction and spheronization technique were found to be non- sticky, spherical, free flowing with uniform size. Also, the coated spherules by fluidized Bed Process were non-sticky, free flowing, uniformly coated with eudragit L-100. All the batches shown satisfactory results.
Summary & Conclusion: The spherules of prepared by using extrusion and spheronization technique were found to be non- sticky, spherical, free flowing with uniform size.
Keywords: *Eudragit L-100, mycelia, arthroconidia, Spheronization, fluidized bed drying (FBD).*

PSIT/PP01/0065

Formulation and evaluation of sodium alginate beads by emulsion gelation method

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Introduction: The drug delivery systems that can precisely control the release rates or target drugs to specitic body site have an enormous impact on the health-care system. The last two decades, in the pharmaceutical industry, have witnessed an avant-grade interaction among the field of polymer and material science, resulting in the development of novel drug delivery systems.
Aim & Objectives: The aim of the research work was formulation and evaluation of sodium alginate beads containing voglibose for the effective use in the treatment of hyperglycemia.
Methods: The gel beads containing oil were prepared by gentle mixing or homogenizing oil and water phase, containing sodium alginate, which was then extruded into calcium chloride solution to produce gel beads.
Results: The effects of types of oil, and its proportions. on the morphology and release characteristics were optimized. A variety of oils were used to study the effect on the sustaining property of the formed beads.
Summary and conclusion: The oil entrapped calcium alginate gel beads showed sustained release. Scanning electron photomicrographs demonstrated minute oil globules on the beads and also throughout the inner surface of the beads. The beads also showed floating behavior depending on the type of the oils used.
Key words: *Voglibose, sodium alginate, sustained release gel beads, oil entrapment method, scanning electron microscopy, floating behavior.*

PSIT/PP01/0066

Development and evaluation of mecitentan loaded oral

microemulsion for improve solubility

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Introduction: Pulmonary arterial hypertension is a chronic, progressive life-threatening cardiovascular disorder in which patient experiences an abnormally high blood pressure in the arteries between the heart and lungs. The exact cause of PAH is unknown. Researchers believe that PAH occurs when there is injury to the cells that line the blood vessels of the lung. Macitentan is tailored drug to treat PAH.

Aim & Objectives: The aim of the present study was to develop macitentan loaded microemulsion for improved solubility and to get faster onset of action by providing oral inhalation delivery Amongst all approaches to enhance solubility of hydrophobic drugs, microemulsion formulation is proven to be best from patient compliance point of view also.

Method: Microemulsion is thermodynamically stable, should be made safer by keeping surfactant ratio to minimal. While given it by pulmonary route will give onset of action rapidly than oral route with reduction in the side effect. In present work, Macitentan microemulsion formulation is optimized by Titration method (Oleic acid %, Tween 80+ PEG-400% and Water%). After optimization it was determined to obtain required minimal concentrations of surfactants (31.5 % Tween 80+ 31.5 % PEG-400).

Result: From the organoleptic and physicochemical characterization of optimized formulation, it was clear and transparent microemulsion formulation having (globule size = 204 nm, PDI = 0.221 and % Transmittance = 99.5%) microemulsion approach is important approach for active pharmaceutical ingredients for the enhancement of solubility, dissolution rate and stability.

Summary & Conclusion: Macitentan is very effective anti-hypertensive drug, used to treat pulmonary arterial hypertension but having poor water solubility and lots of side effects. The microemulsion as vesicular system could enhance solubility and pulmonary application of it gave the alternative route of application.

Keywords: *Mecitentan, Solubility, PAH, Microemulsion, optimized.*

PSIT/PP01/0067

Formulation development of gastroretintative mucoadhesive tablets using natural

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Introduction: Mucoadhesive tablets have the potential to be used for controlled release drug delivery but coupling of mucoadhesive properties to tablets has additional advantage e.g efficient absorption and enhanced biovablability.

Aim & Objectives: To perform the formulation and development of gastroretentive mucoadhesive tablets using natural polymers.

Method: Preformulation study is the first step in the formulation and development of dosage form of a drug substance such as physical evaluation, solubility, melting, pH, bulk properties, etc. After developing a formulation, it is necessary to confirm stability and bioavalability of the formulation by evaluation methods like drug content, thickness, hardness, friability, swelling index, etc for the determination of mucoadhesive strength and dissolution rate index.

Result: Formulations were prepared for simvastatin gastroretetive mucoadhesive tablets by using different natural polymers.

Summary & Conclusion: The work envisages the applicability of polymers such HPMC, fenugreek mucilage, sodium alinate and gum tragacanth in the design and development of sustain release tablet formulation.
Keywords: *Bioavailibility, physical evaluation, mucoadhesive tablets, polymers, hydrophilic polymers, friability.*

PSIT/PP01/0068

Development of bioflavonoid containing chemotherapeutic delivery systems for UV-damaged skin and kangri cancer

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Introduction: The lower abdomen and inner thighs are most likely to become affected by kangri cancer because those areas are exposed to continuous exposure to kangri.
Aim & Objectives: In this article, formulation and characterization of a water-in-oil microemulsion of 5-fluorouracil with rutin (R-5FU) for better skin penetration and inhibition of kangri cancer (skin cancer surfactant) is discussed.
Methods: To produce R-5-FU microemulsions, surfactant-cosurfactant was mixed with oil. Distilled water was added dropwise with the help of a burette by gentle stirring at a constant temperature. The surfactant and co-surfactant were mixed into three particular ratios 1:1, 2:1, and 3:1. Further characterizations were performed, such as visual inspection and thermodynamic stability including a stress test and centrifugation. In visual inspection included assessment of the colour, homogeneity, and odour of the formulation of FU microemulsion.
Results: All three microemulsions, labeled RME1, RME2, and RME3, are highly stable. An oval shape of surface morphology of 5-FU was noticed by using a TEM image. The viscosity of RME3 was found to be 17.25±0.22 pa-s. The average globule size was 100–300 nm for all three RME. The results of human cadaver skin permeability are almost of the same pattern, butRME3 indicates the best skin permeability with negligible side effects on the skin.
Summary & Conclusion: The quantity of 5-FU released from all formulations at 3-hr ranged from 95.57% to 83.67%. None of the three formulations resulted in skin irritation, with irritancy score of zero (IS=0). Observation revealed no lysis, hemorrhage, or coagulation after application.
Keywords: *5-fluorouracil, HET-CAM assay, Kangri cancer, microemulsion.*

PSIT/PP01/0069

Development of bioactive novel formulation for the management of cancer

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Introduction: Cancer is anticipated to be a vital reason for cause of morbidity and mortality in the upcoming few decades worldwide, the present treatment strategies rely greatly on the operation of ordinary cytotoxic medications which have undesirable effects and limited effectiveness.
Aim & Objectives: The majority of the anti-cancer drugs are hydrophobic in character

and hence, having low solubility and bioavailability. Therefore, the preferred beneficial dose will not attain to the target, necessitating a require of higher dose management for therapeutic efficacy. This may harm healthy cells and tissues, foremost to severe side effects, e.g. severe hair fall resulting in baldness, acute vomiting and nausea, low blood cell counts making patients more vulnerable towards rising infection or anaemia.

Method: Existing circumstances has shifted in the direction of alteration of particle size toward nano size i.e. development of nano drug delivery system. Nanotechnology has wider advantages and applications over other delivery systems available. It can be used as a highly sensitive diagnostic as well as a therapeutic element. Moreover, it offers various advantages like extended half-life, enhanced bio-distribution, higher circulation time of the drug, controlled and sustained release of the drug, flexibility in route of administration, increased intracellular concentration of drug, tissue specificity along with promising outcomes concerning stability, biocompatibility and biodegradation.

Result: The perception of bioactive is natural entities that are used to increase the bioavailability of various drugs which are poorly available, harmful, administered for lengthy intervals and expensive. Intravenous administration of drugs achieves highest bioavailability whereas oral management of drugs gives low bioavailability.

Summary & Conclusion: Several therapeutics bears the issue of low bioavailability upon oral administration because of poor absorption and undergo first pass metabolism. The poorly absorbed drugs remain in the physiological system and lead to several adverse effects such as drug toxicity, adverse drug reactions and drug resistance in the treatment of cancer.

Keywords: *Bioactive, cancer, bioavailability.*

PSIT/PP01/0070

Development of oral controlled release matrix tablets for antihypertensive drugs using novel natural and modified gum

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Introduction: Controlled-release dosage forms offer several advantages, such as reduced dosing frequency, increased compliance, improved therapeutic outcomes, minimized side effects, enhanced acceptability, and cost-effective treatment. Hydrophilic matrix systems undergo swelling, followed by gel formation, erosion, and dissolution in aqueous media. These systems allow for high drug loading, and the excipients used are generally affordable and considered safe.

Aim and Objectives: The goal of the current work was to create controlled-release matrix tablets utilizing the direct compression method and water-soluble propranolol HCL as the model drug. The release retardants used in the current work were naturally modified tamarind seed gum and fenugreek seed gum.

Method: Various amounts of tamarind and fenugreek seed gum, both in their natural and modified forms, were used to prepare eight different batches of formulations of propranolol HCL. The developed and optimized controlled-release matrix tablets were then evaluated.

Results: The evaluation results of propranolol HCL controlled-release matrix tablets showed decent physical qualities. The in-vitro cumulative % drug releases from the tablets were exhibited similarly to the marketed formulation. It is clear that modified tamarind seed gum maintained a sustained release for up to 24 hours, and modified fenugreek seed gum maintained a sustained release for up to

18 hours at a 40% concentration. The propranolol HCL tablets followed drug release patterns according to the Higuchi or Hixson-Crowell model.

Summary and Conclusion: The study demonstrated that by using the wet compression approach, hydrophilic natural and their modified forms of polymers can be effectively utilized to develop controlled-release matrix tablets for water-soluble medicines.

Keywords: - *Natural gum, modified gum, controlled release tablets, tamarind seed gum.*

PSIT/PP01/0071

A comprehensive review on the preparation and evaluation of a polyherbal formulation with anti-hyperlipidemic and antioxidant activities: *Ailanthus excelsa*, *Allium sativum*, and *Cymbopogon flexuosus*

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Introduction: This comprehensive review focuses on the preparation and evaluation of a polyherbal formulation consisting of *Ailanthus excelsa*, *Allium sativum*, and *Cymbopogon flexuosus*, and its potential anti-hyperlipidemic and antioxidant activities. The review aims to provide an in-depth analysis of the individual medicinal properties of each herb and their synergistic effects when combined in the polyherbal formulation. It also explores the various extraction and preparation methods used to maximize the bioactive components of the herbs and the evaluation techniques employed to assess their therapeutic efficacy.

Aim & Objectives: Review on the Preparation and Evaluation of a Polyherbal Formulation with Anti-Hyperlipidemic and Antioxidant Activities: *Ailanthus excelsa, Allium sativum*, and *Cymbopogon flexuosus.*

Result: This review covers the medicinal plants and the portions of them that are employed in the efficient treatment of inflammation and the disorders it is related to. Inflammation is a condition linked to many disease states. Inflammation is a significant characteristic of many disorders. It is the tissue's reaction to a wound, infection, irritant, or foreign object. Although it is a necessary component of the host's defence, when it overreacts, it may be considerably more harmful than the disease itself and, in certain circumstances, even deadly.

Summary & Conclusion: The review concludes by summarizing the current state of knowledge regarding the polyherbal formulation of Ailanthus excelsa, Allium sativum, and Cymbopogon flexuosus. It emphasizes the promising results seen in the management of hyperlipidemia and oxidative stress and recommends further research and clinical studies to establish its safety and efficacy as a potential therapeutic option.

Keywords: *Polyherbal formulation, Ailanthus excels, Allium sativum, Cymbopogon flexuosus Anti-hyperlipidemic, Antioxidant activities*

PSIT/PP01/0072

Antimicrobial activities of skincare preparations from plant extracts

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Introduction: Microbial disease, bacteria, ye ast, mold, fungus, bacteria, protozoa, which cause various diseases on the skin. refers to the unintentional or accidental interaction of organisms. To treat such diseases, we use different types of medicinal plants. The antimicrobial properties of *Gossypium herbaceum, Mangifera indica, Piper betel, Daucus carota, Curcuma longa* have been investigated for many years. However, the antimicrobial property of these plants has not been evaluated in topical formulations.

Aim & Objectives: The Aim of the present study were to (1) formulate topical Cream,

Shampoo, Soap and few more dosage forms containing herbal extract of different parts of (*Gossypium herbaceum, Mangifera indica, Piper betel, Daucus carota, Curcuma longa*) plants and (2) Evaluate the antimicrobial activity of these herbal formulations.

Method: Herbal topical formulations were followed by evaluating their organoleptic characteristic, physicochemical properties and antimicrobial activity against Escherichia coli and Staphylococcus aureus.

Result: Above mentioned herbal Extracts (*Gossypium herbaceum, Mangifera indica, Piper betel, Daucus carota, Curcuma longa)* had a strong antimicrobial activity in the cream, shampoo, soap. The minimum effective concentration was found to be 3 w/w% (approx.) for all herbal preparations against the two tested microorganisms.

Summary & Conclusion: This study evaluated and confirmed the antimicrobial effect of plant extracts in the prepared topical herbal formulations.

Keywords: *Antimicrobial activity, Gossypium herbaceum, Mangifera indica, Piper betel, Daucus carota, Curcuma longa, Herbal Formulations.*

PSIT/PP01/0074

Development and characterization of wheat gluten/oleaginous antifungal gels for topical application

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Introduction: Wheat Gluten based antifungal gel for the topical application by using herbal polymer which has good gelling properties like Wheat Gluten and also developed a Ayurvedic formulation by using herbal material.

Aim & Objectives: To developed wheat gluten and herbal formulation-based gels by using Wheat Gluten and Chamarognashak oil, Shuddh Gandhak, Yashad Bhasma, Tankan Bhasma, Kapoor, Bees Wax gels for topical application.

Method: Wheat gluten was added 2% Carbopol 940 and neem oil were added to it Then PEG 400 and drug were added to it by Using Design of Experiment 2^3 factorial design. the viscosity and spreadbility Texture analysis (TA) using the automatic TAXT2 ***Ex vivo* permeation study** was performed in Franz diffusion cell assembly (area 3.14 cm2 and cell volume 60 ml) using goat cadaver skin as the permeation membrane evaluate the antifungal activity against *Aspergillus niger.*

Result: However, if the diluted form of formulation was used for cup plate method, the result could be better as the obtained results were not uniform (zone of inhibition was not obtained in symmetrical form). Among different wheat gluten gels, WG 4 was considered to be the best formulation in inhibiting fungal growth, possessing better diffusion ability in comparison to the other formulations. HO 5 was considered as the best formulation as it possessed the best anti-fungal activity against *A. niger*.

Summary & Conclusion: On the basis of above result, the food poisoning technique was considered as a better method for determining anti-microbial efficiency as it gave clearer result in comparison to the cup plate technique Formulation **WG 4** and **HO 5** was considered as the best formulation as it possessed the best anti-fungal activity against *A. niger*

Keywords: *Wheat Gluten(WG), Herbal Ointment (HO)Chamarognashak oil, Shuddh Gandhak, Yashad Bhasma, Tankan Bhasma, Kapoor, Bees Wax topical formulation for antifungal activity.*

PSIT/PP01/0077

Transderma ldrug delivery system: Transdermal film of naproxen sodium

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Introduction: A transdermal film is a medicated adhesive film that is applied to the skin to deliver medication. This frequently improves healing and alleviation to an afflicted body part.
Aim & Objectives: the present investigation primarily focused towards development of transdermal film using naproxen sodium as a model drug.
Method: The drug was dissolved using a solvent system of ethanol and water in a ratio of 2:8. With continuous stirring, the polymer (HPMC, PVA) was dissolved into the solvent-drug mixture. Additionally, penetration enhancer (DMSO), plasticizer (PEG400, dibutyl phthalate), and other excipients (menthol, mint extract) were added and thoroughly mixed. The films were prepared using the solvent evaporation method. Multiple patches were formulated, varying the ratio of the components.
Result: The formulations were characterized for drug excipient compatibility by in-vitro drug release studies. Based on the physical and chemical studies performed on the formulations, it was found that formulation number-4 with 500mg Naproxen Sodium, 500mg HPMC, 300mg PVA, 200mg dibutyl phthalate in 20ml preparation, have shown better result as compare to other prepared formulation. F4 showed percentage drug content of 97.47% and pH 5.7. In terms of disintegration time and dissolution, F4 has shown to be the finest quick release formulation with disintegration time less than 1 minute and dissolution-103.5 per cent after 30 min.
Summery & conclusion: Using plasticizer and polymer at various concentrations, this work revealed the effective production and assessment of naproxen sodium transdermal films. Formulation F4 was the best of the formulations. A compatibility investigation using The FTIR and Electro lab dissolution apparatus and an in vitro dissolution research was performed to check the compatibility of the films. Other film properties of Formulation F4 were also within the USP limit. As a result, the improved formulation F4 was shown to be more resilient and stable, as well as having a better immediate release characteristic and better bioavailability.
Keywords: *transdermal, formulation, naproxen sodium, pain relieving film, evaluation.*

PSIT/PP01/0078

Transmucosal buccal patch of nisoldipine for improve bioavailability: development and characterization

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Introduction: Nisoldipine is a calcium channel blocker commonly employed to treat hypertension, however its oral bioavailability is poor due to its considerable metabolization mostly by the cytochrome P450 enzymes and its low solubility in water.
Aim & Objective: The research was conducted to improve Nisoldipine's bioavailability in order to produce buccal patches with a high rate of absorption. The purpose of this study was to develop and assess the efficacy of Nisoldipine mucoadhesive buccal patches for increasing oral bioavailability.
Method: We successfully prepared and evaluated buccal patches made from designs using different polymers and combinations of those polymers (Carbopol 934P, HPMC E15, Na CMC, Edragit RLPO, and PVP K 30) for factors including film weight, thickness, folding endurance, drug content uniformity, surface pH, in vitro residence time, in vitro drug release, and ex-vivo permeation.
Results: Good results were observed in the swelling research, bioadhesion time, in-vitro drug permeation study, and ex-vivo permeation study in porcine buccal mucosa, and the optimized formulation became

subjected to ex-vivo permeation experiments. It was found that HPMC E15 swelled more quickly than eudragit RLPO, leading to a faster rate of drug release. The release profiles observed with the optimal formulation F6 (99.83 ±2.36%) were significantly different from those obtained from the other formulations. Hydrophilic polymer HPMC E15 (E15) swells into a gel-like layer when dissolved in water. The F6 formulation using PEG as a permeability enhancer was tested ex-vivo to determine drug release. Drug release was 88.66±2.15, compared to 51.55±2.14 in the control investigation.

Summary & Conclusion: This study established that the buccal route was an effective means of administering the produced patches, suggesting that this might be a viable alternative drug delivery technique for the systemic administration of nisoldipine.

Key Words: *Hypertension, nisoldipine, bioavailability, bioadhesion, buccal, transmucosal*

PSIT/PP01/0079

Combination effect of Metformin hydrochloride and *Allium sativum* polysaccharide for treating diabetes mellitus

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Introduction: Allium sativum(garlic) is the commonest Allium species of the world, that are known for its edible and medicinal values. Garlic polysaccharides have been investigated for their potential benefits in the treatment of diabetes. That's why the main aim of this research is to focus on extraction of polysaccharides from Allium sativum and combine it with metformin for an effective result

Aim & Objectives: To combine the effect of Metformin Hydrochloride & *Allium Sativum* Polysaccharide for treating Diabetes Mellitus.

Methods: Additionally, an ascorbic acid standard solution was made. A triplicate of each sample and standard was created. After that, the samples were put in a dimly lit area and left to incubate for 30 minutes. A UV spectrophotometer was used to test each sample's absorbance at 517 nm after the incubation time. For each concentration, this complete experiment was carried out three times, and the average absorbance value was noted

Results: The peaks that indicate the presence of functional group in both metformin and *Allium sativum* are visible when combination IR was taken.

Summary & Conclusion. Numerous studies have been undertaken to study the influence of these polysaccharides on diabetic therapy, to extract polysaccharides from Allium sativum have been shown to successfully reduce blood glucose levels in diabetics. Its active ingredients stimulate insulin production,

Keywords: *Diabetes Mellitus, polysaccharide, Metformin hydrochlorid*e

PSIT/PP01/0080

Formulation and evaluation of pharmaceutical gel

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Introduction: Pharmaceutical gels are homogenous, semi-solid formulations that typically contain solutions or dispersion of one or more drugs in appropriate hydrophobic and hydrophilic bases. The following study was done to make naproxen sodium effective for topical applications since it functions as a pain-relieving NSAID.

Aim & Objectives: To formulate and evaluate naproxen sodium-incorporated pharmaceutical gel.

Method: carbopol 490 and gum acacia was mixed together and kept for 24hrs. after that the mixture was stirred continuously in

magnetic stirrer for about 30mins followed by the addition of triethylamine to the formulation to increase its viscosity. 3 formulations were prepared taking carbopol 490, HPMC and aloe Vera gel in different formulations. Farther all the formulations were evaluated for their chemical and physical properties.

Result: Among the 3 formulations the one with only carbopol 490 was the most ideal formulation. Viscosity, pH and other physical and chemical characteristics for the formulation showed significant compatibility as a transdermal formulation. For the above formulationcalculated viscosity was 1890 cp and pH was found to be 5.7 with a excellent consistency

Summary & Conclusion: The findings of UV spectroscopy, FTIR, and viscosity tests on the various gel formulations proved that they displayed variations in the spreadability of the medication in the gel, changing its therapeutic window. Therefore, it was discovered that the gel with the most satiating consistency released drugs more effectively than the other in terms of their anti-microbial action.

Keywords: *Gel, formulation, naproxen sodium, evaluation, pain relieving*

PSIT/PP01/0081

Pharmacological and phytochemical evaluation of *Ocimum sanctum* leaves extracts for its anti-inflammatory, analgesic and antipyretic activities

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Introduction: Ocimum sanctum, commonly known as 'Sacred basil' or 'Holy basil', is grown as a household plant in India and is considered the most sacred of all the herbs. This holy plant graces nearly every Indian household. Long-term use of non steroidal anti-inflammatory drugs (NSAIDs) increases risk of having a range of gastrointestinal problems. Therefore, new anti-inflammatory, analgesic, antipyretic drugs having lesser side effects are being searched all over the world as alternatives to NSAIDs.

Aim & Objectives: To evaluate the anti-inflammatory, analgesic and antipyretic profile of *Ocimum sanctum* leaves extracts.

Methods: Anti-inflammatory profile of hexane (STH), chloroform (STC), ethyl acetate (STE), butanol (STB) and water (STW) extracts of OS was carried out by using carrageenan induced paw edema. STE a most active extract was further validated in dose dependent manner for anti-inflammatory, analgesic and antipyretic activity as well as oral toxicity profile in small laboratory animals. Identification of bio-actives flux and chemical signature of most active fraction STE was developed by using the high-performance liquid chromatography fingerprinting.

Results: An ethyl acetate fraction (STE) exhibit most potent anti-inflammatory activity followed by STB, STW, STC and STH. Dose response study of STE showed anti-inflammatory, analgesic and anti-pyretic potential in dose-dependent manner without any toxic effect at dose 2000 mg/kg. Chemical fingerprint revealed the presence of flavonoids.

Summary and Conclusion: The present research revealed that STE possess anti-inflammatory, analgesic and anti-pyretic properties. However, future research is

advocated to evaluate the pharmacological properties of isolated bioactive compounds.

Keywords: *Analgesic, anti-inflammatory, anti-pyretic, Ocimum sanctum*

PSIT/PP01/0087

Exploring the therapeutic potential of Paederia foetida Linn: Molecular docking and In Vitro evaluation for anti-inflammatory and antioxidant activities

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Introduction: *Paederia foetida* Linn (Rubiaceae) is widely distributed in temperate and tropical regions of Asia. Traditionally it has been extensively used in traditional Chinese, Ayurvedic, and other system of medicine to treat various ailments, including arthritis, vesical calculi, inflammation, asthma, diarrhea, dysentery, piles, diabetes, seminal weakness, and more. The plant is known to contain numerous bioactive phytochemicals, primarily iridoid glycosides, flavone glycosides, anthraquinones, and terpenoids.

Aim & Objective: To explore the therapeutic potential of *P. foetida* through molecular docking and *in-vitro* evaluation of anti-inflammatory and antioxidant activities of the extract.

Methods: In this study, we conducted molecular docking analysis of 256 earlier reported compounds from *P. foetida* with cyclooxygenase-2 (COX-2) using Autodock to understand the interactions between the protein and ligand. The physicochemical and ADME properties of the compounds were also studied using Molsoft ICM-Browser. Additionally, we furthermore, studied the ethanol extract of *P. foetida* leaves for its *in vitro* antioxidant and anti-inflammatory activities.

Results: Our *in-silico* study revealed that among the isolated compounds, paederoside, methyl paederosidate, paederocidic acid, and daphylloside exhibited better docking scores and stronger hydrogen bond interactions with COX-2, along with comparatively better ADME properties than the other compounds. Additionally, the ethanol extract of P. foetida demonstrated promising results in DPPH free radical scavenging activity (IC50 111.38 µg/ml) and *in vitro* membrane stabilization activity (70% protection at 300 µg/ml).

Summary & Conclusion: The present study highlights the potential of the ethanol extract of *P. foetida* leaves as well as several major compounds from the plant that showed promising interactions with COX-2 and favorable ADME properties. These findings open up possibilities for further research to explore these compounds as potential lead molecules for treatment of inflammation and to elucidate their molecular mechanisms of action.

Keywords: *Bioactive phytoconstituents; Anti-inflammatory activity; Molecular docking, Ethanol extract; Cyclooxygenase-2; Paederia foetida*.

PSIT/PP01/0090

Curcumin-loaded cellulose magnetic fiber nanocomposites capped with GQDs for targeted and pH-controlled drug delivery

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Introduction: The limitations of conventional cancer therapy delivery systems include a lack of tumor specificity, damage to healthy cells, low drug loading efficiency, and the inability to observe drug localization.

These drawbacks reduce therapy effectiveness and increase costs.

Aim and Objective: In this study, we propose a co- precipitation synthesis of amine-functionalized Magnetic Cellulose Nanofibers (MCNFs) using a hydrothermal approach. We then introduce a simple method to directly couple Graphene Quantum Dots (GQDs) onto amine-functionalized MCNFs, resulting in the novel GQD-MFNCs. These GQD- MFNCs offer targeting, imaging, and bio-sensing capabilities for cancer therapy.

Methods: A simple one step fabrication process was used for the preparation of MFNCs wherein In-situ co-precipitation methodology contains reaction of iron with ammonia in controlled temperature environment and cellulose fibers acts as a carrier and stabilizing agent. Further amine functionalization of MFNCs was done by using APTES and methylbenzene. Then Curcumin was used as a model drug for studying the release characteristics. epoxy and carboxyl groups present on GQDs make them possible to functionalize MFNCs. A facile direct coupling of GQDs on amine-functionalized MFNCs was used for the synthesis of CU loaded-GQD-MFNCs. To evaluate the efficacy of the fabricated WCNFs, NH 2 -MCNF, and G-CU-MCNFs, characterization using spectroscopic techniques, in vitro, particle size, zeta potential analysis, VSM, in-vitro cytotoxicity study, TEM, SEM-EDX analysis.

Results: The synthesized dispersible CU loaded-GQD-MFNCs shows a particle size of 429 nm.

The SEM images revealed that the CNFs and MFNCs displayed a role as a carrier. This bionanocomposites exhibited colloidal and thermal stability and magnetic property with saturation magnetization. CU was used as a model drug, indicates 74.50 ± 0.8 estimated loading on MFNCs and exhibits pH-controlled drug release behaviour as the temperature increase could accelerate drug release rate to some extent.

Summary and Conclusion: This present invention demonstrates a simple step by step synthesis of drug loaded Magnetic Fiber Nanocomposites capped with GQDs for theranostic application. Then a facile direct coupling of GQDs on amine-functionalized MCNFs will be used for the synthesis of GQD- MFNCs. Controlled drug delivery and magnetic hyperthermia/ photothermal impact will be resulted in synergistic therapeutic effects that don't harm healthy cells. Further studies are warranted to confirm its anticancer activity in vitro and in more stringent co-culture and in vivo models.

Keywords: Cellulose Nanofiber, magnetic nanocellulose fiber composite, Curcumin, Cancer therapy, GQDs, magnetic hyperthermia

PSIT/PP01/0091

Formulation and pharmacological evaluation of a novel polyherbal infusion targeting obesity

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Introduction: As per the World Health Organization, 2022, about 1 billion are obese globally that resulted in associated co-morbidities leading to untimely death. Herbal formulations are becoming popular in recent times to manage obesity.

Aim & Objective: To evaluate the anti-obesity effects of the polyherbal infusion (PHI) comprising of *Citrus limon, Averrhoa carambola* and *Piper nigrum* in a high fat diet induced obese rat model.

Method: Animals were divided into: Group I: standard pellet chow; Group II: only high-fat diet (HFD) for 24 weeks and Group III: HFD followed by 30 days *ad libitum* administration of a PHI formulation at a dosage of 50 mg/kg body weight. Measurement of body weight, ELISA, and blood parameters like biochemical and haematological and histopathological examination of adipose

tissue and liver were observed. GC-MS analysis of PHI was performed.
Results: 30 days of treatment with the PHI resulted in a significant ($P < 0.01$) reduction of the body weight of the HFD induced obese as compared to the untreated obese animals. Treatment normalized the lipid, glucose and haematological profiles and decreased the pro-inflammatory TNF- α, IL-4, and IL-1β and increased expression of anti-inflammatory IL-10. Liver histopathology revealed decreased number of lipid droplets in the treated group. Three compounds were identified by GC-MS analysis: D- Limonene, longifolenaldehyde, and caryophyllene oxide.
Summary & Conclusion: PHI administration to experimental animals showed promising anti-obesity property and could be a healthy beverage to tackle obesity and associated co-morbidities.
Keywords: *Obesity, Polyherbal Infusion*, ELISA, *Averrhoa Carambola, Citrus Limon, Piper Nigrum*

PSIT/PP01/0092

Extracellular vesicles as a therapeutic tool for drug delivery system

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Introduction: Cell derived nanovesicles are lipid bilayer-containing membrane vesicles that are generated from cells. Cell derived nanovesicles are cell-released particles with bioactive chemicals within (lipids, proteins, and nucleic acids) that control intercellular communication, intracellular communication. Exosomes, microvesicles, apoptotic bodies, Ectosomes and oncosomes together known as Extracellular Vesicles.
Aim & Objective: To overview the use of extracellular vesicles as a therapeutic tool for drug delivery system.
Method: Through Literature Review and using Statistical Analysis.
Result: As per statistical data EVs are used as a drug delivery system to treat 79% cancer diseases, 9% Inflammation, 4% cardiovascular, 4% neurodegenerative diseases, 2% myocardial infraction and 2% autoimmune disorder.
Summary & Conclusion: Extracellular vesicles play a crucial role as a therapeutic tool in a drug delivery system and are used in the treatment of diseases like cancer, neurodegenerative diseases, cardiovascular disease, immune disorders and many more. This is because they minimise immune resistance and tumorigenic risk and maximise the biological activities that progenitors naturally possess. The therapeutic efficacy of EV-based delivery systems has been anticipated and accepted as a result, raising expectations for potential future clinical uses. EVs' precise characterisation and evaluation, regulated drug loading and release profiling, and systematic collecting of the pertinent pharmacological and toxicological data.
Keywords: *Extracellular vesicles, apoptotic bodies, exosomes, Mesenchymal stem cell (MSCs), oncosomes.*

PSIT/PP01/0093

Development, improvement, and assessment of carriers for antihyperlipidemic drug solubility and bioavailability enhancement

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Introduction: Lovastatin, a widely prescribed lipid-lowering agent, has shown remarkable therapeutic efficacy in managing cardiovascular diseases. However, its poor aqueous solubility severely limits its bioavailability, leading to suboptimal therapeutic outcomes. Nanoparticulate carriers have emerged as promising tools to

address this challenge by enhancing drug solubility and bioavailability.

Aim & Objective: This research aimed to develop, optimize, and evaluate nanoparticulate carriers for enhancing the solubility and bioavailability of lovastatin. Initially, solid lipid nanoparticles (SLNs), nanostructured lipid carriers (NLCs), and polymeric nanoparticles were formulated using various lipid and polymer matrices. The formulation parameters, including drug-to-carrier ratio, surfactant type, and concentration, were systematically optimized using a Design of Experiments (DoE) approach to achieve optimal drug loading and nanoparticle stability.

Methods: The characterized nanoparticulate carriers were subjected to comprehensive in vitro evaluations. Particle size, polydispersity index (PDI), zeta potential, drug encapsulation efficiency, and drug release profiles were analyzed using advanced analytical techniques. Additionally, the morphology and surface characteristics of the nanoparticles were studied using transmission electron microscopy (TEM) and atomic force microscopy (AFM).

In vivo studies were conducted to assess the pharmacokinetic profiles and bioavailability of the optimized nanoparticulate formulations compared to the conventional lovastatin formulation. Animal models were administered the nanoparticulate carriers via oral and parenteral routes to evaluate the enhanced drug absorption and sustained release characteristics.

Result: The results demonstrated that the optimized nanoparticulate carriers significantly improved lovastatin's solubility and bioavailability compared to the conventional formulation. The nano-sized carriers exhibited prolonged drug release, providing sustained therapeutic levels over an extended period. Moreover, the in vivo studies revealed enhanced oral absorption and reduced first-pass metabolism, leading to higher drug concentrations in systemic circulation.

Summary & Conclusion: The development and optimization of nanoparticulate carriers for lovastatin offered a promising approach to overcome its solubility challenges and enhance bioavailability. These findings hold great potential for improving the therapeutic efficacy of lovastatin in cardiovascular management, reducing dosage frequency, and minimizing potential side effects associated with high doses of the drug. Further investigations are warranted to explore the long-term safety and clinical efficacy of these nanoparticulate carriers in human subject's patient outcomes and facilitating the management of cardiovascular and central nervous system disorders.

Keywords: *Nanoparticulate carriers, lovastatin, anti-hyperlipidemic, bioavailability.*

PSIT/PP01/0094

Development, optimization, and evaluation of carrier's antihypertensive drug

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Introduction: Prazosin, a potent alpha-1 adrenergic receptor antagonist, exhibits promising therapeutic potential for various cardiovascular and central nervous system disorders.

Spanlastics are a relatively recent class of lipid-based carriers known for their unique ability to improve drug solubility and stability. Invasomes, on the other hand, are transdermal delivery systems based on deformable vesicles that can penetrate the skin barrier efficiently, providing an alternative route for drug administration.

Aim & Objective: The development process involved the selection of appropriate excipients and the optimization of formulation parameters using quality-by-design (QbD) principles. The formulations were assessed for physicochemical properties, such as particle size, zeta potential, drug encapsulation efficiency, and drug release kinetics. The in vitro skin permeation studies

were performed to evaluate the potential of invasomes for transdermal drug delivery.
Methods: In vivo studies were conducted using animal models to investigate the pharmacokinetic behavior of prazosin-loaded spanlastics and invasomes. The obtained pharmacokinetic data, including peak plasma concentration, area under the curve, and drug half-life, were compared with a conventional prazosin formulation to assess the enhancement in bioavailability.
Result: The result revealed that the developed spanlastics and invasomes significantly improved the solubility and bioavailability of prazosin compared to the conventional formulation.
Summary & Conclusion: This study successfully developed and optimized spanlastics and invasomes as carriers for prazosin, demonstrating their potential to overcome the solubility and bioavailability limitations of the drug. The findings suggest that these novel carrier systems hold promise as effective strategies to enhance the therapeutic efficacy of prazosin.
Keywords: *Prazosin, spanlastic, invasomes, transdermal drug delivery.*

PSIT/PP01/0097

Polyherbal Fast Dissolving Tablets: Opportunity in herbal drug delivery system

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Introduction: There are various synthetic drugs used for the treatment of hyperglycemia and they may have various side effects such as, dermatological reactions, liver problems, nausea, vomiting, lactic acidosis and diarrhea. There is considerable interest in the field of medicinal plants due to their natural origins and fewer side effects. administration without water, anywhere, anytime, lead to their suitability to geriatric and pediatric patients, mentally ill, the bedridden, and patients who do not have easy access to water.
Aim & Objective: to review the advantages, limitations, formulation challenges, manufacturing techniques, patented technologies, marketed formulations and evaluation tests of ODTs.
Method: This review was done by selection of relevant articles then detailed analysis and finally summarizing the data which helps in identification of gap and establishes relationship between theoretical approach and practical experiments.
Result: This review helps to find the method to formulate the FDT and mechanism of super disintegrant and benefits of polyherbal Formulations.
Conclusion & summary: Available FDTs technologies work on the primary concept, to maximize the porous structure of the tablet matrix to achieve speedy tablet disintegration in the buccal cavity along with good taste-masking properties and mechanical strength. Future challenges for many ODT manufacturers include reducing costs by finding ways to manufacture with conventional equipment, packaging, enhanced mechanical strength and taste-masking potential.
Keywords: *FDT, Techniques, super disintegrants, polyherbal*

PSIT/PP01/0101

Formulation and characterization of corticosteroid loaded topical nanostructured lipid carrier for atopic dermatitis

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Introduction: Atopic dermatitis (AD), also known as atopic eczema, is a recurring inflammatory skin disease characterized by xerosis (dry skin), variably distributed eczematous lesions, intense pruritus, and

high serum immunoglobulin IgE levels (IgE-induced hypersensitivity). One of the major issues associated with current therapies available is that primarily all of them are associated with side effects.

Aim & Objectives: To formulate and characterize corticosteroid loaded nanostructured lipid carrier for atopic dermatitis with natural lipid

Method: NLC were prepared by microemulsion technique. This technique allows the formation of nanoparticles at mild temperature conditions.

Result: The outcomes demonstrated that corticosteroid loaded nanostructured lipid carrier with natural lipid were non-toxic and accomplished 80.50% entrapment with better flow properties. The optimized formulation had particle size 160.40 nm. The in-vitro drug release study was undertaken at 37±0.5°C in double distilled water at pH 5.5 phosphate buffer containing corticosteroid nanostructured lipid carrier formulation showed a controlled release upto 12 hours. Drug release data verified prolonged drug release obeying the Higuchi model (r2 = 0.981).

Summary & Conclusion: The experimental study showed lipid nanocarriers facilitate skin permeation through adhesion, occlusion, and hydration effects on the skin. On concluding, the newly developed formulation is an expectant modality for the cure of atopic dermatitis.

Keywords: *Formulation, Clobetasol propionate, Nano-structured lipid carrier, Topical delivery, Natural lipid.*

PSIT/PP01/0109

Development and evaluation of polyherbal medicated lozenges

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Introduction: Lozenges have bright future as a novel method of delivering drugs for local action and systemic effect in the oral cavity.

Aim & Objectives: To Developed and evaluated poly herbal lozenges for cold and flu. The polyherbal lozenges were created by exhaustive investigation of spices, character and reproducibility in home grown tablets for cold Flu.

Method: For formulation of 4 batches 42 gm of Sucrose was accurately weighed which was dissolved in 20 ml of water by heating on water bath when the temperature reaches 110℃ than the powdered extracts were added and as the temperature reaches between 145℃ to 150℃ than magnesium stearate, methylparaben, starch and flavouring agent was mixed. Finally, it was transferred in to mould to prepare hard lozenges.

Result: Polyherbal lozenges were formulated using extracts *Saussurea lappa, Glycyrrhiza glabra linn, Terminalia chebula* and *Zingiber officinalis* of above herbs in different concentrations. The formulated polyherbal lozenges were evaluated for the various parameters such as weight variation, hardness, friability, thickness, and stability study were performed and the. All the formulated formulations were evaluated for their antibacterial activity against staphylococcus aureus strain.

Summary & Conclusion: Herbal medicine are a treasure house of information from which we may derive leads to fill many blank spots in the modern medicine traditionally the plant is utilized it many disease conditions.

Keywords: *Polyherbal, formulation, lozenges, cold and flu*

PSIT/PP01/0110

Formulation, development and evaluation of *Cinnamomum tamala* tablet

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Introduction: Diabetes mellitus is one of the common metabolic disorders acquiring around 2.8% of the world's population and is anticipated to cross 5.4% by the year 2025. Since long back herbal medicines have been

the highly esteemed source of medicine therefore, they have become a growing part of modern, high-tech medicine.

Aim & Objectives: The aim of the present investigation is to develop the formulation and evaluation of *Cinnamomum tamala* Tablet.

Method: The dried leaves were ground to coarse to fine powder in a mixer and then extracted with 95% ethanol using a soxhlet apparatus for 15 hours. After filtration, the concentrate was dried to yield dried powder. Then the dried granules were passed through sieve number 20. Finally, the tablets were compressed with 12mm punches by using single punch machine. The prepared tablets were evaluated by Weight variation test, Thickness, Hardness, Friability, In Vitro Disintegration Time, In vitro dissolution test.

Result: The finished tablets color was Blackish; Weight variation was ± 5%, Hardness, 4.8±0.28 ,4.4±0.40, 4.7±0.25 kg/cm2, Friability 0.12 ±0.25, 0.18±0.06 ,0.15±0.05%. Thickness was measured as 3.2±0.25, 3.8±0.55, 3.4±0.30 mm and Disintegration time 9.3±0.57, 10.6±1.5, 10.3±1.1 min is good for stability to consume for human use.

Summary & Conclusion: The research work done on that basis and the selected plants for the formulation was literally proved for the therapeutic use of anti diabetic purpose.

Keywords*: Ketoacidosis, Hyperglycaemia, Diabetes mellitus, NDDG, Cinnamomum tamala*

PSIT/PP01/0111

Bilayer tablets: Advancements in polymer-based formulations

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Introduction: Bilayer tablets have emerged as a sophisticated drug delivery system, offering improved therapeutic outcomes and patient compliance. Bilayer tablets are a type of pharmaceutical formulation that consists of two distinct layers, typically stacked on top of each other within a single tablet. Each layer is designed to have specific properties and functions, allowing for controlled drug delivery and enhanced therapeutic outcomes. Bilayer tablets provide a platform for combining drugs with different solubilities and release profiles, allowing synergistic therapeutic effects and reducing the pill burden for patients. This layer-by-layer approach offers flexibility in dosing regimens, improves treatment compliance, and reduces potential drug-drug interactions.

Aim & Objectives: This review focuses on the utilization of polymers in the development of bilayer tablets, highlighting their role in enhancing drug release profiles, achieving controlled release kinetics, and facilitating the simultaneous delivery of multiple drugs.

Method: The thorough study of research available in the literature was followed by summarizing the knowledge in the form of a systematic review using data sheets, tables, figures and discussion.

Result: Bilayer tablets formulated with polymers represent a promising avenue for optimizing drug delivery. The judicious selection of polymers enables tailored release kinetics, ensuring optimal therapeutic outcomes and patient satisfaction.

Summary & Conclusion: This review sheds light on the significant role of polymers in bilayer tablet development, paving the way for innovative pharmaceutical formulations.

Keywords*: bilayer tablets, controlled release, drug-drug interactions, immediate-release, polymer-based formulations, synergistic effects, sustained-release.*

PSIT/PP01/0113

A Review on recent advancements for encountering neglected diseases by mesoporous metallic vano carriers (MMNC's)

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Introduction: Neglected diseases are medical disorders which are not well-researched due to lack of commercial and public interest. Mesoporous metallic nanocarriers (MMNC's)are a relatively new form of drug delivery with the potential to provide long-term circulating efficacy and high bioavailability of therapeutic agents. Their nanometric size, high surface area, and diverse drug stabilization and loading capacities of these carriers create an ideal platform for addressing some of the critical challenges of neglected diseases

Aims & Objectives: To explore the potential of MMNCs for better drug delivery to combat neglected diseases.

Methods: We utilized databases like Scopus, Pubmed, Embase, Web of Science, and Science Direct to review the current development related to MMNCs and neglected diseases, which can be encountered.

Results: This review reports the most recent developments of mesoporous metallic nanocarriers for the diagnosis and treatment of neglected diseases, as well as illustrating possible promises and limitations of each technology.

Summary and Conclusion: Further research is needed to explore the potential of mesoporous metallic nanocarriers for tackling neglected diseases. This review is a useful reference for researchers interested in understanding the current state of the field and the promises of mesoporous metallic nanocarriers for future developments.

Keywords: *Mesoporous Delivery, Metallic Nano Carriers, Neglected Disease, Leishmaniasis*

PSIT/PP01/0116

Formulation and evaluation of microspheres for colon targeting

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Introduction: Microspheres or micro-particles are complex drug formulations combining an Active Pharmaceutical Ingredient (API) with an FDA-approved polymer such as PLGA. Microsphere drugs enable the sustained release of APIs into patients over prolonged periods of time, varying from weeks up to several months.

Aim & objectives: The aim of the present work was to prepare the colon targeting microspheres of anti-bacterial drugs.

Method: Method of microsphere formulation is the spray drying technique, where a solvent containing the dissolved polymer is atomised using high pressure. This generates an extremely fine spray which is dried rapidly, forming spherical particles.

Result: The purpose of this research was to formulate and evaluate coated microspheres of 5-Fluorouracil for colon targeting.

Summary & conclusion: Analytical method used in present study was founded to suitable for the estimation of fluorouracil, which was indicate by the high regression values obtained in the standard plot.

Keywords: *Microspheres, Atomised, Evaluate, Colon targeting, High regression.*

PSIT/PP01/0120

Exploring the application of HPTLC bioautography, an analytical tool for therapeutic

evaluation bacopa based preparations

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Introduction: Herbal medicines find extensive use in treating diseases, disorders, and infections. Standardizing herbal formulations is crucial for consistent quality, safety, and effectiveness. Bacoside, derived from Bacopa monnieri, is a popular brain tonic enhancing memory and learning. It comprises tetracyclic triterpenoid saponin glycosides, primarily Bacoside A and B.

Aim & Objective: To perform therapeutic standardization by HPTLC Bioautography in Bacopa based preparation.

Method: The basic principle of method detection of Acetylcholinesterase inhibitory activity is that the enzyme converts α-naphthyl acetate (subtract) into α-naphthol. α-naphthol reacts with fast Blue B salt (chromatographic agent) to make purple colour background on TLC plate, while AchE inhibitor produce white spot. The standard Bacoside acid and Bacopa SLN Formulation were applied to TLC plate was developed in Toluene: Ethyl acetate: Methanol: Formic acid (3: 3: 5: 2: 5: 1).

Result: The congruence of Rf values between standard Bacoside A and the adulterated Bacopa SLN formulation establishes the presence of shared phytoconstituents. Furthermore, HPTLC analysis revealed distinctive white spots exclusively in the standard Bacoside A, underscoring a disparity in composition when compared to the adulterated Bacopa SLN formulation. Notably, only the standard Bacoside A exhibited acetylcholinesterase inhibitory activity, a characteristic absent in the adulterated Bacopa SLN formulation. This observation suggests that a minimal threshold of active drug content is imperative to confer acetylcholinesterase inhibitory activity.

Summary & Conclusion: In present study, HPTLC bioautography has been used to confirm therapeutic efficacy of Bacoside in herbal formulation by detecting Ach inhibitory activity.

Keywords: *Herbal formulation, Bacopa monnieri, HPTLC Bioautography, Acetylcholinesterase inhibitory activity.*

PSIT/PP01/0123

Antioxidant potential of natural sources: Effects of extraction methods on content and activity

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Introduction: The role of antioxidants in maintaining human health and preventing various diseases has garnered significant attention in recent years. Antioxidants are compounds that counteract the harmful effects of oxidative stress, which is linked to the development of chronic conditions such as cardiovascular diseases, cancer, and neurodegenerative disorders.

Aim & Objective: The aim of this study is to investigate the effects of different extraction methods on the antioxidant content and activity of natural sources. The objectives of the study is to compare the antioxidant content of various natural sources using different extraction techniques and to assess the antioxidant activity of extracts obtained from different sources and extraction methods,

Methods: A variety of natural sources, including fruits (e.g., berries, citrus fruits), vegetables (e.g., spinach, broccoli), nuts (e.g., almonds, walnuts), and herbs (e.g., rosemary, thyme), are selected for this study based on their known antioxidant content.

Extraction Methods: Different extraction methods will be employed, such as solvent extraction, steam distillation, and cold-press extraction. Each natural source will undergo these extraction techniques to obtain a range of extracts. Antioxidant Content will be

analyzed for their total phenolic content, total flavonoid content, and vitamin content using established chemical assays.

Result: Preliminary results indicate significant variations in antioxidant content and activity among the different natural sources and extraction methods. The relationship between antioxidant content and activity is complex and depends on the specific source and extraction method.

Summary & Conclusion: The study highlights the intricate relationship between antioxidant content and activity in extracts from various natural sources. The choice of extraction method plays a crucial role in determining the overall antioxidant potential of these sources. Therefore, the selection of an appropriate extraction method should consider the specific goals of utilizing these antioxidants.

Keywords: *Antioxidants, natural sources, extraction methods, antioxidant content, oxidative damage, ultrasound-assisted extraction.*

PSIT/PP01/0125

Formulation and analysis olanzapine mucoadhesive gelling system for nasal drug delivery

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Introduction: Schizophrenia is one of the most common mental disorders, causing hallucinations, personality changes, confusion, social disengagement, an increased risk of suicide, and other potentially lethal behaviors. Olanzapine is an atypical antipsychotic that belongs to BCS class II and is extensively used to treat schizophrenia, but it is less effective when taken orally. To address these limits, this work looks into the formulation and evaluation of olanzapine nanosuspensions with the goal of boosting their effectiveness and improving their retention time at the site of absorption by converting nanosuspensions to in-situ gel for nasal drug delivery.

Aim & Objectives: To formulate and evaluate a mucoadhesive in-situ gelling system for nasal drug delivery.

Method: The nanosuspension of olanzapine was made by an antisolvent precipitation approach with TPGS as a stabilizer. It was then transformed into an in-situ gel formulation by the addition of Gellan gum as a gelling agent and HPMC E 15 as a mucoadhesive agent. The produced gel was tested such as particle size, gelling time, mucoadhesion, release studies, etc.

Result: The nanosuspensions show smaller particle sizes (16.78 ± 1.57nm), typically in the nanometer range, which is advantageous for better drug delivery through biological barriers. The in-situ gelling system forms a gel quickly upon contact with simulated nasal fluid (gelling time: 20±3 sec) and improves medication retention (mucoadhesion time: 32±1.2 mins) time.

Summary & Conclusion: The proposed olanzapine nanosuspension based in-situ gel represents a novel approach to schizophrenia treatment. This formulation has the potential to improve therapeutic outcomes and also minimize the systemic adverse effects.

Keywords: *Nanosuspension, Schizophrenia, Mucoadhesive, Antipsychotic, In-situ gel.*

PSIT/PP01/0126

Design and development of mucoadhesive system

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Introduction: Gastroparesis is a clinical syndrome characterized by nausea, vomiting, early satiety, and upper abdominal pain, for which domperidone is the preferred treatment. The disease-related gastric

dysmotility inhibits oral absorption, whereas nasal administration ensures regular dosing.
Aim & Objectives: To prepare a stable In-situ gelling mucoadhesive microemulsion of the drug for nasal delivery.
Method: The oil phase was oleic acid (4%), the surfactant was Smix (50%) consisting of Kolliphor RH 40: Dubcare GPE 810 (1:1), and the co-surfactant was transcutol HP. The best results were obtained with Smix in a 3:1 ratio. Using gellan gum LA (0.2%) and HPMC E 15 (0.3%), this improved microemulsion was converted to In-situ gelling mucoadhesive microemulsion gel.
Result: The In-situ gelling mucoadhesive microemulsion was a clear liquid that gelled when stimulated externally. This formulation demonstrated greater mucoadhesion (20 + 1.2 minutes) with 80.42 + 6.538% drug permeation and was steady for 3 months.
Summary & Conclusion: Domperidone has been successfully developed as an in-situ gelling method. Domperidone microemulsion with particle size in the micron range was created. The in-situ gelling system, which included microemulsion, mucoadhesive, and gelling polymer, demonstrated good mucoadhesion and gelling capabilities.
Keywords: *Mucoadhesive; Gastroparesis; Microemulsion; In-Situ gelling; Nasal*

PSIT/PP01/0127

Studies on the solid dispersion of anti-hyperuricemia drug

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Introduction: In individuals with or without gout, Xanthine oxidoreductase inhibitors (XORI) are used to treat hyperuricemia. In comparison to conventional treatments, the chosen novel drug (D) of BCS class II of the XORI category, offers the unique benefit of requiring a lower dosage while causing fewer side effects. Limited bioavailability and poor solubility of the drug can be improved by preparing the solid dispersion of it.
Aim & Objective: The objective of this project is to enhance the water solubility of solid dispersions (SDs) by employing water-soluble polymers (P) in their preparation.
Method: The study involved the preparation of binary and ternary SDs by combining a drug (D) with PEG 4000, PEG 6000, and PVP K30 in different ratios. After preparation, the SDs were subjected to instrumental characterization using FTIR, XRD, and DSC and evaluated for assay, solubility, and dissolution.
Results: No chemical modifications were observed during the drug's characterization. PEG 6000 containing binary SDs showed the greatest solubility in water. At 5 and 15 minutes, respectively, the plain drug released 12.37% and 15.98% in water. The ternary system (D:P) demonstrated a drug release of 36.08%, in contrast to the binary SDs (D:P) ratio of 1:9, which obtained a remarkable 80% release at the end of 15 minutes.
Summary and Conclusion: Studies on drug characterization revealed no chemical alterations. Using PEG 6000 in the SDs increased solubility by 1.29 times, with improved dissolution in water. These findings showed that the fusion method to produce SDs successfully improved both the drug's solubility and dissolving characteristics.
Keywords: *Hyperuricemia, solubility, dissolution, solid dispersion, polymers.*

PSIT/PP01/0128

Formulation & evaluation of nanoparticles

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Introduction: In formulation development and drug delivery, the term 'nanoparticles' refers to a variety of particles used to deliver drug products or proteins to their target site.

These include liposomes, solid lipid nanoparticles (SLNs) micelles and polymeric nanoparticles.

Aim & Objectives: The aim of present study was to formulate and evaluate nanoparticles of carvedilol by using different hydrophilic polymers.

Method: Polymeric nanoparticles such as desolvation, dialysis, ionic gelation, nanoprecipitation, solvent evaporation, salting out, spray drying and supercritical fluid. However, the choice of an appropriate method depends upon various factors.

Result: Polymeric nanoparticles were developed to a satisfactory level in terms of particle size, drug entrapment, drug release and antimicrobial activity.

Summary & Conclusion: A nanoparticle is a small particle that ranges between 1 to 100 nanometres in size. Undetectable by the human eye, nanoparticles can exhibit significantly different physical and chemical properties to their larger material counterparts.

Keywords: *Micelles, carvedilol, desolvation, supercritical fluid, hydrophilic polymers, nanoparticles*.

PSIT/PP01/0130

Cinnamomum tamala loaded aluminium nanoparticles: Microwave assisted extraction and formulation

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Introduction: Metallic nanoparticles are nanosized metals, with a size range of 10-100nm. Metallic nanoparticles are extensively utilized as drug delivery carriers for various therapeutic agents. Synthetic antibacterial agents show high toxicity risk for human body and instability at high temperature and pressure. Aluminium nanoparticles are developed as these formulations are stable over a varied temperature with a higher loading efficiency.

Aim & Objective: The objective was development and evaluation of aluminium nanoparticles using methanolic leaf extracts of *Cinnamomum tamala* to get over the problems related with conventional formulations, such as low uptake and high cost.

Method: Microwave irradiation method was used for the preparation of Aluminium nanoparticles of methanolic extract of *Cinnamomum tamala*. The optimization of aluminium nanoparticles was carried out using 2^3 full factorial designs. A total of 6 batches were prepared with varying amounts of aluminium nitrate (X_1), stirring speed (X_2) and reaction time (X_3) as independent variables. The Aluminium nanoparticles were characterized for various parameters such as particle size, polydispersity index, zeta potential, entrapment efficiency and in-vitro drug release.

Result: *Cinnamomum tamala* optimized batch had a particle size of 85.1nm, polydispersity index of 0.298, zeta potential of -33.4, entrapment efficiency of 86%, and in-vitro release of 121.223µg/cm^2 in 24 hours.

Summary & Conclusion: It is concluded that *Cinnamomum tamala* Aluminium nanoparticles were successfully formulated and could overcome the drawbacks of conventional formulations.

Keywords: *Methanolic leaf extract, Aluminium nanoparticle, Cinnamomum tamala*

PSIT/PP01/0131

Development and evaluation of transdermal organogels containing nicorandil

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Introduction: Transdermal drug delivery

systems have offered several clinical advantages in drug delivery since their inception more than 20 years ago, and have been gaining momentum in the past decade due to their ability to provide controlled release of molecules, avoidance of first pass metabolism, reduced side effects and increased patient compliance. Transdermal gels/organogels of antianginal and antihypertensive category are very useful as palliative product for treating pain and inflammation associated with atheroma and hypertension.

Aim & Objectives: To perform the development and evaluation of Transdermal Organogels containing Nicorandil.

Method: The prepation of Nicorandil was done in mixture ethanol containing methyl paraben, propyl paraben and lecithin. Evaluation was also performed for the same organogels such as pH measurement, viscosity, spreadability, drug content, in-vitro diffusion study, forced degradation study, etc.

Result: Transdermal preparations of Nicorandil were successfully prepared.

Summary & Conclusion: Based on in-vitro diffusion studies it was concluded that the Nicorandil organogels with a lower concentration of penetration enhancer showed better penetration as compared to the gels.

Keywords: *organogels, in-vitro diffusion studies, inflammation, atheroma, viscosity, forced degradation study.*

PSIT/PP01/0133

Formulation and evaluation of herbal cream for treatment of arthritis

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Introduction: Arthritis is indeed an inflammatory disease that affects around 1% of individuals worldwide. Treatment may include resting the joint and alternating between applying ice and heat.

Aim & Objectives: To promote the welfare of people living with osteoarthritis rheumatic arthritis and related disorders. To promote research, education and other activities relating to the prevention, diagnosis, causes and treatment of arthritis disorders. selection of subjects with osteoarthritis of the hand or knee was based on the criteria developed by the American college of Rheumatology.

Method: There are a lot of things you can do to manage your arthritis. The day-to-day things you can choose to manage your condition and stay healthy are self-management strategies and activities. practice these simple strategies to reduce symptoms and get relief.

Result: This single blinded, randomized clinical trial indicated that the application of 0.5% E. laciniata ointment to affected joints over 2 weeks significantly reduced VAS pain scores for arthritis and RA patients when compared to the application of control ointment.

Summary & Conclusion: An herbal ointment showed significant improvement in pain and stiffness for patients with hand and knee osteoarthritis who applied the ointment to the affected joints for consecutive days.

Keywords: *Arthritis, formulation, osteoarthritis, herbal plants, herbal cream*.

PSIT/PP01/0134

Formulation and evaluation of herbal lipstick by using beetroot

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Introduction: The introduction briefly explains the concept of cosmetics and their role in improving appearance. It introduces the idea of herbal lipstick, which is formulated using natural ingredients and is devoid of harmful synthetic chemicals like parabens and sulfates. The focus is on using ingredients like beeswax, beetroot juice, castor oil, and vanilla essence to create a safer and more natural lipstick option.

Aim and objective: Formulation & evaluation of herbal lipstick by using beetroot.
Methods: The methods section explains the techniques used in the research. It mentions the use of a decoction process to extract color pigment from beetroot. Decoction involves boiling beetroot with ethanol to extract the desired pigments. The general method of lipstick formulation is used to create the herbal lipstick. The evaluation of the formulation is carried out based on various parameters including color and texture, melting point, solubility, breaking point, pH, and aging.
Result: Herbal lipstick was formulated and evaluated and it was found that among all five formulation F5 was best which has dark red color, melting point (61-63), soluble in (methanol, ethanol, chloroform), has breaking point (24), pH balance (6.5) which was more accurate an no defect observed.
Summary & Conclusion: In the present investigation, an attempt was made to develop formulation and evaluation of Herbal Lipstick. The herbal lipstick was formulated as per general method of lipstick formulation. The prepared formulation was evaluated and it was found that F5 formulation was best and was smooth on application.
Keywords: *Beet root, bees wax, carnauba wax, acacia.*

PSIT/PP01/0136

Analytical method development and validation of hydrochlorothiazide and eposartan in api and its dosage form by RP-HPLC

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Introduction: Hydrochlorothiazide is a diuretic medication often used to treat high blood pressure and swelling due to fluid build up.Eprosartan is an angiotensin II receptor antagonist used for the treatment of high blood pressure
Aim and Objective: Quantitative determination of Hydrochlorothiazide and Eposartan in pharmaceutical dosage form.
Methods: The estimation of Hydrochlorothiazide and Eposartan was done by RP-HPLC.The Phosphate buffer was pH4.6 and the mobile phase was optimized which consists of MEOH: Phosphate buffer mixed in the ratio of 70:30 % v/ v. A Symmetry C18 (4.6 x 150mm, 5µm, Make XTerra) column used as stationary phase. The detection was carried out using UVdetector at 273nm.
Results: The solutions were chromatographed at a constant flow rate of 1.0ml/min.the linearity range of Hydrochlorothiazide and Eposartan were found to be from 25-125 µg/ml. Linear regression coefficient was not more than0.999. The values of %RSD are less than 2% indicating accuracy and precision of the method.The percentage recovery varies from 97-102% of Hydrochlorothiazide and Eposartan LOD and LOQ was found to be within limit
Summary and Conclusion: The validation study shows that the developed method is accurate, rapid, precise, reproducible and inexpensive with acceptable correlation co-efficient, RSD (%) and standard deviations which make it versatile and valuable for simultaneous determination of Hydrochlorothiazide and Eprosartan in pharmaceutical dosage forms.
Keywords: *SymmetryC18, Hydrochlorothiazide and Eposartan RP-HPLC.*

PSIT/PP01/0138

Chemically Modified Locust Bean Gum as a Pharmaceutical Excipient

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Introduction: Natural gums are one of the most readily available raw materials and have been the subject of intensive research due to their sustainability, biodegradability and bio-safety. Locust bean gum (LBG) is a natural polysaccharide consisting of units of mannose and galactose.
Aim and Objectives: The aim was to modify LBG by cross linking, using cross linking reagents namely borax, epichlorohydrin, glyoxal, and methyl acrylate so as to modify its properties, and increase its applicability as pharmaceutical excipient.
Methods: The batches of cross-linked LBG were prepared by dissolving the solution of LBG powder in distilled water with continuous stirring, followed by addition of the cross-linking reagents. The resulted product was washed with distilled water and dried.
Result: The characterization of the cross-linked LBG was done by spectral technique and the optimized batches were evaluated on various physical parameters such as swelling index, compressibility, and freeze thaw stability. The result data indicated that LBG-B (Borax) displayed the most appropriate properties among all the cross-linked gums.
Summary and Conclusion: The study concludes that cross linking helped to improve physical properties of the natural gum. Also, that the cross-linked gum LBG-B could be better a pharmaceutical excipient.
Keywords: *LBG, Borax, Swelling, Compressibility, Freeze thaw stability.*

PSIT/PP01/0141

Design and characterization of lipid based lyophilized quercetin nanomicelles

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Introduction: Quercetin, a wonder flavonoid with numerous pharmacological effects, has limited clinical applicability because of problems with solubility and permeability as well as a shorter biological half-life.
Aim & objectives: The study aims to formulate and optimize quercetin nanomicelles to improve its oral bioavailability and sustain its in-vivo plasma levels.
Methods: Quercetin nanomicelles were prepared by the solvent evaporation method using ethanol as solvent, water as anti-solvent, Poloxomer 407, and Gelucire 44/14 as a stabilizer. The effect of the amount of stabilizer on particle size and entrapment efficiency were studied and optimized using a 3-level, 2-factor, factorial design. The prepared nanomicelles were further lyophilized and assessed for mean particle size, polydispersity index, Zeta potential, drug content, saturated solubility, *In-vitro* dissolution, scanning electron microscopy, differential scanning calorimetry, X-ray diffractometry, *Ex-Vivo* permeation, stability study, etc.
Results: The particle size of prepared batches was found in the range of 112±1.3 to 553±1.7 nm with zeta potential ranging from -11.83 to -25.19 mV. The optimized quercetin nanomicelles formulation batch demonstrated a 5-fold increase in solubility compared to pure drug with 91.51±1.8% drug release in 8 h. The results of *Ex-vivo* absorption studies performed by everted sac technique using rat intestine indicated 65.14±1.6% permeation of quercetin from the optimized formulation in 6 h compared to 18.37±2.7% of pure drug.
Summary & Conclusion: The outcome of the current study indicated that quercetin nanomicelles formulation with improved stability could serve as a promising approach for enhancing its overall bioavailability for its multifarious clinical use.
Keywords: *Quercetin, Nanomicelles, Solvent evaporation method, Solubility, Permeation.*

PSIT/PP01/0142

Development and characterization of *Boswellia serrata* nanostructure gel

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Introduction: Boswellia Serrata that possesses potential therapeutic effect against psoriasis has poor bioavailability limiting its clinical application.
Aim & Objectives: The goal of the current study was to explore the potential benefits of Boswellia Serrata nanostructure gel as a prospective antipsoriatic topical delivery system counteracting the drug challenges in terms of its extremely low aqueous solubility, instability, skin irritation, and systemic adverse effects.
Methods: Nanostructures were prepared using emulsification method using Glycerol Mono as a carrier and Gelucire 44/14 as stabilizer. Optimization was performed using 3^2 factorial designs. Optimized Boswellia Serrata-loaded nanostructures were characterized by FTIR, TEM, DSC, *in-vitro* drug release study.
Results: Optimization studies showed that the % Gelucire 44/14 and Stirring speed had significant effect on particle size and % entrapment efficiency. Particle size of BS-NS was found to be 180.9±2.01 nm with an entrapment efficiency of 95.8% ± 0.43. FTIR studies revealed compatibility of Boswellia serrata with the excipient. DSC thermograms indicated molecular dispersion of Boswellia Serrata in Gelucire 44/14 due to the solubilization of drug. Gel of the BS-NS was formulated using Carbopol 934 as gelling agent its significant effect was observed for the treatment of psoriasis in *in-vivo* mouse tail method. The designed system showed nearly 2- fold enhancement in drug release of Boswellia Serrata nanostructures gel as compared to Boswellia Serrata gel.
Summary & Conclusion: The developed system can be utilized in design and development of drugs having poor bioavailability due to limited solubility and permeability and also its topical use in psoriasis can be explored.
Keywords: *Nanostructures, Boswellia serrata, GMO, psoriasis, entrapment efficiency*

PSIT/PP01/0143

Formulation & evaluation of Chitosan- based quercetin dihydrate nanoparticles for ocular drug delivery

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Introduction: Quercetin is a natural flavonoid found in many fruits, vegetables, leaves, and grains and has received significant attention from researchers owing to its anticancer, anti-inflammation, and antioxidant effects. Quercetin reduces oxidative stress associated with eye complications and prevents intraocular inflammation through its anti-inflammatory potential.
Aim & Objectives: Quercetin is reported to have poor aqueous solubility and permeability which is a hindrance to ocular dosage development. Chitosan with its biocompatibility and biodegradable nature is a promising component to prepare nanoparticles. The aim of the present work was to design and characterize chitosan-based quercetin dihydrate nanoparticles to

improve transcorneal permeation into the eye.

Method: Quercetin was loaded into nanocarriers with the help of chitosan by ionotropic gelation method. These were characterized for size, morphology, drug encapsulation and release studies. To avoid unethical irritancy test on rabbits, ocular irritancy test was performed through HET-CAM test. The permeability test was carried out using excised goat's cornea.

Result: Results suggested that quercetin easily permeated across excised goat's cornea showing no irritancy in the HET-CAM test. SEM indicated formation of spherical nanocarriers with good stability. The particle size of the prepared nanocarriers was found to be 116.2 nm with a drug loading efficiency of around 70-80%.

