International Conference 2023

Saturday, Sunday March 25-26, 2023

Venue: APJ Abdul Kalam Auditorium, JCDV, Sirsa (India)

SOUVENIR CUM ABSTRACT-BOOK

THEME

" Recent Developments, Regulatory Challenges, Design & Formulation of Future Therapeutics"

Organized By :

Jan Nayak Chaudhary Devi Lal Memorial College of Pharmacy

Barnala Road, Sirsa (Hry.), India

Affiliated to Pt. B.D. Sharma University of Health Sciences Rohtak & HSBTE, Panchkula

Approved By PCI & AICTE, New Delhi

in collaboration with

Association of Pharmaceutical Teachers of India (APTI)

Website: www.jcdpharmacy.edu.in | conference2023jcdmcop@gmail.com

Source of Inspiration

Man of the Masses

Jan Nayak Ch. Devi Lal Ji

(25.09.1914 – 06.04.2001)

ABOUT JAN NAYAK CH. DEVI LAL MEMORIAL COLLEGE OF PHARMACY

Jan Nayak Ch. Devi Lal Memorial College of Pharmacy, a constituent college of JCD Vidyapeeth, an integrated campus providing high-quality education in areas of medicine, engineering, management and education, spread over lush green 200 acres of land in the heart of Sirsa district, founded in 2002 by Ch. Devi Lal Memorial Trust, has established itself as a pioneer institute in providing Pharmaceutical education in India. The best-in-class facilities with pollution-free surroundings and a peaceful atmosphere make it an ideal place for academic pursuits. The Pharmacy programs at JCDM College of Pharmacy are grounded in continuous quality improvement with greater emphasis on the integration of a strong science foundation with the professional skills required for successful pharmacy practice

Currently,the college is offering D. Pharmacy, B Pharmacy, and M Pharmacy (Pharmaceutics, Pharmaceutical Chemistry, and Pharmaceutical Regulatory Affairs). The college has excellent infrastructure with a total build-up area of more than 2.5 acres, and state-of-the-art research facilities like a Nanomedicine center with HPLC (Shimadzu LC-2010 HT with UV and PDA Detectors), FTIR (Shimadzu IR-Affinity), UV-VIS spectrophotometer (UV-1800), Flash Chromatography, Lyophilizer (Martin Christ GmbH), Differential Scanning Calorimeter (Perkin Elmer), Motic Microscope (Biovis), Refrigerated Centrifuge, Deep Freezer, Heidolph High-Speed Homogenizer, Ultrasonicator, Eight-Basket Dissolution Apparatus, Millipore, Rotary Evaporator, etc. Molecular modeling Lab with tools for Docking, QSAR, and Pharmacophore Modeling, Molecular Dynamics Chemoinformatics. The college has developed a The college has also developed an antimicrobial facility to screen the antibacterial and antifungal activity of organic compounds and phytoconstituents.

The major thrust areas of research activities being carried out in the college are Nanotechnology Drug Delivery, Molecular Modeling in Drug Design, Medicinal Chemistry, and Phytochemistry. The other major areas of emphasis include intellectual property rights, regulatory aspects, and management skills. In the last five years, the college has made a significant contribution to academic research by publishing fifty articles in peer-reviewed journals with high impact factors.

Message from Chief Patron

It give me immense pleasure to know that JCDM College of Pharmacy is conducting two days International Conference on "**RECENT DEVELOPMENTS, REGULATORY CHALLENGES, DESIGN & FORMULATION OF FUTURE THERAPEUTICALS**", on March 25-26, 2023. The conference would no doubt give a boost to the ongoing research in the field of Drug discovery, development and other cutting-edge technologies by providing a platform to faculties, scientists and industrialists for establishing a healthy and professional interaction. It will not only help in updating knowledge but also in understanding recent advances in Pharmaceutical Sciences and establishing benchmarks in health care.

I extend my warm greetings and felicitations to all team members and participating delegates and send my best wishes for the success of the International Conference.

Sh. Arjun Singh Chautala
Chairman
Jan Nayak Ch. Devi Lal Vidyapeeth, Sirsa, India

Message from Co-chief Patron

Dear Friends,

It gives me an immense pleasure to pen down my thoughts on the occasion of two days International Conference on **"RECENT DEVELOPMENTS, REGULATORY CHALLENGES, DESIGN & FORMULATION OF FUTURE THERAPEUTICALS**", on March 25-26, 2023 organized by JCDM College of Pharmacy in collaboration with Association of Pharmaceutical Teachers of India (APTI) with an aim to bringing the eminent academicians, researchers, and industry personnel to share their research experiences in the areas of drug regulatory, drug delivery, drug design, and biotechnology. The theme of the conference is highly relevant and is of utmost importance. I have gone through this the scientific program and could see its rich academic content. This conference provides a forum for bringing academics, industry professionals, and students to come together and share their recent and innovative scientific findings in the field of Pharmaceutical sciences focusing on regulatory guidelines for Pharmaceuticals and Novel drug delivery systems.

Prof. (Dr.) Kuldip Singh Dhindsa
Director General
Jan Nayak Ch. Devi Lal Vidyapeeth, Sirsa, India

Message from Patron

I am extremely delighted to note that the JCDM College of Pharmacy is organizing an **International Conference on "RECENT DEVELOPMENTS, REGULATORY CHALLENGES, DESIGN & FORMULATION OF FUTURE THERAPEUTICALS".**

I hope this conference will provide an opportunity to all the participants to interact with each other and discuss on recent and future challenges in Pharmaceutical Sciences. The deliberation at this conference will surely enable the participants to play an important role in strengthening the recent advancements in Pharmaceutical sciences.

I extend my best wishes for the success of this venture.

Dr. Sudhanshu Gupta

Registrar

Jan Nayak Ch. Devi Lal Vidyapeeth, Sirsa, India

Massage from Dean, FOPS & DSW, UHSR

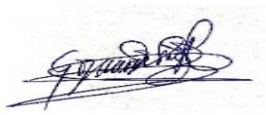
Honoured Pharmacy Professionals,

This conference is an opportunity to learn and share knowledge, ideas and experiences with people from all over globe. There is brainy line-up of speakers and worthwhile titles that will undoubtedly expand the horizon of your knowledge and understanding of pharma world around us. Hopefully you will take full advantage of this opportunity to network, collaborate and grow as one of unique professionals. I am confident that you would leave the conference with a greater understanding of global community challenges and solutions day in and day out.

Recent developments in the field of therapeutic discovery, design and formulation have been driven by modern technology and fundamental research. Notable developments have enabled a better understanding of the molecular basis of diseases and the development of specific treatments. Regulatory challenges in discovery, design and formulation of future therapeutics include, obtaining approval from the apex regulatory bodies, such as the FDA in the USA, the EMA in Europe, the DCG (I) in India and so on. Regulatory control is mandatory to do the watch dogging on procedures of formulations being presented to living beings to prevent tragedies like, effect of phthalidomide that played havoc in the world.

In addition, the cost and time associated with the development of new therapeutics, as well as the cost associated with clinical trials, are significant regulatory challenges. Potential for adverse reactions and drug interactions ought to be considered and need be monitored before any new drug formulation is approved for use. Finally, the development of new formulations requires a complex and multi-disciplinary approach, which often involves collaborations between researchers from different fields. All this complicated system requires careful management and serious coordination.

I wish to encourage you to make use of your time here and to enjoy the company of your fellow attendees. Please remember that honesty, hard work and high character take you to great heights and you always with battle as scientist.



Gajendra Singh, Ph.D.
Dean, Faculty of Pharmaceutical Sciences and
Dean Students' Welfare
PT. B. D. Sharma University of Health Sciences, Rohtak, India

Message from Chairman, ERC, PCI

Dear esteemed colleagues and friends,

It gives me great pleasure to note that JCDM College of Pharmacy is organizing a two-day International Conference, "Recent Developments, Regulatory Challenges, Design & Formulation of Future Therapeuticals" on March 25-26, 2023. As the Chairman, Education Regulation Committee (ERC) for Pharmacy Council of India, I commend the college for their efforts in organizing this conference, which provides a valuable platform for discussing the latest developments, regulatory challenges, and future therapeutics in the field of pharmacy.

I would like to emphasize the crucial role that pharmacists play in research, which is an essential component of advancing pharmacy practice. Pharmacists are trained in drug discovery, development, and clinical trials, and are involved in various stages of research, from preclinical to post-marketing studies. Pharmacists also play a critical role in promoting evidence-based medicine, which is essential for providing safe and effective patient care.

This conference provides an opportunity for pharmacists to learn about the latest research findings, share their experiences, and network with their peers. I encourage all attendees to actively participate in the various sessions, workshops, and presentations, and engage in discussions about the role of pharmacists in research.

I wish the organizers, attendees, and speakers all the best for a successful and fruitful conference. Let us continue to work together to advance the field of pharmacy and promote public health through research and innovation.

Sincerely,

Dr. Deependra Singh
Chairman (ERC)
PCI, New Delhi

Message from Vice President, APTI (Northern Region)

I take this opportunity to congratulate entire team of JCDM College of Pharmacy for organizing the two-day International Conference "Recent Developments, Regulatory Challenges, Design & Formulation of Future Therapeutics", on March 25-26, 2023. This conference has brought a pool of experts to share their research experiences with our budding graduates and post graduates in the field of Pharmaceutical Sciences, who are going ahead to face the global challenges in the areas of Drug discovery, delivery and other key areas of research.

As Vice President, APTI, Northern Region, I convey my best wishes to all the organizers, resource persons and delegates for putting their unending efforts in making this conference a successful one.

Dr. Rohit Dutt
Vice President
Northern Region, APTI

Message from Convener

Dear Conference Attendees,

I hope this message finds you well. As the convenor of this international conference, it gives me great pleasure to present to you this souvenir cum abstract book, which commemorates our time together and serves as a lasting record of the knowledge and experiences shared during our conference.

Over the course of this conference, we have seen remarkable insights and innovations presented by our esteemed speakers, as well as lively discussions and debates among attendees. It is my sincere hope that this souvenir book will serve as a reminder of the valuable connections made and the knowledge gained during our time together.

I would like to take this opportunity to express my deepest gratitude to each and every one of you for your contributions to this conference. Your passion, expertise, and dedication have made this event a great success, and I look forward to continuing our collective efforts towards building a better future for our global community.

Once again, thank you for your participation, and I hope you enjoy this souvenir cum abstract book as a cherished memento of our time together.