Summary & Conclusion: Quercetin loaded chitosan-based nanoparticles offers controlled release characteristics confirmed with drug release and permeation pattern of the drug with no ocular irritancy, thus suggesting significant opportunity in the development of ocular dosage form.

Keywords: *Quercetin, chitosan, ocular, nanoparticles, HET-CAM, transcorneal.*

PSIT/PP01/0147

Development and evaluation of transdermal organogels containing nicorandil

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Introduction: Transdermal drug delivery systems have offered several clinical advantages in drug delivery since their inception more than 20 years ago, and have been gaining momentum in the past decade due to their ability to provide controlled release of molecules, avoidance of first pass metabolism, reduced side effects and increased patient compliance. Transdermal gels/organogels of antianginal and antihypertensive category are very useful as palliative product for treating pain and inflammation associated with atheroma and hypertension.

Aim & Objectives: To perform the development and evaluation of Transdermal Organogels containing Nicorandil.

Method: The prepation of Nicorandil was done in mixture ethanol containing methyl paraben, propyl paraben and lecithin. Evaluation was also performed for the same organogels such as pH measurement, viscosity, spreadability, drug content, in-vitro diffusion study, forced degradation study, etc.

Result: Transdermal preparations of Nicorandil were successfully prepared.

Summary & Conclusion: Based on in-vitro diffusion studies it was concluded that the Nicorandil organogels with a lower concentration of penetration enhancer showed better penetration as compared to the gels.

Keywords: *Organogels, In-vitro diffusion studies, Inflammation, Atheroma, Viscosity.*

PSIT/PP01/0149

Investigation on herbal medicated toothpaste

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Introduction: The tooth composed of crown, root, enamel, dentine and pulp. The present study aims to formulate herbal medicated toothpaste to fight against the pathogenic bacteria like S. mutans, E. Coli and S. aureus, which cause problems like dental cavity, gingivitis and (periodontal) disease etc.

Aim & Objective: Present study is an attempt to formulate Herbal medicated Toothpaste containing Psidium Guajava Linn (Guava) extract and its evaluation for antimicrobial activity against different microorganisms

Method : The leaves of Psidium Guajava Linn plant was collected and extracted with a

suitable solvent. Different toothpastes were formulated by using Design of Experiment. The toothpaste was designed by using Psidium guajava Linn extract, Hydroxy Propyl Methyl Cellulose, sodium carboxymethyl cellulose, sodium saccharide, alum, calcium carbonate, sodium lauryl sulphate, clove oil, peppermint oil, glycerine, polyethylene glycol (PEG -400), methyl paraben, propyl paraben etc.

Result: In present study formulated herbal toothpaste was evaluated for its organoleptic and physical properties such as color, odour, taste, pH, spreadability, viscosity, moisture content, fineness, foamability etc. as per standards specified by BIS and compared with commercially marketed herbal toothpaste formulations. The herbal medicated toothpaste showed that the formulation containing Psidium guajava Linn (Guava) extract have better Antibacterial activity.

Summary & Conclusion: Toothpaste prepared by using various herbal ingredients possess antibacterial, antiseptic and cooling properties. Formulation of toothpaste with Psidium guajava Linn (Guava) extract was acceptable and might be considered as a desirable herbal medicated toothpaste

Keywords: *Psidium guajava Linn leaves (Guava) extract, Herbal Medicated Toothpaste, Quality by Design (QBD).*

PSIT/PP01/0152

Intranasal drug delivery system: An overview

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Introduction: Intranasal distribution is a non-surgical route for delivery of medicament broadly used for localized action or systemic action. Intranasal route is substitute for parenteral route and also useful for long term therapy.

Aim & Objectives: To focus on overview of Anatomy of Nose, Factor Affecting, Various bioavailability barrier, Application, Advantages, Disadvantages, Evaluation of Intranasal drug delivery and the strategies to improve the bioavailability of nasal dosage form.

Method: There are three methods to study diffusion profile of drugs i.e.

In-vitro diffusion studies: The nasal mucosa of sheep was separated and studied

In-Vivo Absorption studies: Animals used as models for study of nasal absorption the animal models used for nasal absorption studies is of two types, i.e., Animal as whole or in vivo form of model and perfusion of isolated organ known as ex-vivo model.

In-vivo bioavailability studies: Conducted on rabbits. The extraction of drug from plasma can be carried out and analysed using HPLC system.

Result: Intranasal drug delivery is a deep rooted and well-prepared method of delivery of medicament to targeted patients.

Summary & Conclusion: Its productivity can be improved by using atomizer to deliver small quantity of medicament in sufficient doses (usually higher than IV, lower than oral). Used correctly this tool can save your time, reduce needle-stitches risks, patient comfort (no needle used) and increased safety. Below article will describe condition where you can find intranasal medicament delivery useful for your practice.

Keywords: *Nasal Mucosa, Intranasal, In-Vivo, In-Vitro, Nasal Spray, Nasal Cavity*

PSIT/PP01/0153

Formulation development and evaluation of intranasal liposomes for antiepileptic drug

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Introduction: Epilepsy is a neurological condition defined by occurrences of varying

severity and duration caused by increased cellular activity of the cerebral cortex. Lipid nanoparticulate drug delivery methods have the potential to improve the bioavailability of nasal formulations to the brain.

Aim & Objectives: To formulate and evaluate Pregabalin intranasal liposomes for the treatment of epilepsy. To overcome the challenges associated with systemic administration of antiepileptic agents.

Method: Characterization of Pregabalin carried out by checking melting point and solubility of extract, UV scanning and FTIR was performed, Pregabalin liposomes prepared by modified ethanol injection method, 3^2 factorial design was applied to explore combined effect, intranasal liposomes evaluated by Transmission Electron Microscopy (TEM), measurement of zeta potential, determination of entrapment efficiency(%EE) and in-vitro studies.

Result: Pregabalin shows an acceptable correlation and shows significant factor effects impacting formulation performance. Zeta potential of Pregabalin liposomes confirms the repulsion among the particles and thereby increases the stability of the formulation. Application of ANOVA showed significant effect in antiepileptic activity.

Summary & Conclusion: The in vitro drug diffusion studies indicated that the rate and extent of drug release from liposomes were significantly retarded with an increase in cholesterol concentration. Thus, Intra-Nasal administration of pregabalin loaded liposomes may be appropriate and valuable drug delivery system for the chronic and acute attacks of epileptic seizures.

Keywords: *Antiepileptic, Liposomes, Pregabalin, Nasal , Bioavailability*.

PSIT/PP01/0155

Formulation optimization and evaluation of boswellic acid loaded nanoemulgel

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Introduction: Rheumatoid arthritis cause loss of joint, lead to dysfunction, deformity due to its progressive nature. Nanoemulgel have improved transdermal, dermal transport qualities, better stability, have controlled release.

Aim & Objective: To formulate, evaluate Boswellic acid (BA) loaded Nanoemulgel, examine drug solubility, in vitro ex vivo permeability, anti-arthritic activity. Design and optimize Nanoemulgel by 3^2 factorial design.

Method: Characterization of BA carried out by checking melting point, solubility of extract, UV Scanning and FTIR was performed, arthritis score evaluation, paw volume of animals measured for 15 days, formulation of Nanoemulgel, 3^2factorial design was applied to minimize number of trial, Nanoemulgel evaluated by viscosity studies, Field emission scanning electron microscopy, stability studies.

Result:100 % of rats developed arthritis on 15^{th} day of protocol. Daily treatment with BA loaded Nanoemulgel starting CFA injections decreased the arthritis score in rats as compared to saline treated animals, application of ANOVA showed significant effect in both dose and arthritis score in rats.

Summary and Conclusion: The BA showed good reproducibility, FTIR frequencies were found to be concurrent with reference spectrum. No drug-polymer interaction was found. Drug release increased with time. The formulation had significant effect on physical, rheological, in vitro, ex vivo characteristics and have good anti-arthritic activity.

Keywords: *Nanoemulgel, Anti- arthritic activity, Rheumatoid arthritis*

PSIT/PP01/0157

Formulation, development and evaluation of herbal antilithiatic solid dosage form

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Introduction: Herbal medicines are efficacious and have lesser side effect compared to modern medicines and also reduce the recurrence rate of renal stone. Traditionally Bryophyllum pinnatum and Apple cider vinegar was found to be used to treat kidney stones.

Aim & Objectives: To check antiurolithiatic activity of herbal medication and formulation and evaluation of herbal antilithiatic solid dosage form. To identify and collect the plant, check the antiurolithiactic activity of Bryophyllum Pinnatum and Apple Cider Vinegar, formulation and Evaluation of polyherbal tablet.

Method: Prepared hydroalcoholic formulation. Formulation is evaluated by Fourier Transform Infrared spectroscopy and In-vitro studies . 3^2 full Factorial Design was applied to minimize the number of trials. Prepared and evaluate mix blend of Drug and Excipients. Drug Excipient compatibility and evaluation of post compression tablet was studied.

Result: The preliminary study of drugs were carried out and which shows the suitability of drugs and excipients for the practical purpose. In vitro tests for nucleation and aggregation has been conducted for B. pinnatum , Apple cider vinegar and their (1:1) synergistic sample and absorbance at 620 nm was recorded to obtain a turbidity slope.

Summary & Conclusion: The herbal tablet of BP and ACV have inhibitory effect on calcium oxalate crystallization and are beneficial for the treatment of renal lithiasis. Polyherbal tablets of ACV and BP were by direct compression method and gave satisfactory result.

Keywords: *Antilithiatic, Bryophyllum pinnatum and Apple cider vinegar*.

PSIT/PP01/0158

Formulation development and evaluation of liposomes of antifungal agent

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Introduction: An antifungal agent is a drug that selectively eliminates fungal pathogens from a host with minimal toxicity to the host. Antifungal drugs entrapped in liposomes have indicated improved skin penetration and localizing effects.

Aim and Objective: To formulate and evaluate liposomes of antifungal agent. To design, develop and evaluate topical drug delivery system of liposomes to enhance skin deposition of antifungal agent.

Methods: Characterization of Eberconazole Nitrate, compatibility studies of drug and excipients, optimization of prepared formulation, characterization of optimized formulation (particle size, polydispersibility index, zeta potential), morphology of vesicles-Transmission Electron Microscope (TEM), in-vitro studies, ex-vivo studies.

Result: EBZ shows excellent solubility and acceptable correlation between absorbance and concentration. It reduces the number of trials and attain the highest amount of information on product properties. Application of ANOVA shows significant effect in antifungal activity.

Summary and Conclusion: The present study concluded the stability of experimental design for design and development of liposomes as carriers for topical delivery of poorly water-soluble drug, EBZ. The EBZ loaded liposomal formulation was successfully converted as antifungal agent. It shows good antifungal activity.

Keywords: *Liposomes, Central composite design, Eberconazole Nitrate.*

PSIT/PP01/0159

Formulation and evaluation of orodispersible tablets for paediatric patients

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Introduction: Geriatric and paediatric patients have trouble swallowing conventional tablets, which results in low patients' compliance. To address this shortcoming, scientists have created an innovative drug delivery system known as mouth dissolving tablets (Orodispersible tablets)

Aim and Objective: To formulate and evaluate Orodispersible tablets for paediatric patients with difficulty in swallowing, nausea and vomiting with prime objective of arriving at cost effective product, by direct compression techniques and to select antiemetic drug.

Methods: Procurement of drug, polymer and excipients, preformulation studies in which melting point, identification test, stability test was performed. formulation design was prepared, precompression assessment, compression, post compression of powder blend was done, and the stability studies were performed.

Result: The optimized formulation of batch MF9 gave the best in-vitro release of 99.66% in 3 min in phosphate buffer pH 6.8. The release of drug followed matrix diffusion mechanism. Hence the formulation MF9 is stable and effective for quick action and it is alternative to the conventional tablets.

Summary and Conclusion: The drug excipients interaction studies were carried out by FTIR. No significant interaction of drug with excipients was observed. During stability studies, no significant variation and drug release was observed, indicating that formulation batch MF9 was stable over the chosen condition for 2 months.

Keywords: *Metoclopramide hydrochloride, Orodispersible, direct compression, superdisintgrants.*

PSIT/PP01/0160

Folic Acid-Linked Solid Lipid Nanoparticles: Novel Approach for Cancer Therapy

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Introduction: Improved therapeutic options for lung cancer are desperately needed to alleviate its impact on patients. The existing medications used to treat lung cancer generally have limitations due to their low oral bioavailability. To reduce the severe side effects associated with conventional treatments for lung cancer, tailored medicines must be developed. Tyrosine kinase inhibitors (TKIs) are used in lung cancer treatment to target specific mutations and signaling pathways driving tumor growth.

Aim & Objectives: To develop and characterize folic acid-conjugated SLNs loaded with the tyrosine kinase inhibitor, aiming for targeted drug delivery in cancer therapy.

Method: In order to verify the conjugate's affinity for the receptor, docking studies were conducted. Excipient screening was performed to identify optimal formulation parameters, resulting in the conjugated drug-loaded SLN. By utilizing carbodimide coupling, folic acid (FA) was conjugated on the surface of SLN. Particle size, polydispersity index (PDI), entrapment effectiveness, drug loading, assay, and in vitro drug release experiments were used to characterize the optimized formulation. To verify the conjugate formation, thin layer chromatography, mass spectroscopy, and FTIR experiments were carried out. To demonstrate the cytotoxic action of formulated formulations, cell line experiments were carried out.

Result: The significant receptor affinity of the compound has been confirmed by docking experiments. The developed

formulation's particle size and PDI were found to be 213.9 nm and 0.167, respectively. Entrapment efficiency and drug loading were determined to be 85% and 7.59%, respectively, while the drug content was found to be 100.36%. Thin-layer chromatography, FTIR spectroscopy, and mass spectroscopy were used to establish conjugate formation. Studies on cell lines revealed that the A549 cell line had promising cytotoxic activity.

Summary & Conclusion: The use of SLNs in cancer therapy paradigms is highlighted by the developed folic acid-conjugated SLNs as a drug delivery method that encompasses formulation optimization and comprehensive characterization.

Keywords: *Folic Acid, Solid Lipid Nanoparticles, Cancer Therapy*

PSIT/PP01/0161

Formulation and evaluation of probiotics composition for topical application

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Introduction: Probiotics are living bacteria that provide the host with health benefits when given in sufficient doses. Probiotics have shown promise in managing various oral infections, including candidiasis (oral thrush) and periodontal diseases. Dissolving probiotic films can deliver a concentrated dose of beneficial bacteria directly to the affected areas, assisting in the restoration of microbial balance and potentially reducing the severity or duration of infections.

Aim & Objectives: To formulate oral topical probiotic preparation and its evaluation and characteriation.

Method: The probiotic-loaded dissolving film was prepared using a Plackett-Burman design, dispersing HPMC E-15, propylene glycol 400, and citric acid. A probiotic extract, plasticizer, and citric acid solution were added, dried, and cut into rectangular pieces.The films were wrapped in aluminum foil and stored at the appropriate temperature.

Result: Based on the concentration of HPMC E-15 and PEG 400, F3 was found to be an Optimized batch having Disintegration time -30 sec, Drug Release 96%, Folding Endurance 30, and viability test 3.8x10 cfu.The Optimized Batch was studied for antimicrobial activity and result showed that the selected lactobacillus sp. has inhibitory activity against the selected indicator strain.

Summary & Conclusion: From the study, it was concluded that the Dissolving Film containing probiotics can be used as an alternate topical preventive therapy to reduce the count of S. mutans effectively in the oral cavity/plaque. Hence, probiotics can be used as topical caries preventive agents.The Dissolving nature of the films improves patient compliance, as they are easy to use and do not require swallowing or chewing. Additionally, the formulation can be tailored to provide additional oral health benefits, such as taste-masking agents to enhance patient acceptance.

Keywords: *Probiotic, dissolving film*

PSIT/PP01/0165

Pytochemical and pharmacological evaluation of *Balanites roxburghii* linn for anticancer activity

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Introduction: The rootpart of balanites roxburghii linn belonging to family zygophyllaceae family were collected, dried and authenticated. The coarse powder of dried plant was subjected to successive solvent extraction from non polar to polar.

Aim & Objectives: To standardise an validate the use of *Balanites roxburghiana* linn as an anticancer.

Method: The soubility of extracts was recorded. The ethyl acetate extract was soluble was soluble in methanol, ethanol,

ammonia, ethyl acetate and sparingly soluble in chloroform, petroleum ether, n-hexane, diethyl ether. The methanolic extract was soluble in methanol, ammonia ethyl acetate and sparingly soluble in chloroform, petroleum ether, n-hexane, diethyl ether. The hydroalcoholic extract was soluble in water, methanol, ammonia, ethyl acetate and sparingly soluble chloroform, petroleum ether, n-hexane, diethyl ether. The water extracts soluble in water, ethanol, ethyl acetate, and sparingly soluble in chloroform, petroleum ether, n-hexane, diethyl ether.

Result: The %yield of ash value was recorded; total ash value was 15.51% acid insoluble ash value was 5.4% and water insoluble ash was 9.4%.

Conclusion & Summary: The preliminary phytochemical analysis of extracts revels the presence of alkaloids, flavonoids, steroids, tannins and saponins. The TLC study was carried out on methanol extract, hydro alcoholic extract and water extract, both the studies confirmed that the flavonoids (Quercetin and rutin) present in methanolic extract. The presence of flavonoids may support the anticancer potential of this plant.

Keywords: Balanties roxburghii, phytochemical screening, Anticancer activity.

PSIT/PP01/0171

Development and evaluation of pregabalin nanoemulsion for nose-to-brain delivery in epilepsy

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Introduction: Epilepsy is a chronic neurological disorder caused by abnormal brain activity. Pregabalin, a medication, is used to treat epilepsy, neuropathic pain, and generalized anxiety disorder. Intranasal delivery offers quick absorption, comfort, safety, and a quicker start compared to oral and transdermal routes.

Aim & Objectives: The aim of the present investigation was to develop and evaluate pregabalin nanoemulsion for nose-to-brain delivery in epilepsy, and the main objectives were to formulate and characterize pregabalin nanoemulsion.

Methods: Nanoemulsion was prepared by aqueous titration and probe sonication method, with isopropyl myristate oil, span 80 surfactant, and tween 80 co-surfactant. Optimization of the formulation was carried out by pseudoternary phase diagram, D-optimal design, and Design-Expert software analysis.

Result: Pregabalin nanoemulsion with 156.52 nm particle size, low PDI value i.e., 0.1350, and 6.5 pH was found suitable for nasal drug delivery, exhibiting strong bioadhesion- 93.82 % and the drug content percentages varied within a range of 65.38 ± 0.5% to 85.14 ± 0.6%. The formulation did not cause any significant damage or adverse reactions, indicating its potential suitability for intranasal delivery.

Summary & Conclusion: The formulation was found to be suitable for intranasal delivery without significant damage or adverse reactions. The pregabalin nanoemulsion hold promise as a promising approach for intranasal drug delivery, offering potential benefits for enhanced drug absorption and therapeutic efficacy.

Keywords: *Pregabalin, Nanoemulsion, Pseudoternary phase diagram, Epilepsy, D optimal design, Intranasal administration.*

PSIT/PP01/0172

Solubility enhancement of poorly soluble drug by hydrotropy

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Introduction: Orally administered drugs have good bioavailability if fully absorbed, but over 40% of new chemical entities are water insoluble. This weak solubility and slow

absorption cause unpredictable bioavailability and damage to the gastrointestinal mucosa. Improving drug solubility is crucial for achieving desired pharmacological responses and determining therapeutic effectiveness.

Aim & Objectives: The main aim of the present study is to increase solubility of poorly soluble drug nitrofurantoin and formulation of fast-disintegrating tablets.

Method: To prepare a 3g HSD with Nitrofurantoin and hydrotropic blend in a 1:2 ratio, accurately weigh Nitrofurantoin and urea. Dissolve urea and Sodium citrate in distilled water at 68°C-70°C. Add Nitrofurantoin and a Teflon-coated magnetic bead, stir until solubilized. Spread the semisolid mass on watch glasses, dry in an oven, and pass through a sieve. Repeat the process for other HSDs with Nitrofurantoin and hydrotropic blends.

Result: Hydrotropic technique increases Nitrofurantoin solubility by 3.91 folds using urea and sodium citrate. Fast disintegrating tablets with 5 min and 5 sec disintegration time were optimized using design expert version 7.0.

Summary & Conclusion: Hydrotropy is a solubilization technique that increases the aqueous solubility of another solute, like Nitrofurantoin, an antibacterial agent used in urinary tract infections. This technique is promising for (FDTS) due to its low solubility and high permeability. A study aimed to enhance solubility and optimize the hydrotropic agent for optimal results. The F7 batch was found to be the optimal batch for disintegration.

Keywords: *Hydrotropy, Solubility, solubility enhancement, Nitrofurantoin, Fast disintegrating tablets.*

PSIT/PP01/0173

Preparation and characterization of gastroretentive floating nanospheres.

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Introduction: Gastro-retentive drug delivery system provides prolong drug residence in the stomach, enhancing absorption and therapeutic effectiveness. Gastro-retentive floating drug delivery is to formulate the drug in such a way that it remains buoyant in the gastric fluids, allowing it to float on top of the stomach contents for an extended period.

Aim & Objectives: The aim of the present investigation was to formulate gastro-retentive floating nanospheres with enhanced gastric residence time, absorption and bioavailability and to evaluate the same.

Method: Gastro-retentive floating Nizatidine loaded ethyl cellulose nanospheres were prepared by solvent evaporation technique using PVA as stabilizers. The resultant nanosphere were characterized by DSC and FTIR. Furthermore, it was evaluated for their floating behaviour, particle size, entrapment efficiency and drug release.

Result: The resultant nanospheres remain buoyant on the gastric fluid and prolong the residence time inside the stomach and Nanospheres showed a sustained release of drug.

Summary & Conclusion: The study developed gastro-retentive floating nanospheres using ethyl cellulose to prolong Nizatidine's gastric residence time, reduce dosage regimens, and provide local action in the stomach. Batch F6(Ethyl cellulose: Sonication time) (1.5:15) was the optimum formulation, exhibiting high floating behaviour, small particle size, good stability, and sustained drug release. The nanospheres remained buoyant in gastric fluid, prolonged gastric residence for 12 hours, and demonstrated efficient drug entrapment and loading. The absence of interaction between Nizatidine and ethyl cellulose showed suitability for drug delivery.

Keywords: *Nizatidine, Nanosphere, Ethyl cellulose, Optimal design, Gastro-retentive*

PSIT/PP01/0174

Optimization of acyclovir self-micro emulsifying drug delivery systems (SMEDDS) by full factorial design

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Introduction: Nowadays Solubility enhancement is the major constrain in the pharmaceutical industry. 70% - 80% of newly exposed lipid-soluble drug candidates show poor aqueous solubility, it is one of the reasons for incomplete oral absorption, low bioavailability and high variability during oral administration.

Aim & Objectives: To elaborate a novel approach for the development and optimization of self-micro emulsifying drug delivery system, for the advancement of solubility and oral bioavailability of acyclovir by oral route.

Method: Box-Behnken method was used to optimize the formulation variables, X1 (amount of oil; Sunflower oil), X2 (amount of surfactant; tween 60) and X3 (amount of co-surfactant; glycerol). 20 experimental runs of acyclovir SMEDDS were formulated. 2^{nd} order quadratic polynomial equation, 2D & 3D contour plots defined the relationship between variables and desired response. Optimization process was carried out using plots of desirability and methods of point prediction.

Result: Melting point was determined experimentally to be 246°C which confirms drug to be Acyclovir. FTIR studies indicated that there was no interaction between drug and excipient. Globule size, turbidity and emulsification time for the optimized formulation were found to be 60.4464 nm, 32.2875 NTU and 60 ± 1 s respectively. The in-vitro diffusion of SMEDDS was significantly higher as compared to pure drug.

Summary & Conclusion: Optimised formulation of SMEDDS suggests that it could be a successful strategy for efficient drug delivery method to enhance the solubility, stability, dissolution rate, and oral bioavailability of a poorly water-soluble drug.

Keywords: *Acyclovir, SMEDDS, Bioavailability, Solubility enhancement, Optimization*

PSIT/PP01/0178

Design of fast-dissolving cyproheptadine pastilles for childrens

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Introduction: The most common type of respiratory illness is common cold. Histamine can produce symptoms of sneezing, itching, and runny nose which are common symptoms in children and Cyproheptadine is an antihistamine.

Aim & Objectives: The present study aims to overcome the above symptoms of the common cold and increase children's compliance by formulating a pastille containing cyproheptadine.

Method: Optimization of the pastille, prepared by melt method, was performed statistically by 3^2 full factorial design. The pastilles were evaluated for weight variation, Hardness, Disintegration time, Drug content, In vitro drug release, DSC, FTIR & XRD studies.

Result: The pastille had a weight variation in the range of 510mg to 490 mg, which is 5%, hardness of 1.39 kg/cm^3, Disintegration time is 41.04 sec, drug content 97.7%, in vitro release of between 92.95 within 60 min. The IR spectral analysis study showed no drug interaction with formulation additives of pastilles. The DSC thermogram of Cyproheptadine and PEG 6000 showed an endothermic peak at 261°C and 61.4 °C respectively. X-ray diffractogram of Cyproheptadine showed sharp and intense peaks suggesting crystalline patterns.

Summary & Conclusion: All batches are examined using different evaluation parameters, and the outcomes with complete acceptance, batch F7 was optimized. In this way, the present work opens a new alternative to the conventional dosage form for the development of fast-dissolving pastilles.

Keywords: *Common cold, Children, Melt method, Cyproheptadine, Pastilles, PEG 6000*

PSIT/PP01/0179

Design of multi-release lansoprazole pastilles.

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Introduction: Lansoprazole is a proton pump inhibitor, that lowers gastric acidity. Since, lansoprazole is unstable at acidic pH values it is available in the form of orally disintegrating tablet or delayed release capsule. In case of orally disintegrating the action is quicker but not sustained there might be chances of reappearance of acidity whereas in case of delayed release system the onset time is longer.

Aim & Objectives: To formulate multi-release system. To design a single step melt solidification process to obtain pastilles of desired pharmaceutical properties. To enhance solubility of lansoprazole.

Method: Immediate release system using Sodium bicarbonate to create alkaline microenvironment to prevent drugs degradation and the sustained release was enteric coated. And as the drug is a BCS Class II its solubility was improved using lipid by Pastillation technology.

Result: The pastilles were evaluated for FTIR, DSC, XRD, Contact angle, Flow properties, Drug content and In vitro drug release. XRD studies showed the conversion of crystalline to amorphous state of drug. Solubility studies showed increase in solubility of lansoprazole with PEG 8000. Batch F5 of immediate and batch F7 of sustained release pastilles showed optimum drug release and higher contact angle.

Summary & Conclusion: This is a very simple single step, solvent free process as compared to other techniques (melt-extrusion and freeze-pelletization) for creating lipid multi-particulates that can then be packed in capsules/sachets. Therefore, use of this unique dosage form may open new avenue in the field of drug delivery.

Keywords: *Pastillation, Multi-release, Lipid based, Solubility, contact angle.*

PSIT/PP01/0182

Designing of *Calendula officinalis* transdermal patch using fish collagen

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Introduction: A wound is a break in the skin's epithelial integrity that can result in the structure and function of underlying normal tissue being disrupted. Proper healing of wounds is essential for the restoration of disrupted anatomical continuity.

Aim & Objectives: To formulate *Calendula officinalis* transdermal patch using Fish Collagen for wound healing using different combination of PVA and DMSO as penetration enhancer.

Method: The transdermal patches were prepared by the solvent casting method. The polymeric solution was prepared by dissolving PVA in dimethyl sulfoxide at 60°C for stirring one hour. After the addition of Calendula officinalis extract, fish collagen and glycerine were then added to the casting solution. Then, the solution was poured into a Petri dish for achieving solvent evaporation. After removal of the residual at 50°C in the oven, the patches are removed by scratching. Transdermal patches were prepared with different polymers and penetration enhancers with constant plasticizer concentration.

Result: All formulations were evaluated for physicochemical properties. The thickness of prepared patches was found to be in the range of 0.134 ± 0.0313mm to 0.442± 0.0580mm. The weight of prepared patches was in the range of 1.493±0.0144gm to 0.989±0.0005gm. The drug was found to be 53.242 ± 0.293% and drug release was found to be 46.010 ± 0.627%.

Summary & Conclusion: The findings of this study suggest that the transdermal patch formulation utilizing *Calendula officinalis* and fish collagen holds promise as a novel approach for promoting wound healing.

Keywords: *Transdermal patch, Calendula, Collagen, wound healing, PVA, DMSO*

PSIT/PP01/0183

Formulation optimization and in-vivo evaluation of natural polymer based mucoadhesive drug delivery system of anti-diabetic drug

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Introduction: Diabetes mellitus is a condition characterized by hyperglycemia, altered lipid, carbohydrate, and protein metabolism, and an increased risk of vascular disease complications. Mucoadhesive drug delivery systems may be defined as drug delivery systems that utilize the property of bioadhesion of certain water-soluble polymers, which become adhesive on hydration and hence can be used for targeting a drug to a particular region of the body for extended periods of time.

Aim & Objectives: The study aims to develop, optimize, and evaluate a natural polymer-based mucoadhesive drug delivery system for anti-diabetic drugs, focusing on drug interaction, bioavailability, dose minimization, and patient compliance.

Method: Sitagliptin, used as an antidiabetic drug, tamarind seed polysaccharide as a natural bioadhesive polymer, and HPMC as a synthetic polymer was selected. Preformulation studies, isolation, and extraction of natural polymers were carried out. Sitagliptin bioadhesive tablets were established using a factorial design. Post compression method, including in vivo studies performed to optimize the dosage form.

Result: The work performed to formulate the bioadhesive tablet of Sitagliptin are prepared using the tamarind seed polysaccharide primary natural polymer and HPMC K4M as a secondary synthetic polymer having property (10-80%) in combination with Carbobol 934 as tablet binder (0.75-3.0%) and Magnesium Stearate and Talc used as lubricants. All formulation were successfully subjected to analyzed the various physical parameters of tablet in-vitro drug release, in-vitro swelling studies, in-vitro bioadhesion, in-vivo studies and stability studies were done properly.

Summary & Conclusion: In this study we could develop successfully optimized tablets of sitagliptin exhibited a unique combination of bioadhesion and drug release pattern which can be developed for the treatment of diabetes.

Keywords*: Natural polymer, mucoadhesive drug delivery system, antidiabetic drug, in vivo evaluation, Type 2 diabetes.*

PSIT/PP01/0188

Formulation and evaluation of nanostructure lipid carrier of calendula oil

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Introduction: Calendula oil derived from calendula officinalis is known for its potential therapeutic benefits in wound healing, inflammation reduction and skin rejuvenation and it possesses antimicrobial, antioxidant, and antiseptic properties for managing inflammation and promoting wound healing.
Aim & Objectives: The study aimed to assess the investigation for formulating and evaluating topical preparation nanostructured lipid carriers containing calendula oil.
Method: Characterization of calendula oil were done by boiling point, solubility and phytochemical analysis methods. The nanostructured lipid carriers containing calendula oil (NLCs) were formulated using 3^2 full factorial design. Physicochemical characterization of NLCs was performed, and formulated of Calendula oil NLCs loaded gel and zeta potential, particle size, in-vitro studies were performed.
Result: The preliminary study of essential oil and other excipients was used to determine and shows the suitability of essential oil and other excipients. Zeta potential value was found within the range of -19.0 mV and particle size at about 175.17 nm with 0.273 polydispersity index. The entrapment efficiency and calendula oil content from NLCs from batch F9 was 80.12% and 75.83%, respectively, suggesting the final batch for further entrapped in gel form for topical application.
Summary & Conclusion: In vitro diffusion study of Calendula oil NLCs gel formulation gives a prolonged drug release compared to plain calendula gel for 08 hrs. Therefore, the Calendula oil NLCs preparation could be a stable and better formulation for wound healing activity.
Keywords: *Calendula oil, Wound healing, Nanostructured lipid carrier, calendula essential oil*

PSIT/PP01/0189

Formulation and evaluation of functionalized multiwalled carbon nanotubes loaded with Bexarotene

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Introduction: Multiwalled carbon nanotubes (MWCNTs) consists of multiple layers of graphite rolled on themselves to form a tube shapedwith an interlayer spacing of 3.4 Å. The outer diameter of MWCNT may range from 1-50 nm, while the inner diameter is usually several nanometres. Bexarotene (BXR) is a novel synthetic derivative of retinoid, with diverse anticancer and antineoplastic effects.
Aim & Objectives: The present investigation aims to formulate and evaluate MWCNTs loaded with BXR, so that it's solubility issue could be resolved, and on administration could be effectively targeted to the desired site without affecting other tissues.
Method: After the pre-formulation studies, the MWCNTs were functionalized by purification, acylation, amination and loading with PEG. Further, the PEGylated MWCNTs were loaded with BXR. Total 13 batches were prepared according to Box-Behnken design, considering MWCNT and PEG concentration, and sonication time as independent variables and, entrapment efficiency and cumulative drug release as dependent variables.
Result: All the 13 batches prepared, batch B6, comprising 35g MWCNTs, 1 ml of PEG and subjected to 30 min of sonication, indicated 92.50% entrapment efficiency, and 82% BXR release upto 72 hrs. The optimized BXR loaded MWCNTs revealed better stability under accelerated conditions for 3 months.
Summary & Conclusion: Our investigation of BXR loading in MWCNTs indicated better drug loading and release upto 72 hrs, which provides an opportunity for such potential molecules to treat cancer by specific targeting.

The investigation also has a potential to be extrapolated onto a preclinical and clinical level.

Keywords: *Multiwalled carbon nanotube, Bexarotene, Box-Behnken Design, Sonication, In-vitro release, accelerated stability studies.*

PSIT/PP01/0191

Formulation and in vivo evaluation of favipiravir tablet containing herbal extracts

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Introduction: The administration of Favipiravir, an antiviral drug, has been associated with an elevation in blood transaminase levels in a proportion of patients. To mitigate the potential hepatotoxic effects of Favipiravir, this study explores the use of herbal extracts, namely Picrorrhiza kurroa and Scutellaria baicalensis.

Aim & Objective: To formulate and evaluate hybrid tablet containing Favipiravir + Herbal extracts and Favipiravir + Isolated compounds of extracts and investigates the effect against Favipiravir-induced hepatotoxicity in rats.

Methods: Direct compression and wet granulation methods were used for tablet formulation. Pre-compression and post-compression parameters were evaluated. Different treatments such as Favipiravir, Favipiravir + P. kurroa extract, Favipiravir + Baicalin, Favipiravir + Baicalein, and Favipiravir + S. baicalensis extract were tested in rats. The effect of herbal extracts and active constituents on the hepatic parameters was studied.

Results: Administration of Favipiravir for 21 days caused a significant increase in the SGOT, SGPT, ALP, total bilirubin, and uric acid levels and a decrease in the liver weight. Whereas administration of Favipiravir + Baicalein and Favipiravir + S. baicalensis extract caused a significant decrease in the biochemical parameters like SGOT, SGPT, ALP, total bilirubin and uric acid and the extract reversed the Favipiravir-induced decrease in liver weight also.

Summary & Conclusion: Treatment with Favipiravir + herbal extracts was found to be effective. Future treatments using above combination of Favipiravir either with herbal extract or with active compound could ameliorate Favipiravir- induced hepatotoxicity.

Keywords: *Hepatotoxicity, Herbal extract, Favipiravir*

PSIT/PP01/0192

Silver colloid in therapeutics: Development of an antibacterial emulgel

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Introduction: Transdermal route of drug administration is effective route of drug administration. Many Gram-positive and Gram-negative bacteria leads to deadly infections. Colloidal Silver possesses low toxicity and it is widely used to treat bacterial infections by various mechanism like destabilization of cell membranes, production of reactive oxygen species and inhibition of metabolic pathways.

Aim & Objectives: The present study was to investigate the antibacterial activity of formulation containing silver colloids by incorporating different concentration of gelling agent.

Method: Different formulations of emulgel containing varying concentration of gelling agent such as Carbopol 934P, NaCMC, HPMC was formulated. Antibacterial effect was checked using agar well diffusion method.

Result: The antibacterial activity against E. coli gave a zone of inhibition of 8 mm which was interpreted as sensitive according to Kirby-Bauer method.

Summary & Conclusion: Based on findings, formulation F7 containing HPMC-LV15 showed better activity as compare to other formulations as well as control formulation for antimicrobial activity for various skin conditions.

Keywords: *Colloidal silver, antibacterial activity, Emulgel, Topical drug delivery.*

PSIT/PP01/0195

Development of modified release matrix tablet formulation of mebeverine hydrochloride

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Introduction: Mebeverine HCl is a musculotropic anti-spasmodic drug and acts by lowering sodium ion permeability in smooth muscle cells and indirectly lowering potassium ion outflow, preventing hypertonia. Mebeverine HCl is highly water-soluble and has plasma half-life is 2.5 hours resulting in increased frequency of administration leading to systemic adverse effects. Currently, Mebeverine HCl is available as a sustained release formulation of coated pellets encapsulated in capsule and matrix tablet is not available.

Aim and Objectives: In present work an attempt has been made to formulate it as sustained release matrix tablet formulation and compare its performance with innovator product.

Method: Considering the high solubility and dose (200mg) of Mebeverine HCl, granules were prepared using different proportions (10%, and 20% of total tablet weight) of different high viscosity polymers, viz. HPMC K4MCR, HPMC K15MCR, HPMC K100MCR, and Carbopol-934 and compressed into sustained release matrix tablets. Tablets were evaluated for hardness, thickness, % drug content and subjected to in-vitro drug release studies. The pharmaceutical equivalence of the formulation was performed with marketed formulations, Colospa-Retard IP and Morease SR IP.

Result: Formulations with only HPMC sustained the release to a great extent whereas formulations with Carbopol showed burst release. Dissolution profile demonstrated that the combination of HPMC K15M (10%) and Carbopol-934 5% resulted in similar release as that of innovator product of Mebeverine hydrochloride. The mechanism of drug release was found to be non-fickian.

Summary & Conclusion: Conclusively, HPMC, Carbopol and their combinations in different ratios Were found to be potential carriers in the design of oral drug delivery system for Mebeverine HCl.

Keywords: *Matrix tablet, Anti-spasmodic activity, Mebeverine hydrochloride.*

PSIT/PP01/0197

Development optimization and evaluation of nanotechnology-based formulation for effective treatment of alzheimer disease

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Introduction: Alzheimer disease is form of dementia found in elderly population. Nanotechnology based formulation have emerged as a promising approach to outcome hurdles and revolutionize AD treatment and improve the bioavailability. Agmatine formulation used for progression of Alzheimer disease.

Aim & Objectives: Aimed to formulate a formulation with the use of polysorbate 80 overcoating on nanoparticle specifically for

the effective treatment of Alzheimer disease which permit the entry through blood brain barrier. Development, optimization and evaluation of nanotechnology-based formulation.

Method: Preliminary investigation in which drug and polymer was selected, then preformulation study was performed in which melting point, UV, FTIR was studied, then formulation of nanoparticles was performed, in physiochemical characterization of nanoparticle the invitro drug release study was performed and the morphological characterization and functional characterization was studied.

Result: Agmatine absorbance was found to be 0.089 for 12 ug/ml and FTIR peaks was 3388 cm-1 (N-H stretching). Streptozotocin induced Alzheimer rats marked memory impairment which resulted in decreased step through latency time in animals and agmatine treated Alzheimer rats increase step through latency time in rats.

Summary & Conclusion: An increased retention of nanoparticles in blood brain capillaries combined with an absorption to capillary walls which create high concentration gradient and increase transport across cell walls. Thus, IV administration of agmatine loaded nanoparticles may be appropriate and valuable drug delivery system for the Alzheimer's disease.

Keywords: *Alzheimer's Disease, Nanotechnology, Agmatine, FTIR*

PSIT/PP01/0199

Fromaulation, development and evaluation of agmatine sulfate nanocarrier for muscle regeneration

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Introduction: Volumetric muscle loss (VML) is a traumatic or surgical loss of skeletal muscle, causing functional impairment. To address this, tissue engineering and regenerative medicine treatments are being developed. This research aimed to formulate agmatine-loaded gelatin and collagen nanocarrier [AGM- Gelatin-Collagen], which helps in cell adhesion and targeting muscle loss

Aim & Objectives: The study aimed to enhance cell adhesion using agmatine sulfate nanocarrier, improve muscle regeneration, tissue restoration, and study penetration and in-vivo muscle regeneration activity

Method: The process of preparing nanocarriers involves heating and cooling a polymer solution. First, 20 ml of distilled water is heated and dispersed with gelatin. Next, 5 ml of distilled water is heated and methyl paraben and propyl paraben are added. Agmatine and collagen are added, and triethanolamine is added for skin pH adjustment

Result: The optimal batch (B2) of nanocarriers showed the lowest drug release rate (50.6±0.78%), enhancing formulation stability and maintaining pharmaceutical properties. In vivo studies showed disorganized muscle fibers in the scarred area.

Summary & Conclusion: The study developed a agmatine-loaded nanocarrier for muscle loss treatment, showing suitable viscosity and drug release, despite no significant changes after 15 days, suggesting potential for drug delivery.

Keywords: *Polyherbal, formulation, antidiabetic activity, medicinal plants, Type 2 diabetes*, *Insulin*

PSIT/PP01/0200

Fabrication And Evaluation of Simvastatin Solid Lipid Nanoparticle Loaded Gel for The Treatment Of Vitiligo

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Introduction: Vitiligo is an autoimmune disorder characterized by depigmentation (white patches) in the areas of the skin, due to loss of melanocytes. Simvastatin is found to inhibit IFN-γ induced STAT1 activation which is responsible for triggering T-Cell mediated melanocyte destruction, thus inhibition of STAT1 by simvastatin is useful in the treatment of vitiligo if made into a safe and effective formulation.
Aim and Objective: Oral Simvastatin requires higher dose which exhibits adverse effects like myopathy and rhabdomyolysis due to which this research focuses to develop topical SIM loaded Solid Lipid Nanoparticle (SIM-SLN) which can treat vitiligo with lower dose of simvastatin.
Methods: Screening of lipids and surfactants. SIM-SLN suspension is fabricated using modified solvent evaporation method, followed by incorporation in gelling agent. Physicochemical characterization of SIM-SLN-Gel including *in-vitro* studies in vitiligo induced B16 melanoma cell line.
Results: SIM-SLNs were in the size range of 103 nm with PDI < 0.3. The entrapment efficiency was found to be more than of 61%. SIM-SLN-Gel released 66.8% Simvastatin within 6 hour of *in-vitro* release test. The SIM-SLN-Gel exhibited pseudoplastic behaviour in viscosity analysis and good spreadability in texture analysis. SIM-SLNs gave positive results in MTT assay, cellular uptake and oxidative stress reduction study in vitiligo induced melanoma cell line.
Summary and Conclusion: The research suggests that SIM-SLN-Gel formulation might have potential applicability in the treatment of vitiligo by its *in-vitro* capability of reducing ROS in B16 melanoma cell line. Additionally, the nano-size range of SLN is biocompatible and have less immunogenicity, making them excellent candidates in vitiligo.
Keywords: *Simvastatin (SIM), Solid lipid nanoparticle (SLN), Vitiligo.*

PSIT/PP01/0203

Formulation Development and Evaluation of Transdermal Drug Delivery System of an Antianginal Drug

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Introduction: This study aimed to develop and evaluate transdermal medication delivery system for isosorbide mononitrate, a short-lived drug, using polymers like HPMC, PVP, and ethyl cellulose. The results showed promising outcomes for various parameters, with HPMC and PVP (3:1) being the best plan due to better in vitro drug delivery and higher drug content highlighting the importance of transdermal medication delivery for effective drug delivery.
Aim & Objectives: It is clear that most transdermal systems were developed using Cardiovascular drugs. Therefore, it was deemed appropriate to initiate a study aimed at formulating, developing, and evaluating and characterization of transdermal drug delivery
Method: Transdermal films of isosorbide mononitrate were prepared by solvent casting technique. Ethanolic solution of varying concentration of polymers with polyethylene glycol (plasticizer) were prepared on magnetic stirrer at temperature 35-40°C to get uniform dispersion. It was poured onto film former machine and temperature of film former was set at 50-60°C. The film was found within 5 min. and it was scratched by knife. The dried film thus obtained was taken

out and stored in desiccator at room temperature for further use.

Result: This study developed a transdermal drug delivery system using HPMC, EC, PVP as film forming material and polyethylene glycol as plasticizers, resulting in clear, smooth, uniform, substantial, and flexible films.

Summary & Conclusion: The study utilized a polymeric matrix type transdermal film to create antianginal drug delivery system, focusing on improving patient compliance due to extensive pre-systemic metabolism.

Keywords: *Isosorbide Mononitrate, Transdermal film, In-Vitro, Ex- Vivo, Solvent Evaporation Technique, Antianginal drug*

PSIT/PP01/0204

Formulation and development of peeling film for melasma

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Introduction: Melasma is a skin pigmentation disease which causes grey-brown patches to appear on the skin, mostly the face and other body parts directly exposed to the sun. Acquired pigmentary disorder that occurs mainly in women (more than 90% of cases) of all racial and ethnic groups, but particularly affects those with Fitzpatrick skin types IV-VI. Women with moderate skin phototypes who are fertile age are most prone to get melasma.

Aim & Objective: The aim of the study was to formulate and develop peeling film for melasma. The objectives of studies were: To formulate and to characterise optimise and also to conduct stability studies of selected formula.

Method: Preparation of Tretinoin 0.05% W/W Peeling Film: In phase I weigh ingredients like PVA, ascorbic acid, menthol, and PEG 4000. Blend them in a beaker for 15 minutes, then pass through a sieve for a finer blend. In Phase II, mix Tretinoin (22.5mg) and Kaolin (0.5g) in a separate beaker. Add water and tween 20 to the mixture, then stir for 5 minutes to achieve a homogeneous formulation.

Result: The study developed a peeling film for melasma treatment, using tretinoin as an active ingredient, promising potential therapeutic options. Further studies are needed to evaluate efficacy and safety.

Summary & Conclusion: The study suggests that F3, an optimized tretinoin peeling film formulation with a 7:40 polyvinyl alcohol:water ratio, could be a promising treatment for Melasma.

Keywords: *Melasma, Tretinoin ,Topical cream, Peeling film.*

PSIT/PP01/0205

Devlopment and characterisation of topical nanogel delivery for the treatment of eczema

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Introduction: Eczema is a persistent skin ailment that causes inflammation and reaches practically epidemic proportions. This work involves the design, formulation, and testing of a nanoscale gel-like structure capable of effectively delivering therapeutic agents to the affected skin areas.

Aim & Objectives: The aim of the study was the development and characterization of topical nano gel delivery for the treatment of Eczema. To formulate a stable nano gel drug delivery system in order to circumvent the problems related to oral Azathioprine.

Method: Azathioprine niosomal gel was prepared with a different drug-polymer ratio by the coacervation phase separation method.

In the present study, the response surface methodology i.e., 3^2 full factorial design was successfully employed to optimize AZT proniosome formulations. Particle size, Zeta potential, surface morphology, etc was determined for the characterization of niosomes.

Result: The maxima of AZT (10ug/ml) was obtained at 282nm in DMSO and phosphate buffer (co solvency) based on spectrophotometric scanning. The formulations showed good % entrapment efficiency (83.76 ±1.01) and % drug release (69.73 ±1.17), with pH values 6.87 and spreadability of 6.86 gm/sec.

Conclusion: The AZT niosomal gel formulation has shown promising results in drug delivery, with improved stability, enhanced efficiency, and sustained release. Its excellent physicochemical properties and increased bioavailability suggest it holds great promise for effective targeted therapy and treatment of eczema.

Keywords: *Eczema, Niosomes, Carbopol 934, Azathioprine.*

PSIT/PP01/0206

Thermodynamic Stability of Cholecalciferol Nanoemulsion for the Treatment of Plaque *psoriasis*

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Introduction: Plaque psoriasis is an autoimmune condition since our own immune cells mistakenly start attacking healthy skin cells. Stable Cholecalciferol nanoemulsion directly reach to the targeted site and cause local and systemic effect.

Aim & Objectives: To find the thermodynamic stability of nanoemulsion of Cholecalciferol and screened stable formulation which was utilized for plaque psoriasis.

Method: The optimized formulations F1-F15 Nanoemulsions were screened using different stress conditions like centrifugal stress testing, 3000 rpm for 30 min, heating, and cooling cycle, 40ºC and 4 ºC, freeze thaw study, -10 to -20 ºC at deep freezer, and stability study, 40º± 2ºC/75% RH ±5%), n=5 at mentioned days.

Result: F1-F15 Nanoemulsions were undergone accelerated study as per ICH guidelines F3 was found to be unstable due to oils comes out while F1, F2, F4 to F15 were stable in Stability chamber. At refrigeration, 2-8 ±2ºC all formulations F1 to F15 were stable. In freeze thaw study, out of 15 formulations, only F13 was stable after 7 days.

Summary & Conclusion: Cholecalciferol containing nano-emulsions F13 was thermodynamically stable at different stressful conditions and there were no sign of phase separation, creaming, cracking, and phase inversion found. This stable F13 formulation utilized for the treatment of Plaque psoriasis.

Keywords: *Thermodynamic, Nanotechnology, Cholecalciferol, Plaque, Psoriasis.*

PSIT/PP01/0207

Formulation development and evaluation of doxycycline curcumin nanoparticles

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Introduction: Nanoparticle formulations have emerged as a solution to these issues, offering improved drug delivery and enhanced therapeutic outcomes. The combination of doxycycline and curcumin has shown promise in enhancing therapeutic efficacy, but challenges in solubility and bioavailability limit their clinical application.

Aim & Objectives: The aim of this project work was formulation, development and

evaluation of doxycycline and curcumin metal ion nanoparticles. To study antibacterial activity of (1:1) combination of two metal ion nanoparticle on antibiotic resistance micro-organism.

Method: Synthesis for Doxycycline metal ion nanoparticles was used different metal ion are palladium, cadmium, silver, nickel, zinc. Preparation of curcumin extract and synthesis of curcumin nanoparticles was used different metal ion are palladium, cadmium, silver, nickel and zinc. To prepared the antibacterial (1:1) combination of doxycycline and curcumin metal ion nanoparticles on antibiotics resistance micro-organism. The prepared formulation evaluated for various parameters like Melting point, Colour determination, pH determination, Solubility measurement, UV-Spectroscopy analysis.

Result: The melting point of doxycycline in the range 201^0C-205^0C and curcumin in the range 181^0C-183^0C. Solubility absorbance of doxycycline was 0.8923 and curcumin was 0.6434. UV-Spectroscopy absorbance of doxycycline was 0.335021 at 355nm and curcumin was 0.725 at 421nm.

Summary & Conclusion: Antibacterial activity study revealed that all nanoparticles show good activity against normal and resistance strains.

Keywords: *Doxycycline, Curcumin, Nanoparticles, UV-Spectroscopy.*

PSIT/PP01/0211

Evalution of acid neutralizing capacity of a polyherbal home remedy

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Introduction: Acidity is a condition that cause excess acid production in the stomach and is one of most common ailments that almost everyone experiences once in their lifetimes. Many synthetic formulations as well as herbal home remedies are used by people for its treatment.

Aim &Objective: This study was aimed to validate one of the herbal home remedies used to treat acidity.

Method: Decoction of known quantity of herbal crude drug such as Clove buds, Cumin, Fenugreek and Ajwain fruit was prepared and screened for the presence of various phytocontstituents. It was then evaluated for its in vitro Acid Neutralizing and Buffering capacity by titration and pH meter method. The marketed synthetic formulations Cremaffin and Digeine are used as reference standards.

Result: The polyherbal formulation (Decoction) was found to possess a significant acid neutralizing as well as buffering capacity and the results were better than the synthetic reference standards used.

Conclusion: From this study the claim of this herbal home remedy for treatment of acidity is verified and confirmed. The formulation can be used to treat conditions of gastro esophageal reflux disease, hyperacidity and GIT problems.

Keywords: *Antacid, Herbal Formulation, Acid neutralizing capacity, Buffering capacity*.

PSIT/PP01/0214

Formulation development and evaluation of intranasal nanoemulsion of agmatine for the treatment of epilepsy

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Introduction: Epilepsy is a neurological disorder of the brain characterized by sudden recurrent episopdes of sensory disturbance with brief loss of consciousness. To enhance

the drug's water solubility and bioavailability as well as the ability to circumvent physiological barrier intrasal nanoemulsion of agmatine is formulated for the treatment of epilepsy.

Aim & Objectives: The aim of this study was to develop agmatine sulphate nanoemulsion for intranasal administration in the treatment of epilepsy. The nanoemulsion were prepared using an aqueous titration method and probe sonication, with olive oil as the oil phase, span80 and tween 80 as the surfactants. The formulation was optimised based on a pseudoternary phase diagram, and D-optimal design was employed to optimize the dependent variables and independent variables using Design-Expert software.

Method: The prepared agmatine sulphate nanoemulsion was characterized for various parameters including stability, particle morphology, particle size, polydisperity index, zeta potential, centrifugation, heating cooling cycle, drug content, PH, viscocity, in vitro drug diffusion, ex-vivo permeation and ex-vivo biocompatibility studies using excised goat nasal mucosa.

Result: The result showed that agmatine sulphate nanoemulsion had a particle size of 265.4nm, indicating its suitability for nasal drug delivery. The low PDI value of 0.240 indicated a narrow distribution, and the PH 6.4 for nasal adminstriation.

Conclusion: The prepared agmatine sulphate nanoemulsions was found to be suitable for intranasal administration, offering the potential to enhance drug absorption and bioavailability.

Keywords: *Agmatine, Nanoemulsions, Pseudoternary phase diagram, Epilepsy, D optimal.*

PSIT/PP01/0215

Formulation and evaluation of herbal lozenges for the treatment of congnitive function or mood disorder

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Introduction: Oral drug delivery is the most favoured route of administration of various medications and tablets are the most widely accepted dosage form. Absorption of drugs after oral administration may occur at the various body sites between the mouth and rectum. Traditional medicine and herbal formulations have been used by mankind for the cure and treatment of various diseases and disorders.

Aim & Objectives: The aim of present study was the formulation and evaluation of herbal lozenges for the treatment of cognitive function or mood disorder. The objective of study to identify and collect herbal extract form of plant. To evaluate prepared lozenges for its quality.

Method: A gelation beaker is used to create a solution by heating water and starch and sugar for 5-10 minutes. PEG is melted separately and added to a gelatin solution. Acacia, pectin, silica, paraben, and drug are triturated in motor pastel to form a uniform mixture. Peppermint oil and glycerin are added.

Result: FTIR study showed that there was no interaction between the selected drug and excipients. In-vitro drug release study of herbal lozenges was performed in Ph 6.8 phosphate buffer, wherein >90 % of the drug was released within 30 min for all the formulations.

Conclusion: From the present work, it can be concluded that PEG 1500 and gelatin can be successfully used to prepared soft medicated lozenges to check alternes activity.

Keywords: *Oral drug delivery, Herbal, Lozenge, Alertness.*

PSIT/PP01/0216

Taste Masking of Bitter Drugs in Pharmaceutical Suspension

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Introduction: Taste is one of the most important components in the formulation of pharmaceuticals for children, the elderly and immobile patients. For patients' compliance the compounding experts must first find a way to cover up the bitter and unpleasant tastes of the drugs. Bitter taste of pharmaceuticals may be covered up to promote patient compliance, that ultimately decides the product's commercial success.

Aim & Objectives: The main issue is how to deliver bitter drugs orally while maintaining adequate palatability. Two main approaches are use to soften the bitter taste of drugs. i.e., making the medication less soluble in saliva and altering the medication's affinity and composition,

Method: The most recent techniques for masking flavor include inclusion complexation, the use of ion exchange resin, mass extrusion, solid dispersions, coating granulation, spray drying, and microencapsulation, liposomes, emulsions, and gel formation effervescence.

Result: Sensory assessment to put it bluntly, taste is a very individual experience. People can sense flavors in different ways and to different extents.

Summary and Conclusion: The experiment's design will determine how well and consistently taste thresholds can be measured. There's a lot of disagreement in the scientific community about whether bitter drugs can mask their taste. However, taste-masked drug research is becoming more and more important and cost-effective for improving the care of sick patients, especially children. We wanted to explore a few strategies that might work for masking bitter drug taste by figuring out how the drug reacts to taste receptors.

Keywords: *Therapeutic effect, Patient Compliance, mass extrusion, spray drying, Novel excipients,*

PSIT/PP01/0217

Formulation of bioadhesive film as a controlled release carrier for clotrimazole

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Introduction: Clotrimazole is an antifungal drug employed widely in the treatment of oral, pharyngeal and cutaneous candidiasis. Clotrimazole have Poor absorption by mouth with Protein binding upto 90% and having biological half-life 2 hours. The present study focuses on the formulation of bioadhesive film as a controlled release carrier for Clotrimazole.

Aim & Objective: The formulation was intended to provide localized delivery of Clotrimazole exclusively at the site of infection, thereby reducing its total dose and hence, dose-related toxicities.

Method: Bioadhesive films were prepared by solvent casting method using Chitosan and polyethylene Oxide alone as well as in various combinations. Films were evaluated for physical characteristics like, weight and content uniformity, film thickness, swelling index, microenvironment pH and folding endurance, In vitro drug release, in vitro residence time, bioadhesive strength were also studied.

Result: Weight of all the films were not more than 98 mg. Thickness of the films ranged between 0.24 -0.47 mm. Films composed of Chitosan alone provided a swelling index of 52%. Bioadhesive strength was found to be more than 12 g. Microenvironment pH was near to 7.0 for most of the formulations. In vitro residence time of the optimized batch

was more than 7 h and it provided controlled drug release up to 8 h.

Summary and Conclusion: All batches were examined using different evaluation parameters and outcome with complete acceptance. ln this way, the present work opens alternative to conventional dosage form for improving drug solubility

Keywords: *Clotrimazole, Bioadhesive film, Chitosan, Candidiasis*.

PSIT/PP01/0218

Formulation and evaluation of phytosomes for arthritis

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Introduction: Arthritis is a common chronic inflammatory condition affecting millions worldwide. Phytosomes, a novel drug delivery system, offers enhanced bioavailability and therapeutic potential of natural compounds. Phytosomes are used to improve phytoconstituents bioavailability and stability.

Aim & Objectives: To perform formulation and evaluation of phytosomes for arthritis. To formulate phytosomes of herbal extract of *Nyctanthes arbor-tristis* L. (Oleaceae) for arthritis.

Method: Maceration extraction method was used for preparation of extract of *Nyctanthes arbor-trisris* and preformulation study for *Nyctanthes arbor-trisris* and Phospholipon 90H were performed. Absorbance maximum was determined for the extract by using UV-spectroscopy. Factorial design and physicochemical characterization of optimized phytosomes was carried out by Transmission Electron Microscopy, Fourier Transforms Infrared Spectroscopy.

Result: Zeta potential of optimized batch was -12.5MV. Particle size of formulation was 0.659 um. The maximum entrapment was observed in formulation code P4 batch (99.1±0.57%) with the composition of phospholipon 90H and reaction time.

Summary & Conclusion: Formulation of stable phytosomes was confirmed by particle size, zeta potential, Transmission Electron Microscopy. The final optimized complex was spherical, with a mean particle size of 659 nm and zeta potential-12.5 mV showed that complex claimed to be in nano formulation. Thus, the above result clearly supports and validate this novel formulation techniques for improving bioavailability and in vitro diffusion rate of *Nyctanthes arbor-tristis.*

Keywords: *Nyctanthes arbor-tristis, Phytosomes, Phospholipon.*

PSIT/PP01/0220

Development of PLGA nanoparticles for targeted vaginal drug delivery of an antiviral drug

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Introduction: The most prevalent and highly infectious STI is genital herpes caused by Herpes Simplex Virus (HSV), Categorized as HSV1 and HSV2. Hyaluronic acid (HA), the main component of extracellular matrix, is considered one of the key players in the tissue regeneration process. It has been proven to modulate via specific HA receptors, inflammation, cellular migration, and angiogenesis, which are the main phases of wound healing

Aim & Objective: Present study is an attempt to formulate & evaluate Acyclovir loaded PLGA nanoparticles (ACV PLGA) and HA-grafted PLGA copolymers by Double Emulsion Technique.

Method: By using Double emulsion method for preparation of PLGA NP.

Result: In present study formulated Acyclovir-loaded PLGA nanoparticles. The optimum formulation of nanoparticles was having particle size 340 nm and entrapment

efficiency 65.5% ±0.8. Comparative evaluation of PLGA NP and HA-modified PLGA NP and particle size were 417 & 297 respectively. Zeta potential was -11.2 mV & -0.2 mV. Entrapment efficiency % was found to be 38.3% and 61.2%. In vivo and in vitro studied showed good permeability into HeLa cells and can be a safe delivery system with enhanced cellular drug permeation.

Summary & Conclusion: The prepared Acyclovir-loaded PLGA nanoparticle and Acyclovir-loaded HA-PLGA nanoparticles will successfully show good cell permeability into HeLa cell. Acyclovir-loaded PLGA nanoparticles will serve as a promising and safe delivery system with enhanced cellular drug permeation.

Keywords: *Nanoparticles, Targeted Vaginal Drug Delivery, Antiviral drug*

PSIT/PP01/022

Formulation of bioerodeble polymeric insert device to treat periodontal disease

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Introduction: Bioerodible polymers erode mechanically via biological process that solubilise the polymer and enable absorption into the surrounding tissue.

Aim & Objective: The aim of this study was to design, formulate and evaluate a novel bioerodible polymeric insert device to locally deliver an antimicrobial in periodontal pocket for the treatment of periodontal disease

Method: Periodontal insert device were prepared by solvent exchange technique and modified solvent evaporation on solid surface using tetrahydrofluron solvent without using any plasticizers. FT-IR and DSC methods revealed no interaction between Thymol crystal and PLGA. The calibration curve for Thymol crystal was developed in pH 6.8 phosphate buffer at 274 nm in the range of 5 to 30 µg/ml

Evaluation: Thickness uniformity, folding endurance, weight uniformity, content uniformity, tensile strength, surface pH, and in-vitro drug release, tensile properties and antibacterial activity.

Result: Thymol was sufficiently released from F7 insert inhibiting growth of Escherichia coli, Bacillus Subtilus at the end of 24 day and was considered as best formulation. A short- term stability study shows that no change in drug content and physiochemical properties of
insert.

Summary and Conclusion: Kinetic models were studied for zero order and Higuchi models

Keywords: *Local drug delivery, Periodontal Inserts, Antimicrobial agent, Solvent exchange*

PSIT/PP01/0221

Formulation of bio-erodeble polymeric insert device to treat periodontal disease

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Summary and Conclusion: Kinetic models were studied for zero order and Higuchi models.

Keywords: Local drug delivery, Periodontal Inserts, Antimicrobial agent, Solvent exchange

PSIT/PP01/0222

Evaluation of antidiabetic activity of combined extracts of *Gymnema sylvestre* leaves and *Andrographis paniculata* plant in alloxan induced diabetic rats

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Introduction: The *Gymnema sylvestre* (*Asclepiadaceae*) plant leaves are reported to be prescribed in many alternative systems of medicine for the treatment of diabetes. Similarly, *Andrographis paniculata (Acantharean*) whole herb is reported to possess hypoglycaemic activity.

Aim & Objective: To investigate the anti-hyperglycemic effect of individual as well as combined hydroalcoholic extracts of *G. sylvestre* leaves and *A. paniculata* herb in alloxan-induced diabetic rats.

Method: Sprague Dawley rats divided into different groups representing control, diabetic control and extract treated. Diabetes was induced using alloxan monohydrate intraperitoneally. Hydroalcoholic extracts of leaves as well as whole herb were administered by oral route individually as well as in combination. Blood samples were withdrawn from tail vein of diabetic rats and glucose level was estimated at 0-, 1-, 3- and 5-hours using glucometer.

Result: The hydroalcoholic extract of *G. sylvestre* leaves and *A.paniculata* (100mg/kg) showed significant) reduction ($P< 0.001$) of blood glucose level at 3rd and 5th hour in diabetic rats and the % reduction was 24.78 , 54.12 and27.16,41.92 respectively as compared with untreated diabetic control.Similarly The combined hydroalcoholic extracts of both the plants (100mg/kg each) showed more significant reduction ($P< 0.001$) in blood glucose level at 3rd and 5th hour in diabetic rats as compared to individual extracts and the % reduction was 30.92 and 74.32 respectively. However, the maximum % reduction of combined extracts was found at 5th hour (74.32%) and it is found to be even more effective in lowering the blood glucose level than the refence standard Metformin HCl (52.04%) at 5th hour.

Summary & Conclusion: The hydroalcoholic extracts of both *G. sylvestre* and *A. paniculata* plants showed synergistic activity in blood glucose level reduction and this combination can be used in management of type 2 diabetes.

Keywords: *G. sylvestre, A. paniculata, Antidiabetic activity, Alloxan monohydrate*

PSIT/PP01/0228

Solubility enhancement of poorly soluble drug by solid dispersion technique using phospholipid

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Introduction: Epilepsy is a neurological disorder affecting 50 million people worldwide. Medication controls seizures in 70% cases, while surgery, dietary changes, and neurostimulation are considered. Newer AEDs like Lamotrigine offer better safety, but pediatricians must understand their pharmacokinetics, indications, dosage, side effects, and potential drug interactions**.**

Aim and Objective: The aim of the research work was to improve the dispersion with phospholipid and evaluating its anti-convulsant effect.

Method: The solid dispersion was prepared by solvent evaporation method using chloroform, DMSO and ethanol as a solvent and characterized by FTIR, Drug content, In-vitro Drug release DSC, XRD for morphology.

Result: Prepared solid dispersion of lamotrigine was analyzed for various parameters. Drug content was found to be 77.68±1.27%, In-vitro drug release was 96.68±0.41% in 75-minute, aqueous solubility of pure LTG was found to be 0.1515 mg/ml and of prepared solid dispersion was increased to 3.1814 mg/ml.

Summary & Conclusion: Solid dispersion of LTG with soya lecithin also showed the significant antiepileptic as compared to pure LTG, solid dispersion delayed the onset of clonic convulsion and offered complete protection against the PTZ induced seizures in rat compare to its subcutanoues administration. It can be concluded that solid dispersion of lamotrigine using phospholipids showed better antiepileptic activity that the conventional form.

Keywords: *Lamotrigine, Phospholipid (soya lecithin), Ethanol*

PSIT/PP01/0226

Design development and characterization of oro-dispersible tablet for pedriatic use

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Introduction: Tablets and capsules are popular solid dosage forms, but some patients struggle with swallowing. Oro dispersible tablets, also known as mouth dissolving tablets, are ideal for those with swallowing difficulties and active individuals. These tablets dissolve or disintegrate in saliva within seconds due to their super disintegrants.

Aim & Objective: To develop and evaluate orally disintegrating tablets (ODTs) as a suitable dosage form for pediatric patients. To prevent dysphagia and improve patients' compliance. To conduct a comparative analysis of orodispersable tablets using different methods or superdisintegrating agents.

Method: Montelukast sodium tablets was prepared, except gelatin and glycine, and hydrated by lyophilization method. Superdisintegrents and their combination with excipient over physical mixture of same excipients. The sodium starch glycolate, crospovidone were selected for formulation. The developed formulation was evaluated for hardness, friability, drug content, thickness, disintegration time, wetting time, and in-vitro drug release.

Result: The physical mixture of excipients was used to developed montelukast tablets by lyophilization method in different ratio. A lyophilized orodispersiable tablet that

enhances the in-vitro dissolution and in-vivo absorption.

Summary & Conclusion: The in-vitro release of drug was more in formulations prepared with superdisintegrants combination and excipients in comparison to their physical mixture. The lyophilized tablet is more feasible than conventional compressed tablet, lyophilized tablet shows more patients compliance.

Keywords: *Montelukast sodium, lyophilization, orally disintegrating tablets, sodium starch glycolate, Crospovidone*

PSIT/PP01/0227

Formulation and evaluation of *Carica papaya* and *Murraya koenigii* leaves extract tablet

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Introduction: *Carica Papaya* plant is commonly Papaya tree which is rich source of phytonutrients, vitamins, minerals and contain active compounds chymopapain and papain which is widely used for digestive disorder. The *Murraya Koenigii* leaves extract used for haematological disorder.

Aim and Objective: The aim of study was to formulate & evaluate *Carica Papaya, Murraya koenigii* leaf extract tablet to study antianemetic activity, increase in platelet count and taste masking of extract.

Method: The collected *Carica Papaya* plant leaves and Murraya Koenigii Leaves were extracted by maceration method. Liquid herbal extract was dried & tablet were prepared by direct compression method. Hydroalcoholic leaves extract tablets were prepared using Microcrystalline cellulose (MCC) as a binder by the direct compression method & evaluated for various parameters such as weight variation, disintegration time, % drug release.

Result: The prepared tablets were light brown, with flat top and bottom. Hardness was shown in the range of 6.00 to 7.00 Kg/cm2 in all the formulation, weight variation was found to be 0.500 ± 02%, % Drug release for hydroalcoholic extract was found to be 58.95 in 120 min.

Summary & Conclusion: From the results it has been concluded that MCC concentration can be used as a binder to formulate Carica Papaya leaves extract tablets and hydroalcoholic extract is more suitable to consume as compare to aqueous extract tablet. Carica Papaya leaves extract used in dengue, while Murraya Koenigii leaves extract used in hematological disorder.

Keywords: *Papaya, Papain, Tablet, Leaves extract, Carica Papaya, Murraya Koenigii,*

PSIT/PP01/0229

Development and evaluation of nasal mucoadhesive gel using natural polymer

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Introduction: Nasal drug delivery system has emerged to be an important area in the field of pharmaceutical research. This route thus serves as an excellent needle free alternative which may improve patient compliance and allow extended use of self-medication for many chronic diseases. Nasal gels are high-viscosity thickened solutions or suspensions.

Aim and Objective: The objective of present work was to formulate and evaluate mucoadhesive intranasal gel of drug Tapentadol in order to control the drug release through nasal mucosa. The study was focused on the release characteristics of mucoadhesive

chitosan gel varying the polymer concentration.

Method: Formulation of Intranasal Chitosan Gel: The chitosan in different ratio was taken and dissolved slowly in a 25 ml 1% solution of acetic acid, then add drug Tapentadol and mixed with glycerol and benzalkonium chloride. The gel PH was adjusted by adding 5N NAOH until PH 6.4 was reached. And the gel is evaluated for various parameter such as Determination of PH, viscosity, Drug content.

Result: The result of the gel was clear pale-yellow colour, The PH of gel were found within the range of 2.47-3.48 PH, the drug content was found above 90%.

Summary & Conclusion: From the result it has been concluded that development of mucoadhesive gel by using natural polymer such as chitosan was studied and the prepared formulation was found to be better as compared to conventional drug delivery system.

Keywords: *Nasal drug delivery, Mucoadhesive, Antidepressant.*

PSIT/PP01/0231

Niosome: A novel strategy

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Introduction: Niosome are non-ionic surfactant vesicle which are prepare by hydration of synthetic non-ionic surfactant in with or without cholesterol or their lipid. Niosome are microscopic in size with range of 10nm-100nm.

Aim & Objectives: Niosome are novel approach which are advanced for of drug delivery. Niosome are alternative approach of Liposome for chemical drug delivery. Niosome are good carrier for Protein and peptide drug delivery. It is widely use as oligonucleotide carrier.

Method: Method uses for preparation of Niosome: -

1. Ether injection method
2. Hand shaking method (thin film hydration technique)
3. Sonication method
4. Micro fluidization method
5. Multiple membrane extrusion method
6. Revers phase evaporation technique

Composition of noisome are non-ionic surfactant, cholesterol, drug and ionic amphiphiles.

Result: Using noisome the delivery of drug through ophthalmic, transdermal, parenteral route are well studied. There is no apparent toxicity of niosomal formulation. It is used in many diseases like AIDS, Neoplasia, lungs disease, inflammation, etc.

Summary & Conclusion: Noisome is a bilayer vesicle of non-ionic surfactant, which are novel approach and efficient to drug delivery. The drug is incapsulated in the vesicle membrane of non-ionic surfactant and cholesterol. Niosome are reduce toxicity and enhance the bioavailability.

Keyword: Novel drug deliver, bioavailability, Lung disease, Neoplasia

PSIT/PP01/0232

Review of Naringenin-Loaded Targeted Nanoparticles via Hydrogel for Mitigating Rheumatoid Arthritis

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Introduction: Rheumatoid arthritis (RA) is a chronic autoimmune disorder characterized by inflammation of the synovial joints, leading to pain, swelling, and joint destruction. Conventional therapies often involve non-steroidal anti-inflammatory drugs (NSAIDs) and disease-modifying antirheumatic drugs (DMARDs).

Aim and objective: Review of Naringenin-Loaded Targeted Nanoparticles via Hydrogel for Mitigating Rheumatoid Arthritis

Method: The study employs a comprehensive approach to assess the potential of naringenin-loaded targeted nanoparticles via hydrogel for mitigating RA. The method involves several key steps, including:

1. Naringenin encapsulation: Naringenin is encapsulated within biocompatible nanoparticles using techniques like nanoprecipitation or emulsion-based methods.
2. Hydrogel formulation: A suitable hydrogel is formulated to encapsulate the naringenin-loaded nanoparticles, providing sustained release and prolonged therapeutic effect.
3. In vitro studies: The encapsulated naringenin's anti-inflammatory efficacy and cytocompatibility are assessed using in vitro models, including synovial cells and immune cells.
4. Animal models: In vivo studies are conducted using animal models of RA to evaluate the therapeutic potential of the naringenin-loaded targeted nanoparticles via hydrogel.

Results: The results of this study reveal promising findings regarding the use of naringenin-loaded targeted nanoparticles via hydrogel for mitigating RA:

1. Enhanced bioavailability: The encapsulation of naringenin within nanoparticles improves its solubility and stability, leading to enhanced bioavailability.
2. Targeted delivery: Surface modification of nanoparticles allows for targeted delivery to inflamed synovial tissue, reducing systemic exposure and minimizing side effects.

Summary & Conclusion: The utilization of naringenin-loaded targeted nanoparticles via hydrogel presents a promising strategy for mitigating rheumatoid arthritis.

Kewords: *Rheumatoid Arthritis, Naringenin, Nanoparticles, Hydrogel*

PSIT/PP01/0233

Nanotechnology based drug delivery system for the treatment of anterior segment eye diseases

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Introduction: Diseases impacting the anterior segment of the eye are major contributors to global vision impairment and blindness. Topical ocular drug administration is favored due to its user-friendly nature, but challenges persist in effectively delivering drugs due to physiological constraints. The bioavailability of ocular medications through eye drops is often below 5%.

Aim & Objectives: The aim of this review is to explore novel drug delivery systems based on nanotechnology that can enhance bioavailability and improve the treatment of anterior segment eye diseases. The objective is to investigate various nanocarriers, including micelles, nanoparticles, liposomes, and more, as potential alternatives to conventional delivery methods.

Methods: The review discusses current research on nanotechnology-based delivery systems for treating anterior ocular diseases. It covers micelles, nanosuspensions, nanoparticles, nanoemulsions, liposomes, dendrimers, niosomes, cubosomes, and nanowafers. The focus is on evaluating their effectiveness in increasing retention time on ocular surfaces and promoting permeation through the cornea.

Results: Nanotechnology-based delivery systems show promise in enhancing drug delivery to the anterior segment of the eye. These systems offer increased retention, improved corneal penetration, and potential for targeted drug release. The variety of nanocarriers studied underscore the potential for tailored solutions to different disease types and drug properties.

Summary & Conclusion: In conclusion, nanotechnology-based drug delivery systems

hold great potential for improving the treatment of anterior segment eye diseases. These innovative approaches offer enhanced drug bioavailability and localized delivery. However, challenges in clinical translation remain, including safety concerns, regulatory hurdles, and scalability. Despite these challenges, nanocarriers provide a promising avenue for delivering therapeutic compounds to the anterior eye segment, thus addressing a critical need in ophthalmology. Further research and development are necessary to bridge the gap between experimental findings and clinical applications.

Keywords: *Anterior segment, Drug delivery systems, Nanotechnology, Topical ocular drug administration, Liposomes*

PSIT/PP01/0234

To design novel phospholipid complex of sitagliptin and omega-3 fatty acid for the management of diabetes.

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Introduction: A disorder of carbohydrate metabolism called diabetes mellitus is characterised by the body's impaired ability to produce or react to insulin and, as a result, maintain healthy levels of glucose in the blood.

Despite the fact that these outcomes are not caused by the disorder's immediate side effects, diabetes is a significant cause of morbidity and mortality. Instead, they are associated with the ailments brought on by long-term diabetes mellitus. Macrovascular diseases, such as coronary heart disease and peripheral artery disease, as well as microvascular diseases, such as retinal and renal vascular diseases, as well as neurological disorders are among them.

Aim and Objectives: In this study, we developed and evaluated a phospholipid complex of sitagliptin and omega-3 fatty acids (SITA-OMEGA-3-PLC) for its impact on solubility and bioavailability.

Methods: SITA-OMEGA 3-PLC was prepared by rotary evaporation method and characterized using FTIR, DSC, SEM, 1H-NMR, 31P-NMR, and TGA. FTIR showed that the characteristic peaks of sitagliptin and omega-3 fatty acids disappeared in the complex, suggesting that they were packed in the hydrophobic cavity of the phospholipid and held by van der Waals forces and hydrophobic interactions.

Results: The complex showed increased solubility and dissolution rate, with a decreased distribution coefficient, indicating its increased hydrophilicity. Oral bioavailability studies in Sprague-Dawley rats showed that SITA-OMEGA 3-PLC had a significant improvement in bioavailability, with an increase in Cmax, t1/2, and AUC0–1. This enhancement is attributed to the improvement of the aqueous solubility of the complex and a probable decrease in its extent of intestinal and hepatic metabolism.

Summary & Conclusions: phospholipid complexation is a promising approach for increasing the oral bioavailability of sitagliptin and omega-3 fatty acids.

Keywords: *Sitagliptin, Omega-3 fatty acid, Phospholipid, Sitagliptin-Omega-3 fatty acid -phospholipid complex, Solubility, Oral bioavailability.*

PSIT/PP01/0235

Formulation and evaluation of a novel in-situ gel of fennel essential oil for prevention of cataract associated with the risk of diabetic retinopathy

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Introduction: Several therapies were available for the treatment of cataract but there is no herbal *in-situ* gel which used for the treatment or supress the developed disease condition. Fennel essential oil proven as effective in the treatment of ophthalmic disease such as cataract and diabetic retinopathy. Medicament shows effective result, when direct contact with affected area and conventional delivery system does not give effective delivery, which leads to the development novel formulation i.e., *in-situ* gel.

Aim & Objectives: The goal of this study is to design, develop, optimize characterize and evaluation of in situ gel of fennel essential oil for the prevention of cataract which is early symptom of diabetic retinopathy.

Methods: Ophthalmic *in-situ* gel developed by the incorporation of fennel essential oil as medicament. pH tiggered mechanism is utilised for the formulation which response when install into the corneal surface of eye. Sodium alginate used as pH sensitive polymer, HPMC 4000 and HPMC K15 used as film forming & thickening agent, tween 80 used as stabilizer and enhances solubility. Formulations were evaluated by the following parameters such as physical apperance, gelling capacity, pH measurement, viscosity, drug content estimation, antibacterial assay, *in vitro* drug release and kinetic models.

Results: Fennel essential oil were incorporated into the *in-situ* gel shows prominent delivery of herbal medicament through the system. The developed formulations showed sustained release of medicament from delivery system for 5hr, about 50% drug were released from the system.

Summary & Conclusion: Ophthalmic *in-situ* gel remains on the corneal surface of eye and act through pH triggered responses after installation. *In-situ* gel shows effective drug delivery on comparison with conventional drug delivery and better option for future drug delivery. It minimizes the dose regimen, enhance patient compliance, improve bioavailabilty of medicament with sustained release.

Keywords: *Fennel essential oil, in-situ gel, cataract, diabetic retinopathy*

PSIT/PP01/0236

Design and evaluation of novel transdermal patch containing *Tinospora cordifolia* (giloy) for rheumatoid arthritis therapy

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Introduction: The transdermal drug delivery system (TDDS) was created to prolong the drug's release, increase its bioavailability, and increase patient compliance. The matrix dispersion type of transdermal patch disperses the drug in the solvent with the polymers and then allows the solvent to evaporate, leaving a homogeneous drug-polymer matrix. *Tinospora cordifolia* (giloy) TDDS were designed and created with the intention of evaluating their extended release in vitro.

Aim and Objectives: Design and evaluation of novel transdermal patch containing *Tinospora cordifolia* (giloy) for rheumatoid arthritis therapy.

Methods: The goal of the current study was to use the solvent casting technique to create a matrix-type transdermal therapeutic system using *Tinospora cordifolia*.

Results: By using Fourier transform infrared spectroscopy, the physicochemical compatibility of the drug and the polymers was investigated. The results obtained indicated that the drug and the polymers were physically and chemically compatible. Along with the Fourier-transform infrared spectroscopy (FTIR), physical appearance, weight, thickness, folding endurance, swelling index, surface pH, percent moisture absorption, percent moisture loss, vapour

transfer rate, and content homogeneity, the patches were also subjected to other physical evaluations. The mucoadhesive of Biolipstrip was investigated using the Franz diffusion cell method. The drug release from Biolipstrips was examined in vitro on a static MS diffusion setup. The stability of Biolipstrips was examined in a range of temperature and relative humidity conditions.

Summary & Conclusion: The patches containing the polymers ethyl cellulose, polyvinylpyrrolidone (PVP), propylene glycol, glycerol, Methanol: water, and drug BS+AB(MG) as the penetration enhancer were regarded as the best formulations for the transdermal delivery of *Tinospora cordifolia* on the basis of results from the physical evaluation and in-vitro studies.

Keywords: *Rheumatoid arthritis, Translabial, Tinospora cordifolia, Release Kinetic*

PSIT/PP01/0237

Mixed hydrotropic solubilization a novel technique for solubility enhancement of carvedilol

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Introduction: The biopharmaceutics classification system places carvedilol in class II has a low and fluctuating oral bioavailability.

Aims and Objectives: The purpose of this study was to prepare and characterize solid dispersion formulation of carvedilol to enhance dissolution rate.

Methods: Solid dispersions with different drug: carrier ratios were prepared by solvent evaporation method using sodium salicylate, sodium benzoate, citric acid as carrier. The physical state and interactions between the drug and carrier were characterized by infrared spectroscopic (IR), X- ray diffraction (XRD) and SEM. Solid dispersions (especially with drug: Carrier ratio of 1:12) showed a higher dissolution rate than their respective physical mixture and pure carvedilol.

Results: The XRD analysis showed that crystalline form was changed to the amorphous state in the solid dispersions. IR analysis did not show any physicochemical interactions in the solid dispersion formulations. SEM photomicrographs obtained for pure carvedilolwas present as irregular shaped crystals and solid dispersion was determined. It was observed that grater quantity of drug present in the solid dispersion as compared to its physical mixture. The dissolution properties of carvedilol were improved with the use of hydrophilic carriers in solid dispersions due to change in the crystalline form of the drug and more intimate contact between drug and carriers which was dependent on the type and ratio of carrier.

Summary & Conclusion: This study provides evidence for efficacy of hydrotropy in improving the solubility of medications with low water solubility.

Keywords: *Carvedilol, Solid dispersion, Sodium benzoate, Sodium salicylate, Citric acid, Solvent evaporation.*

PSIT/PP01/0238

Design, Optimisation and Evaluation of Donepezil Loaded Nano-Emulsomes for Nasal Drug Delivery

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Introduction: The effective delivery of therapeutic drugs across the blood-brain barrier is a significant hurdle in neurodegenerative illnesses. Nano-emulsomes have recently gained attention as a potential solution for addressing the concern in nasal medication administration.

Aims and Objectives: The primary objective of this research was to examine the use of nano-emulsomes for the purpose of managing

neurodegenerative illnesses. The aims of this study were the investigation of various formulation processes its assessment and current breakthrough.

Methods: The process of synthesizing nano-emulsomes involves both the oil and aqueous phases, and formed a coarse emulsion using high-shear mixing. Subsequently, nanoemulsion where formed by either ultrasonication or high-pressure homogenization techniques. The supplementary lipids were used to make it more stable form known as nano-emulsomes.

Results: The investigation shown that nano-emulsomes exhibit a high level of efficacy in the transportation of therapeutic substances to the brain. The compact dimensions, lipid composition, and capacity for functionalization of these entities facilitate their effective traversal through the nasal mucosa and blood-brain barrier.

Summary & Conclusion: The utilization of nano-emulsomes administration has emerged as a significant for the treatment and control of neurodegenerative disorders. The potential to provide pharmaceutical substances directly to the brain, circumventing systemic circulation, presents a very promising option for future investigation and advancement. The present study highlights the potential of nano-emulsomes.

Keywords: *Nano-emulsomes, Nasal drug delivery, Neurodegenerative diseases, Controlled release*

PSIT/PP01/0239

Controlled Release Fertilizers for growth of Agriculture

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Introduction: Since agriculture is a major contributor to basic food demand across the world and fertilizers are one of the important ingredients required for growth and development of crops. These days novel drug delivery systems are becoming trending in the pharmaceutical industries for the treatment of various diseases and now they are being used in the agricultural field as well.

Aim and Objectives: To overcome the excess exploitation chemical fertilizers and promote efficient use of fertilizers which will prevent plants from effective damage.

Methods: These are granulated fertilizers which release nutrients slowly in the plants which are based on polymers derived from combining urea and formaldehyde on microbial decomposition. There is a basic mechanism of controlled release fertilizers which includes three general steps penetration of water (or water vapor), nutrient dissolution, and nutrient release through the controlled release system.

Results: Utilisation of these nitrogen granulated fertilizers were effective in comparison to chemical fertilizers (BHC , DDT) as they are beneficial in most of the aspects than other fertilizers for plant growth decrease nitrogenous pollution, which leads to eutrophication has been observed.It has been observed that it includes controlled water solubility of the material by semi-permeable coatings, occlusion, protein materials, or other chemical forms, by slow hydrolysis of water-soluble low molecular weight compounds, or by other unknown means.

Summary & Conclusion: The study showed that controlled release fertilizers are better than fertilizers but their use is still limited. Despite of many insufficiencies they are still beneficial for the agriculture, horticulture and silviculture as well as they are ecologically safe. The enormous potential of CRFs can be fully realized only by solving issues related to their development, production, and application.

Keywords: *Controlled release fertilizers, nitrogen, coating, microbial, agriculture, eutrophication*

PSIT/PP01/0240

Applications of Artificial Neural Network in the field of Pharmacy

and Development of Pharmaceutical Product

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Introduction: Artificial Neural Networks (ANNs) are biologically inspired computer programs designed to simulate the way in which the human brain processes thinking in learning, decision making and solving problems. Description about the ANN includes the historical background, its numerous stages of product development, and its different forms that can be used in the field of optimized pharmaceutical product development.

Aim & Objectives: Health care organizations are leveraging machine-learning techniques, such as artificial neural network, to improve delivery of care at a reduced cost. ANN usually makes extremely complex models into a simple and efficient numerical solution.

Methods: A neuro-fuzzy method depends on a fuzzy system that is educated using a neural network learning method to simulate complicated nonlinear issues like pharmaceutical formulation optimization. A neuro- fuzzy system can be modelled as a three-layer fast-forward neural network. The first layer represents input variables, the middle layer represents fuzzy rules, and the third layer defines output variables.

Results: In emulsions, results showed a transformation in neural modal to achieved performance in the sensitivity analysis. While development of nano carriers, results demonstrated that ANFIS helped in the forecast and precision improvement. In tablet production, results mainly showed that it has effective prediction capability in designing and testing a new formulation and showed high efficacy and good compatibility.

Summary& Conclusion: It has been shown that ANN and neuro fuzzy-based computational techniques are powerful tools in pharmaceutical product development. These techniques could be utilized for prediction analysis in pre-formulation studies. Activities including the optimization of various processes, the production of responses and compatibility studies could be executed using ANN and neuro fuzzy-based models in the development of pharmaceutical products.

Keywords: *Artificial Neural Network, Neuro fuzzy model, pharmaceutical product, forward neural network, product development*

PSIT/PP01/0241

Pastilles: Modern concept in drug delivery system- an analysis

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Introduction: Pastilles are a prescription drug formulation that offers a distinct intake route for drug delivery via the buccal mucosa. The pastilles let substances reach the systemic circulation immediately, circumventing hepatic first-pass treatment. This medication administration has been demonstrated to be effective in boosting drug bioavailability.

Aim & Objectives: To investigate the viability of pastilles as a modern dosage form. Pastilles are

oral formulation that improves patient adherence, simplicity of administration, and pharmacological molecular effectiveness, making them an important contemporary dose form. Pastilles are popular in the pharmaceutical industry due to their various benefits.

Methods: The therapeutic pastilles were investigated by searching the databases Medline, Scopus, and Cochrane Central Register of Controlled Trials. The inverse-variance strategy combined results via the utilization of Fisher techniques. Both approaches were used in each investigation separately to determine dose and effectiveness.

Results: Pastilles have been the focus of study into their possible medical effects in treating common ailments. Five studies employed a low Active Pharmaceutical Ingredient (API) and had no detectable effect. A high dose of the API was employed in three experimental trials. The pooled outcomes of these studies demonstrated a substantial reduction in sickness duration of 42%, with a 95% confidence range spanning from 35% to 48%. Five independent investigations were carried out, each using a different application programming interface (API) at a high dosage. The combined outcomes of these studies demonstrated a 20% reduction in the duration of the sickness.

Summary & Conclusion: This study presents compelling empirical data about the diverse effects of API on routine medical treatment, demonstrating that the advantages are discernible mostly at higher API concentrations. In contrast, lower levels do not provide significant benefits. There is a need for a comprehensive investigation into the impacts of medicated pastilles to identify optimal formulations and treatment strategies, especially for acute common ailments.

Keywords: *Pastilles, Buccal Mucosa, Bioavailability, Meta-analysis, Versatility*

PSIT/PP01/0242

Transdermal drug delivery system

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Introduction: Transdermal drug delivery system has been existence for a long time, in the past the most commonly applied system were topically applied creams and ointments for dermatological disorders.

Aim & Objectives: Skin offer an accessible and convenient site for the administration of medication. Transdermal drug delivery system has been safe and effective drug delivery system its aim is to deliver the drug through the skin in a predetermined rate and controlled rate.

Method: There are two possible routes are drug penetration

A. Transepidermal pathways
B. Transappendegeal pathways

Kinetics of Transdermal Drug Delivery-

Percutaneous absorption of molecules is very importance.

STEP- Percutaneous absorption is the penetration of substance is various layer of skin.

Percutaneous absorption of molecule is a step-in process involve –

A. Penetration
B. Portioning
C. Diffusion
D. Permeation
E. Absorption

Result: Transdermal drug delivery not only provides controlled, constant administration of drug, but also continuous input of drug with short biological half life and eliminates pilsed entry into systemic circulation.

Summary & Conclusion: Transdermal drug delivery system is a painless, convenient and potentially effective way to deliver regular doses of many medications. Wide range of drugs can be delivered by improving drug uptake, minimal complication and side effect.

Keyword: *Dermatological delivery, permeation enhancer, epidermis, patches*

PSIT/PP01/0243

Tumor Targeting Drug Delivery System

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Introduction: There are the approaches are available for delivery of drug into the tumor tissues which involving the systemic administration of drugs that packed in nanocarriers that deliver to target site give therapeutic action without causing side effect.
Aim & Objective: The main objective of the approaches is to deliver the drugs via blood tissue barrier and they hide the drugs from the cells which further drug clearance, metabolism and get prolongated in circulation in living organism.
Method: Passive targeting, in this drug administered in the form of prodrug or inactive form when exposed to tumor tissue become highly active. In active targeting: By conjugating the nanoparticles with a drug to desired target site, an active targeting way may be achieved. Whereas in Physical targeting: It uses drug carrier construct that release drug only when exposed to tumor specific microenvironment such as change in pH and temperature.
Approaches to bypass blood brain barrier – Invasive approaches, Pharmacological approaches, Physiological, Miscellaneous.
Result: These system uses nanocarriers to deliver the therapeutic or diagnostic agent to targeted region for therapeutic and early diagnostic purposes and also prevented from toxicity and side effects.
Summary & Conclusion: It is a special delivery system that deliver drug to targeted site of action by using nanocarriers through targeting strategies.
Keywords: *Nanocarriers, targeted tissues, nanoparticles, therapeutic approaches*

PSIT/PP01/0244

Optimization of Novel Method for Isolation of High Purity Food Grade α-Linolenic Acid from *Linum usitatissimum* Seeds

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Introduction: The purpose of this work was to standardise the gas chromatograph-FID (GC-FID) technique for extracting and isolating α-Linolenic Acid (C18:3, -3) from *Linum usitatissimum*. α-Linolenic Acid (C18:3, -3) was isolated from a full lipid mixture using cold maceration and subsequent procedures including saponification, urea crystallisation, esterification, and column chromatography.
Aim & Objectives: To extraction, purification, isolation and characterization of α-linolenic acids derived from plant source Linum usitatissimum Seeds.
Method: The methodology employed in this study consists of several steps, namely: cold maceration for extraction, saponification of flax seed oil, extraction of omega-3 polyunsaturated fatty acids (PUFAs), esterification of the omega-3 PUFAs, fractionation of the fatty esters using column chromatography, and confirmation of α-linolenic acid (C 18: ω-3) through Thin Layer Chromatography (TLC).
Summary & Conclusion: Authors would like to conclude that the standardization of the extraction process has significant importance in the separation of bioactive compounds. The results showed that prolonging the cold maceration period of Linum usittatissimum seeds for 28 days. The study further demonstrates the novel method for the

isolation of α-Linolenic acid (C18:3, ω-3) from FSO by series of successive

Keywords: *ω-3 PUFAs, Lipids, Gas Chromatography, Fish oil, Flaxseed*

PSIT/PP01/0247

Theranostic Nanoparticles, Mechanism and their Application

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Introduction: Theranostic nanoparticles are multifunctional nanomaterials specifically designed to help precisely and self-manage diseases by combining diagnostic and therapeutic functions in a unique biocompatible and biodegradable nanoparticle

Aim & Objectives: To investigate the activity of theranostic nanoparticles for the observations. NPs are more likely to interfere with fluorescence testing due to their distinct physical and chemical characteristics and enhanced reactivity. NPs exhibit a wide range of optical characteristics that substantially differ from optical qualities displayed by identical bulk aterial. Techniques for evaluating the toxicity of nanoparticles include[1]**:** In-vitro techniques such as size and surface charge evaluation, cellular interaction test, proliferation assay, apoptosis assay, necrosis assay, and DNA Assay, Endotoxin, Oxidative Stress, and Damage Assay. In vivo techniques such as Hematology, serum chemistry, histopathology, and biodistribution and clearance.

simultaneous cancer diagnosis and treatment of small animals.

Methods: Theranostic nanoparticles hold the potential to revolutionize disease management. Over the last decade, there has been growing interest in the engineering of various kinds of theranostic nanoparticles for simultaneous cancer imaging and therapy in small animals. However, difficulties still exist in the engineering of biocompatible theranostic nanoparticles with highly specific in vivo tumor-targeting capabilities. But also, a part of routine toxicity evaluation of NPs, cell-based *in vitro* assays are employed to predict the toxicity before subjecting to animals, thus minimizing their utility. These assays provide advantages of animal-free procedures and inexpensive and direct methods with a simple endpoint in the form of colorimetric, fluorescent, and luminescent

Results: Theranoustic nanoparticle are used for treatment due to the small size as it penetrates into the cell. But it causes inflammation, toxicity also it creates an oxidative stress and eventually the toxicity is overcomed by various bioengineered methods.

Summary & Conclusion: This review gives an overview of the properties, toxicities, bioengineered methods and various theranostic treatments of nanoparticles.

Keywords: *Bioengineered, Theranostic, Necrosis, Toxicity, Nanoparticles, Fluorescent, Luminescent.*

PSIT/PP01/0248

Formulation and Evaluation of Bucco Adhesive Drug Delivery System for the Treatment of Hypertension.

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Introduction: Buccal delivery of drugs offers an alternative to oral administration, bypassing first-pass metabolism and gastrointestinal acid degradation. It is accessible for self-medication and terminates drug absorption in case of toxicity.

Aim & Objectives: This project aimed to develop and evaluate 40mg telmisartan buccal tablets using bio adhesive polymers, optimizing formulations for sustained release and bio adhesive strength.

Method: Mix water, NaOH, IPA, Meglumine, Telmisartan, Mannitol, and pass-through Sieve No. 12. Dry granules, HPMC, K100M, Carbopol 934P, and Aspartame, and mix with remaining granular materials. Compress on Rotary Press Tablet Compression Machine and was optimized by 3 2 factorial designs by evaluating various parameter.

Result: The Full factorial design was used to develop Bucco adhesive tablets containing telmisartan. Factors like HPMC K100M and Carbopol 934P were considered, and the polymers had significant effects on swelling weight and drug release. FTIR spectroscopy revealed compatibility between drug and polymer. The tablets were characterized by hardness, friability, swelling, bio adhesive properties, and in-vitro drug dissolution. The optimized batch containing polymer ratio (Mannitol: HPMC K100M) showed the best results.

Summary & Conclusion: The prepared Telmisartan buccal bio adhesive tablets demonstrated reasonable Bucco adhesion and sustained in vitro drug release. Carbopol 934P and HPMC- K100M increased drug release rate, while increasing Carbopol 934 P concentration increased bio adhesive strength and swelling weight. Optimized batch showed maximum drug release (93.97%) and good bio adhesive strength (10.54gm). Improved bioavailability of Telmisartan as an active ingredient can achieve desired effects.

Keywords: *HPMCK100M, Carbopol 934P, Bio adhesive strength, Telmisartan, Bucco adhesive tablet*

PSIT/PP01/0249

Formulation and evaluation of antifungal emulgel containing natural ingredients

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Introduction: A topical drug delievery is used frequently for many skin disorders. An emulgel has several advantages. It is a hydrophilic and hydrophobic. It can be delivered via an emulgel system, it is most stable than other topical formulations. As it is a non-invasive technique, it eliminates the need for treatment and improve patient compliance.

Aim & Objectives: Formulation and evaluation of antifungal emulgel containing natural ingredients. To formulate the Antifungal Emulgel containing natural polymers or their combination. To formulate emulgel with favorable properties such as thixotropic, greaseless, easily spreadable, easily removable.

Method: The experiments involved melting sterile medium, adding subcultured organisms to petri dishes, mixing, solidifying, and creating 8mm diameter cups. Test solutions were added to each cup and incubated at 37°C for 48 hours.

Result: The experiments were conducted under aseptic conditions, using a sterile medium melted at a constant temperature, subcultured organisms added, and test solutions incubated for 48 hours at 37°C in sterile stainless steel cork borer cups.

Summary & Conclusion: The study aims to formulate and evaluate an antifungal gel using the islolated constituent of SR, an antifungal compound used in treating fungal diseases, to provide sustained release over a prolonged period, reducing dosing intervals and improving compliance.

Keywords: *Antifungal Emulgel, Polymer, Shorea robusta, Sterile medium, Sustained release.*

PSIT/PP01/0503

Preparation and evaluation of polyherbal gel utilizing *Aegle marmelos*, fenugreek, and *Calendula officinalis* as antimicrobial agents

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Introduction: Ayurveda, the ancient Indian healing system, is valued for its safety and efficacy. India's rich biodiversity includes 15,000 medicinal plant species, with 7,000-7,500 used by indigenous communities for ailments. Ayurvedic polyherbal preparations are popular for skin conditions and antibacterial effects. Scientific research has led to synergistic formulations, driving global interest due to their effectiveness, minimal side effects, and acceptance as alternative healthcare.

Aim and Objective: This study aimed to formulate topical gels combining extracts of *Aegle marmelos*, fenugreek, and *Calendula officinalis,* and assess their in vitro antimicrobial activity

Methods: *Aegle marmelos*, *Calendula officinalis*, and fenugreek were extracted and isolated. A preliminary phytochemical study confirmed the presence of alkaloids, cardiac glycosides, flavonoids, glycosides, phenols, resins, saponins, steroids, tannins, and terpenoids. The extract and excipient were used to formulate a polyherbal gel, which underwent organoleptic evaluation and antimicrobial testing against Staphylococcus aureus.

Result: Based on the study results, the prepared herbal composition consisting of various herb extracts was evaluated. The durability testing parameters revealed that formulation F2 had superior performance compared to other formulations, primarily due to its high density of active ingredients. Additionally, formulation F2 exhibited significant antimicrobial activity, indicating its potential for combating various pathogens or microbial infections.

Summary and Conclusion: In this study, Researchers confirmed the synergistic antimicrobial effect of *Aegle marmelos*, fenugreek, and *Calendula officinalis* in a formulated gel through in vitro evaluation, demonstrating their combined efficacy against microorganisms.

Keywords: *Aegle marmelos, Fenugreek, Calendula officinalis, Polyherbal Gel*

PSIT/PP02/0001

Synthesis, Characterization, Lethal dose (LD_{50}) and *In vivo* Acute Oral Toxicity Studies of a novel 1,5-Benzothiazepine Derivatives

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Introduction: 1,5-Benzothiazepine is an important pharmacophore containing a seven-member heterocyclic ring; they possess varying bio-activities. 1,5-Benzothiazepine have been discovered to be active against numerous targets from various families of diseases.
Aim & Objectives: To synthesize a novel series of 1,5-Benzothiazepine derivatives and evaluate primarily for *in vivo* acute toxicity.
Method: The chemical reaction for synthesis of 1,5-Benzothiazepine was monitored by 'TLC' and the purity of derived compounds was checked by m.p., elemental analysis. The chemical structure of the synthesized was distinguished by FTIR, ^{1}H-NMR, and Mass spectroscopy. The LD_{50} were determined by acute toxic class method as per OECD 423 guidelines.
Result: The result of *in vivo* acute oral toxicity studies showed that the compounds 6c1, 6e2, and 6e3 were toxic to albino mice and cause death at dose of 1600 and 2900 mg/kg body weight of live albino mice and LD_{50} of compounds 6c1: 4786 mg/Kg, 6e2: 2542 mg/kg and 6e3: 2039 mg/kg respectively.
Summary & Conclusion: This research describes a novel 1,5-Benzothiazepine synthesized successfully with satisfactory yield. The lethal dose for half of the animal number (LD_{50}) of the selected 1,5-Benzothiazepine derivatives were 4786, 2542, and 2039 mg/kg, of the animal's weight.
Keywords: *Acute toxicity, 1,5-Benzothiazepine, In vivo, LD_{50}, OECD.*

PSIT/PP02/0002

Validate HPLC method for the Estimation of Sodium Benzoate in Sodium Fluoride Toothpaste

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Introduction: Sodium benzoate has antibacterial and antifungal properties. It is used as preservative in this formulation concentration up to 0.5% and this estimated by Reverse Phase-High Performance Liquid Chromatography method, Method has been developed and validated for the estimation of sodium benzoate.
Aim & Objectives: In house HPLC method validation performed to estimate the assay of sodium benzoate in Sodium Fluoride 1.1% w/w toothpaste (5000ppm Fluoride), its specification parameters comply within limits are 85.0% - 115.0% on label claim 0.1% w/w.
Methods: The AMV was validated for specificity, Linearity, Precision, Accuracy, stability of analytical solution and Robustness, the methods were validated as per the ICH guidelines. Reagents used like Ammonium acetate, Glacial acetic acid, Acetonitrile and HPLC water and chromatographic conditions are column (Phenomenex Hyperclone C18), Detector Ultraviolet-254m, flow rate, injection volume.
Results: Method is found Linear and Precise over specified range. So, the methods can be successfully applied for the routine analysis of sodium benzoate
Summary & Conclusion: Sodium benzoate have linearity in the concentration range of 70% to 130% of working concentration of

standard, in with correlation coefficient (R^2 = 0.9997). The % Relative Standard Deviation RSD observed on the replicate injections indicate the precision of 0.02,1.11 & 0.90 and over all 0.97% of the system. Accuracy of the method considered acceptable as it well within 98 to 102%.

Keywords: *Sodium Fluoride toothpaste, Analytical Method Validation, Chromatographic conditions.*

PSIT/PP02/0003

Development and validation of novel uv- spectrophotometric method for the estimation of donepezil in bulk and pharmaceutical dosage form

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Introduction: Donepezil Hydrochloride (DH) is used for the treatment of Alzheimer's disease. Donepezil hydrochloride acts as a reversible inhibitor of acetyl cholinesterase, an enzyme responsible for the breakdown of acetylcholine in the brain.

Aim & Objectives: The purpose of work is to develop and validate a robust UV method for the analysis of donepezil hydrochloride

Method: Donepezil hydrochloride exhibits maximum absorption in the UV region at a wavelength of around 229 nm. UV method for donepezil hydrochloride involves various stages, including the selection of an appropriate solvent system, determination of the optimum wavelength for analysis, establishment of linearity and range, specificity, accuracy, precision, robustness, and validation of the method.

Result: A new UV method is developed for analysis of Donepezil and Related substances. The solubility of drugs is in water and Orthophosphoric acid (0.05%). Beer's law was obeyed over the concentration range of 1 - 5 ug/ml with a standard deviation of 0.0003. RSD values below 2 at different concentration levels for Intra and inter-day precision confirms its reproducible. LOD and LOQ were 0.00099 and 0.035 µg/ml.

Summary & Conclusion: Experimental results concludes that the developed method is accurate, precise and reproducible and hence can be suitably applied for the analysis of donepezil and related substances in pharmaceutical preparations and routine quality testing.

Keywords: *Donepezil, Validation, Linearity, Correlation Coefficient*

PSIT/PP02/0004

Synthesis, characterization and predicted Swiss ADME and antimicrobial activity of heterocyclic transitional metal (Ni)

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Introduction: Transition metal (Ni) complex are important in catalysis material synthesis, catalysis material, photo chemistry and biological system. Metal complex possesses the ability to co-ordinate with ligand in 3D dimensional configuration.

Aim & Objectives: To synthesise, characterize and prediction swiss ADME and antimicrobial activity of heterocyclic transitional metal.

Method: By agar well diffusion method the antibacterial activity of nickel metal complex was determined. The antimicrobial agent disperses in the agar medium and inhibits the growth of tested microbial type i.e., bacillus subtillis. The zone of inhibition is 18mm

Result: Anti-microbial activity and various properties including physical property,

lipophilicity, hydrophilicity, pharmacokinetics, drug likeness, medicinal chemistry etc. of the Nickel metal complex was studied.

Summary & Conclusion: The Nicke metal complex with sulpha drug was synthesized and anti-microbial activity as well as various pharmacokinetic study were performed.

Keywords: *Computational approach, Swiss ADME, Biophysical parameter, Docking studies*.

PSIT-PP02-0005

In-vitro and In-silico docking of active constituents of *Momordica charantia* and *Emblica officinalis* as potential α-amylase inhibitors

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Introduction: Commercially, available oral hypoglycemic drugs are known to be potential alpha-amylase inhibitors that reduce postprandial hyperglycaemia. Natural drugs are now a days very popular in treatment of Diabetes.

Aim & Objectives: In this present study, investigated *invitro* alpha-amylase inhibition of *Momordica charantia* & *Emblica officinalis* as well as studied the interaction between active phytoconstituents and alpha-amylase enzyme.

Method: Active constituents of both fruits were identified and docking studies were performed using Autodock Vina, and interactions were studied using PyMOL and Discovery Studio. The alpha-amylase inhibitory potentials of the fresh juice were investigated at the concentration of the fresh juice with alpha amylase enzyme and starch solution at 565 nm was observed.

Result: By docking studies, it was observed that Momoridicin I & II showed better interaction with alpha-amylase enzyme (PDB ID: 1B2Y) and showed binding energies at -8.2 and -8.4 Kcal/mol respectively. The fresh juice of both fruits showed the most effective alpha-amylase inhibition and IC_{50} Values were found at concentrations of 440µl/ml and 312µl/ml respectively.

Summary & Conclusion: The attempt to study Insilico docking studies and Invitro alpha-amylase enzyme inhibition were successfully performed. Comparatively, *M. charantia* showed more enzyme inhibition at low concentrations.

Keywords: *Momordica charantia, Emblica officinalis, alpha-amylase activity, IC_{50}, Oral Hyperglycemic agents, Docking Studies.*

PSIT/PP02/0006

A Study on Quercetin in the management of Diabetes mellitus

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Introduction: Quercetin a most well researched bioflavonoid found in more than twenty plants is known for its anti-inflammatory, antihypertensive, vasodilator effects, anti-obesity, anti-hypercholesterolemic and anti-diabetic activities. Metformin, sulfonyl ureas, thiazolidinediones etc are some of anti-diabetics' drugs used for DM but many of these are costly and even possess side effects. Currently plant-based medicines have emerged as an alternative to treat type2 DM which are cheap and easily accessible to the rural population with no or less side effects.

Aim & Objectives: The purpose of this review is to explore the therapeutic potential of quercetin in the management of Diabetes mellitus and related metabolic disorders. For this purpose, findings of In vitro, animal studies, clinical trials, and review studies were summarized.

Method: A comprehensive and systematic literature review of published studies was performed using databases (e.g., PubMed, Science Direct, Medknow etc) and books to obtain information on the effects of quercetin on type 2 Diabetes mellitus.

Result: The accumulated evidence shows that quercetin prevents oxidative damage, enhances the regeneration of pancreatic β-cell islets. It maintains the glucose homeostasis by interacting with molecular targets in the small intestine, pancreas, skeleton muscle, adipose tissue and liver and decreases hyperglycemia.

Summary & Conclusion: This review demonstrates the therapeutic potential of quercetin in the management of T2DM. It improves oral glucose tolerance, insulin secretion & resistance, as well as pancreatic β-cell function to secrete insulin. It also suppresses the release of pro-inflammatory markers such as IL-1β, IL-4, IL-6, and TNF-α

Keywords: *Quercetin, pigment, Diabetes, hyperglycemia, hyperlipidaemia, homeostasis.*

PSIT/PP02/0007

Ligand-based Pharmacophore Modeling and Virtual Screening in Search of New Scaffold against Mycobacterium tuberculosis

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Introduction: The outbreak of resistance is mostly caused by mutations in the drug target in resistant strains in anti-tuberculosis drug for the infection urges the need to identify potential therapeutic agents. Pharmacophore models can identify the new scaffold to combat with deadly disease.

Aim & Objectives: To build a pharmacophore model and conduct a virtual search to discover possible scaffold against *Mycobacterium tuberculosis*

Method: Structures from recent research active against Mycobacterium tuberculosis (H37Rv) in Middle brook 7H-9 broth medium varying MIC value were selected to generate a pharmacophore model. The 2D and 3D structures of each drug were drawn using BIOVIA Draw. The Pharmacophore generation using 3D QSAR pharmacophore generation (HypoGen algorithm) module and virtual screening were performed using Discovery Studio 2.5.5 from Accelrys Software (BIOVIA, USA). This model was validated against test set compounds and this model was utilized as a 3D query for virtual screening to validate against inbuilt database and the hits further screened by Lipinski's rule of and toxicity study.

Result: 6 HypoGen model was generated. The best HypoGen model consists of three pharmacophore features namely, one hydrogen donor (HBD), one hydrophobic (HYP) and one aromatic centre, (RA). Virtual screening against inbuilt database of Discovery Studio 2.5.5 from Accelrys Software (BIOVIA, USA) yielded Hit compounds.

Summary & Conclusion: The pharmacophore generated here can be used to search other databases to identify new structurally related molecules with improved activity and Molecular docking and molecular dynamic simulations of Hit compounds obtained from the pharmacophore screening can suggest a lead against *Mycobacterium tuberculosis.*

Keywords: *Pharmacophore, Mycobacterium tuberculosis, H37Rv, Virtual screening, BIOVIA*, *Discovery Studio*

PSIT/PP02/0008

Molecular docking, 2D-QSAR and ADMET studies of 4-sulfonyl-2-

pyridone derivatives as potential glucokinase activators

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Introduction: Glucokinase (GK) is the key enzyme for the management of diabetes mellitus. Although the literature has reported numerous molecules for lowering the blood glucose level, still no single moiety has been developed for the management of diabetes mellitus. To trounce this issue, the current area of research has shifted towards the development of allosteric activators of GK as indicated by the many latest reports.
Aim & Objectives: The aim of this research was to develop a 2D-QSAR model from the 28 reported 4-sulfonyl-2-pyridone molecules followed by validation through the molecular docking studies.
Method: A 2D-QSAR model was developed from the reported 4-sulfonyl-2-pyridone molecules and validated through molecular docking followed by ADMET analysis of these compounds to investigate their potential as GK activators.
Result: The created QSAR model was found to be reliable, statistically acceptable, and highly predictable. Molecular docking studies on these molecules further validated the developed QSAR model. ADMET analysis of these molecules further showed promise of being acceptable moieties for further research.
Summary & Conclusion: In our study, some of the molecules emerged as the most potent moieties (*in silico*) which can be further investigated as potential GK activators for the treatment of diabetes mellitus.

Keywords: *Glucokinase, Glucokinase activator, Diabetes mellitus, 2D-QSAR, ADMET, Molecular docking.*

PSIT/PP02/0009

Development and Validation of HPTLC Method for Estimation of Pimecrolimus in Formulations

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Introduction: The High-Performance Thin Layer Chromatography method was developed and validated on chemically derivatized Pimecrolimus in formulations.
Aim & Objectives: To identify the quantitative determination of pimecrolimus, a novel, straightforward, and rapid high-performance thin-layer chromatographic method with a derivatization process was created and validated.
Method: On a silica gel 60 F254 TLC plate, pimecrolimus was chromatographed using toluene-acetonitrile-glacial acetic acid (6:4:0.5, by volume) as the mobile phase. Pimecrolimus was measured using densitometric analysis in the reflectance mode at 690 nm after being visualised with a derivatization reagent that contained anisaldehyde-sulfuric acid in absolute alcohol.
Result: It was discovered that the technique produced compact spots for the drug (Rf= 0.55gb ± 0.03). In the concentration range of 800-4800 ng/spot, the results from the calibration plots' linear regression analysis demonstrated a strong linear relationship with r^2=0.9989. According to the International Conference on Harmonization's guidelines, the method's precision, recovery, repeatability, and robustness were all verified. The limit of quantitation was found to be 97.04 ng, while the lowest detectable amount was found to be 28.90 ng.

Summary & Conclusion: The technique is precise, accurate, reproducible, and selective for the analysis of pimecrolimus, according to statistical analysis of the data. The technique worked well for quantifying and estimating the equilibrium solubility of pimecrolimus both as a bulk drug and in commercially available cream formulations.
Keywords: *Pimecrolimus, HPTLC, validation, Quantitative determination*.

PSIT/PP02/0011

UV-AUC Spectrophotometric Method for Quantitative Estimation of Pimecrolimus

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Introduction: A simple, rapid, accurate and sensitive spectrophotometric method has been developed for estimation of Pimecrolimus from bulk and pharmaceutical cream formulation.
Aim and Objectives: To develop and validate the UV-AUC spectrophotometric method for quantitative estimation of Pimecrolimus.
Method: The method was based on the sulfuric acid reaction and the λ_{max} of Pimecrolimus in acetonitrile was found to be 360 nm. The drug follows linearity in the concentration range 20-120 µg/ml with correlation coefficient value 0.9984. The proposed method was applied to pharmaceutical cream formulation. The accuracy of the method was checked by a recovery experiment performed at three different levels i.e., 80%, 100% and 120 %. The ruggedness of the proposed method was studied with the help of two analysts.
Result: The % amount of drug was estimated 98.03 **%** was found in good agreement with the label claim. The area under curve (AUC) spectrum was recorded between 328.50-375.00 nm. The % recovery was found to be in the range 98.04%–99.03%. The low values of % R.S.D. are indicative of the accuracy and reproducibility of the method.
Summary and Conclusion: This UV spectrophotometric technique is quite simple, accurate, precise, reproducible, and sensitive. The validation procedure confirms that this is an appropriate method for their quantification in the raw material and formulation.
Keywords:*Pimecrolimus, UV-Spectrophotometric, Quantitative determination*

PSIT/PP02/0012

Identification of structural scaffold from interbioscreen (IBS) database to inhibit 3CLpro of SARS-CoV-2 using molecular docking and dynamic simulation studies

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Introduction: SARS-CoV-2 has caused a worldwide pandemic and remained a severe threat to the entire human population. Many FDA-approved drugs from varying inhibitory classes and plant derived compounds were screened to combat this virus. Still, due to the lack of structural information and several mutations, initial drug discovery efforts have limited success.
Aim & Objectives: To identify 3CLpro inhibitory compounds/structural scaffold from IBS database by using molecular docking and dynamic simulation studies.

Method: Scaffold library of Interbioscreen (IBS) database (https://www.ibscreen.com/) was explored through molecular docking, MD simulation and postdynamic binding free energy studies. The 3D docking structures and simulation data for the IBS compounds was studied and articulated. The compounds were further evaluated for ADMET studies using QikProp and SwissADME tools.

Results: The docking results of compounds from IBS at the 3CLpro active site showed that STOCK2N-00385 possesses the highest docking score of -9.53 with a Glide energy of -59.55 kcal/mol. MD simulation was found to be moderately equilibrated since changes around 2.4 Å for 3CLpro and 6 Å for STOCK2N-00385 was observed during 100 ns run time.

Summary & Conclusion: Results revealed that the natural compound STOCK2N-00385 interacted strongly with 3CLpro and ADMET data was also observed in the range of limits. Thus, it suggests that this compound may be potential inhibitors of selected target protein or its structural scaffold can be further optimized to obtain effective drug candidates for SARS-CoV-2.

Keywords: *SARS-CoV-2, Docking, Molecular dynamics, 3CLpro, Natural Products, Interbioscreen*

PSIT/PP02/0013

Synthesis, characterization and biological evaluation of 2,5-Substituted benzimidazole derivatives

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Introduction: Benzimidazole is a heterocyclic aromatic organic compound which enjoy the attention as a versatile pharmacophore in medicinal chemistry.the benzimidazole ring is one of the privileged scaffolds for the Development and synthesis of novel molwecules of therapeutic values .this nitrogen containing heterocyclic moiety exhibits a diverse range of biological activitylikeantimicrobial,anticancer,anticonvulsant,antioxidants,antiinflammatory,antifungal,antipsychotic,antihistaminic,antivarial.

Aim and Objectives: To Synthesize 2,5 Substituted Benzimidazole derivative.

Methods: 1. By using substituted aromatic carboxylic acid and 5-substitued o-phenylenediamine.

2. By using substituted aromatic aldehydes and 5-substitued o-phenylenediame.

Results: All the 19 newely synthesized compound were screened for antibacterial activity at a concentration of 20µg/ml, 60µg/ml, 100µg/ml, by cup-plate methods against two grams positive bacteria namely staphylococcus aureus and bacillus subtilis and two grams negative bacteria namely eschericha coli and pseudomonas aeruginosa.

Summary & Conclusion: As evident from literature survey, Benzimidazole derivatives are potent antimicrobial, antifungal and antioxidants agents taking a lead from these evidences some benzimidazole derivatives were synthesized from o-phenylenediamine using 1 step reaction by combining them with different benzoic acid and benzaldehydes. The structure of synthesizes compound were confirmed with the help of M.P, TLC, Spectroscopy analysis like IR, NMR the synthesized compound has been tested for antimicrobial activity, antifungal activity, antioxidant activity and anti-inflammatory activity.

Keywords: *Antibacterial assay, Antioxidant assay, anti-inflammatory assay.*

PSIT/PP02/0014

Numerous biological activities of benzimidazole

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Introduction: Benzimidazoles, or benzo derivatives of imidazole, are composed of a six-membered benzene ring fused to a five-membered imidazole ring at the 4- and 5-positions of the imidazole ring. It is an essential pharmacophore of several biologically active heterocyclic compounds with various pharmacological actions.
Aim & Objectives: To investigate the modern synthetic approach, structure-activity relationship and numerous biological activities of benzimidazole**.**
Method: Structural-based drug designing of benzimidazole substituted drugs which have better antimicrobial activity by docking study (autodockvina) 2.5.
Result: A potential family of bioactive heterocyclic chemicals, benzimidazoles display a variety of biological properties, including anti-microbial, antiviral, anti-diabetic, and anti-cancer activity.
Summary & Conclusion: This thorough study summarises the chemistry of many substituted benzimidazole as well as their antimicrobial activity.
Keywords*: Benzimidazoles, Anti-inflammatory, Anticoagulants, o-phenylenethiourea.*

PSIT/PP02/0015

Curcumin: The golden spice with anti-cancer abilities

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Introduction: In a world where cancer affects millions of people each year. One natural compound that has gained significant attention in recent years is curcumin, the active ingredient found in the spice turmeric.
Aim & Objectives: the search for effective remedies and preventives continues.
Method: The curcumin, the active ingredient found in the spice turmeric. Derived from the root of *Curcuma longa*, curcumin has been used for centuries in traditional medicine for its incredible anti-inflammatory and antioxidant properties.
Result: While curcumin holds immense potential in the fight against cancer, it is essential to acknowledge that it is not a standalone cure-all. Rather, it should be considered as part of a holistic approach to cancer prevention and treatment, incorporating a healthy lifestyle, a balanced diet, regular exercise, and medical advice.
Summary & Conclusion: Curcumin, the golden spice found in turmeric, possesses remarkable anti-cancer abilities. Its ability to target various molecular pathways involved in cancer, its antioxidant properties, and its potential role in reactivating tumor-suppressive genes make it a substance of immense interest to researchers and individuals seeking natural alternatives to conventional treatments. As more studies continue to shed light on its benefits and novel delivery methods improve its bioavailability, curcumin holds the promise of a brighter, healthier future in the fight against cancer.
Keywords: *Curcumin, Anti-inflammatory, Antioxidant, Health benefit*.

PSIT/PP02/0016

Computational molecular docking studies of natural and newly designed compound against thymidalate synthase

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Introduction: The objective of ligand-protein docking is to anticipate the transcendent authoritative mode(s) of a ligand with a protein of known three-dimensional structure. Nature is an alluring source of modern restorative candidate compounds as colossal chemical differences is found in millions of species of plants, creatures, marine life forms and microorganisms. In drug discovery, molecular docking considers; a helpful approach for anti-cancer to find out the particular chemical compound and target.
Aim & Objectives: To study and evaluate the computational molecular docking studies of natural and newly designed compound against thymidalate synthase and find out the active compound for producing anti-cancer activity.
Methods: Draw and optimising the structure of all compounds and 50 newly designed compounds by chemsketch and Argus Lab.Then study of all compounds to checked all are follow Lipinki's rules or not and study the molecular docking score by using software against thymidylate synthase protein was taken as receptor. Software was used to study the hydrogen bond (H-bonnd) interaction. This software helps to us to find out the amino acid which binds to the ligand throught hydrogen bonding.
Result: Draw the structure and check all compounds follow lipinski's rules follow or not. Only 14 compounds followed the Lipinki's rules. Docking result of the standard drug natural test ligand and 14 newly designed compounds. Standard drug was dock using software against the same receptor the energy value obtains was -296.34 Kcal/mol and -290.03Kcal/mol respectively. Compound T27 has best docking score and these potential compounds can be show as an anti-neoplastic agent.
Summary & Conclusion: From the result we can conclude that compound T27 in the better anti-cancer phyto-chemical derivative than the standard drug Raltiterexed. The name of amino acid residue of receptor 1TJS which underwent interaction with both the standard drug and the best compound T27 were Tyr209.
Keywords: *Anticancer, molecular docking, phytochemical, drug, receptor, ligand, amino acid.*

PSIT/PP02/0022

Design, Synthesis, and Characterization of Tolfenamic Acid Prodrugs.

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Introduction: Prodrug synthesis is an important tool for modifying drug properties and reducing undesired effects of therapeutic moieties. Many prodrugs used clinically offer an advantage over parent drugs and improve clinical efficiency.
Aim & Objective: In the present study prodrug of NSAID, tolfenamic acid is synthesized with natural phenolic/alcoholic promoieties. Physicochemical characterization and spectral analysis were done, in vitro hydrolysis studies in simulated gastric and intestinal fluids were conducted, and synthesized derivatives were molecularly docked with cyclooxygenase (COX-1 and COX-2) proteins.
Method: Tolfenamic acid mutual prodrugs with natural phenolic/alcoholic compounds were synthesized by the Dicyclohexylcarbodimide coupling (DCC) method. Purified synthesized prodrugs were characterized by melting point, Fourier Transform Infra-Red Spectroscopy, Proton Nuclear Magnetic Resonance Spectroscopy, and Mass Spectroscopy. Prodrugs were also characterized by solubility studies, partition

coefficient, and hydrolytic studies, and synthesized derivatives and docking with COX proteins.

Result: Prodrugs exhibited higher lipophilicity and stability in acidic environments as compared to parent drugs. Tolfenamic acid-menthol prodrug hydrolyzed at a higher rate, while tolfenamic acid-vanillin prodrug showed the slowest rate at both pH conditions. Synthesized derivatives docked with (COX-1 and COX-2) proteins and showed strong binding affinity towards COX-2.

Summary & Conclusion: The present study enhances tolfenamic acid's therapeutic effectiveness with natural antioxidants. Prodrug exhibits higher lipophilic character and stability in acidic conditions. Synthesized prodrug exhibited promising pharmacological activity and reduced GI effect after showing greater affinity towards COX-2 after molecular docking. Study shows that a mutual prodrug approach enhances the NSAID therapeutic effectiveness.

Keywords: *NSAID, Prodrug, DCC coupling method, spectral characterization.*

PSIT/PP02/0023

Preparation and Characterization of Biodegradable Complex Coacervate for Colon Targeting

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Introduction: Polymer Complex coacervates formed using natural gums and polymer can be utilized for drug delivery, they offer advantage of being nontoxic ad biodegradable. This Method can be Suitable for drug delivery to colon and other sites for treatment of cancer

Aim & Objective: Chitosan has been used to prepare nanoparticles and microparticulate delivery systems of several drugs but due to its limited stability it hinders drug delivery application. The present study aims to prepare complex coacervate using natural gum and investigate its stability in Simulated Gastric Fluid (SGF), Simulated Intestinal Fluid (SCF) colonic fluid.

Method: Gum was purified and incorporated with chitosan. Gum-chitosan ratio was optimized using potentiometric titration. Complex coacervate was prepared by mixing chitosan and gum solutions, and the effect of pH on coacervate was studied. Coacervate was characterized by FTIR, XRD, DSC, TGA.

Result: pH of complex coacervate was found to be 4.5 and Stochiometric ratio of chitosan and gum was at 1:5, FTIR analysis revealed interactions between gum Ghatti and chitosan in the complex coacervate. XRD showed complex coacervate was more amorphous than individual components. TGA indicated a decrease in thermal stability for the complex. DSC indicated a shift in the glass transition temperature. The coacervate yield was pH-dependent. Morphological studies showed stable films in both SGF and SIF.

Summary & Conclusion: This study successfully created a complex coacervate through electrostatic interaction between chitosan and gum Ghatti. The process involved protonation of chitosan and neutralization of carboxylic groups in gum Ghatti. The resulting coacervate exhibited reduced crystallinity, thermal stability, and glass transition temperature. It demonstrated potential for colon targeting and will undergo further investigation using rat colonic fluid.

Keywords: *Complex coacervate, Characterization techniques, pH effects.*

PSIT/PP02/0024

Synthesis and characterization of alkyl substituted derivatives of paracetamol

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Introduction: Paracetamol is an analgesic and antipyretic drug that is used to temporarily relieve mild-to-moderate pain and fever. Paracetamol is exactly the same drug as acetaminophen. Oxidation of the phenolic structure is likely involved in the analgesic action of paracetamol as well as in its toxification by cytochrome P450.
Aim & Objectives: To perform the synthesis and characterization of alkyl substituted derivatives of Paracetamol.
Method: Alkyl substitute of all the synthesized compounds were determined using open capillary tube and were uncorrected. IR data were recorded using KBr disks on Perkin Elmer R-IX FTIR spectrophotometer and H1 NMR spectra on Bruker Avance-II 400 spectometer.
Result: The reaction of the acetaminophen with appropriate diacyl chlorides resulted in four compounds. (4-Acetylaminophenoxy) acetic acid was synthesised by the treatment of acetaminophen with chloroacetic acid.
Summary & Conclusion: From above study it may be concluded that many synthesized compounds have shown charactrised analgesic and antipyretic activity similar to that of acetaminophen (compound AP1-AP6).
Keywords: *Cytochrome P450, Spectrophotometer, H1 NMR Spectra, Analgesic, Anti-Inflammatory.*

PSIT/PP02/0026

Design, synthesis and preliminary evaluation of 2-cyano pyrrolidine derivatives for their DPP-4 inhibiting activity

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Introduction: Diabetes mellitus is an emerging epidemic of the 21st century is characterized by deficiency of insulin secretion or resistance to insulin action or both leads to high levels of glucose in blood or hyperglycemia in the fasting state or after administration of meal. As per WHO, there are mainly two distinct clinical forms of diabetes, type 1 and 2. A series of (5-substituted pyrrolidinyl-2-carbonyl)-2-cyanopyrrolidine (C5-Pro-Pro) analogues was discovered as dipeptidyl peptidase IV (DPPIV) inhibitors as a potential treatment of diabetes and obesity.
Aim & Objectives: To determine the design, synthesis and preliminary evaluation of 2-cyano pyrrolidine derivatives for their dpp-4 inhibiting activity.
Method: Galvus were obtained as pure samples from Norvatis India, Hyderabad as a free sample.
Result: Treatment of diabetes with 2-cyano pyrrolidine derivatives. design, synthesis and preliminary evaluation was performed as planned.
Summary & Conclusion: DPP-4 is a promising target for the treatment of T2DM.Galvus brand name for the drug Vildagliptin (LAF237) is an orally active antihyperglycemic agent that selectively

PSIT/PP02/0027

Design and green facile synthesis of prospective antimicrobial agents

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Introduction: In the 21st century, where advances in technology and science have transformed worldwide, there has also been a significant increase in microbial diseases that have catastrophically affected humanity. The rise in microbial disease, especially the resistant species, demands the discovery of newer antimicrobials.
Aim & Objectives: This study aimed at designing and synthesizing thiophene-

containing antimicrobial agents using greener techniques. The main objectives were to design the compounds using computational tools, synthesize the compounds, characterize the compounds synthesized, and evaluate them for their antimicrobial activity.

Method: The computational tools used were PyRx, to identify the ligand-protein interaction and BIOVIA Discovery studio to visualize the interactions. Based on the result of docking studies, ten derivatives were synthesized. The application of environmentally friendly greener methods was carried out to enhance the yield. The reaction was monitored using TLC. The anti-microbial activity was done by the Agar-well diffusion method.

Result: The antibacterial evaluation was performed against selected strains. A good docking score was attained in compound II-B with a binding affinity of -7.6 with Ciprofloxacin as the reference. The compound II-B, II-D, and II-J exhibited homogenous antibacterial activity to that of positive control with MIC value ≥12 µg/ml against both gram-positive and gram-negative bacteria followed by compound II-H.

Summary & Conclusion: A series of novel thiophene derivatives with antibacterial activity were designed and synthesized. These results imply that the synthesized thiophene derivative has potential and needs to be evaluated further for development as a good anti-microbial agent.

Keywords: *Thiophene, Schiff Bases, Computational study, Green Chemistry, Anti-microbial activity*

PSIT/PP02/0028

In silico Molecular Docking and ADME/Pharmacokinetic Prediction Studies of Some Novel Isoxazolo[5,4b] quinoline Derivatives as Anticholinergic Agents

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Introduction: Cholinergic toxicity is caused by substances and drugs that mimics or stimulate neurotransmitter acetylcholine. Every year, around 3000000 people are exposed to carbamates and organophosphates and near about 200000 people are dying as a result of exposure.

Aims & Objectives: The present study was designed to investigate the therapeutic potential of isoxazolo[5,4-b] quinoline derivatives as muscarinic receptor antagonist by in silico docking studies.

Methods: The molecular structures were drawn by using Chem-sketch ACD Software, A series of novel Quinoline-isoxazole hybrid compounds were investigated by molecular docking studies using Autodock vina 4.2. Atropine (standard drug) was used to validate docking results. Also, the drug likeness of these compounds was predicted using Molinspiration server considering Lipinski's rule of five.

Results: All the designed ligands were found to have better binding affinity than that of standard drug atropine against muscarinic receptor (PDB Code: 6WJC). Log P values were also calculated in order to determine lipophilic property of best binding molecules that shows Log P in the range for good absorption and elimination i.e., 1.71-3.25

Summary & Conclusion: Compounds 4c, 4d, 4g, 4k and 4n were found to be most potent muscarinic receptor antagonists with binding affinities higher than standard drug i.e., -7.7, -7.9, -7.9, -8.2, -8.2 Kcal/mol. Results clearly demonstrate that isoxazolo [5,4-b] quinoline derivatives may lead to as important targets with potent anticholinergic activity for treatment of cholinergic toxicity.

Keywords: *Isoxazole, Quinoline, Molecular Docking, Molecular Modeling, Computational Chemistry, Cholinergic Toxicity, Muscarinic receptor antagonists.*

PSIT/PP02/0030

Development and characterization of a Novel polyherbal Anti-diabetic Formulation

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Introduction: This dreadful disease is found in all parts of the world and is becoming a serious threat to mankind health. Herbal formulations are becoming popular now days particularly in the treatment of Type 2 diabetes.
Aim & Objectives: To investigate the antidiabetic activities of polyherbal formulation (PHF) containing hydroalcoholic extracts of different plants in streptozotocin (STZ)-induced diabetic rats by administering oral doses (200 and 400 mg/kg body weight).
Method: Animals were divided into diabetic and nondiabetic groups. Rats were fed with a high-fat diet (HFD) and induced with a single low dose of STZ (35 mg/kg) i.p. Diabetic rats were treated with formulation (200 and 400 mg/kg) and metformin 250 mg/kg. Blood glucose levels, Lipid profile and gluconeogenic enzymes were determined. Histopathological changes in diabetic rat organs (pancreas, liver, and kidney) were also observed.
Result: Treatment of diabetic rats with PHF and metformin decreased plasma glucose and lipid profile levels. Formulation treated rats showed significant ($P < 0.001$) decrease in the activities of gluconeogenic enzymes. Histological examination of various organ tissues of normal control, diabetic control, and drug-treated rats revealed significant results.
Summary & Conclusion: The experimental study showed that a persistent and substantial decrease in the average blood glucose level of diabetic rats was observed for 28 days. PHF demonstrated substantial antidiabetic activity similar to the standard drug. The formulation will emerge as a possible mixture that may challenge the synthetic drug.

Keywords: *Polyherbal, formulation, antidiabetic activity, medicinal plants, Type 2 diabetes*, *Insulin*

PSIT/PP02/0031

Schiff bases' synthesis, characterization, and antibacterial activity

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Introduction: According to research, Schiff bases exhibit pharmacological properties such as antibacterial, antifungal, antitubercular, antimicrobial, antimalarial, and anticancer properties. Due to the wide range of biological activity and industrial applications they have, these chemicals are noteworthy. They also serve as the starting point for the synthesis of several heterocyclic compounds.
Aim & Objectives: Schiff bases are by products of condensation processes involving primary amines and synthesised ketones or aldehydes. The ability to stabilise metal ions in a variety of oxidation states, involvement in several industrial and catalytic processes, and wide range of biological activities make schiff bases significant.
Method: By condensing m-phenylenediamine and 2-hydroxybenzaldehyde, a novel Schiff base ligand, (E)-2-(((3-aminophenyl) imino) methyl) phenol (HL), was created. Elements and spectral methods were used to describe the ligand. The coordination behaviour of transition metal ions was investigated, and several techniques were used to determine the bonding and stereochemistry. Quantum chemical properties and molecular structures were estimated.
Result: The Schiff bases treat the different microbial pathogens such as gram-positive pathogen and gram-negative pathogen.