Dr. Anupama Setia
Principal
Jan Nayak Ch. Devi Lal Memorial College of Pharmacy,
Sirsa, India

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Programme Schedule

Conference Day 1st	**Saturday, 25th March 2023**
09:00-10:00 am	**REGISTRATION AND BREAKFAST**
10.00- 11.30 am	***INAUGURAL SESSION***
	Chief Guest& Keynote Speaker: • **Prof. A.K. Madaan, Ex. Dean, FOPS, Maharshi Dayanand University, Rohtak** **Preside Over Guest:** • **Dr. Anupam Sharma, Ex. Dean, UIPS, Punjab University, Chandigarh** **Guest of Honour:** • **Dr. Gajendra Singh, Dean, Faculty of Pharmaceutical Sciences, Pt. B.D. Sharma University of Health Sciences, Rohtak, India** **Welcome Address: Prof. Dr. Kuldip Singh Dhindsa, Director General, JCD Vidyapeeth** **Vote of Thanks: Dr. Anupama Setia, Convener – cum Principal, JCDMCOP, Sirsa**
11:30 am	**HIGH TEA**
12:00-01:30 pm	**SCIENTIFIC SESSION-I** **Session Chair** • **Dr. Neelu Sood, Principal, University Campus School, BPS Mahila Vishwavidyalaya Khanpur Kalan, Sonipat** **Expert Talk: Dr. Gajendra Singh, Dean, Faculty of Pharmaceutical Sciences, Pt. B.D. Sharma University of Health Sciences, Rohtak, India** **Expert Talk: Dr. Rahul Taneja, Scientist, Patent Information Centre, Haryana**
01:30-02:30 pm	**LUNCH**
02:30-03:30 pm	**SCIENTIFIC SESSION- II** **Session Chair** • **Dr. Surinder Goyal, Principal, Vidyasagar Polytechnic& Pharmacy College, Ahlupur, Punjab** **Expert Talk: Mr. Krunal Prajapati, Head of Production, IPS Pharma, UK**
03:30-04:30 pm	Poster Evaluation
06:00-07.30 pm	Cultural Programme
8:00 pm	Dinner

Programme Schedule

Conference Day 2nd	**Sunday, 26th March 2023**
09:00-10:00 am	**BREAKFAST**
10:00-11:30 am	**SCIENTIFIC SESSION-III**
	Session Chair: • **Dr. Kumar Guarve, Principal, Guru Gobind Singh College of Pharmacy, Yamunanagar** **Expert Talk: Dr. Naveen Khatri, College of Pharmacy, Pt. B.D. Sharma UHS, Rohtak** **Expert Talk: Dr. Virender Kumar, Dept of Pharmaceutical Sciences University of Nebraska, Medical Center, Omaha, US**
11:30 am	Evaluation of E-posters
12:00pm	High Tea
12:30 pm	Valedictory function & Prize Distribution **Chief Guest:** **Prof. Sudesh Chhikara, Vice-Chancellor,** **Bhagat Phool Singh Mahila Vishwavidyalaya, Khanpur, Sonipat** **Preside Over Guest:** **Dr. Deependra Singh, Chairman** **Education Regulation Committee, Pharmacy Council of India** **Guest of Honour:** **Dr. Rohit Dutt, Principal, Gandhi Memorial National College,** **Ambala Cantt**

SCIENTIFIC TALKS

S-1
Multidisciplinary Development Process In Drug Discovery

A.K. Madan

Faculty of Pharmaceutical Sciences, Pt. B.D. Sharma University of Health Sciences, Rohtak-124001, India

Drug development process is becoming increasingly complex, time consuming and expensive. This has led the scientists to follow a systematic approach for development of new drug molecules with desired pharmacological efficacy and clinical utility. Presently, it requires more than US $ 1 billion and a time span of over 10 years to introduce a new drug molecule into the market. Stringent regulatory requirements further complicate/delay the new drug approval process. The said drug development process is multidisciplinary in nature and involves numerous but diverse disciplines such as pharmaceutical sciences, computer science, chemistry, biochemistry, microbiology, biotechnology, botany, zoology, mathematics and physics. Leads provided by nature in drug discovery will be exemplified. Role of graph theory (a sub-discipline of mathematics) in streamlining *in-silico* drug discovery process for minimization of cost, time and animal sacrifice will be highlighted. *In order to accelerate drug discovery process a new generation graph theory based molecular descriptors(including those based upon chemical detour matrix) with exceptionally high and unbelievable discriminating power of >10,00,000 for all possible structures containing only five vertices/atoms have been conceptualized. Subsequently, these descriptors were successfully utilized for development of models for prediction of biological activities of diverse nature. Exceptionally high discriminating power amalgamated with negligible degeneracy render proposed molecular descriptors as vital tools for drug design.* Diverse molecular belonging to various generations developed by our research group will be presented. Subsequent utilization of the said molecular descriptors in development of models ranging from prediction of diverse biological activities, pharmacokinetic parameters, permeability through blood brain barrier or inclusion of branched aliphatic compounds or substituted cyclic compounds in urea will be exemplified so as to highlight ever increasing potentialities of graph theory in drug descriptors design and discovery. These models possess immense potential for providing lead structures for development

of wide range of therapeutic agents of diverse nature. Some recent advances in formulation technology for simultaneous improvement of dissolution profile, stability and content uniformity of low dose drugs through inclusion phenomenon will also be briefly described.

About the Resource Person

Prof. A.K. Madan is one of the rare professionals possessing Bachelor's degrees in both Pharmacy and Chemical Engineering, Master's degree in Pharmaceutics and Ph.D. in Chemical Engineering from ***Indian Institute of Technology****, Delhi. He has 12 patents, 18 invited monographs in international books and over 150 research publications [mostly in international journals of repute] with over 3800 citations to his credit. His current* ***h-index*** *and* ***i10 index*** *are 31 and 67 respectively.*

His multidisciplinary background has enabled him to conduct research in diverse areas which include pharmaceutical process development, chemical graph theory, structure–activity/property relationship, pharmaceutical quality control, pharmaceutical technology and biotechnology. His expertise is simply recognized by the fact that some of the mathematical tools/molecular descriptors developed by him for drug design have already been incorporated in numerous leading software developed by various multinational companies. These software for drug design include ***Dragon*** *from Italy,* ***Schrödinger****,* ***ADAPT*** *&* ***Sarchitect TM*** *from USA,* ***Pre-ADMET*** *from South Korea,* ***MOLGEN-QSPR*** *from Germany,* ***ADME Model Builder*** *from Poland and* ***MoDeL*** *&* ***PaDel Descriptor*** *from Singapore. He is acting as referee for review of manuscripts for large number of international journals of repute.*

He has also conceptualized and developed single phase microcapsules, porous solid dispersions, modified techniques for co-inclusion in urea, human guarded insecticide-fertilizer amalgamation, depyrogenation of drugs and coating processes.

He has over 45 years experience in teaching and research. He had been keynote speaker in numerous Conferences. He worked for more than 20 years in DIPSAR (Delhi University) before joining M. D. University, Rohtak in May 1996 as Professor. He was instrumental both in the capacity of ***Dean of Faculty*** *(for ~12 years) &* ***Head of Department*** *(for 6 years) in developing a newly created undergraduate Department of Pharmaceutical Sciences at M.D. University, Rohtak from a scratch into present day centre of excellence for postgraduate courses in Drug Regulatory Affairs and in Industrial Pharmacy and for conduct of quality research. He joined as Professor of Pharmaceutical Sciences at Pt. B.D. Sharma University of Health Sciences, Rohtak on 1st July, 2010 soon after his retirement from M.D. University, Rohtak on 30th June, 2010 on a 5 year contract.*

S-2

Use of Potassium Cyanide In Injection Formulation

Gajendra Singh

Dean, Faculty of Pharmaceutical Sciences, Pandit Bhagwat Dayal Sharma University of Health Sciences Rohtak-124001 (Haryana)

Potassium cyanide is thought to be extremely dangerous substance and people are afraid of looking into it. The attending stakeholders tend to run away from the vicinity of patients suffering from cyanide poisoning and many associates would not like to work in industry with this substance. But this is true that potassium cyanide is extremely useful and friendly material for vitamin B_{12} injection formulation. It would have been a difficult task to make stable formulation of vitamin B_{12} injection with potassium cyanide and thus pharmacist must learn to handle potassium cyanide and take its advantage in pharmaceutical formulations.

About the Resource Person

Professor & Dean and Dean Students' Welfare*:*

Faculty of Pharmaceutical Sciences, Pt. BDS University of Health Sciences, Rohtak.

Academic Qualifications*: Bachelor of Pharmacy, Master of Pharmacy, Doctor of Philosophy* ***(Pharmaceutics)*** *from Delhi University.*

Earlier affiliations*: Head, Department of Pharmaceutical Sciences, GND University, Amritsar, Punjab. Scientists' Pool Officer: College of Pharmacy (Delhi University) Pushp Vihar, New Delhi 110 017 (now DIPSAR)*

Fellowships during studies*:* ***JRF*** *(UGC),* ***R&D*** *(ICMR),* ***E&T*** *(UGC),* ***SRF*** *(CSIR)Minor research project supervised…: 30*

Major research project supervised…: 02

Major research project completed:…..02

Ph.D. theses supervised:……..11

Plenary lectures delivered:…….43

Number of publications: 50 plus in peer reviewed Impact Journals.

Conferences attended: 100 plus

***Countries visited for academics**: Australia, Hong Kong, Holland, Luxembourg, Belgium, France, Canada, USA, UK, Pakistan, Germany, Switzerland, Austria and Nepal.*

Referee for three journals.

Coordinator of University bodies: IQAC/NAAC/IPR Cell

Member of 7 academic and professional bodies around the country.

S-3

IP Commercialization and Technology Transfer

Rahul Taneja

Scientist, Haryana State Council for Science, Innovation and Technology

Directorate of Science and Technology, Panchkula, Haryana

The Indian pharmaceutical industry has changed remarkably over the last few decades, from being traders in imported drugs in the fifties, to major bulk drug producers by the eighties. During this transitional period Indian pharmaceutical units have learnt the importance of Intellectual Property Rights and challenges faced by them during their marketing, production and exporting their products. At present the Indian pharmaceutical industry has about 300 large units, 1700 medium-size units and about 8000 small-scale units throughout the country. There was a time when property of any individual or organization was measured in terms of physical tangible assets like land, buildings, valuables like cars, gold, machinery etc. But with passage of time, intangible assets also got recognition, and now we know these intangible assets as Intellectual Property or IP. Now, in modern concept of ownership, we count both intangible and tangible property as property associated with an individual or an organization. Intellectual Property is the Property, which has been created by exercise of Intellectual Faculty. It is the result of persons Intellectual Activities. Thus Intellectual Property refers to creation of mind such as inventions, designs for industrial articles, literary, artistic work, symbols which are ultimately used in commerce. Intellectual Property rights allow the creators or owners to have the benefits from their works when these are exploited commercially. These rights are statutory rights governed in accordance with the provisions of corresponding legislations. Intellectual Property rights reward creativity & human endeavour which fuel the progress of humankind. The intellectual property is classified into seven categories i.e. (1) Patent (2) Industrial Design (3) Trade Marks (4) Copyright (5) Geographical Indications (6) Lay out designs of integrated circuits (7) Protection of undisclosed information/Trade Secret according to TRIPs agreements. First of all an Idea is generated in mind and these are converted in some form of property. For Instance an idea is either converted into an Innovation or invention; some literary or artistic work; some aesthetic

or decorative feature of article; brand name, trade dress or packaging style etc. Role of Trademark and Patent are widely involved in the field of Pharmaceutical Industries. The commercialization process and the role of IPRs in that process, Intellectual property may be commercialized by sale or assignment, or by entering into various types of contractual business relationships such as licensing. The business vehicle by which this is done may be by way of partnership, joint venture or spin-off company. IPRs play a crucial role as the legal vehicle through which either the transfer of knowledge or the contractual relationship is effected. Alternatively, knowledge may be exploited in-house, in which case the role of IPRs is to block imitating competition. All these forms of property are protected by various legal instruments.