Summary & Conclusion: Schiff bases compounds are significant because of the broad spectrum of biological activity and industrial uses they have. Additionally, they act as the precursors in the production of a number of heterocyclic compounds. an important target for a potential antibacterial drug design against multidrug resistant Gramme positive infections.
Keywords: *Schiff base, synthesis, anti-bacterial activity.*

PSIT/PP02/0032

Synthesis of some novel 2, 5-disubstituted *1, 3, 4-oxadiazole* and its analogesic, anti-inflammatory, anti-bacterial and anti-tubercular activity

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Introduction: Research on 1, 3, 4-oxadazole and their synthetic analogs have revealed a variety of pharmacological activities including anti-microbial, anti-tubercular and insecticidal agents. Some of these compounds have also analgesic anti-inflammatory, anti-cancer and anti-HIV agent, it was our interested to make novel derivatives of the titled compounds and evaluate the anti-bacterial, analgesic, anti-inflammatory and anti- tubercular activities 1,3,4 oxadiazole.
Aim & Objectives: To determine synthesis of some novel 2, 5-disubstituted 1, 3, 4-oxadiazole and its analogesic, anti-inflammatory, anti-bacterial and anti-tubercular activity.
Method: 1,3,4 oxadiazole and its derivatives were obtained from the intermediate pyridine-4- carbohydrazide (I) from which schiffsbise were obtained on treatment with various aromatic aldehyde further on condensation with acetic anhydride produced the title compounds, The remaining derivatives were also obtained from the same intermediate gyridine-4-carbohydrazide (1) by condensation with different cyclizing reagent like phosphoryl chloride.
Result: Most of the tested molecules showed bacterial growth inhibition at tested concentration. The compounds exhibited bacterial growth inhibition at concentration of less than 400ug/ml against both microorganisms (*E. coli* & yeast). Compounds (70) showed growth of inhibition at 25µg/ml against both microorganisms (*E. coli* & yeast).
Summary & Conclusion: From above study it may be concluded that the furan-derivatives of oxadiazoles showed potential antibacterial activities and a para-substituted phenyl derivatives of oxadiazole exhibited significant anti fungal activity.
Keywords*: 1, 3, 4-Oxadiazole, Schiffs base, Analgesic, Anti-Inflammatory, Anti-Bacterial and Anti-Tubercular.*

PSIT/PP02/0034

Quantification of active Compounds by HPLC-PDA method in crude extract of *Aucklandia costus* Falc. and cytotoxicity studies against cancer cells

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Introduction: Cancer is a global issue with an estimated 29.5 million new cases and 16.5 million deaths by 2040. A. costus compounds have shown effectiveness against various cancers, including ovarian, pancreatic, prostatic, colon, bladder, and leukemia.
Aim & Objective: Aucklandia costus has various pharmacological activities, including anticancer, hepatoprotective, antiulcer, antimicrobial, antiparasitic, antioxidant, anti-inflammatory, and anti-fatigue properties. This study isolated and quantified four

marker compounds, evaluating their anticancer activity.

Method: The HPLC-PDA method is essential for chromatographic separation and compound quantification in A. costus. It offers reproducibility, low cost, and reliability. The method uses various solvents, column temperatures, and run times to achieve simultaneous separation of analytes. A run time of 35 minutes was found satisfactory for elution, and various flow rates and column temperatures were assessed for well-resolved spectrograms.

Result: The fractions obtained from the crude extract upon purification yielded secondary metabolites, including dehydrocostus lactone (compound 1), costunolide (compound 2), syringin (compound 3) and 5-hydroxymethyl-2-furaldehyde (compound 4). The chemical structures of these marker compounds were elucidated using detailed spectroscopic studies, including 1D and 2D NMR.

Summary & Conclusion: This study isolated four marker compounds from A. costus crude extract and quantified them using an HPLC-PDA method. The results confirmed that sesquiterpene-rich fractions with exomethylene functionality have significant anticancer potential. These findings will aid in the phytochemical investigation of Asteraceae plants for the isolation of novel compounds and the preparation of synthetic analogs for cancer treatment.

Keywords: *Aucklandia costus, HPLC-PDA method, anticancer, marker compounds.*

PSIT/PP02/0038

Synthesis, biological evaluation of substituted some novel benzimidazole derivative as potent agents.

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Introduction: According to research, the synthesis and biological evaluation of novel benzimidazole derivatives as potent agents. Substitutions were strategically introduced to enhance their efficacy and pharmacological properties. The resulting compounds show promising potential in various therapeutic areas, making them compelling candidates for further drug development.

Aim & Objectives: To **s**ynthesize novel benzimidazole derivatives and evaluate their biological activity as potent agents.

Method: The synthesis and biological evaluation of substituted benzimidazole derivatives will involve multi-step organic synthesis to prepare the novel compounds. These compounds will then be subjected to various in vitro and in vivo assays to assess their pharmacological potential as potent agents, aiming to identify promising candidates for further development**.**

Result: the existence of imidazole creats it an active heterocycle with an extensive range of biological activities such as antiulcer, antihypertensive, anti-inflammatory, anticonvulsant.

Summary & Conclusion: In conclusion, this research focused on the synthesis and biological evaluation of novel benzimidazole derivatives. The multi-step synthesis resulted in a set of substituted compounds. Through rigorous in vitro and in vivo evaluations, promising agents with potent pharmacological activity were identified, showing potential for further development as therapeutic candidates.

Keywords*: Benzimidazole, benzimidazole derivative.*

PSIT/PP02/0039

Design and Synthesis of Novel Derivatives of Lamivudine for Exploration of its Anticancer Potential ThroughInhibition of MAP kinase

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Introduction: Cancer globally affects the health of major population worldwide. Targeted therapies that alter intracellular signalling mechanisms have been utilized to treat cancer. Development of anticancer molecules has been done by inhibiting the enzyme Mitogen Activated Protein Kinase (MAPK) which is overexpressed in carcinomas. Heterocycles explored for the study were pyrimidine nucleus of anti-viral drug lamuvidine and azetidine rings which are biologically active heterocycles.
Aim and Objectives: To design and synthesize new azetidinone derivatives of lamuvidine to get better potential as anticancer agents.
Method: Docking studies and *in silico* screening were carried out on the designed derivatives, which were designed using Autodock 4 software. *In silico* PASS studies also confirmed its anticancer potential through antagonism of MAPK enzyme and also *in silico* toxicity risk assessment studies toxicity risks showed that designed derivatives were devoid of any toxicity risks. Compoundswhich were optimized and shortlisted by docking, were synthesized and structurally elucidated.
Results: In molecular docking studies, interaction of these derivatives with MAP Kinase enzyme was studied. Most active compound of data set possessed binding energy of -7.2 kcal/mol with Lamivudine showing -5.6 kcal/mol. All derivatives were obtained in crystalline form and were stable at room temperature.
Summary and Conclusion: All derivatives have shown good binding energy and binding affinity towards this enzyme. *In silico* PASS results of derivatives correlated well with results obtained from docking. The compounds can be used as leads for development of newer anticancer drugs.
Keywords: *Lamuvidine, Docking, PASS, Toxicity studies, MAP Kinase enzyme, azetidinones.*

PSIT/PP02/0041

Pharmaceutical Applications of Cow ghee: A Comprehensive Review

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Introduction: Cow ghee, a clarified form of butter traditionally used in Ayurveda and other traditional medicine systems, has gained renewed attention in modern pharmaceutical practices. This review aims to provide a comprehensive overview of the pharmaceutical applications of cow ghee, exploring its chemical composition, nutritional properties, pharmacological effects, formulations, clinical efficacy, and safety considerations. By shedding light on the historical use of cow ghee in medicine and its cultural significance, the aim is to bridge the gap between traditional knowledge and contemporary healthcare practices.
Aim & Objectives: In the present scientific world, every concept has to be validated scientifically for its global acceptance. This article aims to provide probable scientific explanations for using cow ghee formulation in Ayurvedic system of medicine and its clinical importance.
Result: As a versatile natural product, cow ghee offers diverse pharmacological properties, including anti-inflammatory, antioxidant, wound healing, and immunomodulatory effects. Its unique chemical composition, rich in essential nutrients and fatty acids, contributes to its potential health benefits. Through traditional formulations and modern innovations, cow

ghee finds its place in creams, ointments, capsules, and more, enhancing its usability in healthcare. Clinical studies have provided valuable insights into its efficacy, showing promising results in areas such as gastrointestinal health, wound healing, and cardiovascular support.

Summary & Conclusion: In conclusion, this comprehensive review intends to shed light on the pharmaceutical applications of cow ghee, showcasing its rich historical significance in traditional medicine, particularly in Ayurveda. further research is needed to address existing research gaps, ensure standardization, and establish its integration into modern medicine. As we navigate the future, cow ghee's potential to bridge the gap between traditional wisdom and contemporary healthcare practices offers promising prospects for natural and holistic healing. With continued exploration and scientific validation, cow ghee stands poised to become a valuable addition to the realm of pharmaceutical applications, supporting the pursuit of comprehensive well-being for individuals worldwide.

Keywords: *Modern pharmaceutical formulation, cow ghee*

PSIT/PP02/0042

Updated Information of spectroscopy based Chemometric Techniques Exploring Chemometric models, Correlation and Simultaneous estimation

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Introduction: Drugs either API or in bulk dosage form can be estimated quantitatively through analytical techniques mainly by chromatography and spectroscop. This technique is a part of simultaneous estimation of drugs.

Aim & Objectives: Chemometrics is used in experimental natural sciences, particularly chemistry, to tackle both descriptive and predictive problems. It is considered as sophisticated advanced technique mainly utilized by researchers and scientist work in area of manufacturing, production and is related to various allied field of science.

Method: It is generally used for calibration, analytical protocols, multivariate data collection, statistical process control, modeling of process, recognition of pattern and classification, signal correction and compression. Till date various categories of drug like anticancer, antidiabetic, antihypertensive etc are estimated through chemometry. The components in mixture belonging to the white-black and grey system can be determined through chemometric analysis.

Result: This technique can pay a significant role in pharmaceutical industries for the discovery of newer molecule with maximum therapeutic effects.

Summary & Conclusion: Now-a-days chemometric methods are utilized in combination with mass spectroscopy and liquid chromatography to achieve accurate and precise results for estimating the purity and identification of various compounds.

Keywords: *Chemometry, Simultaneous Estimation, Chemometric models, Descriptive, White-Black and Grey system.*

PSIT/PP02/0044

Analytical Method development and validation for Determination of Montelukast by UV-Spectrophotometery

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Introduction: Montelukast Sodium is the orally bioavailable monosodium salt of montelukast, a selective cysteinyl leukotriene receptor antagonist with anti- inflammatory and bronchodilating activities.
Aim and Objectives: To Develop and Validate Analytical Method for Determination of Montelukaste by UV-Spectrophotometery in pure as well as pharmaceutical dosage forms.
Method: A simple and sensitive spectrophotometric method for quantitative determination of Montelukast in either pure form or in pharmaceutical dosage form was developed. Montelukast showed maximum absorbance at 345 nm in Alcohol. It has linear response with correlation coefficient of 0.9991. The linear regression equation obtained is Abs = 0.029x Conc. The method has good precision and average accuracy as 99.34. No significant interference was observed in the absorbance of the drug in the presence of common excipients.
Result: The method has good precision and average accuracy as 99.34. No significant interference was observed in the absorbance of the drug in the presence of common excipients. The method was statistically validated according to ICH.
Summary Conclusion: Montelukast showed maximum absorbance at 345 nm in Alcohol. It has linear response with correlation coefficient of 0.9991. The linear regression equation obtained is Abs = 0.029x Conc. The method has good precision and average accuracy as 99.34. No significant interference was observed in the absorbance of the drug in the presence of common excipients.
Keywords: *Absorbance, Method development, U.V Spectroscopy, ICH*

PSIT/PP02/0049

Bis-Pyrazole as Antiproliferative agent

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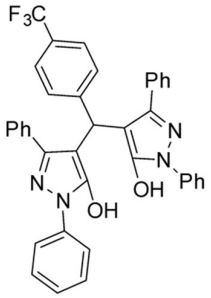
Introduction: Pancreatic cancer is one among the dreadful disease and the prevalence is increasing worldwide. In recent years, pyrazole ring is highly found in USFDA approved antiproliferative agents.
Aim & Objectives: Synthesize and evaluate the pyrazole analogs as anticancer agents against pancreatic cancer cell line (PANC-1). The structure activity relationship also carried out to explain the inhibitory potential.
Method: Condensation of β-ketoester with corresponding phenylhydrazine gives pyrazolone derivatives. Subsequently, two equivalents of pyrazolone condensed with one equivalent of aromatic aldehyde in presence of base provide bis-pyrazole analogs in good yield. Cytotoxic concentration was carried against PANC-1 cell line by using MTT assay.



Result: Among 12 compounds, 3 compounds displayed IC_{50} of cytotoxic concentration at single-digit micro molar level. The SAR studies shows that the highly electron withdrawing group such as trifluoro methyl substituent showed best inhibitory concentration at 4.1 µM.
Summary & Conclusion: Bis-pyrazole analog with trifluoro methyl substituent emerged as potent molecule against PANC-1 pancreatic human cancer cell line.
Keywords: *Pyrazole, Antiproliferative agent, MTT assay*

PSIT/PP02/0050

Development of novel triazine derivatives as parp inhibitors for cervical cancer

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Introduction: Cervical cancer is becoming a serious threat to females with its alarming increase in mortality rate. Due to the drawback of the present treatment, newer drugs need to be developed which are target based. The approach of PARP inhibition can be of great use for treating cervical cancer.
Aim & Objectives: To design, synthesize and evaluate the novel triazine derivatives as PARP inhibitors for cervical cancer.
Method: Structure based drug design approach was used to develop a series of compounds for synthesis, targeting PARP enzyme (PDB-4ZZX) using Schrodinger software. These molecules were then subjected to MMGBSA and MD simulations to find out the efficacy of them with the selected protein. The designed compounds were synthesized and characterized by FT-IR, NMR and LCMS. The synthesized compounds were then taken for *in vitro* assay against HeLa cell line by utilizing SRB assay method.
Result: Among the designed compounds, BCC-8 showed highest dock score. BCC-2 molecule has shown dose dependent cytotoxicity against HeLa cell line with IC_{50} of 10.06 µM.
Summary & Conclusion: The designed compounds could be successfully synthesised, characterised, and found to possess good cytotoxic activity ranging from 10.06 to 57.32 µM concentration against HeLa cell lines. As BCC-2 has potential anti-cervical cancer, it can be taken further as a lead for developing more potent molecules for cervical cancer.
Keywords: *PARP inhibition, Cervical cancer, Triazines, HeLa cell line*

PSIT/PP02/0052

Molecular docking studies of some Aurones and Azaaurones as anti-malarial agents

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Introduction: Malaria still threatens global health seriously. Current findings of antimalarials only focused on inhibitors acting on single targets; multi targeting anti-malarials are highly desired to overcome the drug resistance problems. In this regard, several researchers gained interest in aurones (AU) and their nitrogen analogues, i.e., azaaurones (AZA-AU), which act as dual-stage anti-malarial agents.
Aim & Objectives: Aim of this study is to find new inhibitors that act on multiple targets by analyzing the interactions and binding modes to gain insights into the key structural requirements required for anti-malarial activity.
Method: Thirty aurones and twenty-one azaaurones were subjected to molecular docking on cytochrome bc1 (PDB code: 3CX5, resolution 1.90 Å) and *P. falciparum* Lactate Dehydrogenase enzyme (PDB code:1LDG, resolution 1.74 Å) using Autodock software 4.2.6. The grid map for both enzymes were set to 60 Å in all directions (X, Y, Z axes), with default grid space 0.375 Å. Docked confirmation of ligands were analyzed for their binding interactions using 2D & 3D visualizations by Protein Plus software.
Result: Docking results revealed that compounds AU- 6, 18, 24 & AZA-AU-33, 37, 50 docked well within the binding sites of *Pf* LDH target having binding energies ranging from -10.33 to
-7.42 kcal/ mol. Hydrogen bond interactions were observed with Gly27A, Ala98A, while π-π interactions were seen with Met30A& Gly99A. Analysis on cytochrome bc1 site displayed hydrogen bond interactions with

His345A, Met455A, where as hydrophobic interactions were seen withLys349A having dock score ranging -6.23 to -5.41kcal/mol.

Summary & Conclusion: Motive of present study was to discover new compounds, which acted on multiple targets to overcome the problem of drug resistance. Docking results of best docked poses with low binding energies were analyzed for hydrogen bond and hydrophobic interactions. These results would be of great help in finding new molecules that can solve the problem of multi-drug resistance.

Keywords: *Malaria, P. falciparum, Drug resistance, Aurones, Azaaurones, Molecular docking*

PSIT/PP02/0053

Design, synthesis and preliminary evaluation of 2-cyano pyrrolidine derivatives for their dpp-4 inhibiting activity

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Introduction: Diabetes mellitus is an emerging epidemic of the 21st century is characterized by deficiency of insulin secretion or resistance to insulin action or both leads to high levels of glucose in blood or hyperglycemia in the fasting state or after administration of meal. As per WHO, there are mainly two distinct clinical forms of diabetes, type 1 and 2. A series of (5*substituted pyrrolidinyl-2-carbonyl)-2-cyanopyrrolidine (C6-Pro-Pro) analogue was discovered as dipeptidyl peptidase-IV (DPPIV) inhibitors as a potential treatment of diabetes and obesity.

Aim & Objectives: To determine the design, synthesis and preliminary evaluation of 2-cyano pyrrolidine derivatives for their dpp-4 inhibiting activity.

Method: The fresh leaves of Abutilon indicum were collected from Trichy district, Tamil Nadu, India. The dried powdered sample was soaked in different solvents like methanol, ethanol, chloroform and petroleum ether for 3 to 5 days for the preparation of the extract. Qualitative analysis and estimation of phytochemicals was performed.

Result: The qualitative phytochemical analysis of the leaves of Abutilon indicum shows that the methanolic extract of leaves showed the presence of high number of phytocomponents when compared with ethanol, petroleum ether, and chloroform and aqueous. The methanolic extracts revealed the presence of alkaloids, steroids, flavanoids, phenols, tannins, terpenoids, aminoacids and carbohydrates. Phytochemicals such as flavanoids and alkaloids have hypoglycemic activities.

Summary & Conclusion: The qualitative and quantitative analysis shows that the leaves of the Abutilon indicum contains significant phytoconstituents (flavanoids and alkaloids) which shows the hypoglycemic activities.

Keywords: *Diabetes mellitus, hypoglycaemic activity, phytoconstituents, extract, flavanoids, alkaloids.*

PSIT/PP02/0054

Antimicrobial activities of some novel triaryl pyrazole: design, docking and *In-silico* studies

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Introduction: Developing the era of resistance towards antimicrobials enhancing the bacterial diseases. Triaryl pyrazole derivatives shows broad spectrum activities such as antibacterial, antifungal, anticonvulsant and anticancer activities.

Aim and Objectives: The study aimed for screening of some novel 1,2,3-Triaryl

Pyrazole derivatives through molecular docking and *in-silico* studies.

Method: The screening of novel triaryl pyrazole derivatives (AS001-AS006) with the help of molecular docking through Autodock 4.2.1 using target protein PDB ID-1KZN. Then the high throughput predictions of pharmacokinetic properties and toxicity studies done via in-silico studies through swissADME and toxicity predictions by Lazar toxicity predictions software. Based on the above studies the all six compounds are synthesized with the help of 2 steps synthetic scheme given aside, having one pot syntheses to obtained pyrazoline in first step followed by oxidative aromatization of pyrazoline in the presence of acetic acid to obtained pyrazoles.

Result: As a result, there are total six novel compounds (AS001-AS006) showing minimum binding energies and have free from toxic effects and safe for the syntheses. Amongs these AS003 and AS004 are most potent.

Summary and Conclusion: The screened compounds with minimum binding enthalpies showed the inverse relationship with stability, pharmacological activity and safe from toxicity.

Keywords: 1,2,3-Triaryl Pyrazole, Cyclization, Antimicrobial, Molecular docking, *In-silico* studies

PSIT/PP02/0055

In silico identification of novel quinoline derivatives targeting hepatocyte growth factor receptors

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Introduction: Structure-based drug design (SBDD) and knowledge of in silico approaches enable the visualisation of the binding process of ligands to targets as well as the prediction of key binding pocket locations and affinities of ligands to their target macromolecules.

Aim & Objectives: To identify novel quinoline derivatives that are designed specifically to bind Hepatocyte Growth Factor (HGF) receptor in treatment non-small cell lung cancer by insilico approach.

Method: Chem Axon Marvin Sketch 5.11, Swiss ADME & admet SAR online webtools were used to predict the physicochemical properties of compounds as well as their toxicity. Several programmes, including Autodock 1.1.2, Discovery Studio Visualizer v20.1.0.19295, and Procheck, were used to examine ligand-receptor interactions of derivatives of quinoline with target receptor (PDB- 1R0P).

Result: All substances were discovered to be orally bioavailable, less poisonous, and to have appropriate pharmacokinetic properties based on in silico experiments. The docking scores of all novel compounds were higher than those of the widely used medication dacomitinib.

Summary & Conclusion: In order to build compounds that are best suited for further study, it is helpful to start with interactions with quinoline analogues since they boost binding energy and the quantity of H-bonds that are produced. The good pharmacokinetic profile of the quinoline moiety, which may aid to medicinal chemists to conduct additional in-depth in vitro, in vivo chemical, and pharmacological research studies, strengthens the quinoline moiety's potential as a new therapy option for non-small cell lung cancer treatment.

Keywords: *Mesenchymal-Epithelial Transition Factor, HGFR, SBDD, Molecular docking, Pharmacokinetics, Binding affin*ity.

PSIT/PP02/0057

Estimation and stability study of ascorbic acid in bulk and dosage form by uv spectroscopy

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Introduction: Ascorbic acid (Vitamin C, Ascorbate, AA) is a water-soluble vitamin which participates in many biological processes. Ascorbic acid is susceptible to oxidation when exposed to oxygen, heat and air. This destruction is a serious problem in that a considerable quantity of the vitamin C content is lost during processing, storage and preparation.
Aim & Objectives: To develop a method for estimation of AA by UV Spectroscopy and to investigate the effect of temperature, exposure to air and packaging material on AA content of pharmaceutical product (vitamin C tablet), Laboratory grade (pure vitamin C)
Method: A new UV spectroscopic method was developed using 0.1M HCl: Methanol (50:50 v/v) as a solvent. The ⌊max was found to be 244nm. The method was validated as per ICH guidelines. Further, AA content of the samples was determined to investigate the effect of temperature, exposure to air and packaging material.
Result: The developed method was found to be linear, sensitive, precise, reproducible, robust and stable. A significant negative correlation was found to exist between AA and time of storage and exposure to air. AA was more stable when stored under refrigeration condition (4-5°C)
Summary & Conclusion: The validated UV spectroscopic method can be used for routine analytical testing of pure AA and its dosage form. The stability results highlight the influence of packaging materials, exposure to air, and storage temperature conditions. The recommended storage condition is refrigeration, maintaining temperatures within the range of 4-5°C.
Keywords: *Ascorbic acid, UV Spectroscopy, Stability, Method validation, Temperature.*

PSIT/PP02/0058

Molecular docking, synthesis and evaluation of 2-((4,6-diphenylpyrimidin-2-yl) oxy)-N-phenylacetamide derivatives as antidepressant Agents

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Introduction: Major Depressive Disorder (MDD) is one of the most prevalent and debilitating forms of psychopathology. Many of pyrimidine's derivatives are reported to possess potential central nervous system (CNS) depressant properties and also act as calcium channel blockers.
Aim & Objectives: To carry out the molecular docking, synthesis, characterization, and evaluation of in vivo antidepressant activity of series of 2-((4,6-diphenylpyrimidin-2-yl) oxy)-N-phenylacetamide derivatives.
Method: The IR spectra were recorded using KBr discs on Shimadzu IRAFFINITY-1 spectrophotometer. The 1H NMR,13C NMR spectra were recorded on Bruker Advance II 400 NMR spectrometer; chemical shifts are given in ppm relative to internal standard Tetramethylsilane (TMS) using solvents like CDCl3 and DMSO-D6. In silico molecular docking study was carried out using Molegro Virtual Docker (MVD-2013, version 6.0). Forced swim testing was conducted to evaluate the synthesised derivatives for antidepressant activity.
Result: Compound 24 showed marked reductions in immobility time with immobility duration of 51.50±0.28 s showing a percentage change of -35.42 from control. Compound 20 showed moderate antidepressant activity with immobility duration of 54.25±0.25 s showing a percentage change of -31.97 from control.
Summary & Conclusion: The synthesised compound having unsubstituted phenyl ring

i.e., compound 24 showed good antidepressant activity whereas compound 20 having nitro substituent at the para position of the phenyl ring showed moderate antidepressant activity.

Keywords: *Antidepressant activity, pyrimidine derivatives, Molecular docking, Forced Swim Test*

PSIT/PP02/0059

Characterization of a traditional polyherbo-mineral Abhrak Bhasma (AB)

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Introduction: Abhrak Bhasma (AB) has been used medicinally for various therapeutic conditions. Bhasma in Ayurveda has been defined as a substance obtained by calcinations by virtue its nanomedicine.

Aim & Objectives: The objective of the study is to characterize the Abhrak Bhasma by various instrumental methods.

Method: In this study, the sample is subjected for the FTIR, XRD, and particle size analysis by using SEM, Malvern particle size analyzer, zeta potential and EDAX.

Result: The FTIR spectrum of the bhasmas shows peak at various ranges from 3100 cm-1 to 3600cm-1 which is responsible for OH or NH stretching vibrations. The XRD spectrum of the bhasmas shows the 2θpeak value at 26.43, 29.49, 49.96, and 60.36, which confirms the presence of the elements like Fe, O, Si, Al and calcium. The AB particle size was in the Nano-particulate range due to the process of making of the bhasmas which is clearly shown in the size range from 100 to 1100 nm. The zeta potential of the sample was found to be in the range of -50 to + 50, which provides stability for the nanoparticle. The EDAX was performed to find the elemental oxide composition of the bhasmas.

Summary & Conclusion: The various instrumental methods and the advanced techniques used for the characterization of the AB are reliable tools to find out the Physical, chemical and structural properties. The results showed the existence of magnetic property in the nano scale, which consists of various elements in oxide form. This report also focusses the unavailability of standard chemical evaluation studies in the Ayurveda. Hence, this work will propose the details of the AB in modern instrumental techniques that will reveal the importance to assess the quality and characteristics of the AB.

Keywords: *Abhrak Bhasma, Characterization, SEM, Nanomedicine.*

PSIT/PP02/0060

Synthesis, Anti-oxidant activities and docking studies of 5-chloro-2-hydroxy chalcone derivatives

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Introduction: Cells produce free radicals through multiple metabolic pathways, which can cause cell damage leading to a variety of chronic diseases. Chalcone moiety is one of the most significant structural components possessing anti-oxidant activity.

Aim & Objectives: The aim of present study was to synthesize 5-chloro-2-hydroxy chalcone derivatives and determine the anti-oxidant potential of synthesized compounds through *in vitro* anti-oxidant assays. Molecular docking of synthesized compounds was carried out and compared with the *in-vitro* results.

Method: Fifteen 5-chloro-2-hydroxy substituted chalcones were synthesized by Claisen-Schmidt condensation via the reaction of the equivalent amount of substituted acetophenone and substituted benzaldehyde in the presence of alcoholic KOH. The identity of synthesized

compounds was established by observing their IR, NMR and mass spectral data. The anti-oxidant screening of synthesized compounds was carried out using ABTS (2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid), de-colorization assay, Ferric reducing antioxidant Power Assay and Hydrogen peroxide (H_2O_2) scavenging assay. Further, the synthesized 5-chloro-2-hydroxy chalcone derivatives were subjected to molecular docking on tyrosinase enzyme (PDB code: 3NQ1, resolution 2.30 Å, co-crystallized ligand: kojic acid) using the software Molegro Virtual Docker (MVD) 6.0. The results of *in-vitro* anti-oxidant assays were compared with the results of molecular docking.

Result: The *in vitro* antioxidant techniques revealed that the synthesized compounds CHC3, CHC6, CHC7 and CHC13 displayed excellent anti-oxidant potential. These compounds also docked well with highest dock scores and key interactions in *in-silico* studies.

Summary & Conclusion: These results would be fruitful for finding new anti-oxidative agents and can aid in the identification of structural requirements for potential anti-oxidant activity.

Keywords: *Synthesis, Claisen-Schmidt condensation, Molecular docking, Chalcone, In-vitro Anti-oxidant activity*

PSIT/PP02/0062

Design, Synthesis, *In vivo* and *in silico* study of novel 3-thioxo 1,2,4-triazine-5-one derivatives as a newer potential antiepileptic agent

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Introduction: In this study a series of 6-(2-aminosubstituted phenyl)-4-(substituted phenyl)-3 thioxo-3,4-dihydro-1,2,4-triazin-5(2H)-one derivatives **(5a-j)** were designed and synthesized for antiepileptic activity.

Aim and objective: The synthesized title derivatives were evaluated for antiepileptic activity by maximal electroshock (MES) and pentylenetetrazole (scPTZ)-induced seizures tests with minimal motor impairment screening by rotarod test.

Method: The structure and purity of the synthesized compounds were confirmed by elemental analysis, IR spectroscopy, ^{1}H NMR, ^{13}C NMR and mass spectroscopy. All the synthesized compounds fulfilled the requirements of suggested pharmacophoric model for anticonvulsant activity.

Result: Compounds **5c** and **5g** showed highest protection up to 70 and 80 % in PTZ and MES-induced seizures, respectively, compared to the control group. The most promising compound **(5c)** 6-(2-Amino-5-chlorophenyl)-4-(4-chlorophenyl)-3-thioxo-3,4-dihydro-1,2,4-triazin-5(2H)one (MES, ED_{50} = 12.54 mg/kg; scPTZ, ED_{50} = 87.23 mg/kg), and **5g,** 6-(2-Amino-5-chlorophenyl)-4-(4-hydroxyphenyl)-3-thioxo-3,4-dihydro-1,2,4-triazin-5(2H)one (MES, ED_{50} = 25.26 mg/kg; scPTZ, ED_{50} = 96.87 mg/kg), showed higher as well as comparable ED_{50} value than those of the reference drugs: phenytoin (MES, ED_{50} = 9.5 mg/kg; scPTZ, ED_{50} = >300mg/kg), carbamazepine (MES, ED_{50} = 8.9 mg/kg; scPTZ, ED_{50} = 100 mg/kg) and Phenobarbital (MES, ED_{50} = 21.8 mg/kg; scPTZ, ED_{50} = 13.2 mg/kg). Additionally, the antidepressant activity of selected compounds (most active)

was determined by Porsolt forced swim test. The compound 5c and 5g showed significant anti-epileptic activity with neither sign of neurotoxicity in the minimal motor impairment test (Rotarod test) nor sign of depressant activity in swim pool test. Moreover, the in-silico studies of these title compounds were carried out for estimation of a pharmacophore pattern and the prediction of pharmacokinetic properties. To determine the mechanism of action of most active compounds a molecular docking study was carried out on the homology model of sodium ion (Na+) channel and $GABA_A$ receptors using Maestro 9.4 program (Schrodinger, Inc., USA).

Summary and Conclusion: Finally, the compound 5c and 5g showed a novel scaffold in the search for safer and efficient antiepileptic activity with no sign of neurotoxicity "Nor" sign of depression.

Keywords: *Antiepileptic, Anticonvulsant, Antidepressant, Neurotoxicity, 1,2,4-triazine, 3-thioxo 1,2,4-triazine-5-one, Maximal Electroshock Seizure (MES), Subcutaneous Pentylene tetrazole (scPTZ)*

PSIT/PP02/0063

Understanding the molecular world of Biochemistry!

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Introduction: The field of biochemistry delves into the intricate molecular processes that underlie living organisms. By unraveling these processes, we gain deeper insights into life's fundamental mechanisms. This main abstract explores the molecular world of biochemistry, highlighting its significance and relevance.

Aim & Objectives: The main aims and objectives of Biochemistry are to elucidate the essential molecular components that govern biological functions, to understand how biomolecules interact and contribute to cellular processes, to showcase the importance of biochemistry in advancing medical, agricultural, and biotechnological research.

Method: In this study, a comprehensive analysis of key biomolecules such as proteins, nucleic acids, carbohydrates, and lipids was conducted. Various experimental techniques, including spectroscopy and chromatography, were employed to examine the structural and functional aspects of these molecules.

Result: The study revealed intricate details about the molecular architecture of proteins, the genetic information encoded in nucleic acids, the role of carbohydrates in energy storage, and the significance of lipids in cellular membranes. The interplay between these biomolecules orchestrates vital cellular processes such as metabolism, signal transduction, and gene expression.

Summary & Conclusion: Biochemistry serves as the foundation for understanding life at the molecular level. Through this study, we gained insights into the complex interactions that drive cellular functions. The knowledge acquired has far-reaching implications for fields like medicine, as it aids in developing targeted therapies, and agriculture, as it improves crop yields and disease resistance.

Keywords: *Biochemistry, biomolecules, proteins, nucleic acids, carbohydrates, lipids, cellular processes, metabolism, gene expression, molecular interactions, medical research, agriculture, biotechnology.*

PSIT/PP02/0064

Computational study of Daidzein and its derivatives – New herbal bioactive compound for the treatment of Psoriasis

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Introduction: Psoriasis is a deliberating disease that affects nearly 0.5-1.5% (2.5 million) of Indian population according to the world Psoriasis Day consortium. (1) Although it makes the person physically, socially and psychologically ill. The inhibition of JAK/STAT, PDE4, PAN SELECTIN receptor will lead to slow down the upregulated inflammatory molecules to settle down. Pithecellobium dulce plants with bioactive compound Daidzein, which have the affinity with molecular receptor of psoriasis. (2) In-silico study of molecular target and ligand shows the interactions, affinity and best conformation of selected substance.

Aim & Objective: In-silico drug design and molecular docking of bioactive compound and its analogue will lead to more potent, more specific and less toxic compound. The antipsoriatic drug ameliorate the pathological expression of psoriatic skin i.e., Hyperproliferation, pruritis, itch and pain which will be helpful in removing scaly skin.

Methods: The parent compound was retrieved from protein data bank and its derivatives were prepared using chemdraw software and then energy minimization of compound was done followed by docking study using Schrodinger software.

The derivatives of the compound were drawn in chemdraw software with elemental analysis and ADMET parameters of the compound were analysed by SWISSADME software.

Result: The daidzein and its derivatives shows effective binding with molecular targets as compared to standard drugs available for treatment.

Summary & conclusion: The computational study of compounds leads us to determine the potential molecule over the existing molecule, which can be a prototype for prevention of Psoriasis.

Key words: *Computational study, ant psoriatic drug, Prototype, Molecular target.*

PSIT/PP02/0066

Quantitative estimation of eliglustat in bulk and In-house capsule formulation by bioanalytical chromatographic method

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Introduction: Gaucher's disease is a lysosomal storage disease which results from an autosomal recessive deficiency of the lysosomal enzyme acid beta-glucosidase (glucocerebrosidase), which is responsible for hydrolysis of glucocerebroside (glucosylceramide) into glucose and ceramide. Eliglustat is a glucosylceramide synthase inhibitor used in the treatment of Gaucher disease (GD).

Aim & Objectives: A novel, safe and sensitive method of chromatographic estimation has been developed for the assay of eliglustat in bulk & in house formulation.

Method: The method has been developed and validated for the estimation of eliglustat using methanol & ACN as diluents. Chromatographic separation of eliglustat was achieved using inertsil ODS-3V C18 column with a mobile phase consisting of a mixture of 0.1% formic acid with water and acetonitrile in a ratio of 40:60 at 287nm.

Result: The calibration curve constructed over a range of 1- 6 mg/mL was linear (R2 > 0.9999). The limit of detection & Limit of quantification for eliglustat were found to be 0.01 & 0.05 µg/ml. The percentage mean recovery of LQC, MQC, and HQC was found to be 88.32%, 89.64%, and 93.01% respective.

Summary & Conclusion: The method was simple, accurate, robust, convenient and suitable for the determination of eliglustat in bulk and in house capsule formulation.

Keywords: *Eliglustat, Method development, Validation, Chromatography, Gaucher disease, etc.*

PSIT/PP02/0067

Development and Validation of RP-HPLC method for Assay of tretinoin in cream formulation

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Introduction: Instability of active drugs and products may lead to under medication of the drug due to lowering concentration in the dosage form and toxic products may be formed. ICH stability guidelines Q1A defines force degradation to elucidate stability, so carried out by RP-HPLC for estimation of *TRETINOIN*.

Aim & Objectives: To study degradation pathway and selectivity of RP-HPLC to achieve improvement in conditions and standards operating procedure.

Method: 1000 $\mu g/ml$ standard stock prepared by diluting Tretinoin in methanol. Working stock solution of 100$\mu g/ml$ and working standard solution of 02$\mu g/ml$ was prepared. According to maximum absorbance 333nm was taken as detection wavelength. In C_{18} Column Acetonitrile:Methanol(50:50) mobile phase was used. System suitability parameters was recorded and result was ploted on calibration curve. Stress degradation of API Tertinoin was studied at 50℃, fromed assay was compared with assay of marketed formulation, recovery studies were carried out by standard addition method and validation was carried out.

Result: The Assay 99.24%, recovery 98.40 and coefficient of linearity curve 0.9995 was estimated. The forced degradation study indicated that the temperature, ionic strength and oxidation greatly influence the degradation behavior of tretinoin, the drug was found to be highly susceptible towards hydrolysis, also tretinoin was found unstable at high temperature.

Summary & Conclusion: The standard drug was exposed to the different stress conditions to study degradation behavior of the drug. This study was typically helpful for understanding stability of Tertinoin and providing a reference for further studies.

Keywords: *RP-HPLC method, Stress degradation, Stability study.*

PSIT/PP02/0068

Development and Validation of RP-HPLC method for Assay of Imeglimin HCL

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Introduction: The instability of active drugs and products may lead to under medication of the drug due to lowering concentration in the dosage form and toxic product may be formed. ICH stability guidelines define force degradation to elucidate stability, so is carried out by RP-HPLC for the estimation of antidiabetic drugs.

Aim & Objectives: To develop and validate the stability of Antidiabetic drugs by spectrophotometry and RP-HPLC, and the main objective is to study force deterioration and validation of development techniques.

Method: The 1000 standard stock was prepared by diluting the drug in water. working stock solution of 100 and working standard solution of 10 was prepared. According to maximum absorbance of the drug observed at 239 nm was taken as the detection wavelength for further study, In C 18 column Acetonitrile: water (30:70)

mobile phase was selected. System suitability parameters were recorded and the result was plotted on a calibration curve. As per ICH guidelines stress degradation and validation were carried out.

Result: The RP-HPLC includes a coefficient of the linearity response curve of 0.9991 and stress degradation of imeglimin hydrochloride drug was studied thus result adopted RP-HPLC can be employed for routine qualitative analysis.

Summary and Conclusion: Development of RP-HPLC method for estimation of Imeglimin hydrochloride. This method adopted for routine analysis of drugs and validation of the RP- HPLC method indicates the stability of drugs and studied RP-HPLC parameters are useful for formulation aspects.

Keywords: *Spectrophotometric method, RP-HPLC method, Imeglimin hydrochloride.*

PSIT/PP02/0069

In silico design, synthesis and study of substituted amino acid chalcone hybrids for their biological activity

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Introduction: Insilico design involves using computer simulations and modelling to design molecules with specific properties. In the context of designing hybrid amino acid and peptide- based compounds for analgesic and anti-inflammatory purposes, insilico methods can help predict their interactions, bioactivity, and safety. This approach streamlines the process of identifying potential candidates for further synthesis and testing in the lab.

Aim & Objectives: To conduct Insilico designing and docking studies of chalcone amino acid and peptide analogue on relevant receptors using Autodock 1.5.7. To synthesize chalcone hybrid peptide analogue with reference to the docking score.

Method: Firstly, Peptide and Dipeptide was synthesized and hybrid analogue of chalcone and dipeptide synthesis for therapeutic potential. All 2D platform were converted to 3D platform using ChemDraw 10.0, evaluation of ADME properties were done by using Swiss ADME, and LD50 values were predicted by Protox. Anti-inflammatory activity screening was done by Carrageenan-induced rat paw edema and finally, characterization was carried out by various analytical techniques.

Result: A compound like SBSB-4, SBSB7, SBSB-10, SBSB-13 SBSB-31, SBSB-33and SBSB34 with docking score -11.58, -11.51, -9.56, -9.50, -8.56, -8.46 and -8.30 have been found active on COX-2 receptor.

Summary & Conclusion: Insilico designing is advantageous over conventional with regard of time, accuracy and economy. Thus, various analogues with peptide were studied. the compound with greater binding affinity considered as a good drug candidate

Keywords: *Insilico, Autodock, Chemdraw, Protox, SwissADME*

PSIT/PP02/0070

Development and Validation of Discriminative Dissolution Test for A Drug Formulation.

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Introduction: Dissolution is an amount of Drug substance that goes within the solution per unit time under standard conditions of liquid / solid interphase, temperature, and solvent composition. Dissolution testing provides the means to judge critical parameters like adequate bioavailability and supply information necessary to formulator

in development of more efficacious and therapeutically optimal dosage form.

Aim & Objectives: To study Development of the Discriminative Dissolution test method for Tenofovir disproxil furamate by HPLC.

Method: The 1000 $\mu g/ml$ standard stock prepared by diluting TDF in methanol. Working stock solution of 100$\mu g/ml$ and working standard solution of 10$\mu g/ml$ was prepared. According to maximum absorbance of drug observed at 260nm was taken as detection wavelength for further study. Formic acid:Methanol (50:50)mobile phase was selected. System suitability parameters was recorded and result was ploted on calibration curve. As per ICH gudlines stress degradation was studied assay was compared with assay of marketed formulation, recovery studies were carried out by standard addition method and validation was carried out

Result: The results involve Coefficent linear curve is 0.9972 and recovery is 98.73% was estimated. The forced degradation study indicated that the temperature, ionic strength and oxidation greatly influence the degradation study indicated that the temperature ,ionic strength and oxidation greatly influence the degradation behavior of drug.

Summary & Conclusion: HPLC method for dissolution test was accurate. It describes the Tenofovir disproxil furamate is vastly release in acidic media as compared to water media. Hence the developed method can be employed for routine dissolution analysis of Tenofovir disproxil furamate Tablet.

Keywords: *Dissolution, Tenofovir disproxil furamate, HPLC*

PSIT/PP02/0071

Development of validated stability indicating method for estimation of methoxsalen in its formulation by HPLC analysis

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Introduction: The current study concentrates on the kinetics and behaviour of Methoxsalen in-solution state drug degradation. The study's design involves selecting an RP-HPLC method for drug estimation, followed by assessments of the kinetics of drug degradation, shelf-life estimation and validation of the method.

Aim & Objectives: To develop method for determination of drug and degradation kinetics in its formulations by HPLC.evaluation of degradation kinetic nd determination of shelf life.

Method: Methoxsalen was analysed for stress degradation in tablet dosage form using the Shimadzu HPLC series 1100. The Agilent ZORBAX SB-C8 (4.6x150mmx5um) column was used for the analysis, with Acetonitrile: 1.28mM Phosphate Buffer (pH 5) in a ratio of 60:40 v/v as the mobile phase. The analysis was carried out at the 248 nm wavelength, with a flow rate of 1.0 mL/min, at which the drug showed a sharp peak. The analysis was carried out by placing the standard in an oven at with acidic, alkaline, oxidative hydrolytic solutions and for thermal degradation the standard taken in oven at 50°C for 48 hours.

Result: The result was found to be highly susceptible in acid, basic, oxidative hydrolysis and at higher temperature. The proposed method was successful used for its assay, drug degradation (stress testing), and efficient of linear curve is 0.9993; and recovery 101.04% was estimated.

Summary & Conclusion: From the study of the sample, it was concluded that investigating of suitable storage conditions for Methoxsalen should consider the influence of temperature. The information obtained understanding the stability and shelf life of Methoxsalen and providing the

reference for further studies of Methoxsalen manufacturing purposes.

Keywords: *RP-HPLC method, Stress degradation, Shelf-life estimation of Methoxsalen.*

PSIT/PP02/0072

Design of Novel C-Di-GMP Analogues as the Potential Inhibitors of Microbial Biofilm Using Shapes Based Similarity Approach

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Introduction: Cyclic-di GMP is a bacterial second messenger that controls different processes in almost all bacterial populations including motility, biofilm formation, cell adhesion, quorum sensing, cell division and virulence. Since Cyclic –di-GMP is absent in mammalian systems there have been studies that explored the use of this signaling pathway for antibacterial intervention specifically to inhibit bacterial Biofilm formations.

Aim & Objectives: We believe that the design of focused analogue library of Cyclic-di-GMP that is conformation distinct would delineate a novel antibacterial strategy. In the current studies, we intended to design novel, diverse and drug like Cyclic-di-GMP analogue library based on 3D-shape similarity studies as potential antibiofilm agents.

Method:

- Analysis of crystal structures of c-di-GMP bound to biomolecules
- Identification of practically available conformations of c-di-GMP
- Study of correlation between c-di-GMP conformations to its biological activity.

Integrating this information to design and develop Pharmacophore required for the design of novel c-di-GMP analogues.

Design of conformational library of c-di-GMP analogues using shape base similarity studies.

Selection of molecules on the basis of drug like properties.

Result: Structurally diverse library of 404 drug like molecules and 63 drug molecules were identified with promising shape and electrostatic similarity with C-di-GMP.

Summary & Conclusion: This study revealed that Telmisartan (Antihypertensive), Eletriptan (Migraine headache), Empagliflozin (Antidiabetic), Raltegravir (Anti-HIV) and Irbesartan (Antihypertensive) demonstrated promising 3D shape and electrostatic similarity with C-di-GMP and thus can be repurposed as a potential candidate for antibiofilm and antibacterial activity against drug resistant strains of bacteria.

Keywords: *C-di-GMP, Biofilm, Shape based similarity, Drug repurposing.*

PSIT/PP02/0073

In silico design and synthesis of hydroxy benzoic acid as an analgesic and anti-inflammatory agents

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Introduction: 4-Hydroxybenzoic acid, also known as p-hydroxybenzoic acid (PHBA), is a monohydroxy benzoic acid, a phenolic derivative of benzoic acid. Develop new and effective therapies for the treatment of Inflammation from 4-HBA hybrid amino acid.

Aim & Objectives: Insilco Designing and synthesis of hybrid amino acid and peptide analogs 4-Hydroxy Benzoic Acid hybrid Amino Acid and Peptide Analogues on relevant receptors using Auto dock and

Characterization of the synthesized compounds using IR, 1H NMR, and Mass Spectrometry for Analgesic and Anti-inflammatory Agents.

Method: Insilco and Docking studies concerning the receptor. Development of Synthesis of compounds with their Characterization of the synthesized compounds like physicochemical characterization, spectral analysis (FTIR, NMR, and mass), Prediction of -ADME activity using SwissADME Software, Toxicity Activity using Protox Software, Analgesic Activity using PASS Software and the molecular docking studies of compounds were performed by software on COX-2 receptor (PDB ID-2147). Screening of the characterized compounds for Analgesic and Anti-inflammatory Activity.

Result: The Molecular modelling and docking studies revealed that amongst the 32 compounds RLYJ-1, RLYJ-2, RLYJ-5, RLYJ-7, RLYJ-10, and RLYJ-16 show much better docking scores compared to standard on COX-2 Receptor (PDB ID-2147).

Summary & Conclusion: All Synthesised Drugs have Potent activity when compared against Standard analgesic and Anti-inflammatory agents. we found that the compound RLYJ-1 is more potent than the RLYJ-10 when compared with diclofenac sodium as a standard.

Keywords: *4-HBA, Anti-inflammatory, cox 2*

PSIT/PP02/0075

Design and Synthesis of Imidazole analogues for the discovery of new leads against Colon Cancer

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Introduction: Colorectal cancer (CRC) ranks as the third most common cancer worldwide, Beta-catenin and T-cell factor (TCF) are crucial parts of the Wnt signaling pathway, regulating cell growth and development. Abnormal activation of this pathway, mainly involving beta-catenin accumulation, has been linked to colon cancer. Targeting beta-catenin and TCF thus become a promising approach for cancer treatment.

Aim & Objectives: Imidazole, a heterocyclic compound, is being investigated as a potential inhibitor of the beta-catenin and T-cell factor (TCF) interaction in the Wnt signaling pathway. HI-B1 (Imidazole derivative) discovered as a potential Wnt pathway inhibitor. The unique structural characteristics of the imidazole ring enhance the diversity of interactions with target protein. Thus, Objective of this project is the development of new Imidazole derivatives as anti-cancer agents.

Method: By using two step multicomponent reaction we have synthesized 6 Imidazole derivatives using different Substituted benzaldehyde, Phenacyl alkyl amine and ammonium acetate.

Result: The Imidazole derivatives were successfully designed, synthesized and characterized. Docking studies were carried out to understand the probable mode of action of the compounds as β-catenin/Tcf inhibitors.

Summary & Conclusion: The results of the docking studies were compared with the reference molecule H1B1 as a β-catenin/Tcf inhibitor demonstrated promising binding affinities. Also, the interactions between the synthesized compounds and protein were studied and depicted that functional groups of ligands were involved in interaction with active site amino acid residues. Drug Likeness properties of the synthesized molecule were also determined using Swiss ADME Software and confirmed with Lipinski Rule of 5.

Keywords: *Anticancer agents, Wnt Signaling Pathway, Imidazole, docking*

PSIT/PP02/0076

Synthesis and evaluation of cefixime- metal ion complexes against multi-drug resistant microorganisms

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Introduction: Antibiotic metal complexes are gaining recognition due to their efficacy against resistant microorganisms. Cefixime metallic complexes would be an alternative for treatment against the multi-drug resistance microorganisms.
Aim & Objectives: The study aimed to synthesize and evaluate cefixime-metal ion complexes with silver, copper and platinum against multi-drug resistant microorganisms.
Method: Probe **s**onication was used to synthesize cefixime-metal ion complexes with silver, copper and platinum in aqueous media. Physicochemical studies, UV, FTIR, XRD and FESEM characterized synthesized cefixime metal ion complexes. The antibacterial study used agar well diffusion and MIC determination by resazurin dye method.
Result: Cefixime metallic complexes showed colour changes indicating the reduction of metal ions. UV spectrum of complexes has shown shifting or change of absorbance. FTIR peaks suggested complexation with metal and retention of functional groups. FESEM analysis of Cefixime silver complex showed a spherical shape with 41–54 nm. EDX confirms the presence of metal ions in the complexes. Antibacterial activity of the synthesized cefixime metallic complexes against resistant *E. coli, S. aureus, and K. pneumoniae* indicated better activity against *K. pneumoniae* than plain cefixime. The MIC of complexes was observed less than plain drug. In acute oral toxicity, liver and kidney were observed after 14 days without significant changes.
Summary & Conclusion: The cefixime metallic complexes were successfully synthesized and characterized. Complexes' antibacterial activity was better than plain cefixime against MDR microorganisms. The MIC of complexes observed less specifically with silver metal, indicating a better alternative for the treatment against resistant organisms.
Keywords: *Cefixime, metal ion complexes Antibacterial effect* resistant E. coli, K. pneumoniae, and S. aureus.

PSIT/PP02/0077

Investigation of New Heterocyclic Analogues for its Pharmacological Potential

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Introduction: About 95% of TB deaths occur in developing nations, with 38% in India. Multidrug-resistant TB poses challenges due to inadequate treatment. Innovatively designed heterocyclic analogues target *DprE1* enzyme, inhibiting cell wall synthesis; potentially improving the treatment. Mechanism involves inhibiting *DprE1* coupling, epimerisation, *DprE1* enzyme production, resulting bacterial growth inhibition.
Aim & Objectives: To investigate heterocyclic analogues for its pharmacological potential in Tuberculosis using molecular dynamics and its characterizations by TLC, NMR & invitro antibacterial study.
Method: In-silico study involved molecular docking, molecular dynamics, drug likeness analysis, ligand preparation, receptor grid generation, simulations using DprE1 enzyme (PDB ID:4KW5) as a target protein. ADME properties and structure-based drug likeness were predicted. Heterocyclic analogues were synthesized, characterized using TLC, melting point, FTIR, NMR, and mass

spectroscopy. Anti-tubercular activity was evaluated through disc diffusion and colorimetric resazurin microtiter plate assay.

Result: Molecular docking revealed dock scores of all heterocyclic analogue -10.26 to 15.48 kcal/mol (*4KW5:DprE1*). Characterization data confirmed its structure. IR spectra displayed N-H stretching bands indicating amide linkage, NMR spectra showed signals validating presence of imidazolidine ring, mass spectrometry confirmed the molecular weight. In vitro studies demonstrated significant antitubercular activity of heterocyclic analogue against mycobacterium smegmatis, with zone of inhibition value ranging from 11-17 mm.

Summary & Conclusion: Benzothiazole-imidazolidine analogues effectively inhibit DPrE1 enzyme. Molecular docking indicates improved binding energy compared to references, while molecular dynamics affirms stability. Anti-tubercular activity demonstrated, potential against MDR-TB.

Keywords: *Mycobacterium Tuberculosis, benzothiazole heterocyclic analogue, DprE1enzyme inhibitor.*

PSIT/PP02/0078

Assessing the Potential of Vitamin Drug Conjugate for its Activity against Infectious Disease

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Introduction: According to WHO, over 10 million people suffer TB annually, with 1.6 million deaths. Drug-resistant TB poses a public health threat. Vitamin drug conjugates offer potential for novel antitubercular therapies by improving bioavailability and reducing side effects.

Aim & Objectives: To assess the potential of a vitamin drug conjugates against the infectious disease tuberculosis and characterize the conjugates using TLC, NMR, MS and molecular modelling.

Method: The study synthesized Vitamin-Drug conjugates using amidation reactions, resulting in Isoniazid-Niacin, Isoniazid-Pantothenic Acid, and Pyrazinamide-Niacin conjugates. Characterization techniques confirmed structural integrity and purity. Pharmacokinetic and pharmacodynamic properties were evaluated using drug likeness and ADME predictions. The binding affinity and complex stability were assessed through molecular docking and molecular dynamics simulations. Antitubercular activity was evaluated using disc diffusion method.

Result: ISO-NIA, ISO-PA, and PYZ-NIA exhibited docking scores of -7.15 kcal/mol, -7.25 kcal/mol and -7.95 kcal/mol respectively. NMR spectra showed amide and imide bond peak confirming their structure. MS confirmed molecular weight. In vitro studies demonstrated significant antitubercular activity, with zone of inhibition value of 15mm and 14 mm for INH-NIA and PYZ-NIA.

Summary & Conclusion: The study highlights the potential of vitamin drug conjugates for targeted antitubercular therapy, offering enhanced efficacy and reduced drug resistance. Designing and synthesizing vitamin-drug conjugates can improve targeted drug delivery and minimize systemic toxicity.

Keywords: *TB, vitamin-drug conjugate, Isoniazid, Pyrazinamide, Pantothenic acid, Molecular modelling.*

PSIT/PP02/0079

Effective Drug Candidates against Global Pandemic of Novel Corona Virus (nCoV-2019): A Probability Check through Computational Approach for Public Health Emergency

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Introduction: The incidence of infection of coronavirus 2 (SARS-CoV-2) has increased worldwide. Various strategies are being tested worldwide including drug repurposing due to the lack of effective treatment. Indian Council for Medical Research has declared antiretroviral protease inhibitors can be used to treat CoV-19

Aim & Objectives: To identify the potent clinical antiretroviral drug candidate against Cov-19 through computational tools and repurposing of protease inhibitors for the treatment of Cov-19

Method: HIV protease inhibitors, including Ritonavir, Lopinavir, Saquinavir are used to treat CORONA virus. A molecular docking study explored binding modes of antiretroviral derivatives with protease enzyme, targeting COVID-19 receptor 6LU7. The interacting amino acid residues were identified as Hie41, Glu166, Ser144, Hip164, Leu141, Hie41 etc. The molecular dynamics simulations (MDS) evaluated the stability of docked complexes and determined the binding free energies.

Result: Molecular dynamics studies and free energy calculations showed that Saquinavir has highest bonding affinity to SARS-CoV-2 main protease. SAQ exhibits better stability and low deviation from its initial conformation, with RMSD between 3-4 Å. Saquinavir has a good G-score (-9.538) and E-Model score (-101.66), making it promising first-line agent for treating SARS-CoV-2 infection.

Summary & Conclusion: The study analysed the interaction between antiretroviral protease inhibitors and Covid-19 protease enzymes, revealing effective treatment for Covid-19 infection. Based on G-Score and E-Model scores, Saquinavir would be effective as a first line drug for the treatment of Covid-19 either as a single agent or in combination with Ritonavir.

Keywords: *Antiretrovirals, nCoV-2019; Global Pandemic, Respiratory Infections, SARS, MERS.*

PSIT/PP02/0080

Design and Syntheses of Novel 2,5-Disubstituted 1,3,4-Oxadiazole Derivatives as Anticonvulsant Agents

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Introduction: Seizures, a common name for epilepsy, are the second most common neurological disorders after stroke, affecting roughly 1% of the total population. The seizures are caused by an imbalance of excitatory and inhibitory neurotransmitters.

Aim and Objective: 1,3,4-Oxadiazole shows various therapeutic activities such as anticonvulsant, anti-microbial, anti-tuberculosis, etc. Also, the studies reveal that 1,3,4-oxadiazole derivatives substituted at the 2^{nd} and 5^{th} position show good anticonvulsant activity. Therefore, the present study aimed at developing novel 2,5-disubstituted 1,3,4-oxadiazoles.

Method: 2,5-Disubstituted 1,3,4-oxadiazoles were synthesized in a two-step reaction. The first step involved synthesizing acid hydrazides (I), in the presence of a suitably substituted ester. In the second step, cyclization of (I) to substituted 1,3,4-oxadiazole, using aromatic carboxylic acids and phosphorus oxychloride was done. *In-silico* studies were performed against the GABA selective protein (PDB:6HUP) using AutoDock 4.0. *In-vivo* studies were carried out by using maximum electroshock seizure (MES) model and Isoniazid (INH) induced chemical model. Diazepam and Phenytoin were used as the standard drugs.

Result: The synthesized compounds were characterized by UV, FTIR, Mass and

NMR spectroscopy. The highest and lowest binding energies were predicted for compounds D2 (-7.03) and D3 (-6.59). *In-vivo* study indicated that compound D4 displayed maximum potency in the MES model, while compound D2 was more potent in INH model, with percentage inhibitions of 57.57±0.10 and 60.74 ±0.10, respectively.

Summary and Conclusion: The study concludes that 1,3,4-oxadiazole derivatives substituted at 2nd and 5th position exhibit significant anticonvulsant activity.

Keywords: *Seizures, 2,5-disubstituted 1,3,4-oxadiazole, Condensation, Cyclization, Anticonvulsant activity, Molecular docking.*

PSIT/PP02/0081

Method Development and Validation of Quantitative Estimation of Hydroxychloroquine Sulphate in Bulk and Pharmaceutical Dosage Form by FT-IR Spectroscopy

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Introduction: FT-IR is used for quantitative analysis of drug as it is a quick, inexpensive, and non-destructive method of gathering data, it doesn't utilize any harmful chemicals, and required little training. It avoids laborious processes like the use of chemometric analysis, multivariate analysis, or internal standards.

Aim & Objectives: As no Infrared spectroscopy method development was reported for the determination of specific drugs IR spectroscopic was developed and validated.

Method: 5 different concentrations of 5, 15, 25, 35 and 45 µg % were prepared by adding 5, 15, 25, 35 and 45 mg of API Hydroxychloroquine Sulphate to 95, 85, 75, 65 and 55 mg KBr powder. The standard curve was obtained by plotting area values and Absorptive values of API Hydroxychloroquine Sulphate, using baseline technique, vs, concentration. From the spectra, wave numbers of the 2398.60-2258.60 cm^{-1} were considered for the estimation of hydroxychloroquine sulphate in AUC and absorptive intensity methods.

Result: In the spectra obtained was analyzed the H-SO4 stretching band between 2398.60-2258.60 cm^{-1}. The values of these bands/peaks were provided in absorbance. Method Validation: Accuracy, precision, limit of detection and quantification were within a limit.

Summary & Conclusion: It is obvious that FTIR spectrometry is capable of the analytical quantification of pharmaceutical products. The methods proposed are simple, precise, and less time-consuming compared to other methods reported in the literature.

Keywords*: FT-IR analysis, API hydroxychloroquine Sulphate, AUC, intensity*

PSIT/PP02/0090

Synthesis of novel sulphonamide schiff bases as anticonvulsant agents

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Introduction: Epilepsy is a common chronic neurological disorder characterized by recurrent unprovoked seizures. The seizures are transient signs of excessive neuronal activity in the brain.

Aim and Objective: Sulphonamide moiety is well-established and possesses various pharmacological activities including anti-convulsant, anti-microbial, and anti-inflammatory. It was observed from various studies that Schiff bases, because of their reactive imine group, play an important role

in the treatment of epilepsy. Thus, it was decided to synthesize a novel series of sulphonamide Schiff bases.

Method: The syntheses of the compounds were performed in a single-step reaction by reacting benzene sulphonamide and suitably substituted aldehydes. The physicochemical characterization was done by thin-layer chromatography, solubility, and melting range. The structural conformation of the compounds was done by FTIR, Mass, and NMR. The *in-vivo* studies were carried out by using maximal electroshock seizure (MES) and chemical-induced (CI) murine models. Diazepam and Phenytoin were used as the standard drugs.

Results: The result of *in-vivo* study indicated that compound 2 displayed maximum potency in the MES model, while compound 4 was more potent in CI model, with percentage inhibitions of 36±0.3% and 68.87±0.85% respectively

Summary and Conclusion: The study concludes that benzene sulfonamide Schiff bases may act as potential anti-convulsant agents.

Keywords: *Epilepsy, Schiff bases, Sulphonamide, Anti-convulsant*

PSIT/PP02/0091

Synthesis of 1,5-Benzodiazepine and Its Derivatives by Condensation Reaction Using H-MCM-22 as Catalysis

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Introduction: constitute an important class of biologically active compounds and their synthesis has been receiving much attention in the field of medicinal and pharmaceutical chemistry owing to their application as anticonvulsant, anti-inflammatory, analgesic, hypnotic, and sedative agents and to their hypnotic activity. Benzodiazepines are generally synthesized by the condensation of o-phenylenediamine (OPDA) with a, b-unsaturated carbonyl compounds, b-haloketones, or with ketones using acidic catalysts which are critical to enhance the condensation process.

Aim & Objective: simple and versatile method for the synthesis of 1,5-benzodiazepines is via condensation of o-phenylenediamines (OPDA) and ketones in the presence of catalytic amount of H-MCM-22 using acetonitrile as solvent at room temperature. In all the cases, the reactions are highly selective and are completed within 1–3 h.

Method: The method is applicable to both cyclic and acyclic ketones without significant differences. The reaction proceeds efficiently under ambient conditions with good-to-excellent yields.

Result: The XRD patterns of samples of MCM-22 zeolite are in agreement with those already reported. All acquired X-ray patterns identified the products as highly crystalline materials.

Summary and Conclusion: The work reported has used H-MCM-22 catalyst for the synthesis of various benzodiazepines by using substituted OPDA and a series of symmetrical and unsymmetrical ketones at room temperature. This method is quite simple and selective. The catalyst gave high isolated yield of the derivatives of 1,5-benzodiazepine in a shorter reaction time at room temperature and can be recycled several times.

Keywords: *Polyherbal, medicinal plant, Antipsychotic activity.*

PSIT/PP02/0092

In-silico insight into molecular interaction between COX isoforms and NSAIDs

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Introduction: Inflammation is largely controlled by cyclooxygenase (COX) or prostaglandin endoperoxide synthase (PTGS). Three different isoforms of this inflammatory isozyme exist, and each has a unique structure, location, and function. It has been established that COX plays a role in the control of pain, fever, or inflammation.
Aim & Objectives: To perform structural analysis by PyMol and to analyze interaction differences between NSAIDs and COX isoforms.
Methods: For structural analysis, the multiple COX structures listed in the RCBS Protein Data Bank have been used. The program PyMol was used to analyze and compare the X-ray crystallographic structure. The Hydrogen bonding interactions between COX and its inhibitors were analyzed by PyMol and hydrophobic interactions were analyzed by Discovery Studio.
Results: According to the examination of the crystal structure, COX-2 has an additional side pocket in comparison to COX-1. Inhibitors become COX-2 selective inhibitors due to an extra pocket. The structural analysis provides insight of selectivity of NSAIDs towards COX isoforms.
Summary & Conclusion: Through a comparative analysis of existing literature, this poster provides a holistic understanding of how NSAIDs interact with COX-1 and COX-2 enzymes, shedding light on their intricate mechanisms of action and clinical relevance. The structural analysis will help in development of more effective COX inhibitors. The interaction analysis may help in the development of effective NSAIDs with lesser side effects.
Keywords: *Cyclooxygenase, NSAIDs, PyMol, polar interactions, hydrophobic interactions*

PSIT/PP02/0093

Protein Data Bank as a Source of Three-Dimensional Structure of Acetylcholinesterase and BACE-1 Enzymes

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Introduction: Three-Dimensional structure of enzymes acetylcholinesterase and BACE-1 enzyme are required for performing the structure-based drug designing of anti-Alzheimer drugs. Protein Data Bank is an excellent database for obtaining the in-depth knowledge about the 3D structure of enzymes which can be utilized in performing the structure-based drug designing and ligand-based drug designing of novel anti-Alzheimer compounds.
Aim & Objectives: To perform in-silico search of protein database entries of acetylcholinesterase and BACE-1 enzyme from protein data bank.
Method: The PDB IDs of the enzymes were selected depending upon their resolution, organism category, ligand with which they were co-crystallised, presence and absence of mutations. PDB IDs with resolution less than 2.5 Å were selected. Mutations should be zero and all the PDB entries should belong to homosapiens category.
Result: Retrieved PDB IDs of the enzyme acetylcholinesterase from protein data bank were viz. 7XN1, 4BDT, 7E3H, 6O4W, 6O4X, 4EY4, 4EY5, 4EY6, 4EY7, 4EY8, 5HFA, 5HF9, 5HF5 and 6O5V and PDB IDs of BACE-1 enzyme were viz 6FGY, 6EQM, 6OD6 ,6E3Z, 6UWV, 6UWP, 6UVY, 6UVV, 6UVP, 7MYI, 7MYU and 7MYR.
Summary & Conclusion: Amongst all these PDB IDs the best PDB ID can be selected and could be utilized for carrying out structure-based drug designing of anti-Alzheimer drugs.

Keywords: *Acetylcholinesterase, BACE-1, Protein Data Bank, Enzymes.*

PSIT/PP03/0002

Phytochemical investigation and cardiotonic activity of ethanolic extract of the roots of the plant *Jasminum multiflorum*. Andr

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Introduction: Nowadays cardiac arrest is a very common problem. The drug from synthetic origin also shows several side effects in this regard. In the current study, the pre-clinical study of the ethanolic extract of the root of *Jasminum multiflorum* was evaluated for such a purpose.

Aim & Objectives: To observe the cardiotonic activity of the ethanolic extract of the roots of Jasminum *multiflorum* on frog heart. During the investigation of the cardiotonic activity, the ethanolic extract of the root of J. multiflorum was compared with standard Digoxin (in varying dose). The varying dose (0.25 mg/ml, 0.6mg/ml, 0.8 mg/ml) of the extract was injected into the isolated heart of *Bufo melanostictus.*

Method: The frogs were borrowed from the horticulture department of Howrah. They were fed water at Librium. All the animals were divided into 8 groups (4 groups for standard and 4 groups for test drug). Frogs were anaesthetized by chloroform & the heart was isolated. Then in varying dose (extract 0.25 mg/ml, 0.6 mg/ml, 0.8mg/ml, 1.0 mg/ml) was injected to the myocardium of the frog heart. The standard drug digoxin was also injected separately to other 4 groups of animals accordingly. A change in heart rate was observed.

Result: The increase in heart rate (normal 30-50 beats / minutes) on an isolated frog heart was observed after administering the varying dose of the extract in respect to time. Among different dose 0.6 mg/ml & 0.8 mg/ml dose showed the usefulness of the extract & when compared with the standard digoxin, it showed significant ($P<0.005$). so, after further research and formulation it may be used to treat ischemic heart.

Summary & Conclusion: After performing the experiment, it was observed that there are sufficient increases in rate of heart in frog in respect to time. There is persistent and substantial increase after the introduction of test drug. It showed nearby similar statistical evidence comparing to digoxin. So, if formulation may be done, it may challenge the drug from synthetic origin.

Keywords: *Extract, Cardiotonic activity, J. multiflorum, Digoxin.*

PSIT/PP03/0003

Medicinal plants in the treatment of myocardial infarction disease

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Introduction: Myocardial infarction (MI), also referred to as a "heart attack," is brought on by a partial or total interruption of blood supply to the myocardium. In recent years, herbal remedies for MI have become effective, secure, and readily accessible

Aim & Objectives: The purpose of this presentation is examining the medicinal plants and phytochemicals that have been used to treat MI in order to assess the potential contribution of natural substances to the development of herbal MI treatments.

Method: A literature search was used to find information utilizing electronic databases such Web of Science, Google Scholar, PubMed, Sci Finder, Reaxys, and Cochrane.

Result: The identification of 140 plants from 12 families led to the abstraction of data on the plant families, parts of the plant employed, chemical contents, extracts, ulcer model used, and dose. The majority

of the MI plants, according to the data, belonged to the Fabaceae (11%) and Asteraceae (9%) families, and the most prevalent natural components in plants with MI were flavonoids (43%), glucosides (25%), alkaloids (23%), phenolic acid (19%), saponins (15%), and tannins (12%).

Summary & Conclusion: The plants of Fabaceae was found to be cardioprotective due to presence of flavonoids.

Keywords: *Myocardial infarction, phytochemicals, fabaceae, coronary artery.*

PSIT/PP03/0004

An Overview on herbal, safe, and effective mosquito repellents: Recent developments and prospects

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Introduction: Mosquito-borne diseases continue to be a significant global health concern, necessitating the development of safe and effective mosquito repellents. Although widely used, traditional synthetic repellents raise concerns due to their potential adverse effects. As a result, there has been a growing interest in herbal-based alternatives that offer a safer and more environmentally friendly approach.

Aim & Objectives: The aim of this study is to explore the recent developments in herbal mosquito repellents and identify the opportunities they present in terms of safety, efficacy, and commercialization. including the identification and utilization of plant extracts, essential oils, and natural ingredients with promising mosquito-repellent properties.

Method: A comprehensive review of scientific literature, research articles, academic journals, and relevant books was conducted. Databases such as PubMed, Scopus, and Google Scholar were searched.

Result: Recent advancements in this field have shown the potential of utilizing natural ingredients to repel mosquitoes effectively. However, rigorous scientific studies and standardized safety evaluations are necessary to ensure their efficacy and safety

Summary & Conclusion: In summary, the study explores the recent developments in herbal mosquito repellents. The limitations of conventional synthetic repellents, including concerns about chemical toxicity and environmental impact, have driven the interest in herbal alternatives. Recent advancements involve the utilization of plant extracts, essential oils, and natural ingredients that demonstrate promising mosquito repellent properties. Furthermore, the growing market demand for natural and safe products presents significant commercial opportunities. Collaboration between researchers, manufacturers, and entrepreneurs can drive the development of innovative and affordable herbal repellent solutions.

Keywords: *Mosquito repellent, Herbal, Ecofriendly, Safe, Insecticides*.

PSIT/PP03/0006

Investigation of effect of ethylene glycol-induced nephrolithiasis on calcium oxalate crystals and oxidative damage of renal cells

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Introduction: Nephrolithiasis is a significant health problem with a worldwide prevalence of between 2% and 20%. Kidney stones are linked with chronic kidney disease. Preventing reappearance is precise

to the type of stone like calcium oxalate, calcium phosphate, cystine, magnesium ammonium phosphate, and uric acid stones.

Aim & Objectives: To investigate the Effect of Ethylene Glycol-Induced Nephrolithiasis on Calcium Oxalate Crystals and Oxidative Damage of Renal Cells of rats by administered ethylene glycol at doses of 0.4% (LD), 0.75% (MD), and 1.0% (HD) in drinking water for 28 days.

Method: Three different doses of ethylene glycol in drinking water (0.4%, 0.75%, and 1.0%, v/v) were selected to induce nephrolithiasis. For this, twenty animals were randomly divided into four groups. Animals of groups 2, 3, and 4 were administered ethylene glycol at doses of 0.4% (LD), 0.75% (MD), and 1.0% (HD) in drinking water for 28 days. Mortality rate, behavioral and clinical changes were noted in animals of all experimental groups. Serum was separated by centrifuging the blood at 1000 rpm. for 10 min and was used to estimate calcium, phosphate, magnesium, and total protein, urine samples collected on 14 and 28 days of calculi induction treatment were analyzed for calcium, oxalate, phosphate, Magnesium, and total protein.

Result: No treatment-related clinical signs were observed. However, there was 40% mortality in group 4 rats, administered with 1.0% of ethylene glycol in drinking water. Ethylene glycol treatment (Groups 2, 3, and 4) caused a significant dose-dependent reduction in body weight. Calcium and oxalate excretion levels were noted in all ethylene glycol-treated animals. Similarly, there was a significant ($p<0.05$) increase, as compared to untreated control in urinary oxalate excretion level, a significant dose and time-dependent ($p<0.05$) increase in urinary phosphate excretion, decreased urinary magnesium excretion. The total protein content in the urine of ethylene glycol–treated animals was found to be significantly ($p<0.05$) increased. Ethylene glycol administration also caused a significant ($p<0.05$) elevation in phosphate content, a significant reduction ($p<0.05$) in magnesium content, a significant ($p<0.01$) increase in total protein was noted in all ethylene glycol-treated animals in a time and dose-dependent manner

Summary & Conclusion: The ethylene glycol was administered at doses of 0.4% (LD), 0.75% (MD), and 1.0% (HD) in drinking water for 28 days in female Wistar rats to induce Nephrolithiasis. The blood and urine samples were collected on 14 and 28 days of treatment and analyzed for various biochemical parameters. The ethylene glycol significantly decreased body weight with a concurrent increase in urinary excretion of calcium, oxalate, phosphate, and total protein. Moreover, there was a significant reduction in serum calcium and magnesium, while a significant increase was observed in levels of phosphate and total protein in serum.

Keywords: *Nephrolithiasis. Ethylene glycol, Calcium Oxalate Crystals, Oxidative Damage, Renal Cells.*

PSIT/PP03/0007

An insightful review on *Cassia fistula* (Linn.f.)

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Introduction: *Cassia fistula* (Linn.f.) commonly Known as Amaltas belongs to family *Fabaceae.* It is native to India, Sri lanka and diffused in various countries including Mexico, China etc. It is an ornamental shaded tree used in the event *'Vishukkani'* on the day of vishu. Plant has rich source in flavonoid and glycoside present in cassia fistula might be medicinally important or nutritionally valuable. Flower contains phenylalanine. Leaves mainly contain anthraquinones derivatives, sennosides A & B. and Fruit contains Kaempferol have been reported. Its efficacy in many disorders such as

constipation, skin disease, leprosy, cardiac disorders, liver. It contains many phytoconstituents such as chrysophanic acid, which is responsible for pharmacological activity.

Aim and objectives: This review highlights latest scientifically proved medicinal activity of cassia fistula against various diseases.

Methods: *Cassia fistula* hydro-alcohol seed extract was investigated for various biological activity like anticonvulsant effect by using MES, Hepatoprotective activity was studied against various hazards chemicals which induced Hepatotoxicity in rats, Anticancerous activity was tested against the normal cell line VERO and the human colon cancer cell line COLO 320 DM. VERO cells were only mildly cytotoxic when exposed to Rhein.

Result: It has been reported to possess various quantitative and qualitative phytochemical screening of the extract, analytical techniques and its activity used in cassia fistula plant.

Summary & Conclusion: Hydro-alcoholic extract of *Cassia fistula* seed possesses Hepatoprotective, anticonvulsant activity in mice by MES model. Various Phyto active constituents present in plant origin which shows various types of biological activities.

Keywords: *Cassia fistula*, *Anticonvulsant activity, Hepatoprotective activity, antimicrobial activity, Phytochemical and Pharmacological uses.*

PSIT/PP03/0008

A herbal syrup: Formulation and antistress effect in male rat

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Introduction: People's concern in traditional medicine has increased recently; however, customary herbal medicines need to be converted into a modern system of medicine to increase patient recognition.

Aim and Objective: The present work includes the fabrication and characterization of polyherbal syrup with hydroalcoholic extract of *Crocus sativus* and *Mikania cordata leaves*.

Method: Physicochemical analysis of selected crude drug was done. Various physicochemical evaluations of polyherbal syrup such as pH, density, specific gravity, viscosity, refractive index and accelerated stability testing were determined. The qualitative determination of a flavonoidal biomarker (Quercetin and Kaempferol) was performed via HPTLC. Antistress activity was assessed using foot-shock induced stress model. Twenty albino rats (5 mice in each group) were grouped into normal control, stress control, polyherbal syrup (200 mg/kg) and diazepam (1 mg/kg). Polyherbal syrup treatment was given orally for 2 weeks with prior use of foot shock induced stress.

Results: The study given above shows result data which are obtained from physio-chemical analysis of selected crude herbs for syrup preparation showed physicochemical characters, accelerated stability testing of polyherbal syrup was validated & standardised as per Ayurvedic pharmacopoeia limit. A significant variation was found in number of mountings, duration of immobility and active avoidance response in foot shock induced stress as compared to stress control group.

Summary and Conclusion: The research data approved that polyherbal syrup showed significant anti-stress potential which attributes to the explored biomarkers (Quercetin and Kaempferol) and the stability studies of standardized formulation justify its shelf life.

Keyword: *Antistress activity, kaempferol, Polyherbal syrup, Quercetin, Crocus sativus, Mikania cordata*

PSIT-PP03-0010

Spinacia oleracea- an overview of its chemical, nutritional, phytochemical and pharmacological profile

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Introduction: Spinach, scientifically known as *Spinacia oleracea*, is a leafy green vegetable that is widely consumed worldwide. It is recognized for its nutritional benefits, including being low in calories and carbohydrates while being rich in essential nutrients such as vitamins, minerals, and antioxidants. Spinach supports cardiovascular health, is useful in diabetes, promotes eye health, and contributes to bone health.

Aim & Objective:

- To summarize nutritional composition and implications for human health
- To highlight specific health benefits: cardiovascular, inflammation, digestion, eye health, bone health, useful in diabetes etc.
- To discuss scientific evidence, clinical studies, and research findings

Method: The hypoglycemic action of spinach-derived compounds has been examined in multiple animal studies. Using Wistar rats dosed with alloxan monohydrate (to destroy pancreatic β-cells and cause insulin deficiency permanently) and subsequently administered a daily dose of 70% spinach ethanolic extract (100 mg/kg body weight) for 12 days orally.

Result: Researchers observed a significant lowering of plasma glucose levels (152 mg/dl) in treated rats when compared to the control rats (250 mg/dl). Evidence from cell culture experiments supports spinach extracts' insulin-like and insulin-sensitizing actions. Park et al. investigated the effects of fresh spinach either processed as juice or extracted with ethanol on the differentiation of 3T3-L1 pre-adipocytes.

Summary & Conclusion: Spinach is a nutrient-rich vegetable with many health benefits. Its composition, packed with essential vitamins, minerals, and antioxidants, supports immune health, bone health, and energy production. The antioxidants and phytochemicals present in spinach also help reduce the risk of chronic diseases like cardiovascular disease, certain cancers, and age-related macular degeneration. Regarding cardiovascular health, spinach's ability to lower blood pressure, improve lipid profiles, and support healthy blood vessels contributes to a healthy heart and reduces the risk of heart disease.

Keywords: *Antioxidant, Nutrient-rich, Digestive health*

PSIT/PP03/0012

Antimicrobial profile of various extracts and fractions of *Clematis erecta* L.

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Introduction: In the traditional system of medicine, the plant *Clematis erecta* L. (Upright Virgin's Bower; Ranunculaceae) has been used to cure various ailments such as microbial infections, mental

disorders, pain, inflammation and urinary disorders. But this has never been investigated for the detailed antimicrobial potential till date.

Aim & Objectives: The present research work was deigned to evaluate antimicrobial activity plant aerial parts against bacterial and fungal strains. The various crude extracts/fractions were prepared as per standard procedure.

Method: The antibacterial and antifungal activities of test samples were investigated using disc diffusion method.

Result: The fraction ethyl acetate, out of various other test samples, possessed the highest against gram positive (*Staphylococcus aureus* MTCC 7443 and *Staphylococcus epidermides* MTCC 1133); gram negative organisms (*Pseudomonas aeruginosa* MTCC 2449 and *Escherichia coli* MTCC 1235). It also demonstrated antifungal activity against *Candida albicans* MTCC 1637 and *Aspergillus niger* MTCC 1235. After ethyl acetate, methanol extract was potent though to possess antibacterial and antifungal activity. The remaining test samples were devoid of antimicrobial activity. On the basis of phytochemical studies suggested that ethyl acetate fraction contained higher content of phenols followed by methanol extract and both extract / fractions showing presence of polyphenols as major classes of phytoconstituents.

Summary & Conclusion: As per the above-mentioned evidence, a clear conclusion can be drawn that the antimicrobial profile of *C. erecta* aerial parts is due to polyphenols.

Keywords: *Antibacterial activity, Antifungal activity, Polyphenols, Medicinal plants*

PSIT/PP03/0015

In vitro and *in vivo* anti-oxidant and anti-diabetic evaluation of cladodes crude extract and solvent fractions of *Opuntia elatior* mill (Cactaceae)

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Introduction: Ariel part of *Opuntia elatior* (Cactaceae) has been used in folklore remedies to treat diabetes in America, Mexico and India. However, the anti-diabetic potential of cladodes of this medicinal plant is not scientifically validated and authenticated.

Aim & Objectives: The present study aimed to evaluate in vitro and in vivo anti-oxidant and anti-diabetic potential of methanol extracts and solvent fractions of *Opuntia elatior* cladodes

Method: Phytochemical analysis performed according to standard procedure. The methanol extracts and solvent fractions of *O. elatior* cladodes were evaluated at different concentration (12.5-400µg/ml) for anti-oxidant activity by using DPPH assay. In-vitro anti-diabetic effect of extract and fractions were also analyzed by using α-amylase inhibition. Oral sucrose tolerance test of crude extract in different concentration in animal also studied. Different dose (200 and 400mg/kg body weight) used for anti-diabetic potentials in staptozotocin induced diabetic albino rats. The extracts were administered for three weeks in different group.

Result: The acute oral toxicity study of *Opuntia elatior* cladodes extract and fractions have no mortality in the experimental animals at the dose limit of 2000mg/kg during the observation period. The outcome of present study indicates that extract and different fraction shows potential anti-oxidant activity. Cladodes extract also significantly decreases elevated level of blood glucose in dose dependant manner and also caused to reverse the cholesterol, triglyceride, High density lipoprotein (HDL) and low-density lipoprotein (LDL) values when compared to untreated diabetic rats.

Summary & Conclusion: The result indicates the beneficial effects of O. elatior cladodes extract by scavenging 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radicals, inhibiting α–amylase enzyme, and improving serum lipid profile levels. The cladodes crude extract of *O. elatior* are effective in lowering blood glucose and improving insulin levels in diabetic rats. The claimed traditional use as anti-diabetic has scientific ground.

Keywords: *Antioxidant, antidiabetic, α-amylase, α–glucosidase, streptozotocin, Opuntia elatior*

PSIT/PP03/0016

Therapeutic Efficiency and Cost Effectiveness of Herbal Drugs- A Reasonable Approach.

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Introduction: Since times immemorial, mankind has relied on herbs and plants on natural origin to alleviate its sufferings. Irrespective of the geographical separation among different civilizations, the dependence on plants for treating diseases and ailments was common to all settlements.

Aim & Objectives: This study will focus on the scientific and well documented cases of efficacy of such drugs and also provide a commentary on their cost effectiveness.

Materials and Methods: The study on the therapeutic efficiency and cost-effectiveness of herbal drugs followed a systematic review and meta-analysis methodology, beginning with a comprehensive literature search across relevant databases to identify eligible studies and clinical trials up to a specified date. Inclusion and exclusion criteria were established, ensuring the selection of appropriate research, and data extraction encompassed herbal drugs' details, medical conditions, therapeutic outcomes, and cost-related data from the chosen articles. The quality of each study was assessed, and a meta-analysis was conducted to synthesize findings, employing statistical software for calculations. Subgroup and sensitivity analyses were performed, where applicable, and ethical considerations, particularly if human subjects were involved, were addressed. The study acknowledged its limitations, including potential biases and data heterogeneity among the selected studies.

Results: The results of the study indicate that herbal drugs showed promise in treating various medical conditions with fewer side effects than conventional pharmaceuticals in some cases, but cost-effectiveness varied, influenced by patient preferences and condition specifics. Collaborative research and standardized regulations were emphasized for integration into mainstream healthcare, while further research was deemed necessary to validate benefits and ensure safety.

Summary & Conclusion: The Ethno pharmacological basis of various existing drugs is well established. With advancements in science and technology, the herbal medicines have also seen a transition from galenicals, pills, extracts to high end herbal capsules and other refined formulations. Inspite of meteoric rise in the sale and composition of herbal medicines around the globe, there have always been questions on the efficacy and cost effectiveness of these remedies. In this context, government regulatory bodies are required to check all safety parameters with respect to public health for home medicine use by itself.

Keywords: *Efficacy, Herbal drugs, Cost effectiveness, Remedies, Natural Products.*

PSIT/PP03/0018

Microsponges in drug delivery: Recent advancements and future prospects

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Introduction: Numerous advantages of using microsponges as an effective drug delivery system include better drug solubility, targeted delivery, and controlled release. Recent developments in drug-loading systems and microsponge production have paved the way for resolving a wide range of therapeutic challenges. These extremely porous polymeric microspheres referred to as microsponges, capable of encapsulating both hydrophilic and hydrophobic drugs, have been observed to facilitate drug loading and solubility. Their porous nature permits extended drug release, leading to reduced dose frequency and enhanced patient compliance.

Aim & Objective: The aim of this review is to explore the possible advantages and applications of microsponges in drug delivery. The additional focus is on exploring the recent developments in microsponge formulations and drug-loading techniques. The study also investigates the use of microsponges in challenging therapeutic disciplines such as cancer therapy, dermatology, and biologic delivery.

Methods: An extended literature search was carried out to collect information on microsponges as a drug delivery system. Various research articles, reviews, and patents related to microsponge formulations, drug-loading techniques, and their applications were analyzed.

Results: Microsponges possess substantial advantages in drug delivery due to their unique characteristics. They have been found to be promising across diverse therapeutic sections, including cancer therapy, dermatology, and biologics delivery. Recent progress in nanotechnology and AI-guided design has further expanded the potential of microsponges for personalized medicine.

Summary & Conclusion: The review illustrates that microsponges represent an efficient drug delivery system with enhanced drug solubility, controlled release, and targeted delivery capabilities. Their potential applications in various therapeutic fields offer centered drug distribution, minimizing off-target toxicity and improving treatment efficacy. The integration of nanotechnology and AI-guided design accelerates the development of microsponge formulations for personalized medicine, catering to individual patient needs. Altogether, microsponges promise immense contributions to revolutionizing drug delivery and advancing precision medicine.

Keywords: *Microsponges, drug delivery systems, drug solubility, controlled release, targeted delivery.*

PSIT/PP03/0019

Utilization of waste biomass as phenolic antioxidants generated from *Shorea robusta* and *Mentha arvensis*

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Introduction: Waste biomass generated from industries poses a significant challenge in terms of disposal and utilization. Extracting valuable components like polyphenols and antioxidants from this biomass can offer a sustainable solution.

Aim & Objectives: This study aims to extract and evaluate the phenolic content and antioxidant potential of waste biomass from *Shorea robusta* and *Mentha arvensis*.

Method: Solvent extraction was employed to recover polyphenols from Shorea robusta sawdust and Mentha arvensis spent leaves. Phenolic content was determined using the Folin-Ciocalteu method. Antioxidant potential was assessed through DPPH Assay, Ferric Reducing Antioxidant Power (FRAP) Assay, and Metal Chelating Assay.
Results: *Shorea robusta* sawdust exhibited the highest phenolic content and antioxidant activity. The correlation between antioxidant assays and total phenolic content indicated an interesting relationship.
Summary & Conclusion: The study highlights the potential of waste biomass as a source of valuable antioxidants, contributing to sustainable practices and reducing reliance on synthetic antioxidants.
Keywords: *Waste biomass, Polyphenols, Antioxidants, Total Phenolic Content, Antioxidant Activity*

PSIT/PP03/0021

Evaluation of antidepressant properties of *Pithecelobium dulce* seeds extract in mice model

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Introduction: *Pithecellobium dulce* belongs to Fabaceae family. It is a small to medium-sized, evergreen, spiky tree that may reach a height of 18 meters and is grown all throughout India's plains and in the Andaman Islands.
Aim and Objectives: This research focuses on pharmacological evaluation of anxiolytic and anti-depressant properties of ethanolic seeds extract of *Pithecellobium dulce* in albino mice by using diverse standard parameters.
Methods: The seeds of *Pithecellobium dulce* were obtained from the Lucknow region. The animals were maintained in proper conditions, at room temperature of 25±1°C with 12-hour light/dark cycle. Group 1: Mice were given only normal saline each day for 15 days. Mice were divided into 4 groups; Group I was administered 1% CMC, Group 2 was given Diazepam (2.5mg/kg, p. o.) for 15 days, Group 3 was given ethanolic seeds extract of *Pithecellobium dulce* (ESEPD) (200mg/kg/day, p. o.) for 15 days & Group 4 was given ethanolic seeds extract of *Pithecellobium dulce* (ESEPD) (400mg/kg, p. o.) up to 15 days. Different parameters were followed in evaluation such as elevated plus maze, forced swimming test and tail suspension test.
Results: In all the models, ESEPD significantly demonstrated anxiolytic and antidepressant potential at both the doses when compared to control.
Summary and Conclusion: In conclusion, ESEPD is significant anxiolytic and anti-depressant herbal drug.
Keywords: *Anxiolytic, antidepressant, Pithecellobium dulce, mice, Elevated Plus Maze*

PSIT/PP03/0023

Effect of aphrodisiac potential of *Withania somnifera* root of methanolic extract chronically administered on male albino rats

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Introduction: A substance (food or drug) that stimulates sexual desire is known as an aphrodisiac. Many different plants have been employed as sex stimulants in traditional medicine. Plant has produced several phytochemicals, each of which has unique pharmacologic and biological characteristics for aphrodisiac potential.

Aim & Objectives: The aphrodisiac potential of *Withania somnifera* roots in Albino rats is examined in the current study. *Withania somnifera* (Solanaceae) is a semi-woody or perennial shrub found in many tropical and subtropical nations.
Methods: The roots of *Withania somnifera* were extracted using petroleum ether, water, and ethanol in this study. Preliminary phytochemical screening revealed that the ethanolic extract contained the most phytoconstituents. On the basis of an acute toxicity investigation, the ethanolic extracts were then examined for their aphrodisiac effect in experimental rats at doses of (100, 200, and 400 mg/kg body weight). The weight of the testis and other accessory organs of albino rats were taken after the administration of ethanolic extract of *Withania Somnifera*. The other parameters observed during the study were estimation of protein, glycogen and cholesterol. Stage and ocular micrometers were used to conduct the micrometric studies. Spermatogenic components of the testies, such as spermatogonia, spermatocytes, and spermatids were determined. Sperm count is also determined in the cauda epididymis.
Results: In the current investigation, testis and accessory organ activity were enhanced by the administration of an ethanolic extract of *Withania somnifera.* Out of the three doses, the ethanolic extract at the 400 mg/kg body weight has been shown to be extremely stimulating, increasing the weight of the testis and male reproductive accessory organs. Additionally, spermatogenesis has increased as evidenced by the rise in spermatogenic components in the testis and the number of sperm in the cauda epididymis.
Summary & Conclusion: The findings of the present investigation thus indicate that ethanolic extract of *Withania somnifera* roots has strong aphrodisiac action in experimental rats.
Keywords: *Aphrodisiac, Withania somnifera, Spermatogonia, Spermatocytes, Spermatids Sperm Count, Cauda epididymis*

PSIT/PP03/0025

Analyzing DNA methylation alterations in the promoter region of genes related to breast cancer

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Introduction: The most frequently occurring cancer in women is breast cancer, which is brought on by the genetic and epigenetic alterations. It is becoming widely accepted that aberrant methylation in the promoter region of the DNA has clinical significance in breast cancer.
Aim & Objectives: The aim of the present work was to evaluate the promoter methylation status of four candidate genes (BRCA1, BRCA2, GSTP1 and MGMT) and to explore their potential use as biomarker for the detection of breast cancer.
Method: This study was conducted by forming two groups, one group comprises the tumor sample (case) and the other group had non-tumor tissue (control). The samples were obtained and processed for DNA extraction and bisulphite conversion. Pyrosequencing was then conducted to determine the methylation levels in tumor as well as non tumor tissues.
Result: In our study we observed that there is a significant difference in the methylation levels of the above-mentioned genes in tumor tissues as compared to the non tumor tissues.

Summary & Conclusion: The current findings suggested that individuals with breast cancer commonly have higher promoter methylation levels of tumor suppressor genes that leads to their lesser expression and contribute to the development of malignancy. The methylation levels may also be used as promising biomarkers for breast cancer.
Keywords: *Breast cancer, DNA methylation, Pyrosequencing, Biomarker, BRCA1, BRCA2, GSTP1, MGMT*

PSIT/PP03/0028

Antiulcer effect of *Euphorbia neriifolia* Linn. leaf extract

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Introduction: Ulcer is a common gastrointestinal disorder which is seen among many people. It is basically an inflamed break in the skin or the mucus membrane lining the alimentary tract. Ulceration occurs when there is a disturbance of the normal equilibrium caused by either enhanced aggression or diminished mucosal resistance.
Aim & Objective: Present study to evaluate the antiulcer potential of *Euphorbia neriifolia* linn. leaf extract
Methods: The 70% v/v hydro-alcoholic extract of dried leaves of *Euphorbia neriifolia* was evaluated for its antiulcer activity using two models. Models are pylorus ligation induced gastric ulcers model and ethanol induced gastric ulcer model in mice. It was found that the hydro-alcoholic extract of leaves has significant antiulcer activity in dose dependent manner where 3 different oral doses prepared (100 mg/kg of body weight, 200 mg/kg of body weight and 400 mg/kg of body weight). Evaluation was done on both models comparing with reference standard Omeprazole (20 mg/Kg/ p. o.).
Results: The compounds like sugar, tannins, flavonoids, alkaloids, 24-methylene cycloartenol, triterpennoidal and saponins were detected by usual chemical test in hydro-alcoholic extract.
Summary & Conclusion: The above result shows that Euphorbia neriifolia leaves probably contains some active ingredients that could be developed for above mentioned abnormal condition as have been claimed by traditional system of medicine.
Keywords: *Euphorbia neriifolia, gastric ulcer, ethanol, pylorus*.

PSIT/PP03/0029

Therapeutic standardization by HPTLC bioautography in stem cell based herbal preparation

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Introduction: Herbal formulations (herbal medicines or herbal remedies) are derived from plant sources and harness the therapeutic properties found in nature. Standardization of herbal formulations is essential to ensure consistent quality, safety, and efficacy. Stem cell formulations encompass various types of stem cells, including embryonic stem cells, induced pluripotent stem cells, and adult stem cells. These formulations are designed to enhance the survival, proliferation, and differentiation of stem cells, optimizing their therapeutic potential.
Aim & Objectives: To perform Therapeutic Standardization by HPTLC Bioautography in Stem Cell based Herbal Preparation
Method: HPTLC Bioautography is hyphenated technique of HPTLC to identify various pharmacological actions of compound. It can be used as

separation as well as identification of bioactive compounds having therapeutic activity. Umbilical cord derived mesenchymal stem cells are preferred because of its easy availability and high stem cell content. Proliferation of umbilical cord stem cells yields an enriched homogeneous mesenchymal stem cells revealed by surface marker expression. Firstly UC-MSC culture is prepared followed by preparation of UC-MSC preconditioned media and standard resveratrol. Using standard resveratrol and UC-MSC preconditioned media TLC plates was developed in n-hexane: ethyl acetate: methanol: formic acid in ratio 6:2:1:1. Plates examined in UV chamber at 254 nm.

Result: The Rf values of Standard Resveratrol and Stem cell formulation were identical which confirms the presence of phytoconstituents. White coloured spots against blue background were observed on HPTLC plates which were positive for both Standard Resveratrol as well as Stem cell Formulation.

Summary & Conclusion: α amylase inhibitory activity was shown by both Standard Resveratrol and Stem cell Formulation which confirms anti-diabetic activity.

Keywords: *Stem cell based herbal formulation, Anti-diabetic activity, HPTLC Bioautography.*

PSIT/PP03/0031

To investigate the antiviral, antimicrobial, hepato-protective activities of polyherbal formulation of *Phyllanthus niruri.*

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Introduction: Medicinal herbs are plants or parts of plants that possess therapeutic properties and are used to promote health, treat ailments, or alleviate symptoms. They contain bioactive compounds with potential benefits for physical, mental, or emotional well-being. The healing property of the medicinal plant can be used by converting it into a suitable dosage form. A natural treatment for numerous liver problems, including jaundice brought on by various infections, is the herbal syrup of Phullanthus amarus Schum & Thonn. It includes five herbal extracts (Phyllanthus amarus, basil leaves, amla, cinnamon, and vatch), whose combined effects aid in the treatment of liver disorders and promote health. Phyllanthus niruri extract, also known as Chanca piedra, is utilized for kidney stone prevention, liver support, and antimicrobial properties.

Aim & Objectives: To investigate the Antiviral, Antimicrobial, Hepato-protective activities of polyherbal formulation by Phullanthus amarus Schum & Thonn.

Method: The crude extract was collected and after that ethanolic extract was prepared. Finally, the final formulation of syrup was done and evaluation was performed with some parameters i.e., pH, density and viscosity.

Result: Antibacterial properties are present in the produced syrup formulation against Coagulase-positive Staphylococcus aureus.850g/disc produced the largest zone of inhibition when facing Coagulase-positive A. Staphylococcus. It passes all the physical parameters and for Formulation A (density:1.14g, pH:4.80, Viscosity:0.052c.p.); for Formulation B (density:1.07g, pH:5.63, Viscosity:1. 62c.p); for Formulation C (density:1.09g, pH:5.11, Viscosity:1.24c.p.) and suitable for treatment of various liver diseases.

Summary & Conclusion: Ayurveda is the field of medicine where Phyllanthus niruri is most frequently employed. It has various pharmacological activities as antibacterial, hepatoprotective, anti-inflammatory, antiviral, etc. The prepared herbal syrup mixture is useful for treating many livers disease conditions, including jaundice.

Keywords: *Anti inflammatory, antiviral, Antimicrobial, Hepatoprotective, Polyherbal formulation, medicinal plants, Kidneystone.*

PSIT/PP03/0034

Green synthesis of selenium nanoparticles using *Euphorbia hirta* leaf extract for biomimetic attribute

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Introduction: Selenium (Se) is a micronutrient that plays a role in several biological processes. Nano-Selenium has considerable anti-cancer activity and an apparent ability to inhibit metastasis.
Aim & Objectives: This study was aimed at optimizing the synthesis of Selenium Nanoparticles using *Euphorbia hirta* leaf extract (EH-SeNPs) and evaluate it for antioxidant, antibacterial, and anti-cancer activity.
Method: The EH-SeNPS were synthesized by reducing selenious acid with *E. hirta* leaf extract. EH-SeNPs were characterized by UV-Vis, FTIR, XRD, FE-SEM, EDAX and ICP-AES and evaluated for antioxidant activity by DPPH assay and well diffusion method for antibacterial activity. The MTT assay was employed *in-vitro* to the MCF-7 cell line to determine the anti-cancer activity.
Result: The UV spectra showed maximum absorbance at λmax 273 nm, confirming SeNP formation. FTIR validated the functional groups. The DLS, SEM, and TEM images depicted a size of 92.14 nm with PDI 0.324 and a stable Zeta potential of -25.4 mV. XRD analysis confirmed the crystallinity of EH-SeNPs. Selenium was verified in EDAX analysis (60.2 % weight) and ICP-AES 77.99±4.7 µg/mL selenium content. The IC_{50} value 43.51 ± 0.33 µg/mL indicated that the EH-SeNPs possess significant antioxidant capacity. Moreover, EH-SeNPs exhibited a broad spectrum of antibacterial activity. In addition, EH-SeNPs displayed dose-dependent anti-cancer with IC_{50} values of 56.48 ± 0.27 µg/mL.
Summary & Conclusion: Thus, experimental evidence provides insight into the successful synthesis of the SeNPs from the leaf of *E. hirta,* its potential therapeutic value, and the prospect of developing an anti-cancer formulation.
Keywords: *Green Synthesis, E. hirta*; *Selenium nanoparticles; Antioxidant; Anti-cancer*

PSIT/PP03/0035

Unleashing the Power of CART cell therapy: Advancement and challenges

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Introduction: The emergence of Chimeric Antigen Receptor (CAR) T-cell therapy has revolutionized the field of cancer treatment by harnessing the immune system's potential to target and eliminate malignancies.
Aim & Objectives: This presentation delves into the advancements and challenges that characterize CAR T-cell therapy. Through an extensive literature review and data synthesis, we highlight the remarkable progress witnessed, particularly in hematologic malignancies, where CAR T-cells have demonstrated impressive response rates and durable remissions. The integration of various CAR designs, co-stimulatory domains, and target antigens has contributed to enhanced therapeutic outcomes. However, challenges persist, encompassing cytokine release syndrome, limited efficacy in solid tumors, and manufacturing scalability. This work critically examines these obstacles and explores strategies such as

combination therapies, engineered CAR T-cells, and personalized treatment approaches that hold potential to overcome these limitations. Ethical considerations regarding patient consent, gene editing, and equitable access are also addressed, reflecting the responsible evolution of this dynamic field.

Result: The review underscores the multidisciplinary nature of CAR T-cell therapy, where collaborations between researchers, clinicians, and technological advancements converge to optimize treatment outcomes. The integration of artificial intelligence further amplifies the precision and potential of CAR T-cell therapy, propelling it toward a future of targeted and transformative cancer care.

Summary & Conclusion: This presentation serves as a comprehensive exploration of the journey to unleash the power of CAR T-cell therapy, reflecting its transformative impact on cancer treatment and patient well-being.

Keywords: *CAR T-cell therapy, cytokine release syndrome, gene editing, targeted and transformative cancer care.*

PSIT/PP03/0036

Exploring *Annona squamosa* (custard apple): Nutritional insights and therapeutic potential of leaves in disease management

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Introduction: *Annona squamosa* L. commonly referred as custard apple, cherimoya, sitaphal, sharifa is a tropical fleshy fruit belonging to *Annonaceae* family. This plant species is native to Brazil, India, Peru, West Indies, South & C. America.

Aim and Objectives: To highlight the nutritional and medicinal properties of *Annona squamosa* leaves include their antioxidant, antidiabetic, antimicrobial, antiobesity and anti-cancer effects.

Methods: The phytochemical analysis and identification of various chemical constituents of the plant parts including stems, root extracts, bark and seeds which showed the presence of hexanoic acid, octanoic acid and purines. Analysis of leaf oil through GC-MS reveal the presence of 59 compounds with notable components like β-caryophyllene, δ-cadinene, α-muurolene, α-cadinol, and isoquinoline alkaloids. Isolation of two acetogenins (annoreticuin and isoannoreticuin) from leaves showed selective cytotoxicity towards specific tumor cells.

Results: *Annona* leaves possess antioxidant, antidiabetic, antimicrobial, antiobesity, and anti-cancer properties, nutritional benefits, combating free radicals, regulating BP, enhancing digestion, boosting immunity, and displaying anti-inflammatory characteristics. Phytochemical analysis reveals the presence of various organic acids and compounds, contributing to plant's therapeutic potential.

Summary and Conclusion: *Annona squamosa*, with its wide range of nutritional and medicinal properties has been utilized as flavoring agent and additive in households and restaurants. In-vitro and in-vivo studies show promising results but further research and clinical trials is necessary to fully understand the impact of leaves extracts and other parts on human health. The multifaceted benefits of this versatile tree make it a valuable natural resource with potential for various applications.

Keywords: *cherimoya, multifaceted, acetogenins, GC-MS, food additives.*

PSIT/PP03/0037

Study of *In-vitro* hepatoprotective activity of *Alstonia scholaris*

(Saptaparna) different leaf extracts in carbon tetrachloride induced hepatotoxicity in HepG2 Cell Lines.

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Introduction: Liver diseases are a major health burden in worldwide, prompting the exploration of natural compounds with hepatoprotective properties. This study investigates the potential hepatoprotective activity of *Alstonia scholaris* (commonly known as Saptaparna) through *In-vitro* experimentation.

Aim & Objectives: The different leaves extract of *A. scholaris* were selected for *In-vitro* hepatoprotective activity.

- HepG2 cell derived from human hepatocellular carcinoma, was employed as the cellular model to simulate hepatotoxicity. Different leaf extracts of *A. scholaris*, including petroleum ether, chloroform, methanol, and aqueous extracts, were used and subjected to a series of assays to evaluate their hepatoprotective potential.

Method: The *In-vitro* assessment revealed that the extracts of *A. scholaris* demonstrated a significant reduction in CCl4-induced cytotoxicity in HepG2 cell lines. The petroleum ether, chloroform, methanol, and aqueous extracts showed different hepatoprotective effects by mitigating oxidative stress markers, including reactive oxygen species (ROS) and GSH parameters. Moreover, the aqueous extract exhibited a pronounced impact on restoring cellular antioxidant defense mechanisms, such as superoxide dismutase (SOD) and catalase (CAT) activities.

Results: Phytochemical analysis of the *A. scholaris* extracts revealed the presence of various bioactive compounds, shows hepatoprotective properties. These findings suggest that *A. scholaris* holds promise as a potential source of natural hepatoprotective agents.

Summary and Conclusion: This study highlights the hepatoprotective potential of different leaf extracts from *A. scholaris* using an *In-vitro* HepG2 cell line model of CCl4-induced hepatotoxicity. The results support the traditional use of *A. scholaris* in folk medicine for liver-related ailments.

Keywords: *Alstonia scholaris, Hepatoprotective activity, HepG2 cell lines*

PSIT/PP03/0038

Phytochemical standardization and biological evaluation of *Sesamum Indicum* for antidiuretic activity in albino rats

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Introduction: In Traditional Chinese Medicine, the sesame seed is employed as an ingredient in addition to being a crucial component in the creation of edible oils and food. Sesame seeds have bioactive substances such polyunsaturated fatty acids, phytosterols, and phenolics that are good for human health. Both in-vitro and in-vivo research has indicated that sesame seed lignans have considerable antidiuretic activity.

Aim & Objectives: In the allopathic medical system, new antidiuretics that are treat disorders including pituitary diabetes insipidus, nephrogenic diabetes insipidus, polyuria, nocturia, and bedwetting, medications must be orally active, strong, and selective. Current antidiuretic

medications include the diuretic chlorpropamides, antiepileptic carbamazepine, ADH, the counterpart of vasopressin, layperson or desmopressin.

Method: The effects of Sesame indicum Linn extracts on various groups of rats were investigated (White, Red, Black). Furosemide 20mg/kg was used to induce diuresis in all animal groups. Eight groups of six creatures each were formed from the animals (I-VIII): The groups (I) and (IV) received normal saline solution (25ml/kg), the groups (III) and (IV) vasopressin was given (3-5 milli unit), the groups (V) and (VI) received the hydroalcoholic and ethanolic extracts of red sesame, and the groups (VII) and (VIII) received the Black sesame extracts at 250 mg/kg body weight in both ethanolic and hydroalcoholic forms. Each animal received oral therapy before being put in a metabolic cage that was created to segregate urine and faeces at room temperature.

Result: Treatment of diuretic rats with extracts of black, red sesame and vasopressin increased water absorption and maintain fluid balance into the body. Sodium, potassium and chlorine estimation is justified the blood and electrolyte balance into the body.

Summary & Conclusion: The results confirm the assertion that the herb has anti-diuretic properties by showing that white, red, and black ethanol extract of sesame seeds has robust diuretic action. The current study provides additional justification for the traditional usage of Sesamum indicum Linn seeds in the management of pituitary diabetes insipidus, nephrogenic diabetes insipidus, polyuria, nocturia, and bedwetting.

Keywords: *Sesamum indicum* L., *sesamine, antidiuretic, diuretic.*

PSIT/PP03/0039

Compendious update on anxiolytics herbs: A strategic approach

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Introduction: Complementary and alternative medicines have increasingly been integrated in therapeutics due to high cost of prescribed drugs, coupled with adverse effects thereby prompted patients to seek herbal/natural remedies for the management of anxiety a psychological intervention suffered by individuals of all age's groups bringing up to level of concern and need to be managed on prior basis.

Aim and Objectives: The objective of the review was to focus on the herbs that have been reported in traditional and scientific literature to treat the condition and bypassing the detrimental effect of synthetic preparations.

Methods: Data on anti anxiety drugs including *Rosmarinus officinalis, Lavandula angustifolia, Mentha piperita* was collated and compiled from the scientific database such as Pub Med, Science Direct and from the repository available in library of Chitkara College of Pharmacy, Chitkara University, Punjab.

Result: Outcomes from different sources showed promising results in comparison to standard drugs selected for the evaluation of test herbs.

Summary & Conclusion: To sum up anxiolytic effects of herbs was significant for single as well as for polyherbals and led to conclude their further exploitation on industrial and research scale to explore for NCEs and the formulations derived there from offering the promise of an effective herbal remedy comprising rich number of biomolecules of therapeutic interest i.e., for treatment of anxiety.

Keywords: *Anti- anxiety, Medicinal plants, Herbals*

PSIT/PP03/0040

Identification of some potential antidiabetic phytochemicals in Indian classical drugs as possible inhibitors of GLP-1 agonist, SGLT2 and PPARγ for type -2 diabetes treatments through molecular docking studies, pharmacophore modelling and ADMET profiling: An in-silico study

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Introduction: Diabetes mellitus is a multifactorial condition characterised by a persistent increase in blood glucose levels. Antidiabetic medicines are currently available to treat the related diseases. Their combined consequences urge the search for an effective and safe medicine that can lower blood glucose levels while causing fewer negative effects. Several researchers are launching new initiatives to investigate plant sources, which are known to contain a diverse range of active compounds. Indian traditional medications have been utilised to treat a variety of human diseases.

Aim & objectives: Identification of some potential antidiabetic phytochemicals will be carried out in Indian classical drugs through Insilico approach with molecular docking studies, pharmacophore modelling and ADMET profiling.

Methods: The possible inhibitors of GLP-1 agonist, SGLT2 and PPAR-γfor type -2 diabetes treatments will be investigated through molecular docking studies, pharmacophore modelling and ADMET profiling. The current study sought to uncover novel plant-derived anti-diabetic chemicals in several Indian traditional medicines. The virtual screening of phytochemicals against three diabetes targets will be performed to determine antidiabetic activity.

Results: Following the discovery of drug-likeness prediction, pharmacophore modelling will be performed to better understand the anti-diabetic action of the screened compounds.

Summary & Conclusion: Docking scores, drug-likeness, and pharmacophore investigations of various phytochemical components of Indian classical medications will be used to assert that they are anti-diabetic.

Keywords: *Insilico, Antidiabetics properties, Pharmacophore modelling, Molecular docking, Virtual screening.*

PSIT/PP03/0043

Development of Polyherbal Formulation for the management of breast cancer by using prior studies.

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Introduction: Breast cancer is one of the principal causes of death among women and there is a pressing need to develop novel and effective anti-cancer agents. Natural plants products have shown promising results as anti-cancer agents.

Aim & Objective: To investigate the anti-cancer activity of different traditional herbs on the basis of prior studies.

Method: A literature search was conducted for all English language literature published. The search was conducted using electronic databases, including PUB-Med, Embase, Web of Science and Cochrane library. The search strategy included keywords such as breast cancer, anti-cancer biologically active components, herbs, clinical research, chemo-therapy drugs.

Result: The literature provides documented evidence of the chemo-

preventative and chemotherapeutic properties of Ginseng, garlic, black cohosh, turmeric, camellia sinesis, flaxseeds, and black cumin.

Summary & Conclusion: The nine herbs displayed anti-cancer properties and their outcomes and mechanisms of action include inhibition of cell proliferation, angiogenesis and apoptosis as well as modulation of key intracellular pathways. However, more clinical trials and cohort human studies should be conducted to provide key evidence of their medical benefits. On this basis the formulations have to be developed for the management of breast cancer.

Keywords: *Breast cancer, polyherbal formulation, mechanism, anti-cancer, chemotherapy.*

PSIT/PP03/0045

In-silico screening and HPTLC - MS analysis of *Ziziphus jujube* phytoconstituents for their anti-diabesity activity.

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Introduction: Diabetes and obesity are most important global health issues. Researchers have identified that, worsening of both leading to the creation of term "diabesity". Diabetes, is decreased insulin production, causes high blood sugar levels. Obesity, is an abnormal buildup of body fat, which leads to chronic diseases, including type 2 diabetes.

Aim and objective: Investigation of herbal plant for its anti-diabesity activity, including Herbal plant selection, its Extraction & Standardization, In silico studies, Development of HPTLC method, High-Resolution Mass Spectrometry of the extract.

Method: In silico screening of bioactive compounds present in *Ziziphus jujube* to identify potential anti- diabetic and anti-obesity agents. Subsequent (HPTLC-MS) analysis to identify and quantify the bioactive compounds present in extract.

Result: Total Phenolic Content was found to be 121.48 mg/ml & Total Flavonoid Content found to be 123.88 mg/ml. The sample had a significant 97.22% antioxidant activity. The top five compounds with high binding scores for 4EMA were Rutin, Betulinic acid, Mauritine D, Norbixin and Asimilobine.

Conclusion: Norbixin and Asimilobine were found to be the two main phytoconstituents after mass analysis. Their docking studies, indicates to study the plant's potential for preventing diabetes.

Keywords: Anti-diabesity, In silico screening, Ziziphus jujube, HPTLC-MS.

PSIT/PP03/0049

Exploring the anti-ulcer potential of ethanolic extract from *Cycas revoluta* leaves: Apromising alternative to conventional therapies

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Introduction: Peptic ulcer is among the most serious gastrointestinal diseases in the world. Several orthodox drugs are employed for the treatment of the disease. Although these drugs are effective, they produce many adverse effects thus limiting their use. In recent years, there has been a growing interest in alternative therapies, especially those from plants due to their

perceived relative lower side effects, ease of accessibility, and affordability. Plant medicines with ethnomedicinal use in peptic ulcer management need to be screened for their effectiveness and possible isolation of lead compounds.

Aim & Objectives: To investigate the anti- ulcer activity of ethanolic extract of leaves *Cycas revoluta*.

Methods: In albino rats, the antiulcer activity was explored using ethanol-induced and acetic acid-induced gastric ulcers model.

Results: In both models investigated, different dosages of CREE (200 mg/kg and 400 mg/kg) show significant antiulcer activity. When compared to the control group of mice, animals treated with CREE had a higher rate of antiulcer activity.

Summary and conclusion: Peptic ulcers pose significant health concerns, with conventional treatments often associated with adverse effects. This study explores the potential of *Cycas revoluta* leaf extract (CREE) as an alternative therapeutic option. Utilizing rat models for induced ulcers, the research demonstrates noteworthy anti-ulcer effects at doses of 200 mg/kg and 400 mg/kg of CREE, outperforming control groups. These findings suggest that CREE could serve as a natural remedy for peptic ulcers, offering a safer alternative to conventional treatments. However, further investigations are necessary to elucidate the specific active compounds and mechanisms underlying its effects. If substantiated by additional research, CREE could provide a valuable avenue for addressing peptic ulcers with reduced adverse effects.

Keywords: *Peptic ulcers, alternative therapy, Cycas revoluta leaf extract, anti-ulcer activity, rat models, induced ulcers, conventional treatments, adverse effects, natural remedy, dose-dependent response, potential mechanism*

PSIT/PP03/0050

Molecular Characterization of Dengue Virus Strains Isolation from Blood Samples Targeting C-prM Gene Region

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Introduction: In recent decades, the global incidence of dengue has reached 390 million infection per year. The present study is carried out to investigate the Dengue Virus (DV) serotypes during 2019 in eastern U.P region targeting the C-prM region.

Aim & Objective: The aim of present work was Detection of dengue serotype targeting C-prM gene in whole blood specimens.

Method: The whole blood specimens (EDTA blood) were selected and dengue was detected using standard rapid diagnostic test kit. The samples were obtained and processed for RNA extraction then PCR was performed and its product was purified in order to confirm the dengue virus infection. Sequencing PCR purification and Phylogenetic analysis then were conducted. The nucleotide sequences were aligned using the cluster W-Software and phylogenetic analysis.

Result: The total number of 60 blood specimens collected from dengue patient out of which 10 best specimens were selected that showed better visualization of C-prM gene on the gel. All of them were sequenced and five best sequences selected for phylogenetic analysis.

Summary & Conclusion: The study was an attempt to characterize the strain of DV

at molecular level targeting C-prM intergenic region based on sequencing and their phylogenetic analysis among the available strains of DV from the database.

Keywords: *Dengue, Sequencing, Phylogenetic Analysis.*

PSIT/PP03/0051

Development of Enteric Coated Tablets with unique combination of therapeutic and nutraceutical actives to treat Colitis

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Introduction: Ginger oil and coconut water powder are combined with the intention of creating an anti-inflammatory and electrolyte-rich source. The development and characterization of enteric-coated ginger oil tablets containing coconut water powder for the treatment of ulcerative colitis were the main goals of this study.

Aim & Objectives: Development of enteric coated tablets with unique combination of therapeutic and nutraceutical actives to treat colitis. a colitis model induced by 2,4,6-trinitrobenzene sulfonic acid was used to confirm the therapeutic activity of the chosen formulation

Method: The evaluation of both tablets included morphology, micromeritic characteristics, and Fourier transform infrared spectroscopy capabilities revealed no specific interactions between any of the ingredients, and the results supported this conclusion. At pH 1.2, 6.8, and 7.4 buffer, the dissolution profiles of coated tablets were investigated. RP-HPLC technology was used to determine the amount of gingerol present. The comparison study was done between ginger oil-only tablets and tablets containing a powdered mixture of ginger oil and coconut water. The colitis model was used to measure the colon/bodyweight ratio, myeloperoxidase, lipid peroxidase level, and histological evaluation.

Result: Due to the strong flavor and potency of ginger oil, a higher dose is not feasible to make up for metabolic loss.

Summary & Conclusion: The experimental study showed that, the formulation's additional benefit is that in addition to treating the disease condition, it fosters and supports quick recovery due to presence of coconut water powder. According to animal studies, coated ginger oil and coconut oil tablets significantly improved the diseased conditions in Wistar rats when compared to ginger oil tablets alone.

Keywords: *Ulcerative colitis, Ginger oil, Enteric coating*, *anti-inflammatory.*

PSIT/PP03/0053

Unlocking Nature's Secrets: A Comprehensive Review of Natural Anti-Aging Agents

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Introduction: The onset of aging is marked by skin deterioration affecting crucial functions like immunity, fluid balance, and defense against the environment. To counter this, safe andeffective anti-aging solutions are sought as the global population ages. Natural plant-basedanti-aging compounds have gained attention for promoting graceful aging without syntheticchemical drawbacks. The skincare industry, in

pursuit of youthful skin, explores naturalagents with anti-aging potential.

Aim & Objective: This study aims to assess various natural anti-aging agents, focusing on
their ability to enhance skin health and aesthetics. It seeks to provide a grounded evaluationof their advantages, contributing to comprehensive skincare methods.

Method: A thorough examination of the existing body of scientific literature was undertaken, with a specific emphasis on investigations delving into the utilization of natural components like botanical extracts, vitamins, antioxidants, and essential oils within the context of anti-aging skincare.

Results: The analysis of research results show various natural substances with clear anti-aging properties. Extracts like green tea polyphenols and aloe vera act as antioxidants and boost collagen. Vitamins C and E reduce fine lines and enhance skin flexibility, while essential oils improve texture and reduce oxidative stress.

Summary and Conclusion: In conclusion, integrating natural anti-aging compounds into skincare products is crucial. The study underscores their diverse benefits, from protecting skin against environmental factors to enhancing overall health. By combining scientific innovation and traditional wisdom, skincare can effectively address the growing demand for safe and reliable anti-aging solutions.

Keywords: *Natural anti-aging agents, skincare, botanical extracts, vitamins, antioxidants, essential oils, skin health, oxidative stress.*

PSIT/PP03/0055

Standardization and Evaluation of Herbo mineral Asthiposhak vati

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Introduction: Numerous people worldwide experience calcium deficiency due to inadequate calcium intake and vitamin D levels. There are several Ayurvedic and Herbo mineral supplements that can be used to address calcium insufficiency.

Aim and Objectives: To perform and establish method for evaluation of Asthiposhak Vati and its raw materials.

Method: Macroscopic examinations assessed the formulation's organoleptic characteristics. Phytoconstituent studies evaluated phytoconstituents like carbohydrates, proteins, amino acids, glycosides, alkaloids, tannins, flavonoids, and saponins. The formulation was assessed for Modern Pharmaceutical Parameter like FTIR, XRD, ICPMS, SEM, Zeta potential and IPQC tests. The proposed HPTLC method for estimation of Quercetin and Berberine from Asthiposhak Vati was validated as per ICH guidelines Q2 (R1) by performing Linearity, LOD, LOQ, Accuracy, Robustness Specificity Interday & Intraday precision.

Result: Particle Size and Zeta potential of Asthiposhak Vati, indicated good therapeutic action moderate colloidal stability. FTIR spectra and XRD examination revealed the presence of calcite (Calcium Carbonate). Inductively couple plasma mass spectrometry (ICPMS) confirmed the presence of various heavy metals. HPTLC results confirmed that sample contained considerable amount of Quercetin (Rf-0.74) and Berberine (Rf- 0.81). Correlation coefficient value of 0.999 for Quercetin 0.995 for Berberine was obtained.

Summary and Conclusion: The validated method can be used to establish guideline for the preparation, qualitative evaluation, and quantitative evaluation of Asthiposhak Vati (Tablet), enabling us to achieve the optimal levels of efficacy, quality, and quantity of the finished product. The current findings from this study could serve as a guide for next investigations.

Keywords: *Asthiposhak Vati, Calcium Deficiency, Herbo mineral.*

PSIT/PP03/0056

Primary processing, value addition and storage practices of medicinal plants

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Introduction: Natural products, crude drug extracts and pure compounds have been derived from higher plants and their sources. All the medicinal preparations can be said to be based on these raw materials.
Aim and Objectives: To increase value of traditional medicines among practitioners of modern medicines; and hence market value of herbs and herbal products is also seen significantly increased.
Methods: Primary processing of medicinal plants for experimental purposes is an initial step. The techniques include extraction and determination of quality and quantity of bioactive constituents. The steps involved in selecting quality bioactive molecules are selection of an appropriate solvent for extraction method, phytochemical screening procedures, fractionation methods and identification techniques. Extraction procedures include maceration, soxhlation, supercritical fluid extraction etc. Fractionation and purification are achieved by techniques like GC, HPLC, TLC etc.
Result: Several methods can be used to increase the shelf life of medicinal plants, such as refrigeration and freezing; these things can help to extend the shelf life of the medicinal preparations.
Summary and conclusion: All medicinal plant materials need to be protected from deterioration, decomposition as well as from insects, rodents, and other pests and also from livestock and other domestic animals. Therefore, considering all these aspects there is a necessity for monitoring of primary processing, preparation and cultivation of medicinal plants.

Keywords: *medicinal plants, herbs primary processing, extraction methods, storage practices*

PSIT/PP03/0057

Development and assessment of topical formulations from components of herbal and marine origin

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Introduction: Musculoskeletal conditions are the second largest contributor to disability worldwide, low back pain being the single leading cause of disability. Musculoskeletal conditions are not just conditions of older age, they are relevant across the life course.
Aim & Objective: To development and evaluate the topical formulation from components of herbal and marine origin and considering their novel formulation aspect to control pain, minimize joint damage, and improve or maintain function and quality of life.
Method: Development of topical formulations from the extracts of Vitex Negundo in combination with isolated Chitin. As Vitex negundo is being used as a topical application in MSD but in combination with Chondroitin sulphate it enhances the production of cartilage.
Results: The isolated phytoconstituents were found to possess great antirheumatic activity andformulation (TDDS and Taila) prepared in present study were fully standardized and found to be stable.
Summary and Conclusion: The study revealed that transdermal patch have been prepared for lyophilized aqueous extract of Vitex negundo in combination with isolated excipients from Crab and Lobster

by using solvent casting or evaporation method. The current project involved a multidisciplinary approach consisting of Pharmacognostic Approach, Phytochemistry Formulation and Quality Assurance Technique Approach and Analytical Chemistry Approach.

Keywords: *Musculoskeletal Disease, Vitex negundo, Chondroitin sulphate, TDDS*

PSIT/PP03/0058

Formulation and Evalution of Herbal Anti-Aging Cream

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Introduction: Antioxidants used topically may be helpful for shielding the skin from external influences. In the current environment, antioxidant compounds have gained relevance as a crucial component in skin care products like creams and lotions. The global market for herbal preparations is expanding, and plants have been identified as having potent anti-microbial, antioxidant, and anti-inflammatory properties.

Aim & Objectives: Preparing and formulating a herbal anti-aging cream with an emphasis on safety and efficacy is the goal of the current study. Its physicochemical qualities will also be evaluated.

Material and Method: The seeds were dried for three hours and extraction process was carried in Hexane using Soxhlet apparatus after 8 hours the seed oils were extracted from hexane using a rotating vacuum evaporator and dried at 60°C. Oil-in-water (O/W) emulsion base cream was formulated. After heating, the aqueous phase was gradually added to the oil phase while the wax and oil mixture was constantly stirred until smooth cream forms.

Result: The evaluation criteria were listed beneath the results, including the viscosity and phase separation tests, spreadability, homogenicity, accelerated stability test, test for microbial growth, washability, and physical evaluation of the herbal cream.

Summary & Conclusion: The major goals of this inquiry were to create a stable and functionally effective cream and to assess the generated cream's product performance. According to the research, the base of the cream and the extracts are more stable and safer together, which may have a synergistic effect.

Keywords: *Herbal cream, anti-aging, antioxidant, cosmetics, carica papaya*

PSIT/PP03/0060

Development of herbocosmeceuticals for hair care effective against environmental pollutants and changing lifestyle

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Introduction: It is known since from many centuries that hair & skin well-being correlates with physical, social and mental well functions. Hair & skin care by itself can induce a state of self-confidence and may reflect social status. Hair –skin care and psyche reciprotaclely reflect each other.

Aim & Objectives: Nowadays we have to work on increased environmental pollutants like air pollution in UVR/UVA, polycyclic achromatic hydrocarbons, volatile organic compound, (NOx), particulate matter (PM) and cigarette smoke and water pollutants in industrial wastewater and domestic savage include heavy metals (Hg, Cd, Cr, Pb, Zn etc) and non -heavy metals (As, CN, F, S, Se, etc.), and microorganism (enteric pathogenic bacterium, virus, parasites, etc.) are becoming major damaging factor. Similarly, excessive stress, disturbed sleep,

chlorinated water, mobile phone radiation, imbalanced diet-nutrition, and other related life style factors are also found to be responsible for skin and hair related problems.

Methods: Therefore, qualitative research was performed among the intellectual of Maharana Pratap campus, Kanpur (n=200) to collect qualitative data related to hair and skin care. Study revealed that people are suffering with problems of hair.

Result: The hair fall was found to be major problem irrespective of gender and majority of intellectuals would like to prefer herbal products for their hair and skin care. So, authors have developed a herbocosmecetical products for better and effective care of hair.

Summary & Conclusion: Further, it should be noted that herbs are the part of nature and their therapeutic constituents are also dependent on their surrounding environment, so for optimum therapeutic benefit there is great need to conserve our environment.

Keyword: *Herbocosmeceutical, environmental pollutants, lifestyle, hair care.*

PSIT/PP03/0061

Optimization of HPLC Conditions for Qualification of Quetiapine Fumarate and Its Validation through Various Validation Parameters

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Introduction: Chromatography, although primarily a separation technique, is mostly employed in chemical analysis. In which High-performance liquid chromatography (HPLC) is an extremely versatile technique where analytes are separated by passage through a column packed with micrometer-sized particles. Now a day reversed-phase chromatography is the most commonly used separation technique in HPLC. The reasons for this include the simplicity, versatility, and scope of the reversed-phase method as it is able to handle compounds of a diverse polarity and molecular mass.

Aim & Objectives: The present study mainly focuses on the optimization of HPLC conditions and other important perspectives during method development and validation of Quetiapine fumarate.

Method: The Agilent Technologies 1200 Series apparatus (Santa Clara, CA, USA) with PDA detector was used for the HPLC analysis. For monitoring of chromatographic system and data acquisition, the Agilent Chem Station program was used. Reversed phase HPLC mode having stationary phase with C 18 bonded phase i.e., Zorbax XDB C-18, 150 mm x 4.6 mm, 5.0 mm was selected. After assessing the solubility of drug in different solvents as well in mobile phases; ACN: Methanol: Buffer (27.5:27.5:45.0) was selected as mobile phase. Flow Rate was 1.2 mL/min with Injection volume of 20 µL. Column temperature was 40 o C at 250 nm detection wavelength and 20 mins run time.

Results: Satisfactory resolution was obtained at 8.9 mins retention time with the above conditions of HPLC method which were validated by various validation parameters such as Linearity, Accuracy, Specificity, Precision, Robustness and System suitability parameters.

Summary and Conclusion: The developed RP-HPLC method was simple, sensitive, precise and accurate hence can be used in routine for the determination of Quetiapine fumarate in bulk and in pharmaceutical dosage form.

Keywords: *Quetiapine fumarate, Method development, Method validation, Linearity, Accuracy, Specificity, Precision.*

PSIT/PP03/0062

The Pivotal Roles of Herbs and Nutritional Supplements in Managing Polycystic Ovary Syndrome (PCOS): A Review

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Introduction: Polycystic ovary syndrome (PCOS) or stein-Leventhal syndrome or Hyperandrogenic anovulation is metabolic and endocrine disorder which affect women at reproductive age at 18 to 35 years. This disease is having physical and mental effects om wellbeing of the individual. The disease is associated with various co-morbidity if left untreated. The main factors which play significant role in PCOS development includes increased insulin levels, hypothalamic-pituitary dysfunction and ovarian dysfunction. It is one of the most common hormonal problems in young women.

Aim & Objective: To study the several herbs and nutritional supplements used for the management of polycystic ovary syndrome. The review is to understand the natural plants and nutritional supplements available for the treatment of the disease naturally.

Method: In this study we collect data by using search engines like PubMed, Wiley, Elsevier, Scopus, science direct, research gate and google scholar database from 1990-2023 database.

Results: The natural herbs and nutritional supplements used for the treatment of PCOS did not have any side effects and treated the diseased condition naturally. The herbs can be used individually or can be used in combination with nutritional supplements.

Summary & Conclusion: The review has a mention of few herbs and nutritional supplements which can be used to correct the diseased condition. The various herbs have positive effect on the diseased condition and can be used to cure symptoms like hypothyroidism, hyperplasia, obesity, diabetes, Menorrhagia, sleep disturbances, cardiovascular problems, hyperlipidemia, hirsutism, infertility, irregular menstrual cycle, etc.

Keywords: *Polycystic ovarian syndrome, menopause, hypothalamic pituitary dysfunction, nutrition, natural herbs, nutraceuticals.*

PSIT/PP04/0001

Standardization and pharmacological assessment of *Ziziphus mauritiana* extract for the sedative and anticonvulsant

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Introduction: *Ziziphus mauritiana,* sometimes called Indian jujube or ber, belongs to the Rhamnaceae group of plants. Activities that are analgesics, anti-inflammatory, and anti-pyretic Strong painkiller, anti-inflammatory, and anti-emetic effects of aqueous and ethanolic preparations from *Ziziphus mauritiana* were observed.

Aim & Objectives: To investigate the sedative and anticonvulsant activities of *Ziziphus mauritiana* extract by administering oral doses (200 and 400 mg/kg body weight).

Methods: The leaves are extracted with ethanol and lukewarm water with soxhlet apparatus for 72 hours. After that acute oral toxicity study was performed and then locomotor activity, pentobarbital-induced sleeping time and anticonvulsant activity were performed with the extract.

Results: Oral administration of the extract at doses of 200 & 400 mg/kg was employed after an immediate toxicity test. The number of locomotion was decreased, HAEZM at a dose of 400 mg/kg significantly lengthened the period of time spent sleeping and showed a dose-dependent reduction in all phases of an epileptic episode.

Summary & Conclusion: In this study, the extract reduced locomotor activity, however, had a superior profile for an antiepileptic action than diazepam since it decreased locomotor activity to a lesser level. The considerable increase in pentobarbitone sleep hours with the extracts at a higher dose supported the sedative action of *Z. mauritiana*.

Keywords: *Anticonvulsant, Sedative, Ziziphus mauritiana, Actophotometer, Pentobarbital.*

PSIT/PP04/0002

Combination therapy of a novel PHD-2 activator and tirapazamine for Breast cancer chemoprevention

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Introduction: Solid tumours depend on PHD-2 suppression in normoxic and hypoxic cells. PHD-2 inhibition promotes HIF-1α and NF-κB-mediated tumour cell proliferation and adaptation. Therefore, PHD-2 activation could be an effective strategy for cancer chemoprevention.

Aim & Objectives: 1) To screen possible inducers of PHD-2 using virtual screening tools.
2) To determine PHD-2 activation potential through 2-oxoglutarate assay.
3) To test the anticancer effectiveness of screened compound against MCF-7 cells *in-vitro* and DMBA-induced mammary gland carcinoma *in-vivo*.

Methods: 4342 compounds were tested for structural similarity with the PHD-2 activator scaffold R59949. DAPI, AO/EB, and JC-1 staining on MCF-7 cells assessed the compound's apoptotic potential. In-vivo study, administered DMBA followed by screened compound alone and with tirapazamine (TPZ). Histopathology and carmine staining examined animal tissue morphology. Biochemical changes and alterations in protein expression were observed in tissue extracts. Serum metabolomics was examined using 1H NMR.

Results: BBAP-6 IC50 concentrations caused MCF-7 cell apoptosis. In DMBA-treated rats, BBAP-6 decreased oxidative stress and normalised mammary gland

architecture. BBAP-6 therapy elevated PHD-2 and pro-apoptotic proteins and decreased NF-κB and anti-apoptotic proteins. 1H NMR-based serum metabolomics revealed that BBAP-6 reduced hypoxia-induced metabolic alteration.