About the Resource Person

Dr. Rahul Taneja is working as Scientist, Department of Science and Technology, Government of Haryana. Panchkula. He holds professional degrees including Doctor of Philosophy (PhD) in Pharmaceutical Science, Master of Intellectual Property Law, Master of Pharmacy, Master of Business Administration (International Business), Post Graduate Diploma in Intellectual Property Rights and Patent Practices, Master Trainer of European Patent Office and World Intellectual Property Organization and Post Graduate Diploma in Drug Regulatory Affairs and Clinical Trials. As a Scientist at the Council for Science and Technology he facilitates the Micro, Small and Medium Enterprises of Haryana and Chandigarh for IPR related issues. His portfolio further categorically includes dealing with Patents including PCT Application (Drafting Filing and other prosecution including consultancy), Trademarks including Convention Application (search report analysis, documents inspection, filing, caution notice, implementation of IPR Enforcement rules at Custom for seizure of counterfeit goods including consultancy), Designs (filing, reply of examination report) and Copyrights (filing and prosecution and consultancy). Dr. Taneja also selected has Bentham Brand Ambassador 2018-19 by Bentham Science Publication.

He is also promoting and facilitating the Research scholar's, Doctors and Scientist for the protection of Intellectual Property Rights and to protect their invention and innovation. He has also delivered 5 Times LIVE BROADCASTING on News Channel to the Enterprises of

Haryana Cluster and two radio talk (Big FM 92.7, Chandigarh) on the day of World Intellectual Property Rights Day.

He has own Intellectual Property in which 4 Copyright and 2 Industrial Design and 3 Patent Filed in his own credibility. He has also awarded as "Significant Contribution in Healthcare" by ALL INDIA INSTITUTE OF MEDICAL SCIENCE (AIIMS), NEW DELHI.

He has 40 Journal publications, on various IPRs issues and concepts besides articles in various newspapers and newsletters. He has already delivered more than 320 specialized lectures in various National & International Conference and training programme on Intellectual Property Rights in various institutions and industrial associations including Ministry of MSMEs, Micro, Small and Medium

Enterprises – Development Institutes, Karnal (Haryana), Micro, Small and Medium Enterprises – Development Institutes (MSME-DI), Ludhiana (Punjab), National Institute of Technology, Kurukshetra, Guru Jambeshwar University, Delhi University, Punjab University, ITM University, BPS Mahila Vishvidalya, Chitkara University, Shoolini University, PHD Chamber of Commerce and Industries, ASSOCHAM, FICCI, Franchise India, Prestigious Pharmacy Colleges, Engineering Colleges, Management Colleges, and professional institutes.

S-4

Introduction to GMP (Good Manufacturing Practice)

Krunal Prajapati (B.Pharm, M.SC. Pharmaceutical science)

Head of Production, IPS Pharma, UK

The objective of this work helps in bringing the awareness about the manufacturing requirements as per USFDA. GMP covers all aspects of production, from the starting materials, premises, equipment and training and personal hygiene to staff. The tablet is most popular dosage form in the world; GMP of tablet manufacturing was designed to ensure the quality in respect to tablet's potency and efficacy. Implementation of GMP is an investment in good quality medicines. It demonstrates industry and regulatory authority's support for an effective pharmaceutical quality system to enhance the quality and availability of medicines around the world in the interest of public health. Implementation of GMP throughout the product lifecycle should facilitate innovation and continual improvement and strengthen the link between pharmaceutical development and manufacturing activities. It also helps in increasing the process efficiency and product quality by adopting the current, risk-based manufacturing approach and in turn optimizes manufacturing process and improves quality of the end product.

About the Resource Person

Mr. Prajapati is B.Pharm, M.SC. Pharmaceutical science and renounced expert in production of pharmaceutical products and have sound knowledge of regulatory affairs of different countries. He has worked as a Production operator, Quality controller, Quality Assurance supervisor, Production Manager, and his current role is Head of Production. He is working in Pharmaceutical Industry since 14 years. He has traveled across the globe and delivered several invited talks and scientific presentations in conferences.

S-5

Supercritical Fluid Technology for Extraction of Medicinal and Aromatic Plants

Naveen Khatri

College of Pharmacy, Pt. BD Sharma, University of Health Sciences, Rohtak-124001, Haryana, India

A fluid at supercritical condition, also referred to as a dense gas, is a fluid above its critical temperature and critical pressure to a certain extent, inoculated its applicability in supercritical fluid extraction technology due to the possibility of carrying out extractions at temperature near to ambient, thus preventing the substance of interest from incurring in thermal denaturation. In addition to introduction to super critical fluid extraction, important considerations related to supercritical fluid extraction of medicinal and aromatic plants in light of industrial requirements will be discussed. The roles of thermodynamics, product recovery and economic aspects will also be discussed. Fundamental concepts about the equipment needed and basic technology are also presented. A brief review of successful supercritical extraction processes of medicinal and aromatic plants and its future prospects are also discussed.

About the Resource Person

Dr. Naveen Khatri is working as Assistant Professor in College of Pharmacy, Pt. B. D. Sharma, University of Health Sciences, Rohtak, Haryana since 2006. He has more than 17 years of teaching and research experience. He did his B. Pharm. degree from MDU, Rohtak and M. Pharm. degree from GJU, Hisar. He did his Ph.D. under the guidance of Prof. A. K. Madan. All his research papers are published in high impact factor international journals. His research interest is QSAR, Molecular Modeling, design and development of novel molecular descriptors. He has conceptualized novel molecular descriptors which have immense utility in drug development. He is an expert in the field of pharmaceutical analytical techniques.

S-6

Simultaneously Inhibition of BRD4/PI3K Pathways to Overcome the Resistance in Medulloblastoma

Virender Kumar

University of Nebraska Medical Center, Omaha, NE, USA 68198

Introduction: Medulloblastoma is a malignant pediatric brain tumor which shows upregulation of MYC and sonic hedgehog (SHH) signaling. SHH inhibitor face acquired resistance, which is a major cause of relapse. Further, direct MYC oncogene inhibition is a challenging therapeutic target, inhibition of MYC upstream IGF/PI3K is a promising alternative. PI3K only inhibition activates resistance mechanisms and simultaneous inhibition of bromodomain-containing protein 4 (BRD4) and PI3K can overcome resistance.

Methods: We synthesized a new molecule MDP5 that targets both BRD4 and PI3K pathways. We used X-ray crystal structures and molecular modeling approach to confirm the interactions between MDP5 with BD domains from both BRD2 and BRD4, and molecular modeling for PI3K binding. MDP5 was tested to inhibit target pathways and MB cell growth in vitro and in vivo.

Results: Among MDP series, MDP5 showed higher potency in DOAY cells (IC_{50} 5.5 µM) compared to SF2523 (IC_{50} 12.6 µM), and it was equipotent SF2523 in HD-MB03 cells (~5µM). In MB cells, treatment with MDB5 markedly reduced colony formation, increased apoptosis, and stopped cell cycle progression. Further, MDP5 was well tolerated in NSG mice bearing either xenograft or orthotopic MB tumors at the dose of 20 mg/kg, and significantly reduced tumor growth and prolonged animal survival.

Conclusions: Our results showed that inhibition of Shh and group 3 related cancer with newly synthesized MDP5; a dual inhibitor of BDR4 and PI3K is a viable strategy to overcome resistance and effectively treatment of medulloblastoma.

Learning objectives:

Simultaneously inhibiting two pathways with two separate drugs may be toxic to patient. Therefore, we synthesized potent BRD4 and PI3K dual inhibitor named MDP5.

MDP5 showed the ability to target the dysregulated tumor promoting genes at protein and RNA levels and lowered the tumor propagating cells and tumor spheroid.

In vivo studies revealed MDP5 lowers the tumor burden as well as prolong the life span of MB bearing orthotopic mouse model.

Acknowledgements:

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About the Resource Person

Dr. Kumar is working as a Research Assistant Professor in the Department of Pharmaceutical Sciences at the UNMC since 2021. Prior to this position, he served as an Instructor from 2018 to 2021 and as a Postdoctoral Fellow from 2016 to 2018 in this department to work on the delivery and targeting of small molecules and miRNAs. He received his Ph.D. in Pharmaceutics and Drug Delivery from UNMC in 2016, M.S. in Industrial Pharmacy in 2009 from St. John's University, NY, as well as M.S. in Pharmaceutics and B.S. in Pharmacy from Guru Jambheshwar University, Hissar, India. His research focuses on developing nanoformulations for small and large molecules to treat liver diseases (non-alcoholic fatty liver disease and alcohol-associated liver disease) and cancers (pancreatic, melanoma, and medulloblastoma). Further, he is also working on developing a dry powder inhalation formulation for small and large molecules to treat lung disease (asthma, chronic obstructive pulmonary disease). His research is supported by the National Institutes of Health (NIH) as K01 as PI from 2021 to 2026. In addition, he is also serving as Co-I on two R01 grants from 2022 to 2027. He has demonstrated a successful track record of innovation and productive research, as reflected in my peer-reviewed publications.

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PS-2301

Biosynthesis of Silver Nanoparticles Using Ocimum thyrsiflora Plant Extract

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The synthesis of silver nanoparticles by chemical method leads to presence of some of the toxic chemicals absorbed on the surface that may have an adverse effect in medical applications. Green synthesis provides an advancement over chemical and physical methods as it is cost-effective, environment-friendly, and easily scaled up for large-scale synthesis. Silver nanoparticles have the ability to anchor to the bacterial cell wall and subsequently penetrate it, thereby causing structural changes in the cell membrane like the permeability of the cell membrane and death of the cell. In present study, an aqueous extract of *Ocimum thyrsiflora* leaves was used to prepare silver nanoparticles. UV-visible spectra showed a surface resonance peak of 443 nm corresponding to the formation of silver nanoparticles, and FTIR spectra confirmed the involvement of biological molecules in silver nanoparticle synthesis. Reduction of silver nitrate to silver ions was confirmed by the color change from greenish to deep brown. The bio-reduction of Ag (I) into Ag (0) takes place in reaction media and is confirmed by XRD. The electronic micrographs revealed that the silver nanoparticles, which were less than 45 nm in size, were uniform, smooth, and somewhat spherical in shape.

PS-2302

Challenges in Regulatory Filling for Generic Products

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This aims at generic products and challenges in regulatory filing for generic products in the regulatory market of Europe, USA, India. Based on the information collected from various sources such as regulatory Spitsov Govt. websites, discussion with regulatory agents, interviewing pharma professionals and literature surveys from various journals, a clear picture on the generic products and challenges in regulatory filing for generic products of each country was drawn. The different authorities viz. European Medicine Evaluation Agency (EMEA) of Europe, Food and Drug Administration (FDA) of USA, Central Drug Standard Control Organization (CDSCO) of India, carried out the generic products and challenges to filling for generic products in the respective countries. After analyzing the various requirements for the generic products in the above stated countries, it was concluded

that the regulatory guidelines of Europe and India were not well defined, but FDA gives very much well-defined requirements.

PS-2303

Formulation and Evaluation of Duloxetine HCl Loaded Transferosomes for Transdermal Delivery

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Depression is among the most prevalent and debilitating mental disorders. It exhibits a wide range of symptoms that impact cognitive, affective, somatic, and social processes. Transdermal route offers several potential advantages over conventional routes such as avoidance of first pass metabolism, reducing undesirable effects, and majorly providing patient convenience. Transferosomes are one of the vesicular carriers that have received extensive attention recently because of their capacity to penetrate the stratum corneum layer. The proposed study tends to formulate and evaluate Duloxetine HCl containing transferosomes by using lipid film hydration method. Present study involves the usage of central composite design, where the effect of phospholipid 90 G, sodium deoxycholate, speed of rotary evaporator and effect of temperature on entrapment efficiency, drug release and particle size were analyzed. Stability studies were also performed to evaluate the effect of different temperature conditions on the physical appearance, drug content for a period of 90 days. This transferosomal system for transdermal Duloxetine HCl delivery can be a suitable alternative in alleviating the symptoms of depression.

PS-2304

Nanorobots: A Smart Treatment for Heart Bypass Surgery

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New scientific discoveries have greatly aided the advancement of medical science in recent decades. Nanotechnology is one such area that is altering the vision of Medical science. A Nanorobots are a fantastic resource for the field of medicine of the future. Drugs could be transported by Nanorobots and delivered directly to damaged cells. If the traditional drug delivery system cannot reach difficult sites in the human body, then Nanorobots are there. These Nanorobots will be able to heal tissues, and clean blood vessels. The Nanorobots

represents an exciting prospect for the future of healthcare. The most advanced nanomedicine involves the use of Nanorobots as miniature surgeons. The development of neural networks has opened the door to the possibility of creating artificial red blood cells, dubbed respirocytes, that can transport oxygen and carbon dioxide molecules (i.e., functions of natural blood cells). Nanorobots offer greater bioavailability, targeted delivery of medicine, and reduce mistakes during surgery, etc. This paper discusses Nanorobots and outlines how they can replace traditional methods of treatment of cardiac bypass procedures.

PS-2305

Role of Vitamin D in the outcome and recovery of traumatic brain injury, a randomized trial in moderate and severe TBI

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Vitamin D is a fat-soluble secosteroid that is important for healthy bones and muscles. It is mostly made in the skin when it is exposed to sunlight. The prevalence of vitamin D deficiency may be increased because of reduced sun exposure as a result of hospitalization, impaired social functioning, and absence from work, resulting in more time spent indoors. Vitamin D deficiency has been associated with many systemic conditions, such as obesity, cardiovascular disease, and neurodegenerative diseases. Because of this, vitamin D levels may play a role in the development or worsening of cognitive and mental health problems after TBI, which could affect recovery and quality of life. So, more research needs to be done to look at the long-term effects of vitamin D status and supplementation on neurocognitive and psychological function and neuroimaging biomarkers. This will help us figure out if testing for and treating vitamin D deficiency should be part of clinical guidelines for treating neurocognitive disorders.

PS-2306

Development and Characterization of Amoxicillin Loaded Silver Nanoparticles for Time-Extended Delivery

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The medication delivery system might benefit from the use of silver nanoparticles (SNPs). Silver nitrate was used to create the SNPs in this work, while alginate was used as a capping agent. Amox-SNPs nanocomposite was made by loading amoxicillin onto the surface of

SNPs. X-ray diffraction (XRD), ultraviolet-visible (UV-Vis), transmission electron microscopy (TEM), thermogravimetric analysis (TGA), scanning electron microscopy (SEM), Fourier-transform infrared (FT-IR), and zeta potential studies were used to investigate the properties of the Amox-SNPs nanocomposite. Crystalline structures were confirmed by XRD analysis of both SNPs and the Amox-SNPs nanocomposite. According to the evidence from the FT-IR spectrum, the SNPs have been encapsulated in alginate and then loaded with Amox. Nanocomposites of Amox and SNPs were found to be spherical on average and 96 nm in size, as revealed by transmission electron microscopy. Needle-like morphology was verified by scanning electron microscopy (SEM) of SNPs and Amox-SNPs nanocomposites. Positive zeta potential of 6.5 mV was observed for Amox-SNPs nanocomposites. Amox added into SNPs caused a greater loss of mass during TGA (78.9% vs. 56.7%) than SNPs alone. In accordance with the Hixson-Crowell kinetic model, Amox released from AmoxSNPs nanocomposites exhibited delayed release qualities, with 98% of the drug being released within 750 minutes. In addition, the normal (3T3) cell line was used to assess the toxicity of SNPs and Amox-SNPs nanocomposites. This study points to Amox-SNPs' potential usefulness as effective medication delivery vehicles.

PS-2307

Formulation and Characterization of Tofacitinib Loaded Novel Nanoemulgel for Topical Delivery for the Management of Rheumatic Arthritis

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The aim of the present study is to design tofacitinib nanoemulgel for topical administration with optimized particle size, high loading efficiency, along with improved penetration through the skin for the treatment of rheumatic arthritis. The high-energy ultrasonication technique was used to create the formulations. Tofacitinib nanoemulsion was created using oleic acid, tween 80, and propylene glycol. The nanoemulsion was then homogenized with carbopol-934 hydrogel to create a nanoemulgel loaded with tofacitinib. The concentration of independent variables such as X_1 (oil phase), X_2 (surfactant), and X_3 (cosurfactant) was optimized using Box-Behnken design to check its impact on dependent variables such as Y_1 (particle size), and Y_2 (loading efficiency) of the nanoemulsion. The nanoemulsion was found to have a minimum particle size of 106.3 ± 2.8 nm and a maximum loading efficiency of 19.3 ± 1.8%. The nanoemulgels were examined for different organoleptic and physicochemical

stability which were found to be within the usual range. The *in-vitro* release studies showed a 89.64 ± 0.97% cumulative release of tofacitinib from nanoemulgel over a period of 24 hours. The drug release data clearly demonstrated non-fickian drug release from matrix systems. As a result, the tofacitinib nanoemulgel that has been produced could be a viable delivery mechanism for topical routes.

PS-2308

Recent Scenario and Future Perspective of Essential Oils in Pharmaceutical Industries

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In the present scenario, Essential oils and their components are gaining significant attention as they are relatively secure and are extensively acknowledged by consumers; also they have multi-functional use in various formulations. Recently, Essential oils are being used as an ingredient/excipient in various pharmaceutical formulations like ointments, syrups, beads, nanogels, creams, aerosols, suppositories, nanoemulsions, etc. Several database search engines such as science direct, web of science, chemical abstracts, Pub-med, and Google scholar have been used to search by using various keywords like essential oils, pharmacological potential of essential oils, application of essential oils, properties of essential oils and therapeutic approach of essential oils in the management of various disorders, etc. Essential oils obtained from various herbal plant parts are known to possess significant pharmacological potentials, such as antioxidant potential, antibacterial, antiseptic, antiviral, antifungal, and are also utilized in the management of acne along with hyperpigmentation. These properties allow the utilization of essential oils either alone or in combination with using some chemical preservatives to preserve and maintain cosmetic products. However, Essential oils have been extensively used in food preservation, pharmaceuticals, fragrance industries, natural therapies, alternative medicine, and for the prevention of several health illnesses which can be used to carry out further study.

PS-2309

3D Printing Promotes the Development of Drugs

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A new technology called 3D printing is being used in a variety of industries, including aviation, computing, and medical. With its ability to create individualized, highly customizable products, 3D printing holds a lot of promise for the pharmaceutical sector. We were curious how 3D printing might be applied to the pharmaceutical industry. We searched the books using the terms "3D printing"/"additive manufacturing" and "drug"/"tablet" to learn more about the use of additive manufacturing in the pharmaceutical industry. We discovered that 3D printing technology has the following medical applications: first, it can print pills on demand according to a patient's specific condition, making the dosage more appropriate for each patient's unique physical condition; second, it can print tablets with a specific shape and structure to control the release rate; third, it can accurately regulate the dispersal of cells, extracellular matrix and biomaterials to construct organs or organ-on-a-chip for drug testing; eventually, it could print loose porous pills to reduce swallowing problems, or be used to make transdermal microneedle patches to reduce pain of patients.

PS-2310

Quality by Design (QbD) Approach for Optimization and Development of Nano Drug Delivery Systems

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FDA generalized quality by design (QbD) in the field of pharmacy to fully grasp the formulation of high-quality pharmaceutical goods. QbD is based on a complete understanding of how materials and process parameters affect the quality profile of final products. The United States Food and Drug Administration (FDA) supports risk management and science-based quality-by-design approaches to improve pharmaceutical development across a product's life cycle. Based on a solid understanding of the causes of variability and the manufacturing process, QbD is applied to formulation and process design of nano drug delivery systems. In this presentation, the fundamentals of QbD—its goals and constituent parts—are briefly reviewed. Risk assessment and design are among the tools for

implementing QbD in the pharmaceutical industry. We briefly discuss risk assessment, experiment design, and process analytical technology (PAT) as tools for implementing QbD in the pharmaceutical industry. Also, a summary and presentation of the QbD's real uses in the creation of several nanocarriers are provided.

PS-2311

Novel Drug Delivery Systems in Cardiovascular Disease

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Cardiovascular diseases (CVDs) are the leading cause of death globally. As estimated by WHO, 17.9 million people died from CVDs in 2019, representing 32% of all deaths, of which about 85 % were due to heart attack and stroke. Over three-quarters of CVD deaths take place in low and middle-income countries. The CVDs include coronary heart disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism. Cardiovascular diseases are life-threatening issues in the present days. The various novel drug delivery systems like transdermal patches, liposomes, micelles, nanoparticles, microbubbles, drug-eluting balloons, and drug-eluting stents are used for targeted drug delivery and improved therapeutic efficacy and showed better patient compliance. This paper covers application of different drug delivery systems for the treatment of CVDs.

PS-2312

Development and Evaluation of Novel Formulations for Treatment of Inflammatory Bowel Disease

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Inflammatory bowel disease (IBD) is a group of inflammatory conditions of the colon and small intestine. Crohn's disease and ulcerative colitis are the principal types of inflammatory bowel disease. Colon-targeted drug delivery through oral administration is a promising means of improving treatment of IBD by increasing the local concentration of drug in colon. Nanoparticles are solid colloidal microscopic particles with size ranging between 10-100 nm. Nanoparticles in oral formulation give an opportunity for targeted delivery and increased

uptake by inflamed cells and thus minimizing side effects on surrounding cells. In the present study 5- Amino Salicylic Acid (Mesalamine) was selected as model drug for treatment of IBD. 5- Amino Salicylic Acid loaded solid lipid nanoparticles (SLNPs) were prepared by using assorted ratios of SA and TGMS. A hot homogenization technique was selected for preparation of SLNPs. Hot homogenization operates at a temperature above the melting point of lipid, then drug was added to the hot melt. Then drug-lipid solution is mixed, using rotor-stator homogenizer to form Pre- Emulsion. Spirulina was chosen as a natural anti-inflammatory supplement for ulcerative colitis and used as a prebiotic. In order to study the therapeutic potential of the developed nanoparticles and the ameliorating effect of the mesalamine on the inflamed tissue of colon in IBD, 2,4,6-trinitrobenzenesulfonic acid (TNBS)-induced colitis model was selected.

PS-2313

Novel Formulation of Medicinal plants for Hepatoprotective potential

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Medicinal herbs are a gift from nature to humans that play a critical role in maintaining, restoring, and enhancing our health. Numerous cyanogenetic compounds (such as paracetamol, carbon tetrachloride, alcohol, D-galactosamine, and thioacetamide), excessive alcohol use, and microorganisms have been identified to induce liver cell damage. An innate or idiosyncratic reaction might be the mechanism of drug-induced hepatotoxicity. There are few different contemporary drugs that may be used to treat liver diseases. Current pharmacological methods for treating liver diseases are increasingly ineffectual, have long-term negative effects and are expensive in developing countries. Research into affordable, easily accessible medicinal plants-based formulations that don't need to be manufactured under strict pharmaceutical standards creates a lot of interest as an alternative treatment for liver illness. Herbal remedies are more frequently chosen as hepatoprotective medicines because they are less expensive, have a higher level of cultural acceptance, are more compatible with the human body, and have fewer adverse effects than allopathic medications. Now a day's herbal novel delivery system is beneficial for drug control release and sustaining drug activity at an effective medication level in the body with a minimum amount of unfavorable side effects in hepatoprotection.