Summary & Conclusion: BBAP-6 activates PHD-2 and possesses anticancer activity both alone as well as in combination with PHD-2.

Keywords: *PHD-2 activator, MCF-7, breast cancer, DMBA, Hypoxia.*

PSIT/PP04/0003

Antiproliferative effect of 5H-benzo[h]thiazolo[2,3-b] quinazoline analogues on IL-6 mediated STAT3 and the role of the apoptotic pathway against urethane induced lung carcinoma in albino wistar rats

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Introduction: Lung cancer (LC) is the world's leading cause of mortality. Small-cell lung cancer (SCLC) and non-small-cell lung cancer (NSCLC) are the two types of LC, representing 15% and 85% of all LC cases, respectively.

Aim & Objectives: To explore the underlying mechanism of anti-tumor action of newly synthesized 5H-benzo[h]thiazolo[2,3-b] quinazoline analogues against urethane-induced lung carcinoma.

Methods: Animals were randomly divided into five groups (Normal Control, Carcinogen Control, Positive Control, Treatment I, and Treatment II). LC is induced in albino Wistar rats by i.p. injection of urethane (Ethyl Carbamate). After urethane administration, 5-FU and the synthetic analogues were given. The in-vivo anticancer potential, a molecular study of various parameters, and the metabolic study of synthesized compounds were observed.

Results: The present research work revealed that oral administration of the synthetic analogues of 5H-benzo[h]thiazolo[2,3-b] quinazoline normalized various physiological, morphological, and enzymatic parameters in carcinogen-treated animals. Lung tissue samples and serum samples were used for biochemical estimations. Moreover, synthetic analogues of 5H-benzo[h]thiazolo[2,3-b] quinazoline exerted their effect through the inhibition of IL-6, STAT3, and oxidative stress. Immunoblot assay, western blotting, and Nuclear Magnetic Resonance (NMR)-based metabolic assessment of lung tissues of normal control, carcinogen control, and drug-treated rats revealed significant results.

Summary & Conclusion: The experimental study showed that the anti-neoplastic potential of synthetic analogues is due to their anti-inflammatory and antioxidant properties. Thus, we postulated that synthesized compounds might be used as a novel treatment option for LC in an in-vivo study.

Keywords: *Lung cancer, 5H-benzo[h]thiazolo [2,3-b] quinazoline, Urethane, Interleukins, STAT3.*

PSIT/PP04/0005

CRISPR/Cas9 gene editing: A new hope for Alzheimer's Disease (AD)

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Introduction: Alzheimer's Disease (AD) presents a significant burden to global health, with current treatment options offering limited effectiveness due to the disease's multifaceted and progressive nature. The advent of CRISPR/Cas9 gene-editing technology has opened a novel realm of potential therapeutic approaches,

transforming our ability to manipulate genetic sequences.

Aim & Objectives: This review article critically explores the potential role of the CRISPR/Cas9 technique to combat AD. Our central objective is to illuminate the applications, challenges, and future perspectives of utilizing this revolutionary gene-editing system to mitigate AD progression or possibly reverse course.

Methods: A systematic assessment of current primary literature examining the use of CRISPR/Cas9 in the context of AD was conducted. Studies were selected based on their design, quality, and relevance to the objectives.

Results: Preliminary results indicate the promising potential of CRISPR/Cas9 in AD models, notably in the arrangement of pathogenic genes associated with AD such as the amyloid precursor protein (APP) and Presenilin 1 (PS1). The ability to directly and precisely target these genes offers possibilities for minimizing pathological developments and potentially halting disease progression.

Summary & Conclusion: The CRISPR/Cas9 gene-editing framework signifies a transformative progression in the journey toward definitive therapeutic solutions for AD. However, its transition from bench to bedside necessitates further study, addressing issues surrounding safety, delivery, off-target effects, and the ethical implications of human genome editing. Regardless, CRISPR/Cas9 offers a promising beacon of hope, projecting a future.

Keywords: *Alzheimer's disease, CRISPR/Cas9, gene editing, amyloid-beta, tau, neurogenesis, therapeutic approaches.*

PSIT/PP04/0006

Technology development and its influence on assessment of parkinson's disease

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Introduction: Parkinson's disease (PD) is a neurological disorder with complicated and disabling motor and non-motor symptoms. Smart technologies, such as wearable sensors and optical motion capturing systems, have been used to analyse the symptoms of a PD patient to assess their disease progression and even to detect signs in their nascent stage for early diagnosis of PD.

Aim & Objectives: This review focuses on the use of modern equipment for PD applications that were developed in the last decade. Four significant fields of research were identified: Assistance to Diagnosis, Prognosis or Monitoring of Symptoms and their Severity, Predicting Response to Treatment, and Assistance to Therapy or Rehabilitation.

Methods: This study reviews the papers published between January 2008 and December 2018 in the following four databases: PubMed Central, Science Direct, IEEE Xplore and MDPI. After removing unrelated articles, ones published in languages other than English, duplicate entries and other articles that did not fulfil the selection criteria, 778 papers were manually investigated and included in this review.

Results: A general overview of PD applications, devices used and aspects monitored for PD management is provided in this systematic review and further the review explained the easiness of existed equipment's and futuristic technology introduced for prediction and characterisation of disease state.

Summary & Conclusion: this study concludes the best use of modern technology with advantages and disadvantages. The existing use of wearable sensors and optical motion capturing systems, for PD patient to assess their disease progression is much advance technique and further research needs to be done with accessibility and prediction measurement.

Keywords: *Parkinson's disease, technology development, rigidity, bradykinesia, hyperkinesia.*

PSIT/PP04/0008

Pneumonoul tramicroscopic silico volcanokoniosis: A review

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Introduction: Pneumonoul tramicroscopic silico volcano koniosis is a complex and lingo writing term that refers to a lung complaint caused by the inhalation of fine silica dust patches characterised by the accumulation of crystalline silica in the lungs.
Aim & Objectives: To provide a comprehensive understanding of disease and to assess the current treatment options available for patients.
Methods: Method of assessing & diagnosing involve a combination of medical history, clinical examination, imaging studies & lung function tests. Chronic inflammation leads to the formation of fibrous scar tissue, impairing lung function and reducing the affected individual's ability to breathe properly Symptoms include persistent coughing, shortness of breath, fatigue, chest pain & respiratory infections.
Results: Treatment options for this incurable condition primarily focus on managing symptoms, preventing further exposure to silica dust, addressing complications such as respiratory infections and lung function decline.
Summary & Conclusion: Pneumonoul tramicroscopic silico volcanokoniosis **(**Black Lung disease) can develop over time due to prolonged exposure to dust particles, so prevention is key in avoiding this lung disease. The effectiveness of treatments may vary depending on the stage and severity of the disease. Treatment available is not capable of reversing the lung lesions caused by silicosis or stopping its progression.

Keywords: *Crystalline silica, Pneumonoultramicroscopicsilicovolcanoconiosis, Black Lung Disease*

PSIT/PP04/0010

Phytochemical, pharmacological evaluation of *Sapindus emarginatus* Vahl. bark extract for hepatoprotective activity

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Introduction: The *Sapindus emarginatus* Vahl. (Sapindaceae) is an important medicinal plant used in indigenous system of medicine i.e., Ayurveda, Siddha and Unani.
Aim & Objectives: To evaluate the hepatoprotective activity of *S. emarginatus* Vahl. bark extracts against Paracetamol induced hepatotoxicity.
Methods: Hepatotoxicity was induced in Wistar rats by oral of Paracetamol (2000 mg/kg/day for 10 days). Ethanol and aqueous extracts of *S. emarginatus* Vahl. bark were administered to the experimental rats by oral (200 mg/kg/day, for 10 days) and compare with silymarin (50 mg/kg/day, p.o. for 10 days). The hepatoprotective effect of these extracts was evaluated by the blood serum parameters and histopathology of liver. Statistical analysis was performed by using one-way ANOVA followed by Dunnett's test.
Results: In ethanol and water extracts treated animals, the toxic effect of paracetamol was controlled significantly by restoration of the levels of SGPT, SGOT, total & direct bilirubin, alkaline phosphate, triglycerides, cholesterol as compared to the normal and the standard drug silymarin treated groups. Histology of the liver sections of the animals treated with the extracts showed the presence of normal hepatic texture with absence of

necrosis and fatty infiltration, which further evidenced the hepatoprotective activity.

Summary & Conclusion: Present study of Ethanol & water extract of the bark of *S. emarginatus* Vahl. possesses significant hepatoprotective activity.

Keywords: *Hepatoprotective, Paracetamol, Sapindus emarginatus Vahl., Silymarin.*

PSIT/PP04/0011

Exploring the potential therapeutic effects of chamomile-derived compounds in managing endometriosis-associated pain: A novel approach utilizing candy-based delivery systems.

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Introduction: Endometriosis, a chronic condition that causes pelvic pain, places a heavy load on those who are affected. This study investigates the potential of chemicals produced from chamomile to treat pain brought on by endometriosis.

Aim & Objectives: This review paper aims to comprehensively analyze the potential therapeutic effects of chamomile in managing various health conditions by summarizing its chemical composition, evaluating its efficacy in specific conditions, and identifying gaps in the existing research to propose future directions for further investigation.

Methods: This study is a thorough review of the last twenty years' worth of English literature with a particular emphasis on endometriosis therapies. Our goal was to compile the appropriate research in this area given the increased interest in natural therapy for this gynecological problem and its effects on public health. We considered studies that particularly looked at herbal and photochemical treatments for endometriosis and their mechanisms of action.

Results: Chamomile is known for its soothing properties and potential health benefits. It has been traditionally used to promote relaxation, reduce stress, and aid in sleep. Some studies suggest that chamomile may have anti-inflammatory and antioxidant effects, which could potentially provide relief for symptoms associated with certain conditions.

Summary & Conclusion: In conclusion, chamomile holds potential as a complementary approach for managing symptoms of endometriosis. Its anti-inflammatory, pain-relieving, calming, and hormonal-balancing properties may offer relief and improve overall well-being. However, further research is required to establish its effectiveness.

Keywords: *Chamomile, Endometriosis, Symptoms, Pelvic pain, Therapeutic effects, Mechanisms of action, Anti-inflammatory; Antioxidant effects.*

PSIT-PP04-0012

Spinocerebellar Ataxia: Genetic Basis Clinical Features, and Management Strategies

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Introduction: A category of hereditary neurodegenerative illnesses known as spinocerebellar ataxia (SCA) is characterized by increasing cerebellar impairment and poor motor coordination. It is brought on by genetic abnormalities that impact several genes and induce neuronal degeneration, mostly in the brain's cerebellum and its pathways. SCA can appear with a variety of clinical signs, such as speech impairment, tremors, and gait problems, which place a heavy burden on those who are affected.

Aim and Objective: The aim of this work is to provide a thorough overview of the genetic underpinnings, clinical

heterogeneity, and pathophysiology mechanisms of spinocerebellar ataxia. The objective of the study is to combine previous studies to offer insights into new therapy paths and improve diagnostic procedures for this complicated condition.

Method: A thorough assessment of the literature was carried out by compiling relevant articles from online databases. Studies emphasizing the genetic causes of SCA, clinical manifestations, neuroimaging outcomes, and experimental models all fulfilled the inclusion criteria. To summarize the main conclusions and pinpoint knowledge gaps, a thorough study of these sources was carried out.

Results: The review focused emphasis on the genetic wide range of SCA, which has many causal genes and various clinical subtypes. The range of clinical symptoms, from simply cerebellar to multisystemic, was observed. Cerebellar and brainstem atrophy have been consistently observed in neuroimaging investigations. The degeneration of neurons has several proposed processes, including protein misfolding, mitochondrial malfunction, and disturbances in calcium homeostasis.

Summary & Conclusion: A complex set of neurological disorders that have many genetic causes and clinical manifestations is known as spinocerebellar ataxia. The necessity for specialized diagnostic and treatment approaches is highlighted by the confluence of genetic knowledge and clinical observations. To identify potential targets for disease-modifying therapies, more investigation into the molecular pathways causing neuronal degeneration is needed. In addition to improving our understanding of cerebellar pathology, advances in the study of SCA also provide a paradigm for studying other neurodegenerative diseases.

Keywords: *Spinocerebellar Ataxia, Neurodegenerative Disorders, Genetic Diversity, Clinical Variability, Therapeutic Avenues*

PSIT/PP04/0013

Preventive effect of flax seed oil on cataract induced by naphthalene on rats

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Introduction: Cataract is an amyloid disease because assembling and precipitation of proteins from the normally clear soluble lens result in opacification and cataract. Cataract is a painless clouding appearance on the internal lens of our eye. Cataract mostly happens in aged people & those have metabolic disorder, but nowadays children and young people are affected due to digital lifestyle.

Aim & Objectives: To investigate preventive effect of flax seed oil on naphthalene induced cataract.

Method: Animals were divided in to five groups, six animals in each group. Group I considered as normal control. Group II is negative control received 10% naphthalene solution 0.5 ml/kg/day (p.o) for 3days & 1ml/kg/day thereafter. Group III- received naphthalene 1ml/kg + standard drug vitamin E 5ml/ kg p.o. Group IV received naphthalene + (Flax seed oil 1.5ml/kg p.o.) Group V- received naphthalene + (Flax seed oil 3ml/kg p.o.) Estimation of catalase and lipid peroxidation (LPO) was observed.

Results: In this study naphthalene induced cataract were observed for catalase and LPO parameters in flax seed oil treated groups. Group IV (0.421) and group V (0.479) has been shown with respect to control group. The standard treatments were found that (0.254). The treatment significantly ($p< 0.001$) lowered the elevated level of group II (0.685).

Summary & Conclusion: The experimental study showed that due to anti oxidant property, the dose of flax seed oil (3ml/kg) group V, were more affected than the test (1.5ml/kg) group IV.

Keywords: *Flax seed oil, naphthalene, anti cataract, catalase, lipid peroxidase.*

PSIT/PP04/0017

Anti-*Candidal* activity of leaves extract of *Passiflora foetida* Linn.

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Introduction: *Candida* species is one of the major fungi causing vaginal infection. It has increasingly deserved a special attention among the medical community. In spite of the presence of *Candida* species as a human commensal, alarming rates of local and systemic infections have been observed, varying from moderate to severe impact.
Aim and Objectives: The present work aims to investigate the anti-*candida* activity of pet. ether, chloroform, ethanol and aqueous extract of *Passiflora foetida* Linn. leaves.
Methods: The re-cultured fungal strains were used for antifungal evaluation. The strains were streak on the Mueller Hinton media and the drug entrapped patches were placed. For negative control disc of distilled water and for positive control amphotericin B disc (10 µg) were used. The petri plates were kept in incubator for 24 hrs. After 24 hrs the petri-plates were checked for zone of inhibition. The results obtained were compared with standard anti-fungal drugs amphotericin B.
Result: The zone of inhibition of petroleum ether, chloroform, ethanolic and aqueous extract on *Candida albicans* were presented in table 1. Results indicate (Graph 1) that all the selected extracts have significant anti-*candida* activity when compared with standard drug amphotericin B.
Summary & Conclusion: Further studies need to be established to deepen knowledge on this area, namely, focused on clinical trials to provide safer and more effective anti-fungal than the current ones.

Keywords: *Anti-Candida activity, Vaginal infection, Fungal infection, Passiflora foetida Linn.*

PSIT/PP04/0018

Investigation of anxiolytic activity of various extract of aerial parts of *Sarcostemma acidum* (Roxb.) voight

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Introduction: *Sarcostemma acidum* commonly known as somlata belongs to the family Asclepiadacea grown in India, Europe and US is an underutilized crop. The herb is highly uses by the rural and tribal people in curing various disorders such as asthma, swelling, fever and cold, dyspepsia, inflammatory infection, gastric problems and as rejuvenating.
Aim and Objectives: There is a great need to conserve these medicinal plants because they contain highly bioactive components which can be developed into pharmacologically active agents. The present study was aimed to investigate anxiolytic property of hydro-alcoholic extracts of roots of *Sarcostemma acidum*.
Methods: The anxiolytic activity was evaluated with the adult mice by the light–dark box test, and motor coordination with the rota rod test. The efficacy of the root extract at the dose of 200 and 400 mg/kg was compared with the standard anxiolytic drug diazepam (1 mg/kg i.p.)
Results: The results indicate that extract increased the time spent in the brightly-lit chamber of the light/dark box, as well as in the number of times the animal crossed from one compartment to the other.
Summary & Conclusion: The data obtained in the results showed that, the selected plant exhibit significant anxiolytic activity.
Keyword: *Sarcostemma acidum, Diazepam, Anxiolytic Activity*

PSIT/PP04/0019

Evaluation of blood samples of chronic users of pesticides in vegetables and their health risk assessment in uttar-pradesh

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Introduction: In recent years the use of pesticides increased in vegetables which leads to acute and chronic effects on short- and long-term exposure. Pesticides have become integral part of villagers in whole India including Uttar-Pradesh. Health risk was assessed in farmers categorised on the basis of uses and age.

Aim & Objectives: Pesticides are responsible for various incidences of cancer and other diseases worldwide. Its main aim is to carry out scientific studies to create public awareness about effect of Pesticides on vegetables and human health risks.

Methods: Monitoring of Pesticide effect on Vegetables and Human Health Risk in Uttar Pradesh, training and awareness programmes for farmers which were using Pesticides on vegetable crops. More than 140 pesticides user farmers with age (18-55 years) participated in study, Blood samples of farmers were taken for estimation of various parameters.

Results: Farmers blood profile were observed with significant changes in their LFT, KFT, Thyroid, vitamin-D, CRP and electrolytes values. Farmers have some observational changes in their behaviour as they have numbness, tingling sensation and lack of coordination, dizziness etc. Results were observed more significantly in users of pesticides from long duration.

Summary & Conclusion: It can be concluded from this study that pesticide residue on long term exposure creates so many changes as per their exposure of Pesticides in exposed and unexposed populations.

Keywords: *Pesticides, Acute toxicity, Chronic toxicity, Allergic reactions, LFT, Vitamin-D, KFT*

PSIT/PP04/0020

Preclinical evaluation of empagliflozin on nootropic and scopolamine-induced anti-amnesic model of alzheimer's like conditions in rat's

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Introduction: Alzheimer's disease (AD) is a severe neurodegenerative disorder with memory and cognitive decline. India experiences a considerable dementia burden, expected to rise significantly. SGLT2 inhibitors, known for diabetes treatment, it shows therapeutic potential against neurodegenerative disorders due to their ability to cross the blood-brain barrier and enhance brain function.

Aims and Objectives: This study explores the nootropic and anti-amnesic effects of Empagliflozin (EMP) by modulating cholinergic like M1 and NMDA receptor

pathways with the application of molecular docking.

Materials and Methods: Healthy wistar rats either sex was randomly selected for two models: Nootropic and Scopolamine-induced anti-amnesic, where animals treated once daily treatment with an EMP (5 and 10 mg/kg, i.p.) and donepezil (2.5 mg/kg, p.o.) for 26 days. During the final 13 days of treatment, a daily injection of scopolamine (1 mg/kg, i.p.) was used to induce cognitive deficits. Besides that, behavioral analysis was carried out to assess learning and memory functions by using NOR, Y-maze and MWM test in animals.

Results: EMP demonstrated significant improvement of spatial memory in Morris water maze, as indicated by reduced escape latency and increased time spent in the target quadrant and zone crossings through NOR and Y-maze. This experimental data showed significant remarks on improvement in memory function. Furthermore, biochemical analysis revealed its antioxidant potential to reverse memory impairment by restoration of glutathione levels, reduction of lipid peroxidation whereas increase in catalase level. Histopathological examination revealed neuron regeneration in the brain. Molecular docking studies supported EMP's binding affinity with M1 muscarinic and NMDA receptors.

Summary and Conclusion: This study suggest that Empagliflozin exhibited nootropic effect along with potential against Alzheimer's disease by improving memory function, which might be regulated via cholinergic and glutamatergic pathway by interactions with M1 and NMDA receptor.

Keywords: *Alzheimer's disease, Molecular docking, Empagliflozin, Nootropic, Scopolamine, Anti-amnesic, M1 muscarinic.*

PSIT/PP04/0021

Confronting antibiotic resistance: Advancements in treatment and prevention strategies

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Introduction: Antibiotic resistance poses a critical challenge to modern healthcare. This abstract provides a concise overview of strategies for addressing antibiotic resistance in treatment and prevention.

Aim & Objectives: In the realm of treatment, innovative approaches include the development of new antibiotics, combination therapies, and phage therapy, offering promising solutions against resistant infections. Repurposing existing drugs and leveraging technologies like CRISPR-Cas systems also show potential.

Methods: Preventive measures play a vital role in mitigating resistance spread. Public awareness campaigns promoting responsible antibiotic use, coupled with stricter prescription practices, have yielded positive outcomes.

Results: Robust infection prevention and control protocols in healthcare settings are pivotal to limiting the propagation of resistant pathogens.

Summary and Conclusion: This abstract emphasizes the urgency of the antibiotic resistance crisis and underscores the need for a comprehensive global response. Continued research, inventive treatment strategies, and holistic preventive actions are crucial to preserving antibiotic efficacy and ensuring effective medical interventions against bacterial infections. A unified approach, encompassing medical, societal, and regulatory aspects, is indispensable to combat antibiotic resistance and uphold public health.

Keywords: *antibiotic resistance, treatment strategies, preventive measures, new antibiotics, phage therapy, responsible use, infection control*

PSIT/PP04/0026

Predicting cardiovascular risk factors from retinal images using deep learning

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Introduction: Retinal images have been used to predict cardiovascular risk factors such as smoking status, blood pressure, age, and gender.
Aim & Objectives: This study employs deep learning models trained on a dataset of 284,335 patients to predict cardiovascular risk factors previously not considered quantifiable in retinal images. These factors include age (mean absolute error within 3.26 years), gender (AUC = 0.97), smoking status (AUC = 0.71), systolic blood pressure (mean absolute error within 11.23 mmHg), and major adverse cardiac events (AUC = 0.70). The algorithm's accuracy rate is 70%, and when combined with basic demographic data, it can predict heart attack risk over the following year.
Methods: The AI system, when combined with patient age and sex, accurately predicts heart attack risk in 70% of cases. It utilizes a dataset of over 1 million retinal scans, graded by eye doctors from 1 to 5 based on diabetic retinopathy severity. These images are then analyzed by the AI model for diabetic retinopathy symptoms.
Results: By leveraging deep learning and retinal images, this study showcases the potential to predict cardiovascular risk factors previously undetected in such images.
Summary & Conclusion: The AI model's accuracy and ability to identify diabetic retinopathy symptoms offer a promising approach for rapid analysis and diagnosis.
Keywords: *Smoking status, Blood pressure, Cardiovascular risk factors, Retinal images, Deep learning models, Age prediction, Diabetic retinopathy*

PSIT/PP04/0027

Zonisamide with Citral for the Treatment of Neurodegenerative disease: Synergistic Effects and Best Combinations

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Introduction: Citral's anticonvulsant properties entail modulating glutamate receptors and oxidative stress pathways, whereas zonisamide predominantly targets sodium channels and boosts GABA function. These different processes point to the possibility of zonisamide and citral interacting synergistically to improve seizure control.
Aim & Objectives: Examine the synergistic effects of zonisamide and citral on the treatment of "catalepsy- a neurodegenerative disease" and determine the best combinations.
Methods : There will be multiple groups formed from the animals used in each research design.Group I will be our control group which will receive distilled water 1 mL/Kg; Group II: pilocarpine-induced catalepsy model - administered with pilocarpine 1mg/kg, Group III will be given Zonisamide 10-30mg/kg, Group IV will receive Citral dose1-3 mg/kg, Group V: Serotonin analogue (agonist) will be administered according to the body weight, Group VI will receive Serotonin analogue (antagonist) as per body weight by intraperitoneal route.Using tried-and-true techniques like electroencephalography (EEG), behavioural observations, or video surveillance, the animals will be periodically checked for seizure activity.
Results: By increasing GABA activity, the combination of zonisamide and citral lead to a greater reduction in seizure frequency than either treatment alone or the control group. The experiment also aids in determining the ideal dosage of zonisamide and citral that has the most beneficial therapeutic effects with the fewest side effects monitoring.
Summary & Conclusion: Based on the results obtained from the experiment, the

conclusion may suggest that the combination of zonisamide with citral shows promising synergistic effects for the treatment of catalepsy.

Keywords: *Catalpesy, zonisamide, citral, GABA, Serotonin*

PSIT/PP04/0028

In-vitro glucose-uptake inhibition activity of *Mikania micrantha* (L.) Willd. leaf extract on yeast cells

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Introduction: Diabetes mellitus is a worldwide metabolic disorder, resulting from impaired glucose homeostasis and disruptions in carbohydrate, fat, and protein metabolism due to insufficient insulin secretion or action. Medicinal plants serve a vital role in preventive and curative healthcare for humans. Traditional medicines are particularly crucial in developing countries where they offer affordable healthcare options.

Aim and Objectives: To evaluate the *in-vitro* glucose uptake inhibitory effect *of Mikania micrantha* Willd (MM) leaf extract (MME) on yeast cells and also investigate the phytochemical content of MME.

Methods: The different concentrations of aqueous extract of MM leaves (50, 100, 150, 200, 250 µg) were tested against *in-vitro* glucose uptake in 10% yeast solution. 1 ml of 10 mM glucose solution was added for the glucose uptake activity of the extract. Metformin (50, 100, 150, 200, and 250 µg) was used as a standard drug for comparison. Preliminary phytochemical analysis was also estimated.

Results: The results showed that MME exhibited a dose-dependent inhibition of glucose uptake in yeast cells. With increasing extract concentration, the glucose uptake by yeast cells increased significantly compared to the control group and standard drug. The Preliminary investigation showed the presence of alkaloids, glycosides, carbohydrates, tannins, saponins, flavonoids, phenolic compounds, terpenoids and amino acids.

Summary & Conclusion: The results of this study depicted the anti-diabetic properties of *Mikania micrantha* Willd. leaves in a dose-dependent manner when tested in a glucose uptake assay by yeast cells. The antidiabetic activity may be due to the presence of bioactive compounds in the extract that could potentially modulate glucose metabolism. Future research should focus on evaluating the extract's efficacy and safety in animal models and possibly in human clinical trials, paving the way for the development of new antidiabetic therapies.

Keywords: *Diabetes mellites, glucose uptake inhibitory effect, preliminary investigation. Mikania micrantha.*

PSIT/PP04/0029

Phytopharmacological screening of polyherbal extract using *Aegle marmelos, Prosopis cineraria*, and *Linum usitatissimum* on diabetic-associated-depression

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Introduction: The most prevalent non-communicable disease in the world, diabetes mellitus, which is marked by improper glucose metabolism, is regarded as a serious global health issue. A psychiatric disorder called depression can affect a person's behaviour, emotions, and general well-being because it is characterised by a state of low mood and activity avoidance. Diabetes patients have a 2-3 times higher rate of depression than non-Diabetic individuals. Because of their shared biological ancestry,

Type 2 Diabetes and depression have a much worse prognosis and higher mortality than either condition alone.

Aim & Objectives: To Prepare the polyherbal extract using Aegle marmelos, *Prosopis cineraria*, and *Linum usitatissimum* and assessing its toxicity studies and pharmacological activity.

Method: The polyherbal extract of Aegle marmelos and Prosopis cineraria was extracted through the Soxhlet apparatus and the successive solvent used for extraction was ethanol and the temperature was set to 60-70ºC. The Linum usitatissimum mucilage was prepared by soaking it into warm water for 60 minutes with the ratio of (1:7)

Result: By performing the 14 Days Acute Toxicity studies (OECD-423) and 28 Days Sub-Acute toxicity studies (OECD-407) and performing the histopathological studies and assessing their biochemical parameters it is concluded that, the prepared extract has no toxicity and it is safe to use. Also, by performing the animal model studies using Elevated plus maze, zero maze, elevated 8 arm radial maze, T maze and using Rota rod apparatus it is concluded that prepared polyherbal extract is beneficial and its pharmacological active.

Summary & Conclusion: The Polyherbal extract prepared by using *Aegle marmelos*, *Prosopis cineraria*, and *Linum usitattissium* has synergistic action and produces no side effects. In this work I am trying to provide an up-to-date assessment of the natural history of Diabetic associated depression and the management of this disease with the help of the above-mentioned herbs.

Keywords: *Polyherbal, antidiabetic activity, Aegle marmelos, Prosopis cineraria, Linum usitattissium.*

PSIT/PP04/0031

Aquatic extract of *Anogeissus latifolia* roxb's anti-pyretic effects in albino wistar rats

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Introduction: The Combretaceae family plant, *Anogeissus latifolia* Roxb, has a long history of traditional and folk medicinal usage for the treatment of pain, inflammation, and fever. This research looks at whether or not an aqueous extract of *Anogeissus latifolia* Roxb. leaves have any antipyretic effects.

Aim and Objectives: To investigate the antipyretic administration of oral dosages (200 & 400 milligrams per kilogram of body weight) of aqueous extract of Anogeissus latifolia (AEAL) in brewer's yeast-induced pyrexia in rats.

Method: Five groups of six rats each were created from the entire number of the rats. Following induction, dosages of an aqueous extract and a reference drug of 200 and 400 and PCM reference drug 100 milligrams per kilogram of body weight were given to Groups 3, 4, and 5, respectively. Groups 1 and 2 were designated as the normal control group and the negative control group, respectively. We sacrificed the rats and collected blood samples. Were obtained for the purpose of conducting haematological and biochemical tests. The plant underwent phytochemical screening, which indicated the presence of alkaloids, phenolic compounds, flavonoids, tannins, and quinine.

Result: When comparing groups 1 and 2, the Results showed a statistically significant rise (p 0.05) rectal temperature, and in group 3, and 4 group unremarkable decline ($p > 0.05$). C-reactive protein and nitric oxide concentrations were found to be the group 3 & the 4th group values found significantly (p 0.05) greater than the group 2 values. All treatment groups showed non-significant changes in haematological markers compared to group 2. After 4 hours of treatment with 400mg/kg b.w. of *Anogeissus latifolia* aqueous leaf extract, pyretic effects were seen.

Summary and Conclusion: *Anogeissus latifolia* exhibited antipyretic properties in

experimental models, which validates the traditional use of *Anogeissus latifolia* Aqueous Extract in fever.

Keywords: *Anogeissus latifolia, Pyretic effects, Aqueous Extract, Phytochemical screening.*

PSIT/PP04/0034

Acute and sub-acute toxicity study data of isolated β-escin from *Aesculus indica* seeds in wistar rat model.

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Introduction: β-escin is known to have therapeutic effects, neuroprotective capabilities, anti-inflammatory activity, digestive tract protective properties, and the ability to neutralize oxygen-free radicals. To assess the safety, toxicology investigations are required, focusing on the significance of assessing the toxicological profile when selecting an appropriate dose.

Aim and Objective: The isolated β-escin from the Aesculus indica seeds was tested for acute and subacute oral toxicity. Before the subacute oral toxicity, LD_{50} was determined All morphological, biochemical, and haematological abnormalities were documented, as well as mortality, and any changes in important organs. On vital organs, histopathological examinations were performed.

Methods: The experiments employed Wistar rats (150–200 g) of either sex, and the techniques were approved by the Institutional Animal Ethics Committee as per Committee for the Purpose's guidelines Control and Supervision of Animal Experiments New Delhi, India (CPCSEA). The OECD guideline 423 and 407 was used for oral acute and sub-acute toxicity. The animals were evaluated for behavioral abnormalities and general toxicity indications daily after being given the medicine. The liver, stomach, kidney, and heart were all histopathologically evaluated.

Result: The LD_{50} was calculated to be 3000 mg/kg. The biochemical and hemodynamic markers were normal up to a dosage of 300 mg/kg. The 500 mg/kg dose showed minimal changes, whereas the 2000 mg/kg dose showed significant alterations as well as histological abnormalities.

Summary and Conclusion: β-escin dosages of up to 300 mg/kg were found safe, however, doses of moreover 300 mg/kg for long periods should be avoided because they can cause serious harm.

Keywords: *β Escin, Acute toxicity, Sub-acute toxicity, Histopathology, Haematological analysis.*

PSIT/PP04/0037

In silico exploration of physostigmine analogues to understand mechanistic crosstalk between klotho and targets for epilepsy

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Introduction: Epilepsy is a neurological disorder that affects 70 million people worldwide. The role of klotho protein has been highlighted in various neurological diseases such as stroke and Alzheimer's disease. klotho has been linked to reducing induced oxidative stress and inflammation. Thus, in the current study, we aim to understand the mechanistic crosstalk between klotho and targets for epilepsy through in silico studies.

Aim & Objectives: The objective of the current study is to build in-silico library of small molecules approved by U.S. FDA; to

perform High throughput screening. To synthesize pyrroloquinoline and pyrroloindoline based various molecules; to check the activity of synthesized molecules for the treatment of epilepsy.

Methods: Approximately 120 targets of epilepsy from literature were selected and screened through cross docking, based on the docking score five proteins were finalised. The molecular dynamic simulation of these five proteins were performed. Further, pyrroloquinoline and pyrroloindoline based various molecules were synthesized for their evaluation against KLOTHO protein.

Results: It is expected that klotho gene is responsible for the development of epilepsy and the synthesized molecules will show beneficial activity and might be used for the treatment of epilepsy.

Summary & Conclusion: In conclusion, in this study the mechanistic link between klotho and epilepsy has been ascertained. However, further efficacy of newly synthesized pyrroloquinoline and pyrroloindoline based various molecules for their evaluation against KLOTHO protein on preclinical models is required.

Keywords: *Klotho gene, epilepsy, pyrroloquinoline, pyrroloindoline*

PSIT/PP04/0042

Revolutionizing heart disease treatment: Cutting-edge therapeutic breakthroughs

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Introduction: Recent breakthroughs are transforming heart disease treatment, encompassing precision medicine, minimally invasive procedures, regenerative therapies, and digital health technologies.

Aim and Objectives: This abstract aims to provide an overview of these advancements, their methods, and implications.

Methods: A comprehensive literature review was conducted to identify recent advancements in heart disease treatment, analyzing precision medicine's personalized interventions, minimally invasive procedures' improved outcomes, regenerative therapies' potential, and digital health technologies' integration.

Results: Precision medicine enables tailored pharmacological treatments, minimizing adverse effects while enhancing efficacy. Minimally invasive interventions, such as percutaneous coronary procedures and transcatheter valve replacements, have revolutionized cardiology outcomes. Regenerative therapies, like stem cells and tissue engineering, hold promise for myocardial repair. Digital health technologies offer real-time monitoring, early detection, and personalized risk assessment.

Summary & Conclusion: Recent heart disease therapeutic breakthroughs mark a transformative era. Precision medicine personalizes care, minimizing risks and maximizing efficacy. Minimally invasive procedures redefine cardiology, enhancing patient outcomes. Regenerative therapies signal myocardial repair potential. Digital health integration empowers proactive management. Challenges include long-term safety assessments and equitable access. Continued research and collaboration are vital for optimizing these advancements. Heart disease treatment's future promises enhanced outcomes and patient care.

Keywords: *Heart disease treatment, precision medicine, minimally invasive procedures, regenerative therapies, digital health technologies,*

PSIT/PP04/0043

Evaluation of *Myrica esculenta's* ameliorative efficacy against DSS-induced ulcerative colitis in a mouse model

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Introduction: An idiopathic, chronic immune illness of the colonic mucosa known as ulcerative colitis often begins in the rectum and affects the whole colon. Current therapies have many limitations and thus herbal therapy is preferred in this research
Aim & Objectives: To examine MeEt extract's potential as a treatment for Swiss albino mouse models of ulcerative colitis (UC) induced by DSS 3%.
Method: Six mice were allocated into five groups- Group 1: Vehicle Control; Group 2: DSS control; Group 3: DSS+mesalazine (MSZ, 100 mg/Kg BW); Group 4: DSS+MeEt (200 mg/Kg BW); and Group 5: DSS plus MeEt (400 mg/Kg BW). With the exception of group 1, DSS (3%) in drinking water was given to all other groups to induce UC. DAI scores were determined. Mice were euthanized on the eighth day, and the colon length was measured. Using ELISA kits, the concentration of cytokines in the blood and tissues was evaluated. Colon tissue was then examined histopathologically.
Results: DAI scores, colon length, and cytokines levels were significantly increased during induction. The DAI scores and colon length were markedly reversed by oral administration of MSZ at 100 mg/Kg BW and MeEt at 400 mg/Kg BW dosages. Additionally, MeEt 400 increased the expression of IL-10 and IL-1 while downregulating the expression of IL-6, IL-8, TNF-, IL-1, and IFN-γ. Histopatholgical study showed MeEt extract reduced inflammation and damaged colon tissue, histopathological study.
Summary & Conclusion: MeEt at 400 mg/Kg BW dose might serve as a potential alternative therapy for the management of UC which was comparable with that of MSZ.

Keywords: *Myrica esculenta, ulcerative colitis, DSS, herbal therapy, inflammatory bowel disease, colon*

PSIT/PP04/0044

Current Scenario of Pharmacovigilance in Rural India

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Introduction: Pharmacovigilance plays a critical role in identifying and preventing adverse drug reactions (ADRs) associated with pharmaceutical products, especially in resource-constrained rural areas of India.
Aim & Objectives: This review aims to evaluate the current status of pharmacovigilance in rural India, focusing on ADR reporting, system efficiency, and awareness among healthcare providers and the rural populace. Additionally, it seeks to identify barriers to safe drug access and recommend strategies to enhance pharmacovigilance practices in these underserved regions.
Methods: A comprehensive literature search encompassing databases like PubMed, Embase, and Google Scholar was conducted to gather recent articles, reports, and studies related to rural pharmacovigilance in India. The search spanned the last five years to capture up-to-date developments and initiatives.
Results: The pharmacovigilance system in rural India faces challenges such as inadequate healthcare infrastructure, limited awareness, reporting inefficiencies, and underreporting of ADRs. Scarce resources and trained personnel hinder effective implementation, exacerbated by the absence of digital health technologies in remote areas, leading to delayed ADR identification and reporting.

Summary & Conclusion: Significant improvements for rural pharmacovigilance in India to ensure the population's safety and well-being. Addressing challenges related to awareness, accessibility, and reporting mechanisms is pivotal in establishing an effective system. Integrating digital health solutions and telemedicine can narrow the rural-urban healthcare gap, facilitating prompt ADR reporting and drug safety monitoring.

Keywords: *Pharmacovigilance, Rural India, Adverse Drug Reactions, Drug Safety, Public Health.*

PSIT/PP04/0045

A review on Free radical Scavanging and hepato protective activity of *Sauromatum guttatumn* and *Leonotis nepetifolia.*

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Introduction: The liver is a vital organ. Its role in the metabolism and excretion of xenobiotics from the body is crucial. Additionally, it manages the metabolism and excretion of drugs and other xenobiotics from the body by using detoxifying agents to protect against foreign chemicals and warding them off. Numerous hazardous chemicals (including antibiotics, chemotherapeutic agents, thioacetamide, paracetamol, and others), excessive alcohol consumption, and microorganisms have all been shown to damage liver cells. The plant species known as Sauromatum Venosum, also known as Typhonium Venosum, belongs to the Araceae family of arums. It grows naturally in woods and riparian meadows in Asia and Africa.

Aim & Objective: It is grown as an ornamental plant. Its common names include voodoo lily and monarch of the East. *Leonotis nepetifolia* (L) commonly known as Lion's ear, has number of therapeutic properties and is also known as Christmas candlestic, *Leonotis Nepetifolia* in India. It belongs to family Lamiaceae. The Ayurvedic name of the plant is *Granthiparni*, while the trade name is *Barchi Buti*. It has many therapeutic properties and proved in Madagascar, Brazil, Canada, Kenya and many African Countries to treat diseases, rheumatism, dysmenorrhoea, bronchial asthma, fever, diarrhoea influenza and malaria and is also an analgesic. The main aim and objective of this review to study the effect of free radical scavanging property and hepatoprotective property of following plant.

Methods: The decoction of the leaves is used to treat coughs, burns and skin ailments. The whole plant is used for menstrual pain and unspecified female complaints. This plant exhibited various pharmacological activities such as antioxidant activity, antidiabetic, anticancer, anti-inflammatory, anticonvulsant, wound healing, hepatoprotective activity and antimicrobial activities.

Results: Phytochemical examination of this plant indicated the presence of alkaloids (leonurine and stachydrene), iridoid glycoside (leonuride), iridoid glycosides (leonurin and leonuridine), diterpenoids (leocardin), flavonoids (rutin, quercetin, hyperoside, apigenin), volatile oil, tannins and vitamin A. these all show various property related to wound healing, hepatoprotective, and also effective in free radical scanvanging property.

Summary & Conclusion: Several Ayurvedic medicines contain the very medicinal plant Leonotis Nepetifolia. The pharmacological properties of Leonotis Nepetifolia and Sauromatum venosum (syn. Typhonium venosum) are briefly discussed in this article. The quantity of medicinal plants with preventive effects against liver disorders was the focus of this review. In Chinese ethnoclinical practise and Western medicine, a variety of plant-based preparations are utilised to treat liver problems. Many of these medications work as radical scavengers, while others are mutagens or enzyme inhibitors. The presence

of flavonoids, alkaloids, terpenoids, glycosides, and steroids in the plants may be the cause of their hepatoprotective effects.

Keywords: *Liver, Xenobiotics, Detoxification, Liver illnesses, Plant extracts, Hepatoprotective; Sauromatum venosum,*

PSIT/PP04/0046

Pharmacovigilance safety monitoring in clinical trials

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Introduction: Chronic pain is a common and debilitating state that often leads to enhanced levels of stress and anxiety. Mindfulness-based interference has shown a prospect in reducing these symptoms in past studies.

Aim & Objectives: Pharmacovigilance is the study and action related to the detection, assessment, understanding, and prevention of harmful effects or any other drug-related problems. During a clinical trial, pharmacovigilance includes observing adverse events, analyzing safety data, and assessing the risk-benefit profile of the new drug or treatment.

Methods: In this randomized controlled trial, 60 patients with chronic pain were randomly assigned to either a mindfulness-based intervention group or a control group. The mindfulness-based intervention belongs to eight-week sessions focused on mindfulness meditation, body scan exercises, and gentle yoga.

Result: Participants in the mindfulness-based intervention group had significantly lower stress and anxiety levels than the control group at post-treatment ($p<0.05$). There was no significant quality in pain severity between the two groups.

Summary & Conclusion: Our findings propose are mindfulness-based intervention may be an efficient adjunct to regular care for patients with chronic pain experiencing higher levels of stress and anxiety. The studies are required to determine the long-term effects of this intervention on pain management and quality of life in this patient population.

Keywords: *Clinical trials, Phases, Clinical Research, phase I trial, phase II trial, phase III trial, phase IV trial, safety monitoring*

PSIT/PP04/0047

Cell-derived messengers: Exploring extracellular vesicles as disease biomarkers

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Introduction: Extracellular vesicles (EVs) have emerged as a captivating domain in biomarker research, holding the potential to revolutionize disease detection, prognosis, and therapeutic monitoring. These tiny vesicular structures, enclosed by membranous bilayers, are secreted by various cell types, and contain a complex cargo of proteins, lipids, nucleic acids, and other bioactive components.

Aim & Objectives: In this paper, extracellular vesicles are explored as biomarkers in various diseases.

Methods: This study employed a multi-step approach to identify disease-associated extracellular vesicles (EVs) biomarkers. Various biofluids such as blood, urine, and cerebrospinal fluid were used to isolate EVs, and their cargo content was analysed using proteomic, transcriptomic, and lipidomic techniques. Their distinctive feature positions them as minimally invasive and readily accessible biomarkers for diverse diseases, potentially indicating conditions like cancer, cardiovascular disorders, neurodegenerative ailments, and inflammatory states by reflecting the status of their parent cells.

Results: The cargo profiles of EVs contain proteins, RNA, DNA, and lipids derived from their parent cells, and these cargo profiles have demonstrated potential as diagnostic and prognostic biomarkers.
Summary and Conclusion: Due to their non-invasive nature and ability to reflect cellular status, extracellular vesicles (EVs) hold great promise as biomarkers. Looking ahead, engineered EVs with enhanced targeting abilities and customized cargo hold promise for personalized medicine and precise targeted therapy.
Keywords: *Extracellular vesicles, biomarkers, exosomes, microvesicles, apoptotic bodies*

PSIT/PP04/0048

Formulation and evaluation of polyherbal formulation on psychopharmacological activity in albino mice

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Introduction: Anxiety is one of the major psychopharmacological disorders which impairs the normal life of healthy individual. Anxiety associated with insomnia is the major concern in treatment of Psychiatric patients.
Aim & Objectives: To develop Polyherbal formulation and alternative dosage form in form of Dhoop stick and evaluate it for its efficacy in treating insomnia associated with anxiety.
Method: Animals were divided into 4 groups. Rats of either sex were tested using different animal models such as Skeletal muscle relaxant activity using rotarod apparatus, anti-anxiety activity using actophotometer. Groping was done as follows, group I was kept as normal, group II Standard Diazepam (10mg/kg po), group III treated with polyherbal Dhoop(200mg/kg), Group IV polyherbal formulation. Restrain free whole body dosing chamber was prepared for screening of Polyherbal Dhoop. Poyherbal formulation and dhoop was prepared using extract of Jyotishmati, Brahmi and Tagar.
Result: Treatment with polyherbal dhoop and polyherbal formulation significantly ($P < 0.001$) decreased locomotor activity and muscle relaxant activity corresponding to decrease in anxiety levels.
Summary & Conclusion: In present study Jyotishmati, Brahmi and Tagar showed decrease in anxiety levels in rats with decrease in muscle relaxant activity, and locomotor activity. Further studies are required to study more beneficial effects in rats.
Keywords: *Polyherbal, formulation, antianxiety activity, medicinal plants insomnia*, *Dhoop*

PSIT/PP04/0049

Hemigraphis alternata leaves extract: A promising herb for wound management

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Introduction: Diabetes is a multifaceted disorder with delayed wound healing due to persistent hyperglycaemia and related comorbidities. This leads to increased morbidity, mortality and worsens quality of life. *Hemigraphis alternata* possesses anti-

oxidant, anti-diabetic and anti-inflammatory properties.

Aim & Objectives: This study was conducted to determine how effectively *H. alternata* leaf extract could treat diabetic wounds.

Methods: The hydroalcoholic *H. alternata* leaves extract obtained by cold extraction was fractionated using flash chromatography. The emulgel containing HA extract (HA emulgel) was formulated and screened for its wound healing potential in Streptozotocin induced diabetic rats. Wound healing was determined by the wound closure rate, production of VEGF and IL-6, TNF-α levels in the wounds, and histological examination.

Results: The flash chromatographic separation yielded bio enriched fractions. Further wound closure rate in rats treated with HA emulgel was significantly faster than the untreated diabetic rats. The HA emulgel group showed low level of IL-6 and TNF-α with an elevation of VEGF levels.

Summary & Conclusion: This study showed that the HA emulgel has a significant potential in diabetic wound management by enhancing the release of VEGF and reducing the production of pro-inflammatory cytokines which induces cell proliferation, migration and contraction of wound.

Keywords: *Hemigraphisalternata, Pro-inflammatory cytokines, VEGF, Flash chromatography, HA emulgel, Diabetic wound management.*

PSIT/PP04/0050

Assessment of antidiabetic effect of 4-HIL in type 2 diabetic and healthy sprague dawley rats

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Introduction: Type 2 diabetes mellitus (T2DM) is a metabolic disorder characterized by chronic hyperglycemia and insulin resistance. 4-hydroxyisoleucine (4-HIL) is a non-proteinogenic amino acid isolated from the fenugreek seeds and has enormous pharmacological activities.

Aim and Objectives: The present study was undertaken to investigate the antihyperglycemic effect of 4-HIL in streptozotocin (STZ)-induced diabetic rats. Moreover, its toxicity was evaluated in vitro and in vivo employing human embryonic kidney cells and healthy rats, respectively.

Method: For the experiment rats were used STZ and Glucometer Accucheck active strips. Before STZ injection all animals fasted for 6hr. and a single i.p. injection of STZ. To avoid transit hypoglycemia all rats were given a 10% sucrose solution and a standard pellet diet. Body weight (B.Wt.), blood glucose level, and feed consumption of rats were measured weekly. In experiment 1, STZ-induced diabetic male rats were subjected to an oral treatment of 4-HIL, while experiment 2 deals with the effects of 4-HIL on healthy male and female rats following oral administration.

Result: The treatment (experiment 1) declined the elevated blood glucose level, feed intake, and increased body weight(s). Additionally, blood glucose impairment was improved as observed by OGTT and IPGT tests. Pancreatic histopathology revealed mild changes in the 4-HIL group. Moreover, experiment 2 showed increased body weight, normal blood glucose levels, hematological parameters, and histopathological profiles in the treatment group. 4-HIL did not affect the viability of HEK-293 cells, and no signs of toxicity were observed in healthy rats.

Summary and Conclusion: Our study concludes that 4-HIL has potential antihyperglycemic activity without any toxic effects.

Keywords: *4-hydroxyisoleucine, HEK-293 cell, blood glucose level,*

PSIT/PP04/0051

Novel phytochemical-folic acid conjugates- potential strategy for development of anti-cancer agents

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Introduction: Cancer is a major condition that affects the health of individuals worldwide. Today the conventional chemotherapy drugs employed are associated with several undesirable side effects. Literature reports the presence of several natural phytoconstituents with antioxidant, anti-inflammatory and neoplastic property which can serve as alternatives for these chemical-based agents. However, many of the natural phytomolecules suffers from poor solubility and pharmacokinetic issues that need to be addressed.
Aim & Objectives: Ursolic acid (UA) is a natural pentacyclic triterpenic acid compound with promising anti-inflammatory and anti-tumor properties. To overcome the poor bioavailability of this phytomolecule, it was thought appropriate to formulate Vitamin- Herbal Drug Conjugate.
Method: In the present study ursolic acid - folic acid conjugate was docked on the human folate receptor using Autodock to understand its affinity for the folate receptor. Further the ursolic acid-folic acid conjugate was synthesized and effectively characterized using various chromatographic and spectroscopic tools.
Result: The in-silico docking experiments suggested good affinity with binding energy of -23.56 Kcal/mol for the human folate receptor (PDB ID: 4LRH). The pharmacokinetic predictions indicated favorable ADME property of UA- FA conjugate.
Summary & Conclusion: The improved stability of the ursolic acid-folic acid conjugate and increased affinity to cancer tissue can help to reduce the frequency of administration leading to reduction in toxicity to normal cell. Further the efficacy of this conjugate can be evaluated in cancer cell lines, holding potential for development of new drug conjugates with promising potential for treatment of cancer.

Keywords: *Ursolic acid, neoplastic property, ursolic acid-folic acid conjugate, in silico*

PSIT/PP04/0052

Estimation of bio-markers in herbal oils using HPLC and evaluation of their anti-oxidant potential

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Introduction: Today there is a rapid growth of the herbal sector, with an increasing focus on the use of herbal oils. The herbal oils being lipophilic in nature, are being used as excellent alternatives to chemical-based agents in pharmaceutical preparations especially for topical application and in cosmeceuticals and food. There is an urgent need of development of analytical methods for their standardization.
Aims and Objectives: The present study reports the development of HPLC methods for the estimation of markers in herbal oils and evaluation of their anti-oxidant potential.
Methods: Following the ICH guidelines, suitable HPLC methods were developed for the estimation of rosmarinic acid in rosemary oil, glycyrrhizic acid in liquorice oil and curcumin in turmeric oil respectively. The anti-oxidant potential of these oils were determined using the standard DPPH assay.
Results: The HPLC methods were able to quantify the amount of identified markers in the herbal oils. Further the methods exhibited good precision (% RSD <2%) with acceptable accuracy (% recovery between 97-103%) with high sensitivity (as demonstrated through the low LOD and LOQ values). The robustness study also

indicated that the proposed methods did not affect the peak area measurements and also did not alter the peak shape (tailing factor < 2%). The curcumin oil also demonstrated highest anti-oxidant potential when compared to the other tested oils.

Summary & Conclusion: The developed HPLC methods can be used for the standardization and quality measurements of the herbal oils. Also, the utility of these oils as natural substitutes for the chemical based anti-oxidants can be explored.

Keywords: *Antihyperglycemic, HEK-293, rats, streptozotocin, toxicity*

PSIT/PP04/0053

Caffeine and vitamin C can delay the onset of Parkinson's disease: a preclinical study

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Introduction: Literature has suggested reduced risk of developing Parkinson's disease (PD) symptoms like tremors and rigidity among coffee drinkers and significant protection against α-synuclein aggregation responsible for PD by ascorbic acid.

Aim & Objectives: To investigate effect of caffeine, ascorbic acid and their combination on rotenone induced PD.

Method: All animal groups (n=6) were treated with rotenone (2 µg/µl) by intracerebral route except control. Other groups received 0.9 % saline, caffeine (30, 60 mg/kg i.p.), ascorbic acid (100, 200 mg/kg i.p.), standard drug levodopa-carbidopa (100 mg/kg+25 mg/kg p.o.) and combination of caffeine+ascorbic acid (60 and 200 mg/kg i.p.) for 14 days. Muscle coordination, locomotion, catalepsy, histopathology, dopamine, catalase and GSH levels were evaluated.

Result: Rotenone reduced the locomotion and grip strength, increased rigidity and induced circling behaviour on contralateral side of cannulation, decreased levels antioxidant enzymes and dopamine as compared to the control group, indicating PD-like symptoms. Caffeine has shown significant protective effect alone and in combination with ascorbic acid with significant reversal of behavioural and histopathological changes as well as restoration of dopamine and antioxidant enzyme level.

Summary & Conclusion: Beneficial effects of caffeine can be attributed to antioxidant flavonoids and inhibition of adenosine-A2 receptors responsible for neuroprotection against rotenone induced neurodegeneration. Strong antioxidant ascorbic acid can effectively potentiate the antiparkinsonian effect of caffeine. Hence our study suggests the prophylactic potential of caffeine in combination with ascorbic acid to delay the onset of Parkinson's disease.

Keywords: *Parkinson's disease, Substantia nigra pars compacta, Caffeine, Ascorbic acid, catalepsy.*

PSIT/PP04/0054

Ascorbic acid therapy: A potential strategy against comorbid depression-like behavior in streptozotocin-nicotinamide-induced diabetic rats

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Introduction: Ascorbic acid, a natural antioxidant, is primarily consumed through a diet rich in fresh fruits and vegetables. There are evidence suggesting that

depression and diabetes mellitus share many pathophysiological characteristics.

Aim & Objectives: This study examined the potency and efficacy of ascorbic acid (AA) in the management of depression-like behavior in diabetic rats.

Method: Diabetes mellitus was induced by single intraperitoneal injections of nicotinamide (120 mg/kg) and streptozotocin (65 mg/kg) administered 15 min apart. Diabetic (blood glucose ≥250 mg/dL) rats were subjected to intermittent foot-shocks to induce comorbid depression.

Result: The potency (ED50) and efficacy (Emax) of AA against immobility period, hypercorticosteronemia, adrenal hyperplasia, hyperglycemia, hypoinsulinemia, oxidative stress, and inflammatory response were estimated. AA administration caused a dose-dependent decrease ($P < 0.05$) in immobility period with maximum inhibition of 69% (efficacy) at 200 mg/kg and ED50 of 14 mg/kg (potency). AA at 200 mg/kg produced the maximal reduction in hypercorticosteronemia (55.1%) and adrenal hyperplasia (52.6%) with ED50 of 9.8 and 14.4 mg/kg, respectively.

Summary & Conclusion: In conclusion, the present results suggest that AA has therapeutic potential against diabetes comorbid depression but better regulation of hyperglycemia and hypoinsulinemia is required to achieve maximal benefits.

Keywords: *Ascorbic acid; Diabetes comorbid depression; Forced swim test; Hyperglycemia; IL-10; Oxidative stress.*

PSIT/PP04/0056

Synergistic Pharmacological Approaches for Neuropathic Pain Management: Unveiling Multidimensional Solutions to a Multifaceted Disorder

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Introduction: Neuropathic pain, a highly prevalent and intricate neurological disorder, poses substantial challenges in its management due to its multifaceted nature and the limitations of current treatment approaches. This poster delves into an innovative strategy for addressing the complex issue of neuropathic pain through an amalgamation of pharmacological interventions.

Aim & Objectives: This research unveils a novel approach that leverages the synergistic potential of carefully selected drug combinations, each targeting distinct aspects of neuropathic pain pathophysiology. Through a comprehensive evaluation involving behavioral assessments, biochemical analyses, and histopathological examinations, we elucidate the therapeutic benefits of this multifaceted approach.

Method: The animals have been separated into groups. To induce neuropathic pain, rats were fed a high-fat diet (HFD) and then given a low dose of STZ (35 mg/kg) intraperitoneally for 35 days. The unwell rats were given a treatment that contained a combination of medications. The blood glucose levels, lipid profile, and various gluconeogenesis-related enzymes were all measured. Furthermore, the diabetic rats' organs (especially the pancreas, liver, and kidney) were evaluated under a microscope for tissue structural abnormalities.

Result: The pharmacological combination efficiently cures neuropathic pain by decreasing biochemical indicators such as SOD, TNF-α, etc (showed significant $P < 0.001$). Histological testing revealed a clear picture of the disease before and after treatment.

Summary & Conclusion: We overcome the limits of single-agent therapy by treating neuropathic pain through several routes, providing a comprehensive solution to this difficult condition. We hope to change the therapy landscape for neuropathic pain and contribute to more effective neurology

management through our holistic research of pharmaceutical treatments. The findings of this study have the potential to modify therapy tactics and improve the quality of life for people suffering from neuropathic pain.

Keywords: *Neuropathic pain, pharmacological interventions, combination therapy, synergistic approach, multidimensional tar*

PSIT/PP04/0057

Effect of ethanolic extract of *Terminalia catappa fruit* on advance glycation end products in experimental STZ diabetic rats

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Introduction: Diabetes is a group of disorders characterized by hyperglycaemia resulting abnormalities in glucose metabolism. Diabetes is associated with glycation of essential proteins and hormones, due to presence of high blood sugar level. This high blood glucose interacts with bioproteins called advance glycation reaction. The advance glycation leads to formation of glycated proteins, which are abnormal function less proteins and reduces the normal efficacy of body.

Aim & Objectives: To investigate the effect of ethanolic extract of *Terminalia catappa* fruiton advance glycation in streptozotocin induced diabetic rats at a dose of 100 mg/kg body weight.

Method: Animals were divided into diabetic and nondiabetic groups. Rats were fed with a high-fat diet (HFD) and induced with a single low dose of STZ (35 mg/kg) i.p. Diabetic rats were treated with ethanolic extract of *Terminalia catappa* fruiton advance glycation in streptozotocin induced diabetic rats at a dose of 100 mg/kg body weight. Blood glucose, glycated hemoglobin, glycated albumin and serum glycated fructosamine level were observed.

Result: Treatment of diabetic rats with ethanolic extract of *Terminalia catappa fruit* at a dose of 100 mg/kg orally for 14 days and found significant decrease in blood glucose, glycated hemoglobin, glycated albumin and serum glycated fructosamine level in treated diabetic rats as compared to non treated diabetic rats.

Summary & Conclusion: The experimental study showed that a persistent decrease in blood glucose, glycated hemoglobin, glycated albumin and serum glycated fructosamine level in treated diabetic rats as compared to non treated diabetic rats. Ethanolic extract of *Terminalia catappa fruit* demonstrated substantial antidiabetic activity and decrease in advance glycation similar to the standard drug.

Keywords: *Diabetes, HbA1c, Glycated Hemoglobin, Advance Glycation end products, Glycated Fructosamine Glycated Albumin.*

PSIT/PP04/0058

Serotonin syndrome

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Introduction: The serotonin syndrome is a collection of symptoms that are considered to be primarily brought on by drug-induced alterations in the sensitivity of the serotonin receptor systems in the brainstem and spinal cord. A combination of two or more serotonergic medications, at least one of which must be a monoamine oxidase or a selective serotonin reuptake inhibitor, nearly invariably results in severe instances**.**

Aim & Objectives: To provide a comprehensive understanding of serotonin syndrome, including its causes, symptoms, diagnosis, treatment, and prevention, to raise awareness about this potentially life-threatening condition.

Methods: This review aims to increase clinicians' awareness of the potentially lethal but treatable disease known as serotonin syndrome. It details the presentation and therapy of serotonin syndrome and analyses the medicines and combinations that can cause it.

Result: After stopping the drug, the condition often gets better on its own. The suggested course of therapy includes supportive care and stopping "serotonergic" medications. This article discusses Serotonin syndrome associated with serotonergic diseases and its pathophysiology, diagnosis, and therapy.

Summary & Conclusion: The clinical symptom of too much serotonin in the brain caused by an overdose or by the therapeutic use of serotonergic medications is called serotonin syndrome. characterized by the clinical triad of neuromuscular excitement, autonomic consequences, and disturbed mental state. Instead of a "syndrome," it would be more accurate to refer to a spectrum of toxicity that ranges from mild to severe.

Keywords: *Serotonin syndrome, Serotonergic medication, Brainstem, Awareness*

PSIT/PP04/0062

Alzheimer's disease

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Introduction: Phase of Alzheimer's disease (cellular phase) happens in parallel with accumulating amyloid β, inducing the spread of tau pathology. The risk of Alzheimer's disease is 60–80% dependent on heritable factors

Aim & Objectives: Alzheimer's disease is a progressive neurodegenerative disease most often associated with memory deficits and cognitive decline, although less common clinical presentations are increasingly recognized. Alzheimer's disease is the main cause of dementia and is quickly becoming one of the most expensive, lethal, and burdening diseases of this century.

Method: Alzheimer disease is the primary cause of dementia in people above the age of 60. Around 50e75% of people with dementia have Alzheimer's. As per the statistical data collected worldwide, females are more prone to AD than males, and the risk increases even more with age.

Result: People experience greater memory loss and other cognitive difficulties. Problems can include wandering and getting lost, trouble handling money and paying bills, repeating questions, taking longer to complete normal daily tasks, and personality and behavior changes.

Summary & Conclusion: The problem is exacerbated by the lack of routine diagnostic tools for identifying patients early enough in their course for treatment. . The amyloid β cascade hypothesis has been modified by a more thorough understanding of the cellular, preclinical, phase of Alzheimer's disease.

Keywords: *Alzheimer's disease, nanoparticles, blood–brain barrier, liposomes, dendrimers, polymeric nanoparticles, solid–lipid nanoparticles, neurodegeneration; β-amyloid peptide.*

PSIT/PP04/0064

In- Vivo studies for manifesting Streptozotocin-induced Diabetic Nephropathy model in Sprague Dawley Rats.

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Introduction: Diabetic Nephropathy (DN) is a vascular ailment of the kidney that affects patients with high glucose levels in the body (diabetes mellitus). It is also called as DKD (Diabetic kidney disease). It is the no. one cause of kidney damage in people between

the ages of 20-64 in the United States. Diabetes mellitus is extremely common, so it is not surprising that DN affects 3.4 percent of the population.

Aim and Objectives: To establish the rat model of streptozotocin (STZ) induced DN, which is the most common cause of kidney damage in patients with diabetes

Methods: For the development of the diabetic nephropathy model in rats were used STZ and Glucometer Accucheck active strips. Before STZ injection all animals fasted for 6hr. and a single i.p. injection of STZ. To avoid transit hypoglycemia all rats were given a 10% sucrose solution and a standard pellet diet. Body weight (B.Wt.), blood glucose level, and feed consumption of rats were measured weekly.

Results: Kidney of the STZ-induced diabetic rats showed chronic changes in the renal tubules, swollen epithelial cells, vacuolation, and tubular degeneration were seen whereas a control group of rats showed normal.

Summary & Conclusion: Our study concludes that STZ has a significant effect for the development of diabetic nephropathy model.

Keywords: *Diabetic nephropathy, Diabetes mellitus, Streptozotocin, Sprague Dawley rats.*

PSIT/PP04/0065

Knowledge and acceptability for SARS COVID-19 vaccine administration during pregnancy among delivered women in tertiary care hospital in Pune urban area

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Introduction: Vaccination is the most effective way to control SARS COVID-19 pandemic. Its success relies on the development of safe and effective vaccine as well as public acceptance.

Aim and Objectives: To assess knowledge and acceptability of SARS COVID-19 vaccines amongst delivered women in Tertiary care hospital in Pune Urban area.

Methods: This is a cross sectional observational study designed to assess knowledge, awareness and acceptability among women vaccinated with SARS COVID-2 vaccine administration through immunization campaign during their pregnancies.

Results: The present study investigated the effects of SARS COVID 19 vaccine administration during pregnancy, among delivered women at Yashwantrao Chavan Memorial Hospital in Pimpri, Pune. The demographic data of mother as well as data regarding knowledge, awareness, acceptability of vaccines of all enrolled participants was collected.

Summary & Conclusion: The present cross-sectional study in tertiary care hospital Pune reported high acceptance of COVID-19 vaccination in a sample of delivered women. The greatest concern about the COVID-19 vaccine in the refusal group was concern regarding harm to the baby due to vaccine & against vaccination during pregnancy.

Keywords: *SARS COVID-19, pregnancy, maternal immunization, refusal group*

PSIT/PP04/0068

Therapeutic potential of Novel FIH-1 activator in mitigating mammary gland carcinoma through targeting hypoxic pathway.

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Introduction: The present study was aimed to explore the pivotal role of Factor

inhibiting HIF-1α (FIH-1) activation in the regulation of HIF-1α. Considering this, we hypothesized that the chemical activation of FIH-1 would inhibit the HIF-1α activity in mammary cancer.

Aim and Objectives: To screen the novel chemical entity with good therapeutic values against the mammary gland carcinoma**.**

Methods: A library of chemical compounds was virtually screened against FIH-1 based on Lipinski's rule from the ZINC database. Among them, BBAP-8 as the most potent FIH-1 activator with excellent docking score, ADMET profile and *in-vitro* FIH-1 activation assay, respectively. Further, its *in-vitro* activity was scrutinized against MCF-7 cells and *in-vivo* activity against DMBA-induced mammary gland carcinoma through performing various parameters such as hemodynamic, carmine staining, histopathology, western blot and qRT-PCR studies.

Results: Results demonstrated that BBAP-excellent docking score (-8.352 Kcal/mol), favorable ADMET profile, and FIH-1 activator. Further, BBAP-8 showed cytotoxicity with (IC_{50}=16.59±0.49 μM) against MCF-7 cells and activates programmed cell death as evidenced via DAPI, AO/EB, and JC-1 staining. Also, oral administration of BBAP-8 to DMBA-induced mammary cancer Wistar rats showed significant treatment.

Summary and Conclusion: Overall, BBAP-8 was found as a potent FIH-1 activator with the best drug-like molecular profile. It demonstrated significant cytotoxicity and apoptotic changes in MCF-7 cells, restored tissue architecture. Immunoblotting and mRNA expression analysis showed that BBAP-8 can promote FIH-1 activity and downregulate hypoxic markers (FIH-1, GLUT-1, VEGF, and Twist-1). BBAP-8 also promoted apoptosis via BAX, BCL-2, Caspase-8, and Caspase-3 markers.

Keywords: *Apoptosis, Factor inhibiting HIF-1α, DMBA, Hypoxia Inducible Factor-1α, Mammary gland carcinoma.*

PSIT/PP04/0071

Harmony Blend: Empowering Polycystic Ovary Syndrome Management with Shatavari and Shatpushpi Nanoparticles

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Introduction: Polycystic ovary syndrome (PCOS) is a problem with hormones that happens during the reproductive years. Androgen levels are higher in PCOS-afflicted women, which contributes to some of the condition's symptoms. During adolescence, PCOS is a growing health concern. Women are more frequently exposed to psychological and physical pressures than males are, and stress is a factor that is strongly ingrained in society. Although PCOS cannot be avoided, early detection and treatment can assist to avoid long-term consequences like infertility, diabetes, and obesity. PCOS is more common in India than in other states, with Maharashtra reporting the most of cases (22% until 2020).