PS-2314

Enhancing Methods of Poorly Soluble Drugs Using Solid Dispersion Strategy

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Solid dispersion (SD) is defined as the dispersion of one or more active ingredients in inert carriers at solid state prepared by fusion, solvent or solvent fusion methods. The solubility of poorly soluble drugs (especially BCS Class II) can be enhanced by solid dispersion techniques using carriers such as polyethylene glycol 4000, urea, and polyvenyl pyrollidone K 30. The solid dispersion technique has been applied for a range of natural drug constituents to enhance solubility, dissolution, and bioavailability. In addition, solid dispersion has also been explored for making controlled or sustained released natural drug products. The mechanism of this delivery system depends upon the type of solid dispersion, and interaction between drugs, carrier and other carriers used in formulation. At present, several techniques are available which are used to characterize SDs, such as X–ray diffraction, differential scanning calorimeter, FTIR spectroscopy, and dissolution testing, etc. The pharmaceutical applications of solid dispersion techniques are used to enhance the absorption of drugs, obtain a homogeneous distribution of a small amount of drug in solid state, stabilize unstable drugs and protect against decomposition by processes such as hydrolysis, oxidation, photo-oxidation, etc.

PS-2315

Preparation and Characterization of Phenylephrine Loaded Chitosan Based Nanoformulation

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Phenylephrine HCl is a synthetic sympathomimetic agent that chemically resembles ephedrine and epinephrine used for the symptomatic relief of sinusitis, bronchitis, and common cold. The high solubility of Phenylephrine HCl in gastric fluid favors the development of a gastroretentive targeted drug delivery system. Therefore, it was planned to formulate Phenylephrine HCl-loaded chitosan nanoparticles. Chitosan and sodium tripolyphosphate were selected as a carrier to formulate the Phenylephrine HCl-loaded chitosan nanoparticles using ionic gelation technique. Compatibility studies of drugs with excipients were performed by differential scanning calorimetry (DSC), and Fourier transform

infrared spectroscopy (FT-IR). Four chitosan nanoparticles formulations were developed keeping the CS/TPP ratios as 1:1, 1.5:1, 2:1,2.5:1, (M1 to M4) and four more Phenylephrine HCl loaded chitosan nanoparticle formulations were developed keeping the PHE/CS ratios as 0.01:1, 0.02:1,0.03:1, 0.04:1 (M5 to M8). The formulated nanoparticles were characterized in terms of particle size, bioadhesive strength, encapsulation efficiency and loading capacity, in-vitro drug release studies, DSC, FT-IR, Scanning electron photomicrograph (SEM) studies. It has been observed that Phenylephrine HCl can be successfully loaded in the chitosan nanoparticles. Also, CS-TPP nanoparticles as drug carriers for Gastroretentive specific drug delivery were investigated. Further, it has been observed that encapsulation efficiency decreases with an increase in the amount of Phenylephrine HCl in the formulation, however, loading capacity was found to be in the reverse order. It has been observed that particle size of nanoparticles increased with an increase in the amount of chitosan and Phenylephrine HCl in the formulation, whereas bioadhesive strength varies in the reverse order. SEM image of Phenylephrine HCl loaded chitosan nanoparticles confirmed the spherical shape of nanoparticles. *In-vitro* release studies showed that the drug is released in a sustained manner.

PS-2316

Antifungal Drug Delivery System for Treatment of Topical Fungal Infection

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Topical drug delivery is one of the important routes for administration of drugs and the rationale of topical delivery may be of particular interest for skin diseases such as acne, cancer, and alopecia which originate in the pilosebaceous unit. Various drugs like luliconazole, ketoconazole, itraconazole, clotrimazole, and fluconazole are used for topical administration to skin by spreading or rubbing. For topical administration, formulations are designed to allow the dermal penetration of their activities into the deeper regions of the skin such as the viable epidermis and the dermis. These are known as endodermal or diadermal formulations. The absorption into the systemic circulation is not the aim of these formulations. Advantages of topical delivery include targeting at the site of infection, reduction in the risk of systemic side effects, increased patient compliance, improved efficacy of treatment, and avoiding first-pass metabolism. Recent investigations have demonstrated

that the trans appendageal route which is across hair follicles, sebaceous glands, and sweat glands is an efficient penetration pathway and acts as a reservoir for topically applied substances.

PS-2317

Formulation, Optimization and Evaluation of Microwave Assisted Acrylamide Grafted *Linum usitatissimum* Its Application as Novel Matrix for Sustained Release

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Microwave assisted graft copolymerization of acrylamide on *Linum usitatissimum* (flax seeds) was successfully prepared and optimized by the central composite design using four independent variables namely, microwave power, exposure time, concentration of APS and concentration of acrylamide. The results revealed that among significant synergistic effects on the grafting efficiency and the optimized graft copolymer were characterized and confirmed grafting employing FT-IR, DSC, XRD, and SEM analysis. The optimized batch of graft copolymer was further evaluated for drug release behavior using sustained release matrix tablets of Lornoxicam by direct compression method. Three polymers i.e. ungrafted polymer of LM grafted copolymer of LM-g-PAA and synthetic polymer HPMC K100M using a different concentration and also evaluated the difference between them i.e. Pre-compression, Post-compression, and percentage *in-vitro* release of drug by dissolution method using dissolution apparatus. The results of % *in-vitro* release of LM depict within 12 hours, HPMC depicts release within 16 hours and LM-g- PAA depicts sustained release within 24 hours. The best-optimized batch of the LM-g- PAA was compared with the marketed formulation of Lornoxicam tablets and the outcome of LMg-PAA was better than the marketed formulation.

PS-2318

Cytotoxic Effect of Metformin Loaded Palmitic Acid-Conjugated F127 Polymeric Nanoparticles in Breast Cancer

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Metformin is a safe drug that is often used to treat polycystic ovary syndrome and type II diabetes. The drug has attained wide attention in the field of oncology due to its recently

discovered anticancer potential. In the present study, metformin nanoparticles (MN) were prepared using penta-block Palmitic acid-conjugated F127 (PAF127) copolymer through the emulsion solvent evaporation method. The ratio of metformin to PAF127 was altered to obtain an optimized batch with respect to its particle size, zeta potential, entrapment efficiency, and drug loading capacity. The compatibility study was screened using FTIR and DSC. Dynamic Light Scattering (DLS) and FE-SEM were used for the physical characterization of nanoparticles. The nanoparticle size of MN3 batch was found to be smallest (201.6 nm) with a uniform smooth surface, whereas batch MN7 was non-uniform with the largest particle size (959.4 nm). The zeta potential value of nanoparticles was observed between -9.80 to -29.51 mV. The drug loading and entrapment efficiency of MN3 were 65.3 and 74.23%, respectively. Based on studied parameters, MN3 (metformin: PAF127; 1:2 w/w) was selected as the best-optimized ratio. The parameters in other batches (MN1, 2, 4, 5, 6, 7, and 8) were comparatively less valuable, therefore they were not selected for the screening of anticancer activity in breast cancer cell lines. The drug toxicity studies suggested that the optimized MN3 batch showed more cytotoxic potential than that of standard metformin in breast cancer cell lines (MDA-MB-435 and MCF7). The IC_{50} values of MN3 were better for MDA-MB-435 (4.7 ± 1.1 mM) and MCF7 (4.1 ± 1.1 mM) cell lines compared to the standard metformin (5.2 ± 1.2 mM). The results demonstrated that the nano-encapsulation of metformin into polymeric nanoparticles might be a promising and convenient approach to improve its efficiency in breast cancer therapies.

PS-2319

Formulation and evaluation of Econazole loaded deformable liposomes for transdermal delivery

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The aim of the present work is to formulate and characterize Econazole-loaded transfersomal gel for antifungal activity. Econazole is a broad-spectrum imidazole antifungal agent that belongs to BCS Class II. Due to poor solubility, Econazole is incompletely absorbed after oral administration and bioavailability varies among individuals. Topical treatment of fungal infections is usually preferred, but the barrier is to cross the stratum corneum, so formulating the drug in Transferosomes solved this problem. Various transfersomal formulations (F1 to F18) composed of various ratios of Phospholipone 90G, Tween 80, sodium cholate and sodium deoxycholate prepared by lipid film hydration method and evaluated for particle size,

entrapment efficiency (EE %), and in vitro drug release. Formulation (F3) with maximum entrapment efficiency and optimum vesicle size is considered as optimized formulation. The vesicles were spherical in structure as confirmed by Transmission Electron Microscopy The in-vitro release kinetics of optimized formulation was found to follow Higuchi's diffusion model. Therefore, Econazole loaded Transferosomes, e potentially used as a transdermal drug delivery system.

PS-2320

Transferosomes: A Promising Nanoencapsulation Technique

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Transdermal delivery systems have gained much interest in recent years owing to their advantages compared to conventional oral and parenteral delivery systems. They are noninvasive and self-administered delivery systems that can improve patient compliance and provide a controlled release of the therapeutic agents. The greatest challenge of transdermal delivery systems is the barrier function of the skin's outermost layer. Molecules with molecular weights greater than 500 Da and ionized compounds generally do not pass through the skin. Therefore, only a limited number of drugs are capable of being administered by this route. Encapsulating the drugs in transferosomes are one of the potential approaches to overcome this problem. They have a bilayered structure that facilitates the encapsulation of lipophilic and hydrophilic, as well as amphiphilic, drug with higher permeation efficiencies compared to conventional liposomes. Transfersomes are elastic in nature, which can deform and squeeze themselves as an intact vesicle through narrow pores that are significantly smaller than its size.

PS-2321

Nanotechnology-based: Combinational Drug Delivery System for Cancer Therapy

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Cancer is one of the most devastating diseases and it involves various genetic and cellular alterations. The application of nanotechnology in the field of cancer treatment has experienced exponential growth in the past few years. Combination therapy for the treatment of cancer with the help of nanotechnology is becoming more popular because it generates

synergistic anticancer effects by using sustained, controlled, and targeted drug delivery systems and reduces individual drug-related toxicity, suppresses multi-drug resistance through different mechanisms of action. Nanotechnology has a crucial role in cancer therapy regarding the use of different nanocarriers such as liposomes, nanoparticles, dendrimers, polymeric micelles, carbon nanotubes, carbon nanotubes, and quantum dots. Single drug acts through a particular pathway, whereas combinational drugs can show enhanced anticancer activity by acting through several pathways. In case of single drug treatment, MDR proteins, P-gp effluxes drug out of the cell, whereas for combinational formulations P-gp inhibitor blocks the role of MDR proteins and increases the intracellular concentration of co-administered drugs resulting in higher efficacy by overcoming the MDR phenotype. Nanocarriers can protect combinational drugs from degradation by evading the reticuloendothelial system and thus, a high blood circulation profile enables transport through biological barriers, increasing the availability of drugs at the targeted intracellular compartments by reducing the toxicity and other related side effects. In this review, we have focused on the scope of various nanotechnology-based combination drug delivery approaches and also summarized the current perspective and challenges facing the successful treatment of cancer.

PS-2322

Microwave Assisted Synthesis and Characterization of Acrylamide Grafted *Salvia hispanica* and Its Applications in Buccal Drug Delivery

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Microwave-assisted graft co-polymerization of acrylamide on Salvia hispanica (chia) was successfully prepared and optimized by the central composite design using four independent variables namely, microwave power, microwave exposure time, concentration of chia to acrylamide and concentration of initiator. The results revealed that among all studied factors had more significant synergistic effect on the grafting efficiency whereas the concentration of the chia to acrylamide had less synergistic effect on the grafting efficiency. Further the optimized graft co-polymer was characterized employing FT-IR, DSC, XRD and SEM analysis. The results confirmed successful grafting of Salvia hispanica. The graft co-polymer is further employed in the formulation of the Duloxetine HCL Buccal disc using Central composite design 33 the independent variables are used in central composite design i.e. mucilage: diluents, Amount of drug, compression force and dependent variables i.e. In-vitro

% release and bio adhesion time. The results revealed that the mucilage: diluents had more synergistic effect on in-vitro percentage release and bio adhesion time and the factor B and C did not affect the dependent variables. The present study, microwave assisted synthesis of graft co-polymerization is an efficient tool to modify the release properties of Duloxetine HCL by grafting of acrylamide onto Salvia hispanica. The results of stability studies of the optimized checkout batch indicated no significant changes in drug content. Hence the optimized batch was concluded to be stable formulation.

PS-2323

Liposome for The Treatment of Cancer: An overview

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Cancer kills an estimated 3.4 million people throughout the globe each year. Cancer may be brought on by a variety of circumstances, including tobacco use, being overweight or obese, eating processed meat, exposure to radiation, a personal or family history of the disease, stress, or just being born with the disease. The surgical excision of tumor cells, radiation treatment, or chemotherapy are the first-line cancer treatments. The fundamental clinical failure of chemotherapy in cancer treatment is regarded to be the systemic injection of the free medication, since only a limited concentration of the agent reaches the tumor site. These active pharmaceutical ingredients (API) are cytotoxic to both cancer and normal cells, which is why they are often employed in chemotherapy. In order to treat tumors, it is critical to focus on the tumors vascular. When anti-cancer medications are delivered to cancer patients through the liposomal system, they may be safely encapsulated and targeted. As a result of this, the cytotoxic adverse effects of anti-cancer medications may be reduced on healthy cells. This chapter focuses on its use of liposomes in the delivery of anti-cancer drugs.

PS-2324

Antisense Therapy and Therapeutic Applications

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Antisense therapy or oligotherapy is an emerging field of disease treatment and a revolution that has completely changed gene therapy. Antisense oligonucleotides are small synthetic fragments of DNA that have potential to target and bind to messenger RNA of a particular gene causing a particular disease, and modulate specific protein production in the human

genome. Antisense therapy using oligonucleotides has many applications in clinical medicine and has great potential to change the therapeutic landscape for many applications in clinical medicine and has great potential to change to therapeutic landscape for many disease conditions, including their prevention, treatment and management. The current antisense drugs, which are under clinical development phase, target different tissues both systemically and locally. The advancement in the understanding of antisense pharmacology has provided new energy to translate these therapeutics into the clinic. This technology holds the potential to change the therapeutic landscape for many disease conditions.

PS-2325

Drug delivery Systems for Antifungal Therapy

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The prevalence of fungal infections of skin has increased rapidly, affecting approximately 40 million people across the globe. A wide variety of antifungal drugs have been utilized in the effective management of numerous dermatological infections. Fungal infections are often treated by topical or systemic anti-fungal therapy. Topical fungal therapy is usually preferred because of their targeted therapy, fewer side effects, enhanced efficacy, and improved patient compliance. Conventional delivery systems have restricted drug delivery across the skin, resulting in an insufficient therapeutic index and may exert local as well as systemic side effects. Thus, to facilitate the delivery of antifungal drugs and improve treatment aspects, various novel delivery carriers have been developed. Advanced topical carriers, because of their distinct structural and functional features, overcome biopharmaceutical challenges associated with conventional drug delivery systems, like poor retention and low bioavailability. This review summarizes recent advances in novel strategies employed in topical carriers to improve the therapeutic performance of anti-fungal drugs.

PS-2326

Grafting of Natural Polymers and Applications in Pharmaceutical Drug Delivery Systems

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The selection of a proper polymer system is a critical step involved in the formulation of dosage form. Type of polymer/s incorporated in pharmaceutical formulation majorly decides the stability of formulation and drug itself, mechanism, and rate of drug release. Natural

polymers have received more attention because of their advantages over synthetic polymers such as rich availability, low cost, biodegradability and non-toxicity. Delivery of drugs to target sites at a specific concentration for a specific time can be successfully achieved by the use of suitable polymers. Thus, it is not necessary that available polymer till the date should have all ideal properties with respect to above. This makes a demand for tailored polymers with desired features and introduces the concept of grafting for making new polymers to be used in dosage forms. Grafting of natural polymers leads to improved properties and characteristics of backbones of macromolecules such as improvement in gel strength, swelling index, mucoadhesion, drug targeting and drug release profile. Grafting can be achieved by various techniques described herein and can be analyzed by various modern analytical techniques including infrared, NMR, X-ray diffractometer, and differential scanning calorimeter. These grafted polymers offer many applications in terms of site drug/biological carrying capacity, tailored physicochemical properties based dosage form modifications and with desired features, and also to deliver therapeutics at specific sites. Considering these advantages, a number of applications of grafted polymers developed and many patents were filed in this area till the date.

PS-2327

Formulation and Evaluation of Curcumin Loaded Carbopol Gel

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Curcumin, herbal bioactive constituent (*Curcuma longa*) is obtained from rhizome 'Turmeric', belonging to the family *Zingiberaceae.* It is a main active constituent of turmeric (called as principle curcuminoid) which gives bright yellow color due to its polyphenolic pigments. It can be used in different areas like food (as spice and coloring agent), textiles (as dye and staining agent) and pharmaceuticals. Number of herbal formulations of curcumin such as tablets (eg. Haridra®), gels (eg. Curenext®) and creams (eg. Cureveda gold turmeric®) are available in the market for treatment of many diseases. As it has potent antimicrobial activity, it was selected for antifungal gel preparation. The gel formulation is composed of curcumin, carbopol with varying concentration and thioglycolic acid as permeation enhancer. The batch of curcumin containing carbopol (0.8%) releases 72% of curcumin upto 24h and

shows adequate rheological behavior. The prepared gel was further evaluated for spreadability, texture analysis and antifungal activity. It was observed that the gel has uniform spreadability, good adhesiveness and excellent antifungal activity. The results of the present study indicate that the formulated curcumin gel is a potent and reliable herbal drug for antifungal formulation and can be used for pharmaceutical applications.

PS-2328

Nanoparticle as Novel Carrier for Brain Delivery

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A significant barrier to the transfer of bioactive into the brain is the blood-brain barrier (BBB). It acts as a substantial barrier to the entrance of hydrophilic medications, and the efflux pumps on its surface prevent the buildup of pharmacological moieties inside brain cells. In this context, nanoparticles (NPs) have the potential to be a module for transporting significant quantities of medication over the BBB. To get access to the brain and reduce the toxicity of treatment, they can be made with a targeting moiety or coated on surfaces. To increase the likelihood of diseasefree life, the NPs can act as an exclusive dais for the spatial and temporal distribution of pharmacological substances across the brain. This presentation investigates several potential pathways by which NPs may enter the brain, including adsorption, receptor-mediated endocytosis, transcytosis, inhibition of the p-glycoprotein efflux pump, membrane permeabilization effect, and BBB disruption. To provide more precise medication administration, the study also discusses the potential for NPs to improve the movement of therapeutic molecules across the brain.

PS-2329

Formulation and Characterization of Oral Disintegrating Film of Amlodipine besylate Using Fenugreek Mucilage

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The present investigation toward innovative drug delivering system was aimed to formulate and characterize oral disintegrating films (ODFs) of Amlodipine besylate (AB) as well as to ensure patient acceptability to treat hypertension and condition like dysphagia. Amlodipine besylate is a long-acting Calcium Channel blocker. The film was formulated by incorporating

the drug with fenugreek mucilage (FGK), SSG, PEG-400, HPMC and citric acid by using Solvent casting method. The prepared ODFs were evaluated by physical appearance, thickness, folding endurance, surface pH, disintegration time, FTIR, DSC. In-vitro drug release and kinetics of drug release were also studied. The Physical appearance found to be good with smooth surface. Thickness, folding endurance, surface pH, disintegration time and percentage of drug content were found to be in range of (0.0366 ± 0.015 to 0.061 ± 0.005), (62±2 to 90± 4), (6.37 ± 0.29), (18.7 ± 1.52 to 32.0± 2.00), (94.45 to 98.47) respectively. The formulation F6 was found to first order kinetics with R^2 Value 0.9857. Stability studies revealed that there was no significant change in the physical appearance, disintegration time and drug content after 3 months. Hence, it can be inferred that ODF of AB rapidly disintegrate within seconds when placed on tongue and enhance absorption by avoiding the first pass effect and improving bioavailability.

PS-2330

Role of Surface Designed Silver Nanoparticles in Treatment of Various Diseases

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Drug delivery is a method to control the delivery of drug to target site to achieve medicinal effect. As studies reported that silver nanoparticles being unique in physical and biological properties have been developed as an effective drug delivery agent with anticancer, antibacterial, antiviral and antioxidant activities. Adjustable size and shape of silver nanoparticles make them for use as an active drug delivery agent. Studies of molecular mechanics reported that the delivery of nanomaterials affects the morphology of cells, mitosis, cytokine release, cell cycle progression and cell viability. Surface designed silver nanoparticles has been also used as a carrier for drug with enhancing anticancer, antibacterial properties. Synthesis of Chitosan(CS) nanocarrier(NC) based silver nanoparticles(Ag) induce cell death due to the production of reactive oxygen species (ROS) with minimum toxicity to the human normal cells. Schiff base functionalized silver nanoparticles showed potent antibacterial activity as compared to Schiff base alone. Silver nanoparticles anchored 5–methoxy benzimidazol thiomethanol (MBITM) showed more potent antibacterial activity as compared to pure silver or 5-methoxy benzimidazol thiomethanol alone. These above reports proves that silver has delivered organic matter or drug into cells more easily due to their

ability to avoid antibiotic resistance mechanism. So, a novel effective drug delivery system could make already discovered drugs more potent.

PS-2331

Track and Trace System for Pharmaceutical Industry

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Track and trace process for pharmaceuticals is to determine the drugs current and past locations. It is a powerful tool that pharma companies cannot change without regulations mandating track and trace capabilities and specialized requirements for sharing supply chain data. A track and trace system for pharmaceuticals, when created and put into use properly, delivers on what is implied by the name. It follows a drug, a vaccine, a medical device, or anything else in any configuration as it moves forward through the supply chain and traces back to show where it has been in the chain. Track and trace for pharmaceuticals use a purposeful of technology and procedures. Its "building block" is serialization, which gives a product a distinctive identity that enables it to be tracked and traced 24/7, authenticated whenever necessary (for example, a sale, at dispensing, upon return, or during a recall) and transformed into what we call a digital asset with a variety of advantages and applications. Utilizing drug track and trace systems can help safeguard public health and stop the entry of fake medications into the supply chain. The pharmaceutical track and trace system's ability to improve manufacturing sales channel efficiency and lower rates of theft and fraud is one of its most significant advantages.