Aim and Objective: Present research mainly focused on effective nanoformulation for PCOS treatment

Method: Solution of 3ml Fecl3 (0.487g dissolved in 2mol/L HCL) & 10.33ml H2O was stir mixed with 2ml Na2SO3 (0.216g in 2ml water) drop by drop over course of minute. Black precipitant quickly formed which was allowed to crystalline further for 30 min. Suspension was wasted, formation of stable MNPs was achieved by adjusting the PH from 3 to 7.5 & at temperature 90 0 C for 5 min & to 100 0 C for 1 hr under continuous stirring. 1 mg/ml combined extract solution was added to 1mg nanoparticle preparation and incubated in buffer solution at ph 7.4 for 1, 2, 3 hr at RT.

Results: Treatment of PCOS uses the potency of the combination of Shatavari and Shatpushi as well as lifestyle changes are far more successful at preventing PCOS than allopathic treatments, which have severe adverse effects.

Summary and Conculsion: Effective nanoparticle formulation of Shatavari and Shatpushi were prepared for treatment of PCOS with less side effects than allopathic treatments, which have severe adverse effects.

Keyword: *Polycystic ovary syndrome, Shatavari, Shatpushpi, Nanoparticle, Anovulation, hormonal imbalance, Cortisol, Oocyte, Ovary.*

PSIT/PP04/0072

Localized treatments and characterization of drugs for Human Papillomavirus lesions (Group I and Group II HPV)

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Introduction: The HPV (Human Papilloma Virus) responsible for over 90% of all the cervical cancer cases. Studies shows that mitoxantrone (MTX), an anthracene Dione and C_8, an acridine derivative were shown inhibiting the growth of cervical cancer cell line HeLa.

Aim & Objectives: Studying the anti-cancer activity of TEO+MTX formulation by performing mainly permeation tests to check the solubility of assets.

Methods: The TEO+MTX formulation shows opposite effect when the concentration quantified in the 5 period was same as quantifies in donor chamber. This shows that MTX started to permeate the tissue minutes after the formulation was added having reaching an equilibrium between donor and receptor chambers.

Results: The equilibrium demonstrates that the extensive permeation of drug in the tissue, which means Sink conditions takes place. The two groups of HPVs:1) low risk HPV-leading to genital warts and, 2) high risk HPV-i.e., HPV-associated oncogenesis.

Summary & Conclusion: The quantification of C_8 in tissues shows that it can be retained, which can be used as topical application in order to increase the bioadhesion to the vaginal epithelium helping for the safety and efficacy in-vivo. TEO containing propylene glycol and essential oil like limonene, terpinene etc are well known for their permeation enhancing properties.

Keywords: *HPV lesions, Cervical cancer, Group-I and Group-II HPV, Mitoxantrone, TEO (Thymus vulgaris essential oil).*

PSIT/PP04/0075

Comparative evaluation of Ex vivo and In vivo model in ocular pharmacology study.

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Introduction: The eye is a complex organ with multiple barriers that can limit the delivery of drugs to the target tissues. Ex vivo in vitro correlation (IVIVC) is a method used to establish a relationship between the in vitro drug release profile of a dosage form and its in vivo performance.

Aim and Objectives: Comparative evaluation of Ex vivo and Invivo model in ocular pharmacology study. Here we are comparing ocular irritation parameters by using IVIVC.

Methods: A new ophthalmic drug candidate was evaluated for its transcorneal penetration in an in vitro model of the cornea. The model consisted of Ex vivo evaluation is isolated goat cornea. While In vivo test male albino mice was used. The experiment conducted by Ethical committee.

Results: After comparing histopathological study it was found that the drug Ex vivo in

vitro correlation (IVIVC) shows excellent correlation.

Summary and Conclusion: The results of this study suggest that the selected Ex vivo model is best alternative for preliminary In vivo testing. This study will save the number of animals used for primary evaluation.

Keywords: *In vivo, In vitro, IVIVC*

PSIT/PP04/0076

Role of Agmatine in chronic fatigue syndrome in Rats

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Introduction: The chronic fatigue syndrome (CFS) is characterized by extreme fatigue and neurobehavioural abnormalities. Agmatine is a polyamine act as a neurotransmitter in the brain play significant role in stress induced abnormalities.

Aim & Objectives: To investigate the effect of agmatine and its modulators (L-arginine, aminoguanidine and arcain) on CFS induced complications in rats.

Method: Animals were divided into control, CSF + saline and CSF + agmatine and CSF+agmatine modulators groups. Each day animal groups were administered with Agmatine and its modulators before loaded forced swim test. Subsequently, animal groups were evaluated for behavioural assessment by using the post swim fatigue test, Novel Object Recognition, balance beam walking, open field test and tail suspension test. Biochemical estimation of oxidative stress parameters was done for each group.

Result: The behavioural and biochemical abnormalities induced by CFS were improved by repeated administration of agmatine and their modulators dose dependently. The results provide functional pieces of evidence for the therapeutic potential of Agmatine and its modulators in CFS induced complications.

Summary & Conclusion: Prolonged mental and physical stress causes CFS. In behaviour assessments, the CSF-induced group showed increased signs of fatigue, reduction in food intake and body weight; decreased cognitive functions, motor coordination and locomotor activity. The CFS- induced group have shown higher levels of oxidative and nitrosative stress in the biochemical estimation. The CFS conditions have shown improvement with repeated administration of agmatine. Therefore, agmatine may act as novel therapeutic agents in the treatment of CFS.

Keywords: *Chronic Fatigue Syndrome, Agmatine, L-arginine, Aminoguanidine and Arcain*

PSIT/PP04/0077

Agmatine Attenuates Chronic Ethanol Exposure Induced Motor Impairment and Cerebral Cortex Damage during Adolescence in Rats

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Introduction: Chronic ethanol intoxication in rats from adolescents to adulthood induces significant motor deficits including spontaneous locomotion impairment, coordination as well as muscle strength. These behavioral impairments were accompanied by marked neuronal loss with increased in the levels of lipid peroxidation and nitrite in the region of cerebral cortex in rats.

Aim & Objectives: In the present study, we investigate the role of agmatine in ethanol exposure during adolescence in rats induces motor impairments.

Methods: Adolescents rats were divided into different groups. From PND 35 animals received orally (gavage) saline (1 ml/kg) or ethanol (6.5 gm/kg/day, 22.5% w/v) (n = 6) once a day till PND 90. The different dosage of agmatine (20, 40 and 80 mg/kg, po, OD) was administered from PND 70.

Results: In present study, chronic ethanol exposure during adolescence affects the locomotors activity, disruption in postural stability maintenance, the kinetic loss of motor activity, score in rota rod and beam walking and also affects the oxidative parameters. Administration of Agmatine 80 mg/kg, normalizes the alter conditions. Furthermore, oxidative parameters were normalized by agmatine 80 mg/kg.

Summary & Conclusion: It is concluded that due to chronic ethanol exposure during adolescence promotes long term motor impairment as well as decreased spontaneous locomotion and balance which is normalized by Agmatine indicating its strong therapeutic potential.

Keywords: *Agmatine, oxidative stress, ethanol, motor impairment, beam walking*

PSIT/PP04/0078

Modulation of the Gut Microbiota-Brain Axis by Agmatine Mitigates Depressive-Like Behavior in Dysbiosis-Induced Depression

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Introduction: Depression is a disabling and highly prevalent mood disorder associated with gut dysbiosis. Antibiotic consumption affects gut microbiota and induced depression-like behaviours. Agmatine, a neurotransmitter/neuromodulator, abundantly present in gut secreted by microbes and dysregulated in brain areas affected in depression.

Aim & Objectives: This study was designed to inspect the effect of agmatine in depression by modulating gut-microbiota-brain axis in rats.

Method: For the induction of Depression through dysbiosis, cocktail of antibiotics combination of Ampicillin (75mg/kg) & Metronidazole (50mg/kg) were administered orally for 7 consecutive days. Dysbiosis and induction of depression were confirmed by microbial and behavioural studies respectively. Agmatine (20, 40, and 80 mg/kg), probiotics (Lactobacillus spp.) 0.5, 1, and 2 ml/Rat, and their sub-effective dose combination were administered orally to evaluate their effect on Gut-Microbiota-Brain Axis. The depressive-like behaviour in rats was assessed using FST. Microbial estimation was performed for lactobacillus (Beneficial microbe and E. coli (Pathogenic microbe) for evaluation of colonic microflora. Gut morphology was assessed by histopath studies and biochemical parameters like interleukins and tight junction proteins were estimated by ELISA kit

Result: Agmatine (40 and 80 mg/kg, oral), probiotic (1 and 2 ml/Rat, oral) and their sub-effective combination significantly alleviate the behavioural, microbial, morphological and biochemical changes caused by antibiotic administration

Summary & Conclusion: Antibiotic administration induced dysbiosis and depressive symptoms along with morphological and biochemical alterations. Agmatine modulates the gut-brain-axis thereby attenuates the depressive-like behaviour in rats and thus can be intervened for the treatment of depression.

Keywords: *Gut-brain-axis, Antibiotics, Agmatine, Dysbiosis, Microbiota.*

PSIT/PP04/0080

Agmatine mitigates behavioral and functional alterations in 6- OHDA induced ADHD in mice

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Introduction: ADHD is a neurodevelopmental disorder that can arise from a combination of genetic and environmental factors and is characterized by persistent patterns of inattention, hyperactivity, and impulsivity that significantly impact daily functioning and quality of life.
Aim & Objectives: To investigate the effect of agmatine and its modulators (L-Arginine, Arcaine, and Aminoguanidine) on 6-OHDA-induced ADHD-like behavior in mice.
Method: Following the conformation of pregnancy, mother mice were allowed to have a normal delivery. Male pups on PND5 were administered with 6-Hydroxydopamine (6-OHDA) Hydrobromide (25 µg of 6-OHDA in 3 µl of 0.2% Ascorbic acid vehicle, i.c.v.). Agmatine and its modulators were administered for 14 consecutive days (PND25 to 38), and were evaluated for behavioural and biochemical alterations.
Result: In the present study, 6-OHDA-induced ADHD-like behavior was significantly attenuated by agmatine (20, 40, and 80 mg/kg, i.p.), L-Arginine (60 mg/kg, i.p.), Aminoguanidine (50 mg/kg, i.p.), Arcaine (30 mg/kg, i.p.). Agmatine has demonstrated potential in improving selective attention and lowering impulsivity, the comorbid symptoms of depression and anxiety, have also benefited from agmatine treatment. Elevated oxidative st ress parameters and reduced dopamine level were significantly normalized by agmatine and its modulators.
Summary & Conclusion: Agmatine, as well as its modulators, reduced the hyperactivity, normalizes behavioural alterations and attenuated oxidative stress in neonatal 6-OHDA-lesioned male mice. Overall, these finding in an animal model of ADHD is congruent with the emerging clinical use of agmatine as a novel non-stimulant treatment for ADHD.
Keywords: *6-OHDA, agmatine, oxidative stress, ADHD, l-arginine, dopamine*

PSIT/PP04/0081

Screening methods and parameter for the evaluation of topical analgesic agents

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Introduction: Pain is a common symptom associated with many pathological condition and disorders including arthritis, neuropathy, neuralgia, trauma, postoperative states, burns, which causes stress and affect the normal physiological behavior of an individual. As pain is subjective, could be treated by multiple approaches using analgesics. Many folklores traditional agents are used as topical analgesics, but their efficacy and safety are not well established, therefore must be evaluated using modern approaches and parameters.
Aim and Objectives: The aim of this presentation is to compile in-vivo and in-vitro methodologies for pharmacological screening of topical analgesic agents, along with their emerging parameters, for the development of more suitable and effective treatment of pain.
Method: To achieve above mentioned aim and objectives vigorous analysis of relevant databases like PubMed, Medline had been performed with the help of relevant keywords.
Results: The findings revealed that the major in-vivo and in-vitro methodologies for topical analgesic screening are thermal and mechanical models. The hot plate, randall sellito methods are the most commonly used. and Parameters are nociceptive threshold,

withdrawal threshold. Mechanisms, stimuli, endpoints, sensitivity, specificity, reproducibility, validity, and ethical considerations characterize these approaches.

Summary and Conclusion: Topical analgesics rapidly getting popular for the management of pain at approachable sites, particularly to minimize adverse effects among geriatrics and pediatrics. Therefore, there is requirement to screen folklore and traditional herbs with the help of above mentioned in-vivo and in- vitro animal models. Further, combination of multiple methodologies is recommended for a thorough evaluation of topical analgesic medications.

Keywords: *Pain, Topical analgesic, in-vivo and in- vitro.*

PSIT/PP04/0083

Agmatine in Paraventricular Nuclei Regulates HPA Axis physiology in response to stress

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Introduction: Agmatine, novel neurotransmitter and neuromodulator have been emerged as an endogenous regulator of stress. However, its involvement in the physiology of hypothalamus-pituitary-adrenal stress response is still uncovered. Its role in HPA physiology can highlight novel therapy in neurobehavioral disorders.

Aim and Objective: To study the effect of intra-paraventricular (i-pvn) agmatine and its precursor l-arginine on brain CRH, plasma ACTH and serum corticosterone level in eustress, acute immobilization stress (AIS), chronic unpredictable stress (CUS) and chemical stress (LPS).

Method: SD rats were undergone stereotaxic surgery for intra-pvn cannulation. 07 days after surgery, rats were subjected to different stress protocols for respected time period. Experimental groups were treated respectively with single or repeated doses of agmatine or l-arginine by i-pvn routes. All the experimental groups were evaluated for behavioural (anxiety and depression-like symptoms) and biochemical (CRH, ACTH and corticosterone levels) parameters.

Result: Agmatine increases ACTH at a slightly higher dose & shows significant reduction at highest (8 µg/ rat) dose. Whereas, the low dose increases the CORT level in eustress rats. L-arginine has shown decrease in levels of ACTH and CORT in eustress rats. Agmatine and l-arginine leads to inhibition of ACTH and CORT surge in AIS.Agmatine and l-arginine reduced CORT and ACTH levels in both single and repeated dose regimen, also attenuated behavioral alterations and body weight decline occurred by CUS and LPS stressed rats.

Summary and Conclusion: Inclusively, the intra-pvn agmatine and its precursor l-arginine has a dose-dependent andv time-dependent effect on the ACTH and CORT levels. This study reveals strong regulatory involvement of agmatine in hypothalamic influence on HPA

Keywords: *CUS, Agmatine, Stress.*

PSIT/PP04/0084

Preclinical Evaluation of Papain enzyme on Protein deposition induced Macular Amyloidosis

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Introduction: Macular Amyloidosis is a skin condition characterized by the presence of hyperpigmented patches caused by the deposition of amyloid protein in the skin, typically occurring on the upper back or upper arms. Treatment approaches for Macular Amyloidosis can vary and might involve topical therapies, laser treatments, or

other interventions targeting the reduction of hyperpigmented patches. However, a widely accepted or proven cure is not currently available.

Aim and Objective: The main goal of the current research study was to assess the proteolytic activity of the papain enzyme on amyloid protein deposition using both in vivo and in vitro models. Papain, obtained from the latex of the papaya fruit (Carica papaya), is a proteolytic enzyme.

Method: In the in vivo study, a rat received a subcutaneous injection of a complex protein mixture (albumin, α lactalbumin), leading to the development of skin patches on the rat. Subsequently, papain was introduced to evaluate its proteolytic effects on the abnormal amyloid protein deposits.

the in vitro study, freshly isolated chicken ileum was utilized. Various concentrations of the complex protein mixture were administered to the ileum, and the development of hyperpigmented patches was monitored every other day.

Result: The resulting patches on the ileum were then treated with papain. Over time, the papain's proteolytic activity contributed to the gradual reduction of the patches.

Summary and conclusion: Therefore, this was evident that an excessive intake of protein contributes to the occurrence of macular amyloidosis. Additionally, the effectiveness of papain was reduced these patches is attributed to its proteolytic activity on the accumulated amyloid protein.

Keywords: *Papain, Protein deposition, Macular Amyloidosis*

PSIT/PP04/0086

Studies on Diabetic wound healing Activity using Dental Mesenchymal Stem cells in Wistar Rat.

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Introduction: Type I diabetes-mellitus is caused by deficiency of insulin due to damage of insulin producing β cells. Stem cells have ability of regeneration and differentiation. This study evaluates diabetes wound healing activity by using children dental mesenchymal stem cells in diabetes wistar rat.

Aim & Objectives: To Study Diabetes Wound Healing Activity by Using Children Dental Mesenchymal stem cells in Diabetes Wistar Rat. Evaluation of effect of children mesenchymal stem cells (hDMSCs) in diabetic wound healing, epithelisation of wound, antimicrobial effect, collagen release and on blood glucose level.

Method: Diabetic model was established using streptozotocin animals was anesthsized and full skin defect was created. animals divided in three group control, single and multiple doses, hDPMSCs transplanted through Intramuscular injection. Effect on blood glucose, collagen release, epithelisation, wound closure, on antimicrobial activity.

Results: MSC shows Antimicrobial Activity in Gram positive and negative bacteria, help in reduction of blood glucose, wound healing observed in single and multiple treatment as compared to diabetic control group. epitheliasation for multiple dose group was more

Summary and Conclusion: Present study suggest that hDMSCs therapy has ability to restore impaired collagen, wound closure, epithelisation of wound, antimicrobial activity which is required in diabetic wound healing.

Keyword: *wound healing, streptozotocin, mesenchymal stem cells*

PSIT/PP04/0087

Evaluation of Herbal Formulation against Scopolamine induced Alzheimer's Disease in Swiss albino mice.

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Introduction: Alzheimer's is a neurodegenerative disorder, characterized by cognitive loss due to neuronal degeneration particularly in the hippocampus. The therapies available provide only symptomatic limit and are associated with limitations of adverse effects suggesting need of alternative treatment. In this project effect of herbal formulation prepared with novel enriched extracts is evaluated against Scopolamine-induced Alzheimer's Disease in Wistar rats.

Aim & Objectives: Evaluation of the effect of herbal formulation against Scopolamine induced Alzheimer Disease in Swiss Albino Mice**.**

Method: The study was conducted in Scopolamine (1 mg/kg i.p. administered for 14 days) induced Alzheimer's Disease in Swiss albino mice, and treated from 15th days with standard Mentat (397.29mg/kg), Donepezil (2.05mg/kg, p.o), and test Herbal formulation (819.9, 409.95 & 1639.8 mg/kg, p.o) for next 14 days. Behavioural effect was evaluated with Morris water maze, Radial arm and Y-maze by using Mastermaze videotracking software. At the end of study brain tissue were collected for biochemical & histopathological studies.

Results: Herbal formulation significantly improved scopolamine induced behavioral impairments and cognition. In vivo AchE activity is found to be decreasing along with reduction in oxidative parameters.

Summary and Conclusion: The results suggested that Herbal formulation ameliorated scopolamine-induced cognitive and memory impairments, possibly through regulating AChE activity, suppressing oxidative stress.

Keywords: *Alzheimer's disease. AchE inhibition, oxidative stress*

PSIT/PP04/0088

Perinatal Outcome of Pre-Eclampsia Amongst Delivered Women at Tertiary Care Hospital, Pune

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Introduction: Hypertensive disorders during pregnancy being the leading cause of maternal and foetal complications. The purpose of this study was to ascertain the perinatal outcome of preeclampsia in a tertiary care hospital in Pune.

Aim & Objective: To conduct an Observational Safety Study on Perinatal Outcomes of Preeclampsia in Tertiary care hospital in Pune urban area. To determine the maternal and perinatal outcome of preeclampsia amongst women managed at a tertiary care hospital.

Method: A cross-sectional study of 150 delivered women who were given a structured questionnaire and interviewed.

Results: Out of 150 cases of pre-eclampsia, majority 40% were between 21-25 years of age group and most of cases i.e., 66% Nulliparous and 34% multiparous. Caesarean section in 69.3% patient while vaginal delivery in 30.6% was observed. Maternal complications included PPH in 4.6%. Anaemia was most prevalent factor i.e.,93.3% cases in our study and placental abruption was noted in 14% of patients. Out of 150 cases, 93.3% were live birth, 6.67% were IUGR and 6% still births.

Summary and Conclusion: Preeclampsia causes a remarkable increase in adverse maternal and perinatal outcome as pregnant population. A regular audit into perinatal morbidity and mortality in preeclampsia patients with active multidisciplinary approach may improve the clinical outcome.

Keywords: *Pre-eclampsia, Eclampsia, Maternal and neonatal outcomes.*

PSIT/PP04/0089

Unveiling the Healing Power of Ursolic Acid: Revolutionizing Diabetic Wound Recovery

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Introduction: Diabetic wounds present a significant clinical challenge due to impaired healing processes. Ursolic acid exhibits various activities like anti-inflammatory, antioxidant, anti-cancer, anti-diabetic, cardioprotective and hepatoprotective.
Aim: This study aims to explore the potential of ursolic acid, a naturally occurring pentacyclic triterpenoid found in plants, in enhancing diabetic wound healing.
Methods: Ursolic acid's multifaceted mechanisms for promoting diabetic wound healing are elucidated. It displays anti-inflammatory properties by suppressing pro-inflammatory cytokines and chemokines, thereby mitigating chronic inflammation that hampers wound closure. Additionally, ursolic acid fosters angiogenesis, vital for re-establishing blood supply to the wound site, culminating in heightened tissue regeneration. Furthermore, it triggers collagen synthesis and deposition, bolstering extracellular matrix and facilitating wound contraction.
Results: The significance of ursolic acid stems from its ability to concurrently address multiple aspects of impaired diabetic wound healing. By modulating inflammation, angiogenesis, and collagen synthesis, ursolic acid expedites wound closure and enhances tissue remodeling. Its natural origin enhances its appeal as a potential therapeutic agent with minimal side effects. However, optimizing dosages, administration routes, and combination therapies requires further research to harness ursolic acid's full clinical potential.
Summary & Conclusion: In conclusion, ursolic acid emerges as a promising candidate for augmenting diabetic wound healing through its multifaceted mechanisms of action. Its significance lies in its capacity to tackle various impediments associated with diabetic wound healing. This review advocates for ongoing exploration of ursolic acid's therapeutic applications, holding the promise of advancing the management of diabetic wounds.
Keywords: *Ursolic acid, triterpenoid, diabetic wound, cytokines, chemokines*

PSIT/PP04/0090

Evaluation of anti-stress activity of Withania Somnifera in experimental animals

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Introduction: Stress is a normal and healthy response to life's challenges, but too much can cause problems. Long-term stress can cause stress-induced sickness, including a heart attack or heart failure. For both your emotional and physical health, it's important to find ways to reduce stress and manage stressful events.
Aim & Objectives: This study aimed to evaluate the anti-stress activity of the ethanolic extract derived from the roots of Withania somnifera in a rat model using the Elevated Plus Maze (EPM) apparatus
Method: Restraint was performed by daily placing male rats (160-180g at start of experiment) in 20 × 7 cm plastic tubes for 6 h (10-16h) for 21 days. Drugs were administered 30 min prior to stress

procedure. On day 21, after last restraint rats were placed individually in the centre of the elevated plus maze. During 5 min test period, measures were taken.

Result: The current investigation assessed the impacts of chronic restraint stress (CRS) and chronic unpredictable stress (CUS) on rodent behavior within the Elevated plus Maze, a well-recognized model for studying anxiety-like behaviors and screening anxiolytic compounds. The focus turned towards comprehending the diverse impacts of stress and investigating the potential efficacy of Withania somnifera in alleviating anxiety

Summary & Conclusion: This study delved into the intricate relationship between stress and anxiety, with a specific focus on assessing the potential therapeutic effectiveness of Withania somnifera in mitigating anxiety-related behaviors in a rodent model

Keywords: *Withania somnifera, Elevated Plus Maze, stress, anxiolytic, ethanolic*

PSIT/PP04/0091

Assessment of potential anti-lithiatic effect of *Blumea lanceolaria* Roxb. against ethylene glycol induced renal calculi in Wistar rat

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Introduction: Nephrolithiasis, often known as renal stone disease, continues to be a significant
health issue for adults worldwide. Currently, nephrolithiasis is treated medically; however this can be costly and have side effects. As a result, the search for antiurolithic medicines from natural resources has gained importance.

Aim & Objective: The objective of present study was to investigate the anti-lithiatic potential of standardized leaf extract of Blumea lanceolaria Roxb. (EBL) against ethylene glycol induced renal calculi model in rat.

Methods: Ethylene glycol (0.75% v/v) was used to induce calculi in experimental animals. Anti-lithiatic effect was assessed by various parameters like, biochemical parameters, serum and histopathological analysis.

Result: EBL treatment (200 and 400 mg/kg body weight) with preventative and curative dosages has been found to have significant dose dependent anti-lithiatic activity. Elevated calcium, phosphate, and oxalate levels in diseased group animals were shown to be reduced in EBL pretreated animals. Furthermore, serum creatinine, BUN, and uric acid levels in animals treated with EBL were notably reduced to normal levels, similar to those treated with the standard drug Cystone. The histopathology of kidney demonstrates severe renal damage caused by performed crystals

Summary & Conclusion: The extract of *B. lanceolaria* possessed significant anti-lithiatic activity. The possible mechanism responsible for this effect may be the stone forming components like nucleation and aggregation were prevented by EBL. The precise mechanism of the antiurolithiatic action may require additional investigation.

Keywords: *Blumea lanceolaria, anti-lithiatic effect, renal calculi, cystone, serum analysis*

PSIT/PP04/0092

A comprehensive study of ethnomedicinal phytochemical and pharmacological aspect of euphorbia tirucalli

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Introduction: Euphorbia tirucalli, commonly known as pencil cactus, firestick plant & is a succulent plant belonging to the Euphorbiaceae family. Welcome to a comprehensive study delving into the ethnomedicinal, phytochemical, and pharmacological facets of Euphorbia tirucalli. This intriguing exploration aims to unravel the rich traditional uses, chemical constituents, and therapeutic potential of this unique plant. By combining indigenous knowledge with modern scientific understanding, this study offers valuable insights into the diverse applications and promising medical properties of *Euphorbia tirucalli.*

Aim & Objective: In this study, ethnomedicinal, phytochemical, pharmacological facets of *Euphorbia tirucalli.*

Method: The comprehensive study employs a multi-faceted methodology, beginning with ethnobotanical surveys to document traditional uses. Phytochemical analysis follows, involving extraction and identification of active compounds. Pharmacological investigations encompass in vitro and in vivo assays, evaluating various biological activities. Data integration and statistical analysis facilitate correlation between ethnobotanical knowledge, phytochemistry, and pharmacology, yielding a holistic understanding of *Euphorbia tirucalli's* potential benefits.

Result: *Euphorbia tirucalli* has been used by indigenous people for its medicinal properties to cure rheumatism, skin disorders, cough and other ailments. Phytochemical studies have shown that the Euphorbia genus contains mainly triterpenoids, diterpenoids, flavonoids, tannin and polyphenol

Summary and Conclusion: The study unveiled a diverse array of ethnomedicinal uses, corroborated by phytochemical analysis revealing a range of bioactive compounds within Euphorbia tirucalli. Pharmacological investigations showcased significant antimicrobial and anti-inflammatory activities, validating its traditional applications. These findings underscore the plant's potential as a source of therapeutic agents, bridging traditional knowledge and modern science, offering a promising avenue for further research and development. Euphorbia tirucalli has been used by indigenous people for its medicinal properties to cure rheumatism, skin disorders, cough and other ailments. Phytochemical studies have shown that the Euphorbia genus contains mainly triterpenoids, diterpenoids, flavonoids, tannin and polyphenol.

Keywords: *Phytochemical analysis, Pharmacological investigations antimicrobial and anti- inflammatory activities, traditional applications.*

PSIT/PP04/0093

Protective Effect of Dioxolo-Pyran Derivative Isolated from Codiumelongatum Against CCl 4 Induced Hepatotoxicity in Male Wistar Rats

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Introduction: Codiumelongatum is a green marine alga belonging to the family Codiaceae. It is found in the intertidal zone of marine water bodies attached to the substratum. Some researchers suggest the presence of alkaloid, flavonoids, amino acids, carbohydrate and proteins in C. elongatum.

Aim and Objectives: This study is the first report on the protective effect of water extract and isolated Dioxolo-Pyran (DOPD) derivative from C.elongatum against CCl 4 - induced hepatotoxicity.

Methods: Liver histopathology and marker enzymes such as ALT, AST and total bilirubin were measured to evaluate the hepatoprotective effect.
Results: There was a notable increase in mean plasma ALT, AST and total bilirubin levels in CCl 4 -intoxicated rats as compared with the control group. Histopathological damage induced by CCl 4 was improved by water extract and DOPD.
Summary & Conclusions: The results were supported by the histological study of liver excised from rats used in the experiment. Further, it can be concluded that DOPD derived from C. elongatum might have significant hepatoprotective activity.
Keywords: *Codiumelongatum, marine algae, dioxolopyran derivative, hepatoprotective.*

PSIT/PP04/0094

Response of Pertuzumab, Docetaxel and Trastuzumabon metastatic breast cancer

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Introduction: HER2-positive breast tumours, particularly metastatic breast cancers with overexpression of HER2, have an image for being aggressive. Trastuzumab, Pertuzumab, (anti-HER2 monoclonal antibodies) and Docetaxel, dramatically increased progression-free survival and overall survival when combined with chemotherapy, compared to chemotherapy alone.
Aim & Objectives: To investigate the anti-carcinogenic targeted response of the drugs on the metastatic breast cancer with fewer side effects.
Methods: Every three weeks, intravenous study medicines were administered. On the first day of each cycle, pertuzumab was administered; the loading dose in the first cycle was 840 mg, and the maintenance dose in following cycles was reduced to 420 mg. On day 2 of the first cycle, trastuzumab was administered at an initial loading dose of 8 mg/kg; subsequent cycles saw a reduction to a maintenance dose of 6 mg/kg. On day 2 of the first cycle, docetaxel was administered at a dose of 75 mg/m^2, escalating to 100 mg/m^2 if tolerated. All three drugs may be administered on day 1 of consecutive cycles if well tolerated. Transtuzumab and pertuzumab were administered until the disease progressed or there were uncontrollable toxic effects, and docetaxel was administered for a minimum of 6 cycles.
Results: Out of the selected patients 80% patients completely responded and 20% patients partially responded to the clinical studies. Out of 20% of patients 10% showing anemia just after 1 cycle of dosing.
Summary & Conclusions: With the simultaneous blocking of pertuzumab and trastuzumab with docetaxel, HER2-targeted therapy has altered the normal course of HER2-positive metastatic breast cancer.
Keywords: *Metastatic breast cancer, pertuzumab, trastuzumab, docetaxel.*

PSIT/PP04/0095

Development and characterizartion of a Novel polyherbal formulation for in-vitro litholytic activity on urinary stones

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Introduction: The medical term used for kidney stone is nephrolithiasis. Stones are caused by obesity, drinking of little water, fast food, processed meats. It is major and critical problem. Near about 80% people are affected by this disease.
Aim & Objectives: Horse gram seeds have powerful doses of antioxidant. Which are formed a crucial ingredient needed to

reduce and sometime prevents the crystallization process through which kidney stones are formed.

Methods: An extract of each plant was prepared by infusion of three grams of powdered plants with boiled NaCl aqueous solution. Each extract was then filtered and there after setina flask containing a stone. At the end of each week the stone was removed from the experimental medium and weighted.

Results: After 6 weeks of experiments and with *in vitro* study, we have observed that the aqueous extract of polyherbal shasa better effecton dissolution of cystine and carbapatite stones, with mass loss at the end of experiment. While with NaCl solution, the mass was small.

Summary & Conclusion: We observed that only the extract of this polyherbal has better effecton dissolution of cystine and carbapatite stones probably resulting from formulation of complexes between stones and polyphenol sorflavonoids present in the extracts.

Keywords: *Nephrolithiasis, Antioxidant, Kidney stones, Extract, Cystine, Polyphenols*

PSIT/PP04/0096

Pharmacological Evaluation of Antiurolithiatic Property of *Elaeocarpus ganitrus* in Rats

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Introduction: Diseases associated with urolithiasis are also referred to as kidney stones or nephrolithiasis. The crystallization of urine constituents in the kidneys results in calculi, which can develop in either one or both kidneys**.** Nowadays, herbal remedies are increasingly popular, especially for managing kidney stones.

Aim & Objectives: To investigate the urolithiasis activities of herbal extract containing ethanolic extract of the plant in ethylene glycol–induced urolithiasis in Wistar rats by administering oral doses.

Methods: The animals were placed into seven groups, each with six animals. To induce renal calculi, a solution of ethylene glycol (0.75% v/v) in water for drinking will be fed to all groups except the control group for 28 days. The test received extracts (lower and higher doses, by oral routes), with the exception of the control group. cystone will be standard (750 mg/kg). The animals will have unrestricted access to food throughout the experiment.

Results: According to the investigation's findings, both regimens' high phosphate levels were decreased by treatment with an ethanol extract of *Elaeocarpus ganitrus*, which decreased the likelihood of calculi formation. Histopathological examinations of various organ tissues (heart, liver, kidney, stomach), and the results were compared to those of the control groups.

Summary & Conclusion: The result shows a significant effect on urolithiasis disease. The results of the experiment demonstrate that *Elaeocarpus ganitrus* provides dose-dependent protection against ethylene glycol-induced urolithiasis. *Elaeocarpus ganitrus*, often known as Rudraksh, which shows various pharmacological activities but is unknown to us.

Keywords: *Elaeocarpus ganitrus (Rudraksh),* Urolithiasis diseases, ethylene glycol, kidney stone

PSIT/PP04/0097

Cardioprotective Potential of a Traditional *Terminalia arjuna* Bark: An Ancient Cardiovascular Drug

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Introduction: Arjuna, sometimes called *Terminalia arjuna*, is a member of the Combretaceae family. Based on the findings of ancient doctors for ages, its bark decoction is used in the Indian subcontinent for anginal discomfort, hypertension, congestive heart failure, and dyslipidemia. There has to be more research done on Arjuna's potential benefits for different cardiovascular illnesses.
Aim & Objectives: As a result, the current review aims to provide a thorough overview of the literature summarising experimental and clinical research relevant to arjuna in cardiovascular illnesses that was conducted, specifically, during the last ten years.
Methods: The use of the PubMed, Google Scholar, and Cochrane databases allowed for the retrieval of systematic reviews, meta-analyses, and clinical investigations of Arjuna. Most research, both experimental and clinical, has pointed to the crude drug's potential for anti-ischemic, antioxidant, hypolipidemic, and antiatherogenic effects.
Results: Its beneficial phytoconstituents include triterpenoids, β-sitosterol, flavonoids, and glycosides. Its advantageous antioxidant and cardiovascular effects are thought to be caused by terpenoids and flavonoids. The medication has a positive impact on ischemic cardiomyopathy. With Arjuna treatment, no severe adverse effects have been observed yet.
Summary & Conclusion: Its long-term safety, however, has yet to be confirmed. Although it has been discovered to be fairly helpful in treating angina pectoris, moderate hypertension, and dyslipidemia, its specific function in primary and secondary coronary prevention is still unknown.
Keywords: *Cardiovascular Diseases, Coronary Prevention, Antioxidant Triterpenoids, Flavonoids, and Terminalia arjuna*

PSIT/PP04/0098

Evaluation of anti-inflammatory activity of ethanol extract of *Trigonella foneum gracecum*

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Introduction: Methi, or fenugreek, is acknowledged for its potential in diabetes management due to its soluble fiber that moderates blood sugar by slowing carbohydrate digestion, enhancing insulin sensitivity, and controlling glucose. Additionally, fenugreek exhibits anti-inflammatory qualities by inhibiting inflammation pathways, potentially mitigating related concerns. Its pharmacological attributes encompass antimicrobial, analgesic, antioxidant, antiulcer, and antidiabetic effects, making it valuable for conditions like arthritis, diabetes, and cough.
Aim & Objectives: This study aims to explore fenugreek's anti-inflammatory potential in Wistar rats by assessing inflammation markers. The experimental investigation delves into fenugreek's ability to alleviate inflammatory responses.
Methods: The method involved drying fenugreek leaves, grinding them into powder, defecting a 100-gram fenugreek powder batch with petroleum ether for 24 hours, drying the defatted leaves, and further extracting them with ethanol for 48 hours. The resulting extract underwent meticulous filtration and evaporation at 40, yielding a viscous or dry state stored at 4. The process is documented on Page 36 of Shri Ram Institute of Pharmacy's records, Jabalpur (M.P.), India
Results: Fenugreek leaves' composition, including alkaloids, flavonoids, Vitamins K and C, Calcium, Iron, and nicotinic acid. Acute studies at Shri Ram Institute of Pharmacy demonstrated the methanol extract's remarkable anti-inflammatory effect, with dose-dependent reduction in paw edema volume compared to controls. The ethanol extract of *Trigonella foenum*

graecum Linn. Significantly decreased acetic acid-induced writhing and extended paw licking latency, indicating anti-inflammatory potential. Statistical analysis, using one-way ANOVA and Turkey's test, allowed thorough result interpretation. The study underscores fenugreek's anti-inflammatory properties, especially within its ethanol extract, implying therapeutic utility.

Summary & Conclusion: The ethanol extract of *Trigonella foenum graecum Linn.* exhibits dose-dependent anti-inflammatory activity, holding promise for potential therapeutic applications.

Keywords: *Fenugreek, Anti-inflammatory, Anti-diabetic, Ethanolic extract, Wister-rats, Anti-microbial.*

PSIT/PP04/0099

The risk related to hormone replacement therapy and cardiovascular disease related to women

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Introduction: The risks related to the hormone replacement therapy includes so many problems in women's health like increased risk of endometrial cancer (only when estrogen is taken without progestin for women who have had ahysterectomy (removal of uterus) this isn't a problem. Increased risk of cardiovascular disease – heart attack, stroke.

Aim & Objectives: The main objective of this review is to study and identify the causes of the CVS caused by hormone replacement therapy and its treatment.

Methods: The outcomes of the literature review underwent a careful analysis. The information used in the article was sourced from Nature, Scopus, Irjpms.

Results: The result of this review is that hormone Replacement Therapy helps many women get through menopause by the treatment. Related health risks include Increased risk of endometrial cancer this happens only when you still have your uterus and you are Nottaking a progestin along with estrogen. Hormone therapy increases risk of vein clots in the leg and blood clots in the lungs which will be about 2 or3 folds, so it's important to remember that these conditions are extremely rare in the healthy women.

Summary & Conclusion: Hormone replacement therapy is a treatment used to cure the menopause. It replaces the women hormones that are decreasing in females. Estrogen and progesterone are female hormones that are artificially introduced to the patients to mimic hormones created by the human ovary.

Keywords: *Cardiovascular, endometrial, menopause, estrogen, progesterone, mimic.*

PSIT/PP04/0100

Pharmacological and toxicological Evaluation of Inhouse Polyherbal gel (PSIT-164/022) Formulation in the Management of Gingivitis.

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Introduction: Gingivitis is an inflammatory disorder of the gingival tissue that is most usually caused by bacterial infection. Gingivitis is the world's most common chronic gum disease world, infecting about 80 percent of people. A pathogenic biofilm, or plaque, forms around the teeth, which is followed by a host immune-inflammatory response that promotes the disease.

Aim & Objectives: Pharmacological and toxcitiy Evaluation of in house Polyherbal Gel (PSIT-164/022) Formulation in the Management of Gingivitis. The polyherbal formulation consists of Aloe-vera, clove, Tulsi, Curcumin, and Neem.

Methods: Evaluated the Acute dermal toxicity profile (OECD guidelines 404) and pharmacological screening of the polyherbal gel in the management of areca nut and bleomycin induced gingivitis. Marketed gel (Hiora gel) was used as standard group. The data were analyzed using Graph Pad Prism software version 8.0.2.

Results: The result of an investigation showed no significant symptoms of toxicity. Hematological parameter, and there was no gross lesion found in experimental rats' excised organs (Buccal tissue, Mucus membrane, Saliva, Skin) in the polyherbal gel applied rodents. Polyherbal gel showed almost similar effectiveness to the standard group. After Bleomycin & Areca Nut the test group of the polyherbal gel shows a better physiological state in comparison to the negative control group and both the model hence we can say that the polyherbal gel can be helpful for gingivitis.

Summary and Conclusion: The research is focused on evaluating the safety and efficacy of the In-house poly herbal formulation in the management of gingivitis. The polyherbal formulation consists of (Aloe-vera, clove, Tulsi, Curcumin, and Neem) which individually have proved efficacy in the management of gingivitis. We have made a combination of such herbs which are expected to give a Synergistic effect altogether. However, more investigation would be a better option to prove the efficacy.

Keywords: *Gingivitis, Herbal management, Polyherbal gel, Curcumin, Neem, Aloe vera.*

PSIT/PP04/0101

Protective effect of caffeine on haloperidol induced catatonia in rats.

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Introduction: It is a clinical syndrome characterized by a distinct constellation of psychomotor disturbances. Two subtypes have been described: Retarded and excited. Catatonia of the retarded type is associated with signs reflecting a paucity of movement, including immobility, staring, mutism, rigidity, withdrawal and refusal to eat, along with more bizarre features such as posturing, grimacing, negativism, waxy flexibility, echolalia or echopraxia, stereotypy, verbigeration, and automatic obedience. Excited catatonia, on the other hand, is characterized by severe psychomotor agitation.

Aim & Objectives: The present study investigated the Protective effect of Caffeine on Haloperidol induced catatonia in rats

Method: The animals were divided into six groups. Group1 :(control group), Group 2: Haloperidol (1mg/kg) intraperitoneal route, induced Group 3: Haloperidol (1mg/kg) + levodopa-carbidopa (1mg/kg), Group 4: Haloperidol (1mg/kg) + 2mg/kg Caffeine, Group 5: Haloperidol (1mg/kg) + 10mg/kg Caffeine, Group 6: Haloperidol (1mg/kg) + 20mg/kg Caffeine

Result: Treatment with caffeine significantly decrease the catatonic severity, increases the muscle grip strength and increases the locomotor effect as compared to Haloperidol induced group.

Summary & Conclusion: The Catatonia was developed by injecting Haloperidol (1mg/Kg), through intraperitoneal route, daily for 21 days, the Haloperidol (1mg/kg), Caffeine in dosage of 2mg /kg, 10 mg/kg and 20mg/kg was injected through intraperitoneal route daily for 21 days.

Keywords*: Catatonic severity, Haloperidol.*

PSIT/PP04/0102

Development and characterizartion of a novel polyherbal formulation for in-vitro litholytic activity on urinary stones

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Introduction: The medical term used for kidney stone is nephrolithiasis. Stones are caused by obesity, drinking of little water, fast food, processed meats. It is major and critical problem. Near about 80% people are affected by this disease.
Aim & Objectives: Horse gram seeds have powerful doses of antioxidant. Which are formed a crucial ingredient needed to reduce and sometime prevents the crystallization process through which kidney stones are formed.
Method: An extract of each plant was prepared by infusion of three grams of powdered plants with boiled Nacl aqueous solution. Each extract was then filtered and thereafter set in a flask containing a stone. At the end of each week the stone was removed from the experimental medium and weighted.
Result: After 6 weeks of experiments and with in vitro study, we have observed that the aqueous extract of polyherbals has a better effect on dissolution of cystine and carbapatite stones, with mass loss at the end of experiment. While with NaCL solution, the mass was small.
Summary & Conclusion: We observed that only the extract of this polyherbal has better effect on dissolution of cystine and carbapatite stones probably resulting from formulation of complexes between stones and polyphenols or flavonoids present in the extracts.
Keywords: *Nephrolithiasis, Antioxidant, Kidney stones, Extract, Cystine, Polyphenols*

PSIT/PP04/0103

Evaluation Of Cytoprotective Potential of Naringenin Against Cisplatin Induced Nephrotoxicity in Mice

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Introduction: Cisplatin is one of the most widely used and most potent chemotherapy drug. However, side effects in normal tissues and organs, notably nephrotoxicity in the kidneys, limit the use of cisplatin and related platinum-based therapeutics. Renoprotective approaches are being discovered, but the protective effects are mostly partial, suggesting the need for combinatorial strategies.
Aim & Objectives: The cytoprotective efficacy of Naringenin against Cisplatin-induced nephrotoxicity in female Swiss mice was examined in this work.
Method: Animals were treated with amifostine and naringenin, 30 minutes before administration of cisplatin on the first day and followed by up to 8 days. Nephrotoxicity was assessed by body weight and biochemical parameters i.e., Serum Creatinine, Urea, and uric acid.
Results: During this study body weight of the experimental animal changed by 5% maximum observed. Biochemical tests of the kidney showed that pre-treated with naringenin reduced the cellular damage in kidneys and found well effective against cisplatin chemotherapy induced nephrotoxicity.
Summary and Conclusion: These findings indicate that Curcumin reduces the toxic effect of cisplatin on normal tissues. This compound may serve as a safe and effective option to protect nephrotoxicity during cisplatin chemotherapy in cancer treatment.
Keywords: *Cytoprotective, Flavonoids, Cisplatin Cytotoxicity, Nephrotoxicity, Renoprotection.*

PSIT/PP04/0104

Formulation and evaluation of herbal tablets containing *Phaseolus vulgaris l. (fabaceae) & Morus alba l.(moraceae)* extract

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Introduction: WHO report 80% of the world population relies on the drug from natural origin. A large number of medicinal plants are used in the treatment of diabetes. Herbal formulations are becoming popular now days particularly in the treatment of Type 2 diabetes.
Aim & Objectives: The objective of paper is to deals with formulation and evaluation of anti-diabetic activity of tablets prepared from aqueous extract of selected plants.
Method: Successive solvent extraction of the plant material was done with water, acetone, alcohol and petroleum ether and the extracts were screened for the presence of various phytoconstituents. Moreover, the root extract was formulated as tablets using different polymers viz., carbopol and ethyl cellulose. Six batches of the tablets were prepared. The evaluation of formulated tablets (weight variation, friability, hardness and disintegration time) was also done. α-Amylase inhibition activity, blood glucose levels & lipid profile were determined. Histopathological changes in diabetic rat organs (pancreas) were also observed.
Results: Treatment of diabetic rats with HF and metformin decreased plasma glucose and lipid profile levels. Formulation treated rats showed significant ($P < 0.01$) decrease in the activities of α- amylase enzymes. Histological examination of pancreases of normal control, diabetic control, and drug-treated rats revealed significant results.
Summary & Conclusion: From the six batches, two batches Viz. F_3 and F_6 were found to be the best formulations and these two formulations were selected for pharmacological activity. The experimental study reported that the antidiabetic activity and hyperlipidemic activity was found to be significant.

Keywords: *Herbal formulation, Antidiabetic activity, Medicinal plants, Carbopol, Tablets.*

PSIT/PP04/0105

Exploring Mild Cognitive Functioning Differences between Transgender and Cisgender Individuals in Uttarakhand: An In-depth Examination

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Introduction: Transgender adults confront amplified health disparities tied to dementia risk factors such as cardiovascular issues, depression, diabetes, tobacco/alcohol use, obesity, and cognitive impairment, worsened by social inequities and medical discrimination.
Aim and Objectives: To analyse the instances of possible cognitive impairment among general population, a study was conducted on transgender and cisgender subjects, in Dehradun, Uttarakhand.
Method: In this descriptive study, a random number of 100 subjects were enrolled including 50 trans and 50 cisgender subjects of age group from 30-70 years respectively and were counselled and made to fill the questionnaire form having general questions based on their day-to-day activities.
Result: Among 50 transgenders, 76% were suffering from diseases, 62% were alcoholics and 78% were smokers. 82% were anxious about future, 72% often get impulsive easily, 62% forget their belongings. 52% often miss paying bills, 86% and 54% were facing difficulty

recalling names and lack of confidence etc, while in cisgender (54% male and 46% female) subjects, 28% were suffering from diseases, 64% and 60% subjects were alcoholic and smokers, 72% were anxious about future, 58% often get impulsive easily, 52% forget their belongings daily, 42% often miss paying bills, 66% and 48% were facing difficulty recalling names and lack of confidence.

Summary & Conclusion: Due to social discrepancies, low community dwellings and negligence transgenders were significantly proned to cognitive decline as compared to cisgender population which is the major risk factor to Alzheimer ad Parkinson's' disease.

Keywords: *Mild cognitive impairment, alzheimers', parkinson's.*

PSIT/PP05/0001

Orphan drugs: A boon for addressing unmet medical needs and transforming patient care for rare diseases

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Introduction: Orphan drugs are medicinal products used in the treatment of rare diseases, affecting a very small number of the population. Due to their limited profit potential, these diseases are overlooked by the pharmaceutical industry and often called orphan diseases. Consequently, there is a lack of extensive research and development programs for them and limited treatment options are available for their patients.
Aim & Objectives: Orphan drugs are designed and developed to specifically provide medical service to patients suffering from such diseases to address their unmet medical needs.
Methods: This study provides a comprehensive analysis of the available literature to understand the significance of orphan drugs in the context of rare diseases. The research involved extensive information gathering from the existing studies on the development, impact of orphan drugs along with the current challenges faced by the patients and the future of the orphan drugs.
Results: Orphan drugs have emerged as a ray of hope for patients with rare diseases. These drugs provide therapeutic options for patients who previously had no or insufficient treatment options available. The development of these drugs is important not only to improve the quality of life of patients by providing them relief but to also prevent relapse.
Summary and Conclusion: This study emphasizes the importance of further research and development for orphan drugs. In-depth research into these drugs may lead to deeper understanding of the hidden causes behind these diseases and other medical conditions, leading to advancements and innovations in medical science.
Keywords: *orphan drugs, rare diseases, orphan diseases, pharmaceutical industry, medicine, therapeutic drugs*

PSIT/PP05/0002

Digital tools for enhancing pharmacovigilance: A review

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Introduction: As the landscape of healthcare rapidly embraces digital transformation, the integration of digital tools in pharmacovigilance has gained prominence. This poster presentation explores the utilization of digital platforms, mobile applications, and social media to enhance pharmacovigilance efforts, providing a comprehensive overview of their potential benefits and challenges.
Aim & Objectives: The aim of this review is to evaluate the role of digital tools in improving pharmacovigilance, focusing on their potential to enhance adverse event reporting and monitoring. The objectives are to assess the benefits of digital platforms, identify challenges in their implementation, and outline strategies for leveraging their capabilities.
Method: A systematic literature review was conducted to gather and analyse relevant studies, case reports, and expert opinions highlighting the utilization of digital tools in pharmacovigilance. The search encompassed academic databases, grey literature, and conference proceedings.
Result: The review highlights the potential benefits of digital tools in pharmacovigilance, including real-time

reporting, increased patient engagement, and efficient signal detection. Challenges such as data privacy concerns, information accuracy, and regulatory compliance are also discussed. The findings underscore the importance of careful implementation and monitoring of these tools.

Summary & Conclusion: Digital tools offer promising avenues for enhancing pharmacovigilance activities by facilitating timely adverse event reporting and signal detection. While their potential benefits are substantial, challenges must be addressed to ensure data integrity and patient safety. Strategic integration of digital tools, coupled with robust regulatory frameworks, can lead to more effective pharmacovigilance practices and improved patient outcomes.

Keywords: *Pharmacovigilance, Digital Platforms, Data Privacy, Digital tools.*

PSIT/PP05/0003

Pharmacovigilance in Herbal and Allopathic Medicines: Challenges, Opportunities, and Integration

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Introduction: The coexistence of traditional herbal medicines and allopathic drugs necessitates a comprehensive pharmacovigilance approach to ensure patient safety. This study addresses the challenges and opportunities associated with monitoring the safety of herbal and allopathic medicines, emphasizing the integration of traditional herbal knowledge with modern pharmacovigilance practices.

Aim & Objectives: The aim of this study is to explore the challenges and case studies in pharmacovigilance for herbal and allopathic medicines and to propose strategies for enhancing safety monitoring. Objectives include identifying challenges, analysing current reporting systems, and advocating for the integration of traditional herbal medicine insights.

Method: A thorough literature review was conducted to comprehend the existing challenges and opportunities in pharmacovigilance for herbal and allopathic medicines. Case studies were analyzed to highlight instances where adverse effects of herbal medicines went unnoticed due to reporting discrepancies. Comparative analysis was performed on pharmacovigilance practices in different regions.

Result: The study unveiled significant challenges, including underreporting of herbal adverse events, lack of standardized reporting criteria, and limited collaboration between traditional healers and allopathic practitioners. The integration of traditional herbal knowledge into pharmacovigilance practices demonstrated potential for early detection of adverse events and improved patient safety.

Summary & Conclusion: Herbal medicines play a crucial role in healthcare, yet their safety monitoring lags behind allopathic drugs. Integrating traditional herbal wisdom with modern pharmacovigilance can enhance our understanding of herbal medicine safety. Collaboration between stakeholders is necessary to create a holistic pharmacovigilance framework that ensures the safety of both herbal and allopathic medicines. In conclusion, this study underscores the need for proactive and inclusive pharmacovigilance strategies that embrace the unique characteristics of herbal medicines and promote patient well-being in the era of integrated healthcare.

Keywords: *Pharmacovigilance, Digital Platforms, Herb-Drug Interactions*

PSIT/PP05/0005

Role of pharmacists in antimicrobial stewardship programs

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Introduction: The emergence of antimicrobial resistance poses a significant global healthcare challenge, necessitating comprehensive interventions to ensure judicious antimicrobial use. Pharmacists, as integral members of the healthcare team, have a pivotal role to play in antimicrobial stewardship programs (ASPs). Their expertise in medication management uniquely positions them to contribute to the optimization of antimicrobial therapy.

Aim & Objectives: This study aims to investigate the multifaceted contributions of pharmacists in ASPs and highlight their impact on patient outcomes and antimicrobial resistance mitigation. The objectives include evaluating pharmacist-led interventions, assessing adherence to antimicrobial guidelines, and determining the role of pharmacist education in enhancing ASP effectiveness.

Method: A systematic literature review was conducted, encompassing studies published over the past decade. Relevant databases were searched for studies focusing on pharmacist involvement in ASPs, interventions implemented, and outcomes observed. Data were synthesized to identify common themes and trends in pharmacist-driven ASPs.

Result: Pharmacists play a crucial role in ASPs through activities such as therapeutic drug monitoring, dose optimization, drug interaction assessment, and patient education. Their interventions often lead to reduced antimicrobial misuse, shorter hospital stays, and lower rates of resistant infections. Furthermore, pharmacist-led educational initiatives contribute to enhanced healthcare provider awareness and adherence to ASPs.

Summary & Conclusion: The findings underscore the pivotal role of pharmacists in enhancing the efficacy of ASPs. Collaborative efforts between pharmacists, physicians, and other healthcare professionals significantly contribute to the containment of antimicrobial resistance. This abstract highlights the need for recognizing pharmacists as crucial agents in combating antimicrobial resistance and emphasizes the importance of interdisciplinary collaboration for effective ASP implementation.

Keywords: *Antimicrobial, Drug Interactions, Dose optimization, Drug Monitoring.*

PSIT/PP05/0006

Widespread challenges of post covid-19 situation in primary health care: A study

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Introduction: The challenges of Covid-19 have wreaked havoc on every aspect of human life on planet Earth. It is not known how many people are affected with post Acute COVID-19 syndrome and a wide range of prevalence estimates have been reported with a high heterogeneity between studies.

Aim & Objectives: Our main aim was to study the post covid-19 health effects in community in northen region of Madhya Pradesh.

Methods: We designed a cross-sectional study to estimate the prevalence of post COVID-19 conditions in a community setting. We selected a random sample of 312 individuals from three different primary health care centers and collected information on symptoms through a standardized questionnaire.

Results: Our main study finding was an overall population prevalence of 17.24% (95% CI 11.58–17.46%) of post COVID-19. Only 9% of patients were hospitalized in our

study. Prevalence was higher in women than men (16.63% versus 15.06%) and the most frequent persistent symptoms were fatigue (44.6%), smell impairment (27.7%) and dyspnea (24.09%).

Summary & Conclusion: The prevalence of post COVID-19 condition was lower than expected according to other studies published in the literature. The prevalence was higher in women than men, and the most frequent persistent symptoms were fatigue, smell impairment, and dyspnea.

Keywords: *post-acute COVID-19 syndrome, primary health care, COVID-19, general practice, public health*

PSIT/PP05/0008

Anticancer drugs: Clinical and Regulatory perspective

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Introduction: This deadly and dreadful disease, is a broad term covering a varied group of diseases. Several agencies worldwide are developing strategies for acquiring a suitable treatment against this disease.

Aim & Objectives: The paper investigates several suitable treatment strategies under trial, and role of different regulatory bodies like FDA and EMA.

Method: A key search strategy of anticancer drugs and their combinations has been developed. The search strategy will include several important several clinical trials, through databases like Web of Science, PubMed and Scopus (2019-2023). The development of newer strategies through clinical and regulatory assessment, leads to a tail of effective and scientific evidence. Data from published reports was extracted, and the regulatory overview from FDA and EMA has been investigated thoroughly.

Result: In view of varying and differing data, we restricted our regulatory assessments to FDA only. It has been found that 157 clinical assessments are under investigation, as seen through Pubmed (Last 5 Years) against cancer. The assessment through Scopus revealed 1030 assessments. Hence, our study was limited to 335 assessments in Scopus (published in 1ast 1 year). The regulatory assessment-based journey of FDA (Involving approvals and accelerated approvals) has been investigated (For last 5 Years).

Summary & Conclusion: The results revealed that more then 25 approvals have been made by FDA against varying types of cancer. The data-based decisions must be critically analysed by scientists for positive outcomes. The decisive process must be rapid enough for an efficient usage and patient compliant strategy.

Keywords: *FDA, anticancer, clinical trial.*

PSIT/PP05/0010

Advancing Pharmacovigilance: Strategies for Enhancing Drug Safety in India

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Introduction: As clinical trial and research activities surge in India, embracing effective pharmacovigilance measures becomes imperative. This assessment outlines strategies for implementing a comprehensive pharmacovigilance framework to ensure patient safety and enhance drug monitoring practices.

Aim and Objectives: This study aims to provide a comprehensive assessment of strategies for implementing and sustaining an effective pharmacovigilance framework in India. The objectives include:

1. Evaluating the current challenges in pharmacovigilance within the Indian context.
2. Proposing strategies for establishing a robust pharmacovigilance system involving multiple stakeholders.
3. Highlighting the impact of enhanced pharmacovigilance on patient safety and drug monitoring.

Methods: A qualitative analysis of existing literature, regulatory guidelines, and case studies will be conducted to identify challenges and potential strategies in pharmacovigilance implementation. The study will also explore successful international models and their applicability in the Indian context.

Results: The assessment presents a range of strategies, including enhancing spontaneous reporting systems, utilizing advanced data analytics, and promoting collaborations between regulatory bodies, healthcare professionals, and pharmaceutical companies. These strategies collectively contribute to a more comprehensive and efficient pharmacovigilance framework.

Summary and Conclusion: Effective pharmacovigilance is indispensable for ensuring patient safety and optimal drug utilization. By implementing a multi-stakeholder approach and incorporating advanced methodologies, India can enhance its pharmacovigilance practices. The proposed strategies aim to address challenges associated with data volume and signal detection, ultimately contributing to the broader goal of safeguarding public health and facilitating well-informed clinical decision-making.

Keywords: *Drug regulation, Drug safety, Intensive monitoring, Pharmacovigilance*

PSIT/PP05/0011

Application of artificial intelligence and machine learning in early detection of adverse drug reactions (ADRs) and drug-induced toxicity

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Introduction: Pharmaceutical product development is a difficult, expensive, and time-consuming process. The early diagnosis and mitigation of adverse drug reactions (ADRs) and drug-induced toxicity represent a significant challenge that continues to plague the healthcare sector. The top causes of morbidity and mortality worldwide continue to be adverse drug reactions (ADRs) and toxicity, which result in hospitalization and high healthcare expenses, despite the stringent clinical trial procedures and regulatory scrutiny.

Aim & Objectives: Enhancing patient safety, lowering healthcare costs, and increasing the effectiveness of the drug development process are all possible benefits of improving early identification of ADRs and toxicity.

Methods: A crucial component of this approach has emerged: QSAR models. Drug toxicity can be evaluated quickly, cheaply, and with a fair amount of accuracy using QSAR models, which use mathematical equations to predict a drug's biological activity based on its chemical structure. This method makes it possible to identify risks more precisely in the early phases of drug development, resulting in safer and more specialized pharmacological therapy.

Results: The integration of AI and ML technologies in QSAR models has significantly improved predictive toxicology. These models can handle complex datasets, recognize intricate patterns, and yield more accurate predictions of drug toxicity. Deep learning, a subset of ML, enhances accuracy and can handle large-scale chemical data. This combination holds promise for drug toxicity prediction and safer drug development.

Summary & Conclusion: Traditional approaches, such as post-marketing surveillance and adverse event reporting, are reactive and may miss negative effects. To

improve patient safety, lowering healthcare costs, and increasing drug development effectiveness, QSAR models have emerged. The integration of AI and ML technologies in QSAR models has significantly improved predictive toxicology, enabling more accurate predictions of drug toxicity.

Keywords: *Adverse Drug Reactions, Drug-induced toxicity, approach, Artificial intelligence, Machine learning, QSAR, Accuracy, Toxicology*

PSIT/PP05/0012

Revolutionizing Pharmacy: The Power of Remote Telepharmacy Care

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Introduction: Telepharmacy, a branch of telemedicine, involves the provision of pharmaceutical care through telecommunication channels, addressing the challenges of accessibility to quality healthcare services, particularly in remote and underserved areas. The integration of telepharmacy services aims to bridge the gap between patients and pharmacists, ensuring efficient medication management, consultation, and medication review.

Aim and Objective: The primary aim of this study is to investigate the effectiveness of telepharmacy in improving patient outcomes and access to pharmaceutical expertise. The objectives encompass assessing patient satisfaction, evaluating the accuracy of medication dispensing, and analyzing the impact on medication adherence.

Methods: A comprehensive literature review was conducted to gather insights into telepharmacy's conceptual framework and its practical applications. Additionally, a case study approach was adopted to illustrate the successful implementation of telepharmacy in a rural healthcare setting, emphasizing its benefits in real-world scenarios.

Results: The results indicated a significant enhancement in patient satisfaction scores, attributed to the convenience and timely access to pharmacists' guidance. Moreover, the medication dispensing accuracy showed a parallel improvement, minimizing the risk of errors and adverse effects. The study also highlighted the positive influence of telepharmacy on medication adherence rates.

Summary and Conclusion: Telepharmacy presents a promising avenue to revolutionize pharmaceutical services, particularly for individuals with limited access to in-person consultations. However, considerations regarding data security, licensure regulations, and technological infrastructure must be addressed to ensure the seamless functioning of telepharmacy services.

Keywords: *Telepharmacy, telecommunication, pharmaceutical care, remote communication, medication management.*

PSIT/PP05/0013

Toxicovigilance: A New Approach for Toxicological Screening, Quality Control and Regulation of Herbal Medicines

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Introduction: Toxicovigilance is the active process of identifying and evaluating the toxic risks existing in a community, and evaluating the measures taken to reduce or eliminate them.

Aim & Objectives: Herbal medicines are now in great demand in the developing world for primary health care not because they are

inexpensive but also for better cultural acceptability, better compatibility with the human body and minimal side effects.

Methods: Most herbal products on the market today have not been subjected to drug approval processes to demonstrate their safety and effectiveness, so there is urgent need for standardization of herbal medicines for its safety.

Results: Toxicovigilance can contribute for toxicological screening, quality control and regulation of herbal drugs including hazard identification and risk assessment by providing medically validated data which are often overlooked in the process of risk assessment.

Summary & Conclusion: Toxicovigilance is a critical evolution, which should be viewed as a useful accompaniment for the analyzing, monitoring and reporting of adverse drug reactions (ADRs) and toxicity of herbal drugs. Quality control for efficacy and safety of herbal products is of utmost importance and a debated issue in clinical practice.

Keywords: *Toxicovigilance, ADR, Herbal drugs, Quality control, Pharmacovigilance*

PSIT/PP06/0002

Future aspect of IPR policies after pandemic for Vaccine and it's production

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Introduction: Several low-income nations struggled to deploy Covid vaccination campaigns as thoroughly as the majority of high and middle-income nations for the majority of 2021. Some are requesting that IP be allowed to continue in order to assist preparations for upcoming pandemics, despite the fact that IP (Intellectual Property) has been essential in discovering and producing vaccines for the present pandemic. Development and approval of numerous vaccines for the market, supporters of the WTO IP waiver said that the suspension of IPRs was required to increase the capability for worldwide vaccine production.

Aim & Objectives: To promote the production of numerous vaccines and alternative therapies, the safeguarding and improving of the R&D circumstances, particularly the effective safeguarding of IP rights, at the centre of future pandemic planning.

Methods: The outcomes of the literature review underwent a careful analysis. The information used in the article was sourced from Nature, Bentham Science, and Elsevier between 2020 and 2023.

Results: The information above demonstrates that IP has been essential in combating the present epidemic and will continue to be so in the event of future pandemics. Governments should concentrate on supply-side strategies such supporting fundamental research, establishing advanced marketplace promises, resolving trade obstacles, and enhancing the capacity for distribution as an alternative to waiving IP in order to better prepare for pandemics in the future.

Summary & Conclusion: The battle against Covid-19 teaches us many lessons about how governments should collaborate with the forward-thinking pharmaceutical industry to make it easier to develop, produce, and distribute vaccines. IP for future pandemics is very important. IP in respect of development have been extremely high to progress and have capacity to mobilise sufficient capital to progress at all.

Keywords: *Covid-19, Intellectual Property, Pandemics, Vaccine, IP waive*

PSIT/PP06/0003

Unveiling the Vital Role of Intellectual Property in Healthcare: Navigating Pharmaceuticals, Innovation, and Research

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Introduction: IPR, especially in pharmaceuticals, shapes pricing strategies and promotes research during economic downturns, ensuring sustained development. Safeguarding innovative concepts becomes essential for medical progress, motivating researchers and businesses to explore novel treatments, thus enhancing healthcare quality.

Aim and Objectives: This study aims to examine how IP protection stimulates pharmaceutical innovation and contributes to the healthcare sector's advancement. The objectives include:

1. Analysing the role of IPR in incentivizing R&D investments in pharmaceuticals.
2. Evaluating the impact of IP protection on medical breakthroughs and patient outcomes.
3. Investigating recent legal adjustments and patent strategies influencing drug pricing.

Methods: A comprehensive review of literature, patents, and legal frameworks was conducted to explore the multifaceted relationship between IP and pharmaceutical

innovation. Analysis of patent extensions, legal changes, and pricing tactics will provide insights into current trends.

Results: The analysis reveals that robust IP protection fosters R&D investments and spurs medical breakthroughs. Patents and extensions play a critical role in shaping drug pricing strategies. Recent legal adjustments impact IP strategies and market dynamics, influencing healthcare accessibility.

Summary and Conclusion: IP's significance in pharmaceuticals goes beyond financial gains, acting as a driving force for research, innovation, and healthcare improvements. By safeguarding intellectual property, the sector ensures sustainable investment in medical advancements, contributing to the overall well-being of society. This discussion underscores the need for balanced IP regulations that promote innovation while addressing affordability and accessibility concerns.

Keywords: *Intellectual property right, patents, healthcare system, drug, pharmaceuticals, channelling.*

PSIT/PP06/0004

Navigating Pharmaceutical Regulatory Affairs: Ensuring Drug Safety and Compliance

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Introduction: The defence of the pharmaceutical sector is regulatory affairs and act as a conduct between pharmaceutical firms, governing agencies, and consumers. They provide pharmaceutical businesses with evidence-based, strategic guidance on the statutory and regulatory requirements necessary to ensure the production of safe and effective medicines compliance helps ensure that patient care remains a top priority.

Aim and Objectives: To overcome regulatory issues such as lack of agreement on regulatory models, regulatory capacity, and regulatory governance, as well as risk factors associated with overregulation and to recognise regulatory opportunities, such as market consolidation, traceability, and sales transparency of medications.