PY-2301

Application of RSM in the Ultrasound-Assisted Extraction of Phyto-Pharmaceuticals

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In recent years, Response Surface Methodology (RSM) with statistical experimental designs is typically employed in the optimization for non- Conventional extraction procedures. RSM is defined as a collection of mathematical and statistical means commonly used to express the performance of complex systems and optimize various types of complex processes. These days, UAE is effectively functional for extracting the various phytoconstituents from remedial plant resources owing to lesser emission of greenhouse gasses and reduced solvent

and energy consumption, efficiency delivered during the process, and maximum extraction yield. To achieve the best results from extraction of herbal plants, the parameters namely solvent nature, ultrasonic power, concentration of solvent, sonication time, solvent to solute ratio and temperature, etc are required to be optimized. Application of BBD with UAE was found to be an effective method to reduce lengthy extraction processes such as conventional extraction methods for extraction of active phytoconstituents from many herbal plants. Thus, UAE optimized by BBD combined RSM has a huge prospective and it is essential to employ this extraction method so as to achieve a greater approach for herbal drug research.

PY-2302

Traditionally used Herbs are Medicines of Future

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Herbs have served as a source of alternative medicine and new pharmaceuticals and healthcare products. India is a gold mine of well-recorded and traditional knowledge of herbal medicine. Ayurveda is a unique Indian system of medicine and its popularity is now increasing in the rest of the world, as people are getting the benefits. The demand for plant-derived products such as medicine and health care products have a marvelous requirement of plant-based raw materials. Plant-based materials provide abundant opportunities for developing new medicine. Thus there is an enormous scope for India to appear as a major performer in globally herb-based medicines, in research and development capability. There is an imperative need to carry out a scientific evaluation of traditional medicines and to provide and explore their folklore use. Ethno pharmacological investigation of plants of a particular region or cultural group can be active as a pre-screen in plants and further quantitative standardization, isolation, formulation development, and other pre-clinical and clinical studies can be carried out. The continuous supply of medicinal plants can be assured by the promotion of ethical use of herbs or medicinal plant drugs, which will discourage immoral collection and overutilization of ethno medicinal plants.

PY-2303

A review on medicinal plants used in the treatment of Peptic ulcers

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Peptic ulcer is a chronic gastrointestinal disease and is recurring in nature. It is formed by the action of acid and pepsin resulting in the breakage of mucosal lining in the stomach and intestine. The causes of ulcers are *Helicobacter pylori* infection, excessive use of non-steroidal anti-inflammatory disease, stress, smoking, high alcohol consumption, poor diet, etc. Most of the existing therapies for the treatment involve the use of synthetic drugs, which produce several side effects. The major aim of the treatment is to heal the ulcer, relieve the pain and delay its recurrence. Medicinal plants have long been used for the treatment of a vast number of diseases. The shift to natural products for the treatment of diseases also paved a way for new drug discoveries. Hence, there is a need to exploit the plants being used for the treatment of peptic ulcers, their important phytoconstituents, and other therapeutic potential. This review attempts to provide information regarding the drugs derived from medicinal plants having an anti-ulcer effects.

PY-2304

Novel Drug Delivery System in Herbal Medicines

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Novel drug delivery system is a novel approach to drug delivery that addresses the limitations of the traditional drug delivery systems. Our country has a vast knowledge base of Ayurveda whose potential has been realized in recent years. However, the drug delivery system used for administering the herbal medicine to the patient is traditional and out-of-date, resulting in reduced efficacy of the drug. If novel drug delivery technology is applied in herbal medicine, it may help in increasing efficacy and reducing the side effects of various herbal compounds and herbs. For a long time, herbal medicines were not considered for development as novel formulations owing to a lack of scientific justification and processing difficulties, such as standardization, extraction, and identification of individual drug components in complex polyherbal systems. The novel formulations are described to have remarkable advantages over conventional formulations of plant actives and extracts which include enhancement of solubility, bioavailability, and protection from toxicity, enhancement of pharmacological activity, enhancement of stability, improved tissue macrophages distribution, sustained delivery, and protection from physical and chemical degradation.

PY-2305

Optimization of Extraction of Ascorbic Acid

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Citrus fruit is an integral part of a healthy breakfast and thus promotes the beginning of a healthy life every day. Citrus fruits have a variety of vitamins, minerals, and antioxidants such as flavonoids, anthocyanins, phenolic acids, and carotenoids as well as the presence of many nutrients such as fiber to have a positive effect on health immunity. The lemon, orange peel, and amla were subjected to phytochemical analysis, vitamin C estimation and antiaging activity. Vitamin C is one of the essential vitamins for humans and animals. Many methods were developed for the determination of vitamin C such as spectrophotometry, electrophoresis, titration, and high-performance liquid chromatography (HPLC). This study aims to compare vitamin C content of citrus fruits. Orange has a high content of vitamin C using different solvents like petroleum ether, acetone, hexane, and ethanol.

PY-2306

Bioactive Molecules of *Prosopis juliflora* and Their Therapeutic Potential

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Prosopis juliflora (Sw.) DC., belongs to the family Mimosaceae. Non-medicinal uses include firewood, shade, animal fodder, and furniture while medicinal uses are hypoglycemic, antimicrobial, antiemetic, in Alzheimer's diseases, anti-inflammatory, ulcer treatment, wound healing, etc. The study aimed to identify the potential of bioactive constituents of *Prosopis juliflora.* The fat-free coarse powder was extracted with ethanol (95% v/v) by soxhlation for 72 h. Ethanol extract of further subjected to GC-MS analysis. Major constituents are linolenic acid, mome inositol, palmitic acid, linoleic acid, and its methyl and ethyl esters. Identified constituents are bioactive and reported to possess therapeutic effects to manage pathological conditions like microbial infections, cancer, diabetes, inflammation, wound, acne, obesity, etc. Therefore, this plant may be explored further to prove beneficial effects are pre-clinical and clinical levels.

PY-2307

HPTLC Methods and Validation Parameters for Quantification of Withaferin-A from *Withania somnifera*

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Withania somnifera, commonly known as Ashwagandha is the most valuable herbaceous plant in the traditional systems of Indian medicine having many therapeutic effects. It is a desert plant which grows in dried and rain-forest regions. The active chemical constituents of ashwagandha are withaferin A, withanolide A, ashwagandhine, withasomniferin-A, isopelletierine, withasomidienone, tropine, withanone, cuscohygrine, anaferine, hygrine, anahygrine, somniferine, mesoanaferine, etc. It has life-prolonging, rejuvenating effects & also used for the treatment of insomnia, anxiety, convulsion, skin disease, inflammatory conditions, nervous exhaustion, impotency, enhancing memory or cognitive and enhancing insulin secretion, etc. Validation and HPTLC is the most important in evaluating the quantity and quality of herbal drugs. Quality and quantity of *W. somnifera* varies due to different geographical conditions of different geographical areas. Hence, the concentration of the major constituent withaferin-A also varies. It also results in variations of marker compounds in formulations. The level of the macro or micronutrients in the soil should be optimized to obtain better yield and desired concentration of withaferin-A Form *W. somnifera*.

PY-2308

Phytochemical Constituent and Pharmacological Activity of the Resin of *Shorea Robusta Gaertin.f*

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Shorea robusta Gaertn. is a tree commonly known as sal or shala tree, belonging to the family Dipterocarpaceae. This tree is widely used in the Ayurvedic system of medicine and Unani medicine. The various components of the *Shorea robusta* in India are traditionally used in treatment of many diseases like eye irritation, wound healing, burns, antimicrobials, pains, skin diseases and to control diarrhea. Scientifically the plant has been reported for various activities including analgesic, anti-inflammatory, antioxidant, antipyretic, and anti-ulcer. *Shorea robusta* plant indicated the phytochemicals like alkaloids, flavonoids, tannins steroids, and anthraquinone. The resin of the plant has been reported in the indigenous system

of medicine with rich medicinal importance. The extract of the *Shorea robusta* resin was tested for their phytochemical constituents. The ursolic acid, alpha-amyrenone, alpha-amyrin are also present in the resin of the *Shorea robusta*. Literature was collected through books, journals and different databases like (Web of Science, Pubmed, and Scopus).

PY-2309

Herbals as Anti-cancer and Anti-inflammatory agents

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Cancer is now recognized as one of the most common diseases in the world, due to its high mortality rate. Inflammation is our body's immune system against potentially dangerous stimuli like allergens and/or tissue damage. However, a variety of disorders, including allergies, cardiovascular issues, metabolic syndrome, cancer, and autoimmune diseases are the underlying cause of uncontrollable inflammatory responses. Inflammation and cancer are linked through extrinsic and intrinsic processes, respectively. Herbals play a very important role in treatment of cancer and inflammation. Several plant-derived extracts inhibit and regulate signaling process and network associated with the growth as well as proliferation of cancer cells. It is necessary to invent new strategies to prevent and treat disease. Products obtained from plants are a valuable source for the development of novel medications, due to their diverse chemical composition. Herbal medicines are employed as lead molecules in the development of new drugs as well as directly as therapeutic agents. Literature study recommends that the use of herbs can give true benefits on health when used long term. So, researchers are focusing on various phytoconstituents and how well they may work against various diseases at the moment.

PY-2310

Leads from Natural Resources

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Natural products have traditionally been a major source of leads in the drug discovery process. However, the development of high through-put screening led to an increased interest in synthetic methods that enable the rapid construction of the large libraries of molecules. Lead occurs naturally in the earth's crust. It is also found in the combined form of

several minerals. This resulted in the termination of many natural product research programs. It explores the current state of natural product research within the drug discovery process. On the other hand, it evaluates efforts made to increase the amount of leads generated from chemical libraries. For example, a number of other promising agents such as flavopirdol, combretastatin, and betulinic acid are in clinical or preclinical development. A large number of anti-infective agents (such as penicillin, and cephalosporin) in clinical use are also derived from natural products. Natural products are important sources for lead compounds and greater chance of finding physiologically active compounds in nature.

PY-2311

Edible plants as anti-inflammatory drug

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The term Edible means "to eat". Several edible plants are used in traditional medicine for the treatment of inflammatory conditions. Various non-steroidal anti-inflammatory drugs reduce pain and inflammation. Their continuous administration causes many side effects. However, there are medicinal plants with anti-inflammatory therapeutic effects with low or no side effects. In traditional medicine, medicinal as well as edible plants with anti-inflammatory activities have been shown to be effective in the treatment of inflammatory conditions.

PY-2312

Natural products: A promising lead compound in novel drug discovery

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Natural products have traditionally been a major source of leads in the drug discovery process. In INDIA, a wide diversity of Plants having medicinal values as well as spiritual can be seen mainly in the HIMALAYA's region. The WHO (World Health Organisation) estimated that 80% of population in some countries based on the traditional plants for their health. A wide diversity of plants and their medicinal significance has led researchers to predict that the screening of natural products will generate new lead compounds. Structural modifications or optimization of these lead compounds can generate effective therapeutic

agents with minimum or fewer side effects and greater pharmacological activities. Well known vincristin and vinblastin are uses continuously as an effective anticancer agent also derived from leaves of *Catharanthus roseus* plant. Some plants also show their poisonous nature to human's health due to their chemical complexity in plants leaves or in some other plant products. So, by simplifying the chemical complexity of plant products by the extraction or some other known separation techniques we can use individual chemical constituent with optimization against a particular disease in a right known doses to reduce or completely eliminate the risk of bad effect or side effect on human health.

PP-2301

Protective Effect of Bioflavonoid in STZ Induced Diabetic Nephropathy in Experimental Rats

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The aim of this study is to find an alternative and effective treatment to improve the nephropathic complication of diabetes. STZ induces diabetes by destruction of pancreatic β cells and decrease the insulin level in body. Prolonged hyperglycemic condition affects the glomerular filtration rate by damaging the renal tissue. STZ induces oxidative stress, inflammatory cytokines and after some time leads to nephropathy. This flavanone compound (test drug) shows a renal protective effect by improving various parameters. Oxidative stress parameters TBARS, Catalase, nitrites, GSH levels were found decreased after administration of test drug. Lipid profile, inflammatory cytokines and all physical parameters of animals were also decreased in flavanone-treated animals. Test drug treatment also reduced advanced glycation end products. Other parameters like Hba1C Insulin, serum glucose, albuminuria, creatinine clearance, and urine albumin excretion rate were also restored by drug treatment. In histopathology, renal damage score, renal histology score, renal leukocyte count and urinary microscopic score were measured and compared with diabetic nephropathy group and flavanone treated group. Flavanone treatment was found to be effective in improving these parameters. The observations showed a significant diabetic nephroprotectivity of flavanone compound in experimental rats.

PP-2302

Brief Description of Systemic Lupus Erythematosus (SLE) and its Diagnostic Approaches

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Systemic Lupus Erythematosus (SLE) is an autoimmune disorder that can affect multiple body organs. Its mechanisms of action are not well explored. Most common pathology of SLE is accumulation of immune complexes, leukocyte, antigen bodies and various organs including lungs, liver, kidney resulting in inflammation. It also results in secondary diseases like Lupus Nephritis (LN) which ends up manifesting in nearly 50% of the patients. SLE affects people from all age demographics and both sexes, but recent studies suggested that more than 90% of patients are women undergoing menstrual cycle (childbearing-20/50). In this study we have discussed many diagnostic approaches of SLE. The renal biopsies are considered as the standard method to diagnose SLE and LN. Including this, genomic mutations such as TREX1, ATG5, RAD518 and DNASE1 are also found associated with development of SLE. Conjunctival biopsies from SLE patients and cataract patients with active epibulbar lesion were compared. Histologically, SLE specimens showed moderate subepithelial and perivascular mononuclear cell infiltration or granuloma formation in the substantia propria, and squamous metaplasia; thrombosis was not seen. Additionally, many drugs are recommended to treat SLE such as immunosuppressants that promote the development of secondary infections like Salmonella, candida, herpes zoster.

PP-2303

Histological and biochemical study of lymphoma

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Lymphoma is caused by exposure to ionizing radiation and certain types of mutagens like chlorophenols, glycolates, herbicides, and pesticides, etc. These are of types: non-Hodgkin's,

and Hodgkin's. Lymphome is associated with somatic changes in genes like CAS10, ATM, RAD54L, BRAF, CARD11 and RAD54B. The condition of lymphoma can be clinically analyzed by various different methods such as blood test, serological study, immunological study, genetic study, radiology study, biopsy, etc. Blood tests are also used to analyze abnormal lymphocyte count and level of lactate dehydrogenase. PET scans are useful during the treatment phase. Serological study and lymph node biopsy reveals that Hodgkin lymphoma is monoclonal lymphoid neoplasm characterized in cervical lymph nodes with scattered large mononuclear Hodgkin and multinucleated Reed-Sternberg cells with non-neoplastic inflammatory cells (HRS cells) surrounded by a cellular infiltrate of benign inflammatory cells. Common histological findings of non-Hodgkin's lymphoma include follicular and diffuse patterns. Apart from that during the biochemical analysis various biochemical markers are detected like BCL6, MYC, MYD88, P16/INK4A, MLL2/KMT2D, CREBBP/ EP300, KDM2B, JMJD2C, SOX9, HOXA9, AHR, NR2F2, ROBO1, SNCA, SPG20, CNRIP1, TET2, IDH2, etc.

PP-2304

Flavonoids: The Natural Anticancer Agents

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Cancer is a group of diseases which is the main cause of death after heart diseases all over the world. Many chemotherapies are available to treat the cancer disease but there are a number of natural substances available that are secondary metabolites which are able to treat cancer and flavonoids are one of them. They are known to produce several special therapeutic effects such as anti-inflammatory, immune response modulator, in supporting normal cellular functions, and antioxidant effects. The rich sources of flavonoids include vegetables, fruits, beverages derived from plants such as green tea, red wine and products containing cocoa beans or their derivatives, etc. Flavonoids can be classified into six major subtypes or groups on the basis of degree of oxidation, chemical structure, and unsaturation in the linking chain. These are Isoflavonoids, Flavonones, Flavanols, Flavonols, Flavones, and Anthocyanidins. The enhanced generation of reactive oxygen species (ROS) in electron transport chain due to oxidative stress leads to inflammation, development of many degenerative diseases, cancer, etc. Flavonoids help to relieve oxidative stress by regulating ROS homeostasis (scavenge ROS), triggering apoptotic pathways and potent pro-oxidant effect (suppression of pro-oxidant enzymes) in cancerous cells (activation of antioxidant enzymes).

PP-2305

Recent Drug Development Against Influenza Virus

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Drug development comprises all the activities involved in transforming a compound from drug candidate to a product approved for marketing by the appropriate regulatory authorities. It takes around 5-10 years and costs billions of dollars. The idea for a new development can come from a variety of sources which include the current necessities of the market, new emerging diseases, academic and clinical research, etc. the most recent emerging disease is Influenza virus that is a highly contagious zoonotic respiratory disease that causes seasonal outbreaks each year and unpredictable pandemics occasionally with high morbidity and mortality rates, posing a great threat to public health worldwide. Besides the limited effect of vaccines, the problem is exacerbated by the lack of drugs with strong antiviral activity against all flu strains. Currently, there are two classes of antiviral drugs available, but the appearance of drug-resistant virus strains is a serious issue that strikes at the core of influenza control. An awareness of these issues allows the early implementation of measures to increase the opportunity for success. Despite a high level of awareness in the industry, the need to reduce the money and time spent on development, both have increased significantly over the last decade. Therefore, development burden is tending to increase and the need for companies to improve their performance in this area is must.

PP-2306

Potential Benefits of Multi-Targeted Phytochemicals on Alzheimer's Diseases

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Alzheimer's disease is the most common form of Dementia. It is extremely complex, heterogeneous and a leading cause of death nowadays. Presently approved drugs for AD such as Galantamine and Rivastigmine, are from alkaloid class of plant phytochemicals which are associated with unpleasant side effects. They solely target cholinesterase enzymes, while the disease is typified as multifactorial. Pathophysiology of AD is associated with Acetylcholine, Monoamines, β-amyloid, tau protein hypothesis, brain inflammation and oxidative stress.

There are a few phytochemicals that have shown effects relevant to pathological targets as discussed above. Some of such phytochemicals are *Ginkgo biloba*, Ginseng, Melissa officinalis, Salvia Lavandulaefolia and Crocus sativus. Our motive in this review is to describe phytochemicals with lesser side effects and beneficial effects in AD.

PP-2307

Pharmacological Potential of Coumarin-Based Derivatives: A Comprehensive Review

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By combining the benzene nucleus and pyrone ring a class of heterocyclic compounds known as benzopyrone is generated. As a basic parent scaffold 1,2- benzopyrone ring system contained by coumarins. These compounds can be divided into two groups: 1. Benzo-α-pyrone 2. Benzo-γ-pyrone. Data on different coumarin derivatives are gathered in this review article as these compounds have a wide spectrum of pharmacological actions and can be further modified to make more potent and effective medications. Derivatives of coumarin play a significant role in industries and sectors of medicine. This can be linked to their variety of chemical characteristics and multiple biological activities. Coumarin based derivatives has a phenolic hydroxyl group which is generated as one of the most derivative functional groups. The focus of this systematic and comprehensive review on synthetic pathways of coumarin affiliates and their biological activities or potential. According to authors this review could help medicinal chemists to choose appropriate functional groups for development of novel therapeutic drugs.

PP-2308

Nanopore Sequencing Technology

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Nanopore sequencing is a unique, scalable technology that enables direct, real-time analysis of long DNA or RNA fragments. It works by monitoring changes to an electrical current as nucleic acids are passed through a protein nanopore. A nanopore is a pore of nanometer size. It may be created by a pore-forming protein or as a hole in synthetic materials such as silicon

or grapheme that serves as a biosensor and is embedded in an electrically resistant polymer membrane. The resulting signal is decoded to provide the specific DNA or RNA sequence. The scale of such nanopores is comparable with the macromolecules of interest. Molecules entering the pore can be easily monitored and analyzed individually. Rapid advances in nanopore technologies for sequencing single long DNA and RNA molecules have led to substantial improvements in accuracy, read length and throughput. Nanopore sequencing is being applied in genome assembly, full-length transcript detection and base modification detection and in more specialized areas, such as rapid clinical diagnoses and outbreak surveillance.

PP-2309

Novel Targets for Anti-Cancer Therapy

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Targeted therapeutic drugs have become commonplace cancer treatments due to their superior efficacy and safety when compared to traditional chemotherapy drugs. Since the first tyrosine kinase inhibitor, imatinib, was approved for sale by the US Food and Drug Administration (FDA) in 2001, an increasing number of small-molecule targeted drugs for the treatment of cancer have been developed. By December 2020, the US FDA and China's National Medical Products Administration (NMPA) will have approved 89 small-molecule targeted antitumor drugs. Despite significant progress, small-molecule targeted anti-cancer drugs face numerous challenges, including low response rates and drug resistance. We conducted a comprehensive review of small-molecule targeted anti-cancer drugs in order to better promote the development of targeted anti-cancer drugs. Introduction to Targeted drugs in cancer therapy has made a remarkable improvisation. This helped with a greater ratio of completely cured patients reporting lesser side effects.

PP-2310

Modulation of Wnt/TLR-4 by AMBMP Hydrochloride in ameliorating Streptozotocin-induced Dementia of Alzheimer-type

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Alzheimer's disease (AD) is the most prevalent neurodegenerative disorder, characterized by progressive neuronal damage that leads to a gradual but noticeable decline in cognitive

functioning, including symptoms such as memory loss and confusion. With global longevity increasing, the prevalence of AD is increasing, and there is an urgent need for approaches to prevent or delay disease onset and subsequent dementia. This study involves the exploration and evaluation of AMBMP Hydrochloride (intraperitoneal; i.p.) as a novel pharmacological approach, targeting Wnt/TLR-4 signaling in the Streptozotocin-induced rodent model of Alzheimer's. In this present study, a dose of 3 mg/kg Streptozotocin (STZ) was administered intracerebroventricular (i.c.v.) at day 1 and 3, which has not been shown to interfere with the changes in the peripheral blood glucose level but induce a significant cognitive impairment in all animals. Results suggest that the mice model had decreased performance in the Morris Water Maze (MWM), representing impairment of cognitive functions. Biochemical evaluation showed a rise