Methods: Standard literature reviews done and key words such as regulatory compliance, challenges, sales transparency are highlighted.

Results: The foundation of regulatory compliance is quality management systems. They are intended to guarantee consistency in quality and safety across every aspect of pharmaceutical operations, including manufacture, distribution, and post-market monitoring. These systems offer an organised method for satisfying legal obligations while enhancing effectiveness and productivity.

Summary and Conclusion: The purpose of this study is to address regulatory issues, such as differences in regulatory capacity, governance, and model. It also tries to reduce the dangers brought on by both excessive and insufficient regulation. The main goal is to identify potential regulatory developments such market consolidation, medicine traceability, and open sales practises.

Keywords: *Regulatory Challenges, Regulatory opportunities, e-pharmacy policy, Risk of Non-Compliance, Regulatory Affairs Specialist*

PSIT/PP06/0005

Intellectual Property Rights: Need for Pharmaceuticals

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Introduction: The pharmaceutical industry occupies an unusually prominent position in discussions of IP policy and has been at the centre of both domestic and international disputes over the interplay between IPRs,

R&D incentives, pricing, and patient access. IPRs are known to have two main effects on the pharmaceutical industry. First, there is the topic of price and access, where the connection between IPRs (Patents, Copyrights, Trademarks, and Trade Secrets), exclusion of rivals, and the accessibility and cost of new medications are discussed. The second concern is over R&D incentives, or more specifically, the part IPRs play in encouraging the discovery, development, and sale of novel medicines.

Aim & Objectives: To study and understand the role of IPRs in the current scenario of pharmaceuticals by understanding real-time global aspects relating to the use and violation of IPRs.

Methods: The methodology for the study of IPRs in pharmaceuticals utilised the case studies depicting the use of different IPR tools like patents, copyrights, trademarks, trade secrets, Industrial designs etc. which helped in the analysis of their infringement and their outcomes.

Results: IPRs have validated their role in pharmaceutical industries, their regulatory aspects protection of innovators' rights, the cost-effectiveness of the pharmaceuticals along with their safety and efficacy profiles meeting regulatory compliances.

Summary & Conclusion: Studying case studies and real-time incidents that happened in the past in the pharmaceutical sectors helped in the summarisation of the active roles and the need for IPRs in this field. The successful understanding of the results and problems arising in this sector backed by real-time data provides insights and aids in the framing of the regulatory compliances for the implementation of IPRs.

Keywords: *IPR, Pharmaceuticals, Patents, Copyrights, Trademarks, R&D*

PSIT/PP06/0006

Patent Protection in the Pharmaceutical Industry

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Introduction: Patent protection has a pivotal role in shaping the landscape of the pharmaceutical industry, incentivizing innovation and protecting intellectual property rights. This study examines the intricate relationship between patents, innovation, and drug development in the pharmaceutical sector. With the industry's complexities such as high R&D costs, prolonged testing, and regulatory challenges, patents provide essential incentives for inventors and entities to recoup investments and maintain competitiveness.

Aim and Objectives: This study aims to comprehend the significance of patent protection within the pharmaceutical industry. The objective is to analyze its multifaceted impacts on drug pricing, accessibility to essential medicines, and the equilibrium between promoting innovation and ensuring public welfare.

Methods: A comprehensive analysis of scholarly articles, industry reports, and legal discussions forms the foundation of this study, dissecting the intricate nexus between patent protection and the pharmaceutical sector. Case studies offer practical insights, while global perspectives highlight the widespread nature of the debate. By exploring critical discussions and innovative models, this study offers a holistic understanding of how patent protection shapes the industry.

Results: The study reveals that patent protection is a vital driver of pharmaceutical innovation. Exclusive patent rights incentivize substantial research and development efforts, contributing to advancements in medical science. The study highlights the need to strike a balance between fostering innovation and ensuring equitable access to medicines.

Summary & Conclusion: In conclusion, patent protection is instrumental in steering pharmaceutical innovation by granting exclusive rights that stimulate research and development. Balancing the benefits of

patent exclusivity with the imperative of accessible healthcare emerges as a critical concern.

Keywords: *Intellectual property rights, patents, healthcare system, drug, pharmaceuticals, channelling.*

PSIT/PP06/0007

Violation of the Intellectual Property Rights of Pharmacy in India and its Preventive Measures

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Introduction: Intellectual property (IP) is the most valuable resource in this field. IP is defended in law by patents, imprints, trademarks, artificial designs, geographical suggestion and trade secrets. Since there exists the increased possibility that some IPR are invalid, therefore, needs arise to step in to ensure that invalid rights are not being unlawfully asserted to maintain illegitimate monopolies within the pharmaceutical assiduity. Violation of IPR with regard to imprints, patents, trademarks, and trade secrets may be a breach of felonious law.

Aim and Objectives: To enlighten the facts regarding the violation of IPR which has drastically increased the rate of counterfeiting, hence this has created an irresistible challenge that are needed to be overcome by our government.

Methods: Violation of IP has rooted up corruption, which is indirectly a taboo for our Indian government. In order to prevent such violation, the Government has preventive measures like Antitrust, Trademark act 1999 under section 115, Copyrights act 1957 under section 63-63. Government has some special governing bodies for vigilance to prevent counterfeiting. DPIIT (Department for Promotion of Industry and Internal Trade), ICCC (Indian Cyber Crime Coordination Centre), NCCC (National Cyber coordination Centre).

Results: Therefore, violation of IPR should be taken seriously in order to provide protection to the respective ideation and innovation thereby excising powerful vigilance over IP system.

Summary and Conclusion: Pharma businesses get help in guarding inventions from the exploration to development stage through a stronger IPR governance. There are many roles that IPR plays in guarding the pharmaceutical assiduity: protection against infringers, driving profitable growth, and consumer protection. Through studies from the Indian Patent Office, it is found that these many numbers of patents are granted in the recent years 2018-22. With this is it is known that how the deserving candidate is deprived of getting his/her IPR due to infringement of their intellectual ideas among similar category candidates.

Keywords: *Intellectual Property Rights (IPR), IP system, Violation, infringement, pharmaceutical industry*

PSIT/PP07/0001

Development of anti-doping educational module for physical education teachers to prevent doping in sports at the grassroot level: A pharmacist's perspective

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Introduction: Doping is defined as the use of prohibited substances or prohibited methods in sports or violation of Anti-Doping rules and is of significant concern in sports.

Aim & Objective: To develop and evaluate an educational module on doping for Physical Education Teachers (PET) in school

to spread awareness and to prevent doping from grassroot level.

Method: Systematic literature review, responses from PET and through focus group discussion, the module was developed and validated by experts. The effectiveness of the training module delivered by Pharmacists was evaluated through a quasi-experimental study design. The data was gathered using a systematic and pre-tested questionnaire derived from the World-Anti Doping Agency validated questionnaire.

Results: Knowledge score of PET at baseline (24.17±19.63%), immediate post training (76.74±13.02%), and one-month post (65.61±18.41%) intervention showed a statistically significant ($p<0.0001$) change in the knowledge scores.

Summary & Conclusion: The developed Anti-Doping Educational module raised awareness among PET about the significance of doping-free sports and role of pharmacists to prevent the same.

Keywords: *Doping, educational module, sports, pharmacists, physical education teachers*

PSIT/PP07/0002

Empowering pharmacy education: Redesigning the curriculum through NEP 2020 Lens

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Introduction: The National Education Policy (NEP) 2020 in India aims to bring about significant reforms in the education sector, including pharmacy education. These envisions a holistic and multidisciplinary approach with an emphasis on research, innovation, and skill development.

Aim & Objectives: The aim of the study is to identify ways of implementing NEP 2020 reforms in alignment with pharmacy education.

Method: The Pharmacy Council of India (PCI), an apex body, regulate pharmacy education in India. Foreseeing that NEP 2020 will enable to bring higher competency in pharmacy education, there is a pressing need to restructure pharmacy curriculum through NEP 2020 lens. Some key points are hereby discussed which can be incorporated while framing the revised academic structure for pharmacy programs:

1. Multiple entry and exit
2. Multidisciplinary components
3. Language learning and communication skills
4. Hands-on training and internship
5. Social connect and filed visits

Online Training Courses (OTC) for pharmacy teachers in accordance with new guidelines should be provided. After the successful completion of training assessment should be mandatory.

Result: The curriculum framework clearly defines the specific skill set of a pharmacy graduate. Separate titles should be given to pharmacists as per their academic degrees and specializations. Like Diploma in Pharmacy, Degree in Pharmacy with specialization can be called Clinical Pharmacist, Regulatory Pharmacist, Pharmacovigilance Pharmacist, Herbal Pharmacist or Pharmacognosist, Pharmacologist, Pharmacist (Product Development). This will define the roles of pharma professionals more clearly.

Summary & Conclusion: Implementing these reforms will align pharmacy education in India with NEP 2020, producing competent and adaptable pharmacy professionals capable of meeting the evolving healthcare needs of the nation.

Keywords: *NEP-2020, pharmacy education, PCI, curriculum design, pharmacists*

PSIT/PP07/0003

Fiesta of innovation research and collaboration: Thriving towards excellence in pharmacy teaching

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Introduction: Pharmacy teaching has undergone significant changes in recent years with the advancement of technology, changes in healthcare delivery, and increasing demand for patient-centered care. To meet these challenges, pharmacy educators need to constantly innovate, collaborate, and conduct research to improve teaching strategies and enhance student learning outcomes.

Aim & Objectives: The objectives of FIRC are to foster innovation and creativity in pharmacy teaching, encourage collaboration among pharmacy educators and researchers & enhance student learning outcomes through effective teaching strategies.

Method: FIRC was initiated in 2020 as a collaborative effort between pharmacy educators and researchers from different institutions. The event is held annually and comprises of various activities including keynote speeches, workshops, poster presentations, and panel discussions.

Result: FIRC has been successful in promoting innovation, collaboration, and research in pharmacy education. The event has attracted participants from different institutions and has facilitated the sharing of best practices, ideas, and experiences in pharmacy teaching. The event has provided a platform for pharmacy educators and researchers to showcase their research and innovative teaching practices. The panel discussions and workshops have facilitated discussions on current issues and challenges in pharmacy education and have provided opportunities for collaborative problem-solving.

Summary & Conclusion: FIRC is an important initiative that promotes innovation, collaboration, and research in pharmacy education. The event has been successful in enhancing teaching strategies and improving student learning outcomes. Pharmacy educators and researchers are encouraged to participate in FIRC to promote excellence in pharmacy teaching and research.

Keywords: *Pharmacy teaching, innovation, collaboration, research, excellence, FIRC.*

PSIT/PP07/0004

Effect of video-assisted educational intervention on improving mother's knowledge, attitude and practice (KAP) related to malnutrition-A systematic review

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Introduction: Childhood malnutrition is a significant contributor to child morbidity & mortality (about 45% of all child deaths globally), causing stunted growth, diminished cognitive development, and lower economic productivity. Enhancing nutritional knowledge, attitudes, and practices of mothers who are the primary caregivers can positively affect their children's nutritional status.

Aim & Objectives: This systematic review aimed to determine the effect of video-assisted educational intervention to improve knowledge, attitude, and practices (KAP) among mothers of malnourished children below five years.

Methods: This systematic review adhered to PRISMA guidelines and included English articles from databases like PubMed, Scopus, EMBASE, and ClinicalTrials.gov until November 2022. Studies selected followed the PICOS framework, focusing on mothers of children under five, video-assisted educational interventions, comparison groups, KAP outcomes related to malnutrition, and RCT designs. The Cochrane risk of bias assessment tool was used to evaluate the quality of included studies.

Results: This review analysed 11,434 articles and included seven RCTs with video-assisted educational interventions for

mothers of children under five. The interventions varied in duration, content, and were sometimes guided by behavioural theories. Significant improvements were found in mother's knowledge and practice (n=1); knowledge and attitude (n=1) and feeding practices (n=2). However, the effect on children's z-scores was inconclusive.

Summary & Conclusion: Video-assisted educational interventions have the potential to be just as effective as other intervention methods in addressing child malnutrition and positively affect maternal knowledge, attitudes, and feeding practices. Further research is required to better understand their impact on children's z-scores. A standardised scale needs to be developed in this situation to improve the evaluation of results.

Keywords: *Education, mothers, knowledge, attitude, practice, malnutrition, intervention*

PSIT/PP07/0005

Pharmaceutical entrepreneurship: Creating opportunities for pharmacy graduates

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Introduction: In an era of evolving healthcare landscapes and technological advancements, this poster presentation delves into how pharmacy graduates can harness their knowledge and skills to embark on entrepreneurial journeys within the pharmaceutical sector.

Aims and Objectives: The primary aim of this presentation is to shed light on the potential avenues for pharmacy graduates to venture into entrepreneurial endeavors within the pharmaceutical domain.

Methods: This presentation is based on a comprehensive review of pharmaceutical entrepreneurship and its implications for pharmacy graduates, interviews were conducted with experienced pharmaceutical entrepreneurs to gather firsthand insights into their journeys, challenges faced, and strategies employed. The methods encompass both qualitative and quantitative data to present a well-rounded view of the subject.

Results: The results further emphasized that pharmaceutical entrepreneurship not only offers financial rewards but also facilitates the development of groundbreaking solutions that enhance patient care and healthcare efficiency.

Summary and Conclusions: In conclusion, this presentation highlights how embracing entrepreneurship can empower pharmacy graduates to contribute meaningfully to the evolving landscape of healthcare.

Keywords: *Healthcare, Entrepreneurship, Qualitative and quantitative data.*

PSIT/PP07/0008

Skilling B. pharmacy graduates: Reskilling and upskilling

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Introduction: This article delves into the challenges posed by rapid technological and scientific advancements, highlighting the importance of continuous learning to stay relevant in the field.

Aim and Objectives: The objectives include examining the current challenges faced by B. Pharmacy graduates, elucidating the benefits of reskilling and upskilling, and providing

actionable insights into effective strategies for continuous professional growth.

Methods: The methods employed in encompass a comprehensive review of the latest advancements in pharmaceutical education, interviews and surveys with industry experts and pharmacy graduates were conducted to gather insights into their experiences and challenges. Qualitative data analysis was used to extract patterns and recommendations, forming the basis for the strategies proposed in the article to empower B. Pharmacy graduates in their professional journey.

Results: The results revealed a clear consensus among surveyed pharmacy graduates regarding the necessity of continuous skill enhancement in the evolving pharmaceutical landscape. The study highlighted a positive correlation between the adoption of reskilling and upskilling initiatives and career advancement opportunities. Furthermore, the results showcased a strong demand for specialized training in emerging fields ensure the graduates' competitiveness in the job market.

Summary and Conclusion: The study's conclusions stress the need for collaborative efforts among educational institutions, industry stakeholders, and regulatory bodies to establish robust reskilling and upskilling frameworks that equip graduates with the skills needed to contribute effectively to the ever-evolving pharmaceutical landscape.

Keywords: *Pharmaceutical education, Data analysis, Professional growth, educational institutions*

PSIT/PP07/0009

Intelligent Tutoring System: Utilizing user profiling in regulatory affairs courses

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Introduction: In the realm of modern education, the integration of technology and data-driven approaches has revolutionized traditional teaching methods. Intelligent Tutoring Systems (ITS) are computer-based educational platforms that aim to replicate the benefits of one-on-one human tutoring. Leveraging technologies like artificial intelligence, machine learning, and data analytics, ITS have gained prominence for their ability to provide tailored learning experiences. One such innovative tool, user profiling, has emerged as a valuable asset in enhancing the efficacy of courses, particularly in specialized domains like regulatory affairs. The use of user profiling in a regulatory affairs course offers a personalized and engaging learning experience, catering to the diverse needs of learners while fostering a deeper understanding of the subject matter.

Aim & Objectives: To equip learners with comprehensive regulatory knowledge using user profiling, fostering adeptness in navigating dynamic regulatory environments and to assess the impact of user profiling as an Intelligent Tutoring System (ITS) tool on learners' comprehension, confidence, and engagement in a regulatory affairs course.

Method: The content used for User profiling tool in a regulatory affairs course included-

- **Collection of Data**: Collecting information about students' background, learning preferences, and goals.
- **Content Repository**: Curating a comprehensive repository of regulatory information, case studies, and interactive content.
- **Adaptive Learning platform**: The platform would offer content in various formats such as- Presentation slides summarizing key concepts and topics, Video lectures, Audio recordings or podcasts or tutorials explaining complex regulatory concepts for convenient and easily accessible learning. For slow learners, the content could be presented in simplified

language or regional language with additional explanations and examples.
- **Real-time Assessment**: Providing quizzes, assignments, and simulations to assess students' comprehension and critical thinking.
- **Feedback Mechanism**: Offering immediate feedback, clarifications, and suggestions to reinforce learning.

Result: Outcome of the regulatory affairs course using user profiling as ITS tool enriched learning journey that tailor's content, pace, and support to individual needs. This approach allowed a solid understanding of regulatory affairs, enhanced confidence, and provided understanding of regulatory challenges in various industries.

Summary & Conclusion: As regulatory affairs continue to evolve, harnessing the power of user profiling is a step toward creating a cohort of highly skilled professionals ready to navigate the complexities of the regulatory landscape.

Keywords: *Intelligent Tutoring System, User Profile, Artificial Intelligence, Adaptive learning platform, ITS in regulatory course*

PSIT/PP07/0010

Design Thinking Case Study: Redesigning College Library Experience

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Introduction: Design Thinking in Education is a transformative approach for administrators, fostering innovation and problem-solving. It encourages collaborative, empathetic, and user-centric solutions to educational challenges. Administrators play a vital role in creating a culture where educators embrace Design Thinking, ultimately enhancing learning experiences and outcomes.

Aim and Objective:
- To address the imperative need to enhance student engagement with library facilities.
- To explores design thinking strategy to make library more appealing, functional, and user-friendly
- Identifying barriers to student involvement.
- Generating innovative solutions.
- Achieve satisfaction with the library resources and services.

Methods:
- In accordance with the design thinking process the first step was to design a questionnaire based on empathetic principles.
- Problem statement was defined after analyzing the results of the first step.
- Brainstorming and idea generation session was conductedto generate creative ideas.
- A fidelity prototyping method was adapted to design the library usage.
- Finally group of students were invited to test the prototypes and provide feedback.

Results: Smt. Kishoritai Bhoyar College of Pharmacy is known for its commitment to innovation and student-centric approach to education. However, the College Library and Information Centre, while resource-rich, has been facing challenges, especially post COVID, in engaging students effectively and providing a seamless learning experience. The college leadership decides to apply Design Thinking principles to revamp the library experience. Based on the insights, the team defined the core problem: "How might we create a library experience that enhances resource accessibility, encourages collaboration, and integrates digital and physical learning seamlessly?" The team created quick low-fidelity prototypes of the interactive touchscreens, furniture arrangements, and app interface. A detailed implementation plan for the changes.

Summary and Conclusion: By applying design thinking principles, Smt. Kishoritai Bhoyar College of Pharmacy successfully transformed its library and information

centre into a modern and engaging space that addresses user needs and preferences. The redesign not only improved resource accessibility but also enhanced collaboration and the overall learning experience for the students.

Keywords: *Design Thinking, educational challenges, learning experiences, Library*

PSIT/PP07/0013

Innovation in Self Service: Exploring Artificial Intelligence Enabled Tablet Vending Machine

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Introduction: The seamless integration of Artificial Intelligence **(**AI) with tablet vending system can revolutionize the way of direct distribution of Over the Counter (OTC) medication to patient. The incorporation of understanding capabilities of AI machinery with rapid vending of OTC medicines can enhance the patient compliance with enhanced user experience setting new parameters for innovation.

Aim & Objectives: To enhance the frequency of medication for the primary treatment and enhance safety and decreases the chances of error in medication and to provide easy access to patient. With the help of modernised automated artificial intelligent machinery and increased insight and analytics the opportunities for the business profit will increase.

Method: This machine will have a large display which have images of symptom such as coughing, sneezing, diarrhoea, fever, allergy, pain with voice command enabled feature incorporate with the Augmented Reality (AR) in the regional language also. The large display will serve as a notice for awareness & prevention of various diseases. On every 5 machines there will be a registered pharmacist who will monitor the real time dispensing of OTC medicines.

Result: This type of vending machine will be made of thermo-resistance material which protect the medicine from change in temperature, with preinstalled AI in the operating system for vending machine. This AI based drug vending machine will change the way of primary treatment for the betterment of public health and increase the patient compliance, with personal recommendations providing safe and effective medicines.

Summary and conclusion: This machine will vanish all the possibilities of stigma and privacy invasion, discrimination, disclosure of sensitive information. This machine will also provide enhanced user interface and real time data monitoring on the consumption of various medicines and help to perform the Pharmacoepidemiological, and Pharmacoeconomical studies. This data will help in the prediction of any upcoming pandemics or any other contagious disease.

Keywords: *OTC medicines, Augmented Reality, Pharmacoepidemiological studies, Pharmacoeconomical studies.*

PSIT/PP07/0014

Cross-Sectional Study for Assessment of Perception and Approach of Registered Pharmacists of Goa State (India) Toward Continuing Pharmacy Education Program

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Introduction: Continuing Pharmacy Education is a refresher course mandatory by PCI for renewal of Pharmacist registration certificate by State Pharmacy council

Aim & Objectives: To investigate and assess the perception and approach of registered pharmacist of Goa State toward continuing pharmacy education program

Method: A descriptive, cross-sectional survey of pharmacists' attitudes was conducted. Data was collected via self-administered questionnaires. Responses to the questionnaires allowed calculating the participants' scores to interpret the pharmacist's attitudes towards CPE. Also, it allowed the pharmacists to talk freely about the barriers that might hinder them from undertaking CE activities via an open-ended question.

Results: Total 356 Pharmacist completed Questionnaire. The Participant had median score of 42. Attitude. Score was corelated with age and work experience. Continuing Pharmacy Education activity taken by pharmacist was attending CPE Program. Main reason for attending CPE Program is mandatory requirement for renewal of registration. Main barrier in attending CPE is lack of time due to excessive workload and limited number of seats of CPE.

Summary & Conclusion: The current research examined the attitudes, perceptions, and barriers to CPE in a sample of 356 pharmacists. This was conducted using open- and closed-ended questions, which were adapted from the JSPLL questionnaire. In relation to attitudes, 60% of the sample adopted good to excellent attitudes towards CE, 39% had fair attitudes, and 1% had a poor attitude. It was concluded that Goan pharmacist has awareness and positive attitude towards continuing pharmacy education programme

Keywords: *Continuing pharmacy education, Cross sectional survey, SPSS, Pharmacist*

26TH ANNUAL NATIONAL CONVENTION

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A Neoteric Review nn Nanoformulation

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Introduction: Nanoformulation and nano-sized delivery systems are currently developing techniques where active molecules are converted in the nanoscale range and employed to deliver therapeutic agents such as "chemotherapeutic agents, antipsychotic agents, biological agents, and immunotherapeutic agents, etc", to the specifically targeted sites in a sustainable form for the treatment of various diseases. Accurate, site-specific target administration of medication provides numerous benefits in the treatment of chronic human diseases. Nanocarriers such as micelles, liposomes, nanoemulsions, lipid nanocarriers, and nanoparticles have specific advantages relative to traditional medications.

Aim & objectives: To provide effective targeting, greater compatibility with the body's natural functions, increased ability to penetrate tissues, and improved durability.

Method: "Nanoformulation-based systems" are developed utilizing a variety of operations, including homogenization, solvent emulsification, and sonication.

Result: Advanced nanotechnology methods allow active substances to be transferred directly into specific tissues, bypassing physiological barriers. Nanoformulation provides a way to manage nanomaterials with precision by site-specific targeting treatment.

Summary & Conclusion: This approach allows for safe and effective site-specific targeting in chronic disease treatment, improving therapeutic benefits. In this study, we've outlined the current developments in nanoformulations for site-specific targeted therapy and explained how they work.

Keywords: *Nanoformulations, Nanocarriers, Site-specific targeting, Drug delivery.*

PSIT/DL4/0304

Production and Interpretation of Immediate Dispersible Buccal Film of Alogliptin Benzoate

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Introduction: The film dissolves quickly in saliva, making it simple to swallow. Utilizing oral rapid-dissolving films increases patient compliance, reduces costs, and improves drug bioavailability. Instant dissolving film is administered through the buccal channel. It has a shorter dissolve time and a quicker start of action to reach systemic circulation than capsules and tablets.

Aim & Objectives: The present investigation was undertaken with the objective of preparing immediate dispersible buccal film of Alogliptin benzoate with different polymers as the oral films have a considerable improvement over the conventional dosage form.

Methods: Immediate dispersible buccal film aloglipitin benzoate containing 625mg drug, PEG400 and HPMCE15, sodium saccharin, mint flavor was prepared by solvent casting method according to formula. A batch of 25 films was prepared for each formulation.

Results: The formulated film possessed folding endurance (11), Thickness (0.58mm), Tensile strength (54.10gm/cm^2), *In vitro* dissolution (99.16%), *In-vitro* disintegration time (21sec) after 3 months stability test. The

optimized batch F3 exhibit 99% drug release compared to 94% of the marketed film.

Summary & Conclusion: The formulated batch F3 showed excellent drug release profile and was found to be stable as compared with marketed films and other formulated batchs. Thus, stable film f3 was successfully prepared for maintains the glucose levls in blood.

Keywords: *Antidiabetic, Alogliptin benzoate, Solvent-casting, HPMC, PEG 400*

PSIT/DL4/0305

Marburg Virus Disease

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Introduction: Marburg virus disease (MVD) is a severe, often fatal illness caused by the Marburg virus. The virus causes severe viral haemorrhagic fever in humans characterized by fever, headache, back pain, muscle pain, abdominal pain, vomiting, confusion, diarrhoea, and bleeding at very late stages. MVD was first identified in Marburg, Germany in 1967

Aim & Objectives: This article summarizes the countermeasures for Marburg virus disease, focusing on pathogenesis, clinical features and diagnostics. There is an emphasis on therapies and vaccines that have demonstrated, through their evaluation in nonhuman primates (NHPs) and/or in humans, potential for use in an emergency situation.

Methods: A standardized literature review was conducted on vaccines and treatments for Marburg virus disease, with a focus on human and nonhuman primate data published in the last five years. More detail on the methods that were used is summarized in a companion methods paper.

Results: The study identified six treatments and four vaccine platforms that have demonstrated, through their efficacy in NHPs, potential benefit for treating or preventing infection in humans.

Summary & Conclusion: Succinct summaries of Marburg countermeasures are provided to give the busy clinician a head starts in reviewing the literature if faced with a patient with Marburg virus disease. Links to other authoritative sources of information are also provided.

Keywords: *Marburg virus, Filovirus, Ebola virus, Antiviral therapy, Antiviral countermeasure, Vaccine, Treatment*

PSIT/DL4/0306

Role of Nanoparticle in Treatment of Alzheimer's disease

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Introduction: Alzheimer's disease (AD), a neurological condition that progresses and cannot be reversed, is still a significant global public health issue.

Aim & Objectives: Based on its specific qualities, nanotechnology, which we use for this treatment, provides an alternative platform for the targeted diagnosis and management of AD. Present review focused on recent developments associated with treatment of AD using nanoparticles. An innovative method for creating alternative medication delivery treatments for AD in all phases is provided by nanotechnology (NT).

Methods: Nanoparticles (NPs) are particles with at least one dimension smaller than 100 nm that are used in nanotechnology. NPs can interact with biomolecules more easily because of their compact size and high surface-to-volume

ratio and thus can easily penetrate and deliver drugs through blood-brain-barrier (BBB).

Results: To change their mobility across biological barriers, they can be created in a variety of shapes (spherical, cubic, rod-like). NPs are useful for both diagnosing and treating diseases. In order to acquire novel physiological, therapeutic, or diagnostic capabilities, including the capacity to traverse the BBB, they can interact with a wide range of desirable ligands (via adsorbing, entrapping, or covalent bonding).

Summary & Conclusion: Hence it is very necessary to treat Alzheimer's and it can be treated successfully using nanotechnology.

Keyword: *Alzheimer's disease, Nanoparticles, particle size, shape and penetration ability, BBB etc.*

PSIT/DL4/0307

Legal Blindness: An Updated Review

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Introduction: Blindness is a spectrum, everyone's experience with vision loss is different and unique. Normal vision is 20/20 i.e, one can clearly see an object 20 feet away. If the person is legally blind, his vision is 20/200 i.e., an object is kept 200 feet away (the person has to stand 20 feet from it to see it clearly).

Aim & Objectives: This review focused on legal blindness to investigate and bring attention to how persons with declining eyesight may feel unsure, anxious, and ultimately depressed.

Methods: The WHO had a global campaign named "VISION 2020" to reduce blindness. Different methods have been used by researchers to tackle this problem. Rajiv Khandeka, et. al. performed a survey on legal blindness in OMAN, and Matías Osaba, et al. applied the Zung scale technique to gauge the severity of depression in legally blind people.

Results: The WHO team's analysis shows that there are currently at least 2.2 billion visually impaired people worldwide, of whom at least 1 billion have impairments that could have been avoided or that have not yet been addressed.

Summary & Conclusion: The WHO collaborated with the IAPB worked to energize the field. Over a thirty-year period, the prevalence of blindness decreased from 4.8% to 3.1%. According to future perspectives AGENDA 2030: LEAVE NO ONE BEHIND, has launched that will enhance eye health internationally. Yet no specific medication is used to treat blindness, so a novel drug needs to be developed.

Keywords: *Legal Blindness, Depression, Zung scale, VISION 2020, IAPB*

PSIT/DL4/0308

Ash Gourd: Mind Alerting Herbal Formulation

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Introduction: The Ash gourd, *Benincasa hisipida*, a member of the Cucurbitaceae family, is widely cultivated throughout Asia. It is not only a rich source of nutrients but also a great way to improve memory, brain health, and other significant therapeutic benefits.

Aim & Objectives: To prepare and investigate the mind alerting activity of Ash gourd lozenges containing other herbal extract of Tulsi, Brahmi, Shilajit and Ashwagandha, by administering in rats orally (4gm/body weight).

Methods: 800 grams of Ash gourd

fruitare removed cut in to small pieces, and ground to create a fine mixture. 500 ml of ethanol was added to the mix ture and it was the run four times in the Soxhlet apparatus before being collected. The mixture was concentrated on a Rota evaporator tills emi-solid mass (20gm) was achieved. Then, 2 gram of Ash gourd were combined with Tulsi, Bharmini, Ashwagandha, and Shilajit (1:1:1:4) and put in a mould with melted brown sugar. Once cooled, 4gm of lozenges were obtained. Now, physiological behaviour was observed in rats.

Results: Rats demonstrated significant physiological behaviour such tail wagging, jumping, tooth attrition, and increased appetite after ingesting prepared lozenge 2-3 times per day.

Summary & Conclusion: The experimental study showed alertness of brain in rats consuming lozenges and was observed up to 20 days. Therefore, using this fruit as herbal formulation and in various products will increase healthy life, reduce harvest losses and provide compensation to the cultivators.

Keywords: *Ash gourd, Shilajit, Brahmini, Ashwagandha, Tulsi, Lozenges.*

PSIT/DL4/0309

Pharmacovigilance Based on Artificial Intelligence in the Context of Limited Resources

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Introduction: Data-driven automatic approaches must be quickly applied to all facets of pharmacovigilance in order to support healthcare professionals, given the rapid development of artificial intelligence (AI) technology and the vast volume of pharmacovigilance-related data stored electronically.

Aim & Objectives: The goal is to create and deploy a resource-constrained, AI-driven pharmacovigilance system that effectively monitors and diagnoses adverse medication responses, improving patient safety and regulatory compliance. This study's goal is to investigate the use of artificial intelligence (AI) in pharmacovigilance in environments with limited resources, evaluating how well it might improve adverse drug event detection, monitoring, and patient safety while maximizing resource allocation and operational effectiveness.

Methods: Utilize AI algorithms for effective pharmacovigilance while facing resource limitations. Use machine learning to identify negative medication responses, give instances more attention, and improve signal detection. Despite limited resources, optimize data consumption and decision-making with AI-driven analytics, reducing risks and boosting patient safety.

Results: Despite resource limitations, AI-driven pharmacovigilance enhances adverse medication event monitoring, improving patient safety. Advanced algorithms prioritize actions by analyzing data for early detection. Drug safety profiling is enhanced by effective resource allocation and prompts actions, which is advantageous for public health.

Summary & Conclusion: Even in situations with limited resources, the incorporation of AI technology in pharmacovigilance has enormous potential for effectively monitoring adverse medication occurrences and enhancing patient safety. With this strategy, data analysis, action prioritization, and resource allocation are all optimized, which improves public health outcomes and regulatory compliance.

Keywords: *Artificial intelligence, Adverse drug reaction, Patient safety,*

Resources-constrained, Regulatory compliance

PSIT/DL4/0310

Risk Management in Pharmacovigilance by Specialist Cohort Event Monitoring Studies

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Introduction: The past decade has witnessed a transformative shift in post-marketing safety and risk management towards proactive evaluation of benefit-to-risk ratios. Pharmacovigilance (PV) activities aimed at identifying, characterizing, and minimizing risks associated with medicinal products have gained significance due to evolving European Union (EU) PV legislation mandating risk management plans (RMPs) for new medicines.
Aim & Objectives: This paper discusses Specialist Cohort Event Monitoring (SCEM) studies, an innovative tool contributing to post-marketing safety surveillance. SCEM studies monitor patients in secondary care settings, addressing the need for comprehensive safety assessment beyond routine PV practices. The framework focuses on observational research, capturing real-world drug usage and patient outcomes.
Methods: This paper discusses Specialist Cohort Event Monitoring (SCEM) studies, an innovative tool contributing to post-marketing safety surveillance. SCEM studies monitor patients in secondary care settings, addressing the need for comprehensive safety assessment beyond routine PV practices. The framework focuses on observational research, capturing real-world drug usage and patient outcomes.
Results: SCEM studies offer distinct advantages, such as analyzing drug use patterns, evaluating subpopulations, and enhancing signal detection. Lessons learned from SCEM implementation underscore the importance of considering treatment guidelines and addressing non-response challenges. Adaptive study design and real-time monitoring enhance response rates and study effectiveness.
Summary & Conclusion: In conclusion, SCEM studies bridge the gap between event monitoring and targeted safety research, providing a robust means of evaluating the safety of new medicines in diverse clinical settings. Their potential for extending beyond post-marketing periods and national boundaries makes SCEM a valuable tool in risk assessment and pharmacovigilance planning.
Keywords: *risk management plans, specialist cohort event monitoring studies, post marketing safety surveillance, non response challenges, and targeted safety research.*

PSIT/DL4/0311

Review On Spinal Muscular Atrophy (SMA): Cause and Therapies

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Introduction: SMA is the most prevalent hereditary cause of newborn mortality, caused by a mutation in SMN1gene, which results in the death of motor neurons and increases muscle weakening. SMN, a necessary protein, is typically produced by SMN1 gene. SMN2 is a paralogous gene that founds in humans.
Aim & Objectives: The main objective of this review is to study and to clarify about how and what the reason is behind the cause and the current therapies which are used for the treatment of SMA.

Methods: Several methods have been followed to ensure the high quality of this review paper. The comprehensive readings of recent published journals like "SCOPUS", "IRJPMS", "MDPI" and some video podcast, webcast, and online videos.

Results: The result of the review is, SMA disease has several types, which occur in different age groups of infants. There are some treatments that either delay progression or manage the symptoms in order to prevent complications. The current therapy is Antisense anti-neuronal mediated treatment. Trials showed that antisense therapy is able to boost SMN expression in the CNS, resulting in increase in longevity and righting reflex test proficiency.

Summary & Conclusion: SMA is a severe muscle weakness affecting children, causing difficulty in head movements or sitting unassisted. Nusinersen is the first approved therapy for SMA, potentially increasing SMN protein and improving motor function. Early treatment is expected to become the standard of care. Advancement of promising therapies in clinical trials requires efficient and safe management under FDA guidance.

Keywords: *SMA, SMN protein, Clinical trials, Nusinersen, Antisense therapy*

PSIT/DL4/0312

Evaluation of Hepatoprotective Activity of Aqueous Extract of *Glycyrrhiza glabra* against Rifampicin –Isoniazid induced Hepatotoxicity in Rat

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Introduction: Drug-induced liver injury is a cause of acute and chronic liver disease caused specifically by medications and the most common reason for a drug to be withdrawn from the market after approval. Herbal formulations as a preventive treatment are becoming popular particularly.

Aim & Objectives: To evaluate the hepatoprotective activities of *Glycyrrhiza Glabra* extracts in Rifampicin-Isoniazid induced Hepatotoxic male wistar rats by administering oral doses (100, 200 and 400 mg/kg body weight).

Methods: In Hepatoprotective assay, Rifampicin (50mg/kg) Isoniazid (100mg/kg) induced acute liver injury after that wistar rat were treated for 21 days with extract at a dose of 100 mg/kg, 200mg/kg, 400mg/kg body weight and standard drug liv-52 (2.5mg/kg). Blood samples were collected and serum enzymes alanine aminotransferase (ALT or SGPT), aspartate aminotransferase (AST or SGOT), alkaline phosphatise (ALP), superoxide dismutase (SOD) , serum bilirubin were assessed in the selected groups of animal.

Results: In hepatoprotective assay the extract markedly reduced hepatospecific enzymes such as ALT, AST, ALP and decrease level of total protein when compared with standard group.pre treatment with LIV-52 *Glycyrrhiza Glabra* extract had showed with good protection against rifampicin-isoniazid induced toxicity to liver.

Summary & Conclusion: From the above result, it can be concluded that the plant extract is capable of managing rifampicin-isoniazid induced hepatotoxicity.

Keywords: *Glycyrrhiza Glabra, Rifampicin-Isoniazid, LIV-52, Hepatotoxicity.*

PSIT/DL4/0313

Folate Grafted Gellan Gum Nanoparticulate System for Tumor Targeting

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Introduction: In the quest for precise and effective cancer therapy, the development of advanced drug delivery systems is pivotal.
Aims and Objectives: The intention of present research work is to formulate usnic acid (UA) loaded folate (FA) modified gellan gum (GG) nanoparticles (NPs).
Methods: NPs were typified and further characterized for particle size, polydispersity index, entrapment efficiency, zeta potential, atomic force microscopy, differential scanning calorimetry, X-ray diffraction analysis, and in-vitro release. In-vitro tube formation assay, tumorsphere assay, autophagy assay, DNA cleavage assay, internalization by confocal and FACS based internalization analysis, caspase assay and cell cycle assay were performed for biological activity.
Results: Obtained experimental results explored that FA-GG NPs displayed a sustained release of UA (97.74% in 48 h) compared to gellan gum NPs (91.45% in 12 h). In cytotoxicity studies, UA loaded NPs exhibited an enormous cytotoxic potential against MDA-MB-231breast cancer cells. In the in vivo bio-distribution study, using albino rat model the free UA concentration was found 2.65 ± 1.14% post two hours of intravenous administration, however, in the case of UA loaded NPs the obtained level was 7.65 ± 1.15%, respectively, lung. The Cytotoxic study, Cell cycle, Apoptosis, and Internalization assay may also suggested effective results with the nanoparticles system against breast cancer cells.
Summary & Conclusion: The overall anticancer study and result of internalization deciphered the higher anticancer potential of UA loaded NPs and suggested that the NPs system may potential candidate for breast cancer targeting and drug delivery of UA towards tumor cells.
Keywords: *Anticancer delivery; Gellan gum; Folic Acid; Nanoparticles; Nanotechnology; Usnic acid.*

PSIT/DL4/0314

Preparation and Evaluation of Hydrogel Formulation Containing *Ocimum sanctum* Leaves Extract for Anti-Inflammatory

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Introduction: A three-dimensional network of hydrophilic (water-loving) polymer chains that can absorb and hold a sizable quantity of water inside their structure is referred to as a hydrogel. Because of this special quality, hydrogels may expand and store water without losing their structural integrity.
Aim & Objectives: The goal of this study was to create an anti-inflammatory hydrogel formulation using the methanolic fraction of *Martynia annua* and *Ocimum sanctum* and test it on several animal models.
Methods: Hydrogel formulations were created using the leaves of *Martynia annua* and *Ocimum sanctum.* Different ratios of CMC and Carbopol 940 were used. In mice with ear edema the produced hydrogel was examined for optimization reasons and its anti-inflammatory effectiveness. Evaluation of the percentage of ear edema inhibition as

well as biochemical markers were used to determine the effectiveness.

Results: The presence of sterols, terpenoids, and fatty oils were found extract of *M. annua* and *O.* sanctum. According to the current study, hydrogels of *O. sanctum* and *M. annua* have been found to exhibit anti-inflammatory characteristics.

Summary & Conclusion: The *M. annua* and *Ocimum sanctum* prevented ear edema. The anti-inflammatory properties of extracts are demonstrated by their ability to reduce histamine synthesis, release, or activity. The notable activity may be due to flavonoids.

Keywords: *Anti-inflammatory, Carbopol 940, hydrogel, Martynia annua, Ocimum sanctum*

PSIT/DL4/0315

Nanodiamonds: An Expansion Nanotechnology for Effective Drug Delivery in the Treatment of cancer

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Introduction: Nanodiamonds have emerged as a significant nanotechnology platform, offering unique properties that make them promising for drug delivery applications, particularly in cancer therapy. This review examines the latest developments in utilizing nanodiamonds for effective drug delivery to cancerous cells.

Aims and Objectives: The primary aim is to offer a comprehensive overview of the current state of nanodiamond-based drug delivery systems. Objectives include an assessment of the synthesis methods, surface modifications, biocompatibility, and their applications in targeted and controlled drug delivery for cancer treatment

Methods: The synthesis of nanodiamonds is typically done through detonation synthesis, followed by purification and surface functionalization. The anticancer drug is then conjugated to the nanodiamond surface using covalent bonding or adsorption, with optimization of various parameters. Characterization techniques confirm the successful conjugation, creating a platform for targeted anticancer drug delivery.

Results: The review reveals that nanodiamonds offer several advantages, including high stability, tunable surface chemistry, and excellent biocompatibility. These properties enable effective encapsulation and delivery of various anticancer agents, enhancing therapeutic efficiency while minimizing side effects. The review highlights numerous successful applications of nanodiamonds in delivering different therapeutic molecules to cancer cells.

Summary & Conclusion: Nanodiamonds represent an exciting expansion in nanotechnology, providing new avenues for targeted and efficient drug delivery in cancer therapy. Their unique properties and versatile applications underscore their potential as promising carriers for anticancer agents. Future research focusing on clinical translation and overcoming existing challenges will further solidify the role of nanodiamonds in revolutionizing cancer treatment strategies.

Keywords: *Nanodiamonds, nanotechnology, drug delivery, cancer*

PSIT/DL4/0316

An update on biosensor that detects Tumor DNA

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Introduction: Tumor is a leading cause of deathaworldwide accountingafor nearly 10 million deathain 2020. The mostacommon cancer are breast, lung, colon, rectum, and prostate cancer. Manyatechnologies can analyze purified DNA in thealab, but these cannot detectaDNA where it isareleased.

Aim & Objectives: A new technologically advanced sensor that detects the presence of tumor DNA in live organisms by a catch strategy, usingaCRISPR technology toatest free-floatingaDNA sequences on aagenomic level & compareasamples with predeterminedacancer sequences.

Methods: A bacteria known as "Acinetobacter Baylyi" can takeaup DNA fromathe environment, a skill knownaas natural competence. This allows for horizontal gene transfer, baylyi integrates cell-free DNA with its own genome &produces a new proteinin this engineered. *AaBaylyi* to findaDNA specifically theamutated KRAS gene whichahelpscolorectalacancer grow that convert into CATCHatechnology cellularaAssay of targetedaCRISPR – discriminated Horizontal geneatransfer.

Results: These bacteria detect donor DNA from genomes of colorectal cancerous cells, organoidsa& tumors. This new biosensorais capable ofaidentifying various infections, cancer, and other diseases.

Summary & Conclusion: In this observation a new biosensorthat detects cell-free DNA. A CATCH technology that is capable of the detection of colorectal cancers cell. This technology as a possible that my challenge tumors.

Keywords: *CATCH, Tumor DNA, Cell-free DNA, Acinetobacter baylyi, Colorectal cancers cell (CRC).*

PSIT/DL4/0317

Zonisamide with Citral for the Treatment of Neurodegenerative disease: Synergistic Effects and Best Combinations

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Introduction: Citral's anticonvulsant properties entail modulating glutamate receptors and oxidative stress pathways, whereas zonisamide predominantly targets sodium channels and boosts GABA function. These different processes point to the possibility of zonisamide and citral interacting synergistically to improve seizure control.

Aim & Objectives: Examine the synergistic effects of zonisamide and citral on the treatment of "catalepsy- a neurodegenerative disease" and determine the best combinations.

Methods: There will be multiple groups formed from the animals used in each research design. Group I will be our control group which will receive distilled water 1 ml/kg; Group II: pilocarpine-induced catalepsy model - administered with pilocarpine 1mg/kg, Group III will be given Zonisamide 10-30mg/kg, Group IV will receive Citral dose1-3 mg/kg, Group V: Serotonin analogue (agonist) will be administered according to the body weight, Group VI will receive Serotonin analogue (antagonist) as per body weight by intraperitoneal route. Using tried-and-true techniques like electroencephalography (EEG), behavioural observations, or video surveillance, the animals will be periodically checked for seizure activity.

Results: By increasing GABA activity, the combination of zonisamide and citral lead to a greater reduction in seizure frequency than either treatment alone or the control group. The experiment also aids in determining the ideal dosage of zonisamide and citral that has the most beneficial therapeutic effects with the fewest side effects monitoring.

Summary & Conclusion: Based on the results obtained from the experiment, the conclusion may suggest that the combination of zonisamide with citral shows promising synergistic effects for the treatment of catalepsy.

Keywords: *Catalpesy, zonisamide, citral, GABA, Serotonin*

PSIT/DL4/0318

IoMT'– 'IoPT' an Intelligent Solution towards Efficient Digital Health

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Introduction: Life is precious; and even a single life is also very important, but due to lack of health services, its awareness about diseases, and good access to healthcare systems, people are dropping their lives.

Aims and Objectives: As artificial intelligence has revolutionized various fields of life; health services have also benefited from it.

Methods: The IoT, in modern times is said as a network in which many devices are connected, and these devices can communicate by computer network. In IoT healthcare system, there exist wireless systems where different applications and sensors are attached to patients, information is obtained, and this information is forwarded to a doctor or specialist through an expert system.

Results: Medical devices for Internet of things (MD-IoT) are remotely accessed. In all situations, IoT is very helpful in the treatment of patients. Thus, the Internet of Things can play a significant role in accelerating drug development, streamlining its production, and lowering the related R&D cost, as well as improving the administration of medicine to patients. In this way, treatment of patients is quite possible and may improve the standard of life and upbringing the concept of smart healthcare system.

Summary & Conclusion: Worldwide rapid technological development with increasing Internet access and the pervasiveness of mobiles as smart phones makes e-health or m-health relevant to all. Digital-e-health has expanded from web-based services to health apps, online video services, and social media. Similarly, the enabled mobiles use with same health services. New services and technologies are constantly being developed.

Keywords: *Internet of things, healthcare system, telemedicine, community pharmacy*

PSIT/DL4/0319

Formulation design, characterization of Celecoxib loaded solid lipid nanoparticles (SLN) for topical delivery

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Introduction: Topical route is the most preferred route fastens in patient fulfilment; though, oral administration is more prone to hepatic first pass metabolism required higher dose of drug. Drugs are administered topically for their action at the site of application, or for systemic effects.

Aim & Objectives: To investigate bioavailability and compatibility of celocoxib loaded solid lipid nanoparticles for topical delivery.

Methods: Preparation of Celocoxib SLNs, firstly lipid films prepared by using Solid lipids phosphatidylcholine (PC), cholesterol (CH), in different ratio. Preparation of topical gelling system: The gel formulation was prepared with SLNs and gel base to get CSLNG1 – CSLNG8 of Celocoxib,

Results: Characterization of celecoxib SLN: The effect of the lipid and surfactant concentration on the particle size distribution of celecoxib loaded SLN prepared by using PC and CH with span 80. Characterization of celecoxib SLNs topical gel (CSLNG1 – CSLNG8): The main ingredient of the topical gel formulation is the gelling agent from all required chemicals. The high concentration of gel forming agent may lead to formation of gels with high viscosity leading to non uniform distribution of drug and showed problem with handling of gel.

Summary and Conclusion: The proposed work developed novel drug delivery system using nanoparticles with biodegradable natural polymer might be helpful to develop nano formulations for the effective treatment of infection with reduced side effects. Thus, the present research work designed solid lipid nanoparticles SLNs with topical gel semisolid formulation to increase the bioavailability and might be overcome the challenges associated with the drug.

Keywords: *Bioavailbility, compactability, nanoparticles, celecoxib, SLN topical deliver*

PSIT/DL4/0320

Drug-eluting Stent and its Adverse Effect

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Introduction: Today improved versions of drug-eluting stents are considered safe for most people when used with anti-clotting medication. In general, drug-eluting stents are less likely to cause restenosis than are bare-metal stents.

Aims and Objectives: Stents are used to treat coronary artery disease. This condition happens when plaque builds up in the artery that supplies blood to the heart muscle, called a coronary artery. This builds up causes the artery to narrow and can change blood flow to the heart. Without proper blood flow, the heart doesn't get enough oxygen.

Methods: Most people can safely tolerate drug-eluting stents. But like any medical procedure, coronary angioplasty and stenting do involve some risks, including, allergic reaction to the anaesthetic, dyes, or other materials used.

Results: The investigation shown that nano-emulsomes exhibit a high level of efficacy in the transportation of therapeutic substances to the brain. The compact dimensions, lipid composition, and capacity for functionalization of these entities facilitate their effective traversal through the nasal mucosa and blood-brain barrier.

Summary & Conclusion: This paper discusses the adverse effect of using drug eluting stent, meta-analyses of long-term outcomes from these trials associated drug- eluting stents use with adverse events, believed to be attributable to late stent thrombosis, occurring more than around nine months after the initial procedure.

Keywords: *Drug-eluting stents, Coronary artery, Coronary angioplasty and stent thrombosis*

PSIT/DL4/0321

Role of liraglutide at cellular level improves diabetic cardiomyopathy by suppression of cardiac inflammatory and apoptosis markers

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Introduction: One of the main causes of mortality for diabetes people globally is diabetic cardiomyopathy. The continuous oxidative stress caused by hyperglycaemia in the heart, which led to the maladaptive reactions of inflammation and apoptosis in DCM. Liraglutide is used for reduced inflammation, apoptosis, oxidative stress, fibrosis, hypertrophy, and cardiac dysfunction in DCM.
Aim & Objectives: Role of liraglutide at cellular level improves diabetic cardiomyopathy by suppression of cardiac inflammatory and apoptosis markers
Methods: Using the terms liraglutide, DCM, *In-vitro, In-vivo,* inflammation, apoptosis, oxidative stress, fibrosis, hypertrophy, and cardiac dysfunction were search by the PubMed database.
Results: A long-acting glucagon-like peptide-1 analogue called liraglutide has been shown to have a variety of therapeutic uses in medicine and other biological processes. Liraglutide's abilities to shield the heart from cardiomyopathy brought on by diabetes have been extensively explored. Liraglutide has the potential to reduce DCM in part because of its therapeutic effects as an anti-hyperglycaemic, antioxidant, anti-inflammatory, and anti-apoptotic drug.
Summary & Conclusion: Our review shows that persistent hyperglycaemia-induced oxidative stress has the worst effects on cardiac function in diabetics. This stress not only results in direct oxidative damage to the heart tissue but also spreads cardiac inflammation and apoptosis as adaptive responses. When the hyperglycemic condition is not managed, these adaptive responses quickly become maladaptive, progressing DCM towards an advanced staghound form. It has been shown that all of these medications increase levels of endogenous antioxidants, which helps the heart fight oxidative stress brought on by hyperglycemia. Additionally, it was shown that they prevented NF-B pathways from causing myocardial inflammation. Liraglutide's comparable effects could be a result of their shared chemical structure. Liraglutide has shown pre-clinical promise in improving retrograde cardiac function in diabetic circumstances, which bodes well for the treatment of DCM.
Keywords: *Glucagon-like peptide-1, Liraglutide, Oxidative Stress, Systolic dysfunction, Diastolic dysfunction.*

PSIT/DL4/0322

Effect of Central Histaminergic Transmission on Nociception

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Introduction: Histamine is a biogenic amine that plays a crucial role in various physiological processes. Discovered in 1910, histamine was later identified as the mediator of anaphylactic reactions. Histamine exerts its effects by binding to its four receptors: H_1, H_2, H_3, and H_4.H_1 and H_2 receptors have excitatory actions, primarily mediated by activation of $Gq/_{11}$ and PLC, leading to the generation of second messengers that cause depolarization and increased firing. H_3 receptors, located on histaminergic and other neurons, provide negative feedback

to regulate histamine synthesis and release, as well as the release of other neurotransmitters.

Aim & Objectives: To investigate the Histamine's role in nociception modulation has been investigated, and it has been demonstrated that histamine can cause both antinociception and hyperalgesia depending on the dose and the receptor involved. Studies using selective H_3 receptor agonists and antagonists suggest that low levels of histamine act on presynaptic H_3 receptors and modulate nociception.

Methods: In group of three rat and mice, at high relatively high dosages, intra-cerebroventricular (i.c.v.) administration causes antinociception in mice as well as rats histamine injections into the dorsal raphe nucleus and periaqueductal grey region of rats produced antinociception while those into the median raphe nucleus resulted in hyperalgesia. The minor descending histaminergic pathway originates from hypothalamic neurons, in addition to the two ascending histaminergic pathways.

Results: The effects of both an agonist and an antagonist of the H_3 receptor toconfirm that low levels of histamine act at the presynaptic receptor. In all three assays, the selective histamine H3 receptor antagonist thioperamide produced antinociception in mice and rat.

Summary & Conclusion: Histamine is a versatile neurotransmitter involved in various physiological processes and plays a complex role in nociception regulation through its interactions with different receptors. Further research is needed to fully understand the intricacies of histaminergic neurotransmission and its implications in pain modulation**.**

Keywords: *Histamine, Pyridoxal phosphate, L-histidine decarboxylase, Basophils, Platelets*

PSIT/DL4/0323

Acute dermal toxicity of herbal test substance

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Introduction: The evaluation of acute dermal toxicity plays a pivotal role in assessing the safety of substances for potential human exposure.

Aim & Objectives: This study aimed to evaluate the dermal toxicity of a herbal extract administered topically on female Sprague-Dawley rats.

Methods: Twenty-four rats, weighing 180-220 g, were individually housed in controlled conditions. After a week of acclimatization, rats were categorized into groups: control, vehicle (20% soft white paraffin), and three treatment groups (50 mg/kg, 300 mg/kg, and 2000 mg/kg herbal extract). The herbal extract was applied once, focusing on acute skin toxicity. General anesthesia was induced using ketamine and xylazine for fur shaving on the dorsal thoracic region. Throughout the 14-day study, rats were assessed for mortality, edema, erythema, eye changes, mucous membranes, behavior, breathing patterns, and weight. Hematological parameters were measured using a semi-automatic analyzer. Statistical analysis employed GraphPad Prism software.

Results: Notably, there were no significant differences in body or organ weights between treated and control rats ($p > 0.05$). Skin irritation tests showed no erythema or edema, and in acute toxicity studies, initial reactions subsided. Behavioral patterns remained unchanged. The rats' weights progressed steadily without outliers. The absence of erythema or edema indicated the herbal extract's lack of irritant potential.

Summary & Conclusion: This study demonstrates that the topical application of the herbal extract, even at relatively high doses, did not result in adverse dermal effects or systemic toxicity, highlighting its potential safety for dermatological applications. The research underscores the importance of rigorous preclinical assessments to ensure the safety of herbal products before human use.
Keywords: *Sprague-Dawley rats, herbal extract, erythema, oedema*

PSIT/DL4/0324

A Comprehensive Review on the Use of Herbal Medicines and Nutraceuticals for Rapid Wound Healing

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Introduction: The intricate interplay of biological processes involved in wound healing necessitates innovative approaches, making herbal drugs and nutritional supplements a subject of substantial interest.
Aim & Objectives: This comprehensive review delves into the extensive utilization of potent herbal drugs and nutritional supplements to expedite the process of wound healing.
Methods: Herbal drugs, derived from diverse plant sources, have been acknowledged for their multifaceted properties that contribute to wound healing. Phytochemicals such as flavonoids, terpenoids, and polyphenols present in these herbs possess anti-inflammatory, antioxidant, and antimicrobial capabilities, which collectively foster an environment conducive to accelerated tissue repair. Nutritional supplements, comprising vitamins (A, C, and E), minerals (zinc, copper), and amino acids (arginine), have pivotal roles in collagen synthesis, immune function, and cell proliferation, integral to wound healing.
Results: Incorporating these interventions in wound care regimens has shown promising results. Clinical trials have demonstrated enhanced wound closure rates, reduced infection risks, and improved scar outcomes. However, the heterogeneity in study designs and patient populations warrants cautious interpretation of these findings. Yet, challenges persist, including standardization of herbal formulations, determination of optimal dosages, and potential interactions with conventional wound care approaches. Rigorous scientific inquiry and regulatory guidelines are imperative to ensure the safety and efficacy of these interventions.
Summary & Conclusion: In conclusion, this review underscores the potential of potent herbal drugs and nutritional supplements in accelerating wound healing processes. Their multifunctional properties, ranging from inflammation modulation to cellular regeneration, hold promise for addressing the complexities of wound repair. As research in this field progresses, a more comprehensive understanding of these interventions' mechanisms and clinical applicability will be essential in shaping the future of wound care strategies.
Keywords: *Nutritional supplements, Herbal drugs, Phytochemicals*

PSIT/DL4/0325

Anti-depressant activity of medicinal plants: A Review

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Introduction: An extremely dangerous mental condition called depression affects 322 million individuals worldwide. It significantly contributes to the global disability rate of 7.5% and the 800,000 suicides each year, especially among the

elderly, according to data from 2015.Compared to men, more women experience depression. Depression may also lead to suicide. Clinical studies have frequently shown that therapeutic herbs including lavender, hops, maypop, lemon balm, and valerian may effectively cure mild forms of neurological illnesses, particularly stress, anxiety, and depression.

Aim and Objectives: This review focuses on the potential of herbal remedies to alleviate depression and anxiety.

Methods: To assess the evidence of anxiety and depression, web search was conducted on the Ayush Portal, PubMed, Research Gate, Scopus, Google Scholar, Academia, and Google.

Results: According to the review, the majority of medicinal plants reported to have antidepressant activity by controlling the synapses that produce serotonin, noradrenaline, and dopamine as well as the activities of the hypothalamic-pituitary-adrenal axis, the antioxidant defence system, and inflammatory mediators.

Summary & Conclusion: Medicinal plants and their active ingredients are thought to be a new source for the creation of antidepressants since they have the potential to treat depression in many ways.

Keywords: *Antidepressant, Antianxiety, lavender, Lemon balm.*

PSIT/DL4/0327

Therapeutic delivery of Meloxicam loaded hydrotropic solid dispersion buccal film for periodontal pain

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Introduction: Buccal mucosal membrane offers an attractive drug-delivery route to enhance systemic and local therapy.

Aim and Objectives: The prime focus of the recent experiment was the development of meloxicam hydrotropic solid dispersion-loaded oral, buccal film for oral drug delivery in periodontal pain.

Methods: Meloxicam Hydrotropic solid dispersion was prepared using a 2M sodium salicylate hydrotrope to enhance the solubility of meloxicam. Hydrotropy is a novel greener approach to improving poorly aqueous soluble phytoconstituents solubility.

Results: Solid dispersion in a 1:4 ratio was prepared by solvent evaporation and evaluated for in-vitro physicochemical parameters. FTIR, XRD, and drug release have confirmed meloxicam solubility improvement in the molecular dispersion of sodium salicylate hydrotrope. Further, the in-house hydrotropic solid dispersion-loaded oral, buccal film was prepared by solvent casting method using HPMC,

Summary & Conclusion: The buccal film was homogenous and yellow and had higher drug content uniformity of 98.56±3.24. Depending on polymer type, film thickness ranged from 0.16 mm to 0.24 mm with a higher thickness of 0.24±0.011. Folding endurance and tensile strength of all prepared films were significant for the patient's palatability. In-vitro curcumin release was substantially improved, with the highest release of 94.66% for seven days of study in sodium salicylate hydrotrope. All films followed first-order kinetic in the release kinetic study. Hydrotropes for buccal film formulation is a robust and sustainable technique for oral mucosal delivery of clinically significant Meloxicam. Hence,

it is notified to be applied in designing other dental diseases.

Keywords: *Hydrotropes, hydrotropic solubilization, meloxicam, oral drug delivery, buccal film, green technology.*

PSIT/DL4/0328

Anti-oxidant activity of ethanolic fruits extract of *Scindapsus officinalis* (Roxb)

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Introduction: The herbal medicines are used in the ailment of several diseases from the ancient time. India is known worldwide for its Ayurvedic treatment. *Scindapsus officinalis* is often used traditionally for erectile disorders, respiratory diseases such as cough, bronchitis, pharyngitis, asthma and other worm infestation, dysentery, troubles of the throat, rheumatism arthritis, and diarrhoea.

Aim & Objectives: The in-vitro antioxidant activities of the fruits of *Scindapsus Officinalis* Roxb (Araceae). The fruits of the plant were shade dried with the help of grinder was subjected to successive soxhlet extraction with Petroleum Ether and 90% v/v Ethanol.

Method: The extracts, *Scindapsus officinalis* Roxb. scavenges DPPH radical in a concentration dependent way. The antioxidants react through DPPH, a purple colored stable free radical and convert it into a colorless α-α-diphenyl-β-picryl hydrazine.

Result: The quantity of DPPH reduced could be quantified by measuring a decrease in absorbance at 517 nm. The IC50 value was found to be 45.21and 40.11µg/ml for ethanolic extracts while the IC50 value of ascorbic acid was 18.53µg/ml significantly reduced DPPH radical by bleaching it. The ethanolic extract was found to be near to standard compounds and brought about significant antioxidant potential.

Summary & Conclusion: The observed data showed that the total phenolic contents of ethanolic extracts of fruits of *Scindapsus officinalis* Roxb. found to 56.75mg of gallic acid equivalent (GAE)/g, and total flavonoids content of extracts of *Scindapsus officinalis* Roxb. found to be 6.86mg equivalent of quercetin /gm of the dry weight basis which is quantitatively a greater value.

Keywords: *Scindapsus officinalis (Roxb), DPPH, antioxidant, ascorbic acid.*

PSIT/DL4/0330

Rationale Development of Nano Drug Delivery System for Local Intra-Periodontal Pockets for Enhanced Treatment of Periodontitis

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Introduction: Periodontal pockets work as a natural reservoir filled with gingival crevicular fluid (GCF) for the controlled/sustained release delivery of antimicrobials directly to the periodontal pocket. This review article focused on the current scenario of non-surgical controlled/sustained local intra-pocket delivery of antibiotic drugs in the enhanced treatment of periodontitis.

Aim & Objectives: The goal of using an intra-pocket device for the delivery of antimicrobial agents are the achievement and maintenance of minimum inhibitory

concentration (MIC) and reduction of inflammation for the desired period of time on the periodontal site.

Method: Novel controlled drug delivery systems e.g., nano delivery (nanomaterials, nanorobots, nanopores, quantum dots, dendrimers, liposomes, nanocarriers, nanoparticles, nanofibers, and nano gels) have been prepared by different methods (High-Pressure Homogenization, Homogenization in Aqueous Media, Homogenization in Non-aqueous Media, Combined Precipitation and Homogenization, Nanojet, Media Milling, Emulsification-Solvent Evaporation Technique, Supercritical Fluid Process), etc.

Result: Due to their nano-scaled size, nanomedicines are capable of penetrating into tissues of periodontal, cells and pathogens to improve patient compliance and increase therapeutic efficacy with a precise control rate of release of drug for a particular dosage released from a delivery system without the need for frequent administration with clinical evidence.

Summary & Conclusion: The study by review showed nano drug delivery shows different activities according to their size, shape, charge, and surface area. The nano drug delivery possesses activity against different microbes. Small particle size and the charged surface have provided nano-formulations an easy route to target the pathogenic cells. The newer advances in nanotechnology and nanomaterials have provided satisfactory results in the treatment of periodontitis. More researches in the advancement of nanomaterials and nano-devices are required to achieve satisfactory results in periodontology. Newer nanomaterials and devices are being conscious for further improvement.

Keywords: *Periodontitis, Inflammation, Controlled/sustained drug delivery, Local delivery, Nano-drug delivery, Minimum inhibitory concentration, Nanomedicines, Nanorobots, Nanopores, Quantum Dots, Dendrimers, Nanocarriers, Nanoparticles.*

PSIT/DL4/0331

The Study of Anti-pyretic activity of Tridax proumbens in experimental rats

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Introduction: Fever, often recognized as pyrexia, is characterized by temperatures more than 38.3°C (100.9°F) which persists for further 3 weeks despite adequate examination. Herbs make up a large portion of the most important forms of medicine. *Tridax procumbens* is also used as treatment for boils, blisters, and cuts by local healers in parts of India[4].As there are no experimental reports on antipyretic activity on *Tridax Procumbens*, present study attempts to evaluate its antipyretic effect in rats.

Aim & Objectives: The Study of Anti-pyretic activity of Tridax proumbens in experimental rats.

Methods: The alcoholic extract was prepared by using Soxlet apparatus. 4 groups of Rats were divided as Normal group, Control and Test 1 and Test 2 group and various concentration of test drug was tested on Brewer's Yeast Induced Pyrexia in Rats.

Results: At concentrations of 200 and 400 mg/kg, the ethanolic leaf extract of *Tridax procumbens.* demonstrated a substantial impact towards the Brewer's yeast generated pyrexia technique. The temp of rats treated with the extracts was reduced in a daily dosage manner.

Summary & Conclusion: *Tridax procumbens* leaf extract has antipyretic effect in Rat,

Keywords: *Rats, Tridax procumbens, Extracts.*

PSIT/DL4/0332

Formulation, in-vitro and in-vivo pharmacokinetic evaluation of Ondansetron HCL microneedles carrier loaded Transdermal Drug Delivery System

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Introduction: An Ondansetron HCl polymeric microneedles carrier loaded transdermal patch were formulated to enhance the bioavailability, patient compliances and improves therapeutic effect.

Aim & Objectives: To formulate the sustained drug delivery system of poor oral bioavailable and GIT degradation candidate through novel formulation, via polymeric microneedle loaded transdermal drug delivery system.

Method: Ondansetron HCl MNs patches were prepared by optimized hot solvent evaporation &homogenization method and were evaluated by mechanical strength, particle size in nanometer, scanning electron microscopy, folding endurance and entrapment efficiency by multiple linear regression method.

Result: Ondansetron HCl MNs patches were optimized F5, F6 and F7 formulation has particle size 130 ± 2.55 nm. Ondansetron HCl MNs was loaded in transdermal patch by solvent evaporation method and evaluated for its physical characteristics, skin penetration studies, drug content, mechanical strength and in-vivo pharmacokinetics studies in male 50 SKH-1 hairless mice. In-vivo pharmacokinetics studies in Ondansetron HCl loaded transdermal drug delivery system show increase in AUC_{0-a} in mg/ml when results compared with standard marketed oral dosage form of Ondansetron HCl, studies confirm the increased in bioavailability of Ondansetron HCl by polymeric microneedle transdermal patch.

Summary & Conclusion: From the obtained results data, this was concluded that drug-loaded polymeric microneedle transdermal patch will be an innovative and promising way of drug delivery system for poor bioavailable drug and enhances the patient compliances by ease of termination from therapy.

Keywords: *Transdermal drug delivery system, Microneedles, Bioavailability, Anti-emetics, Solvent evaporation method.*

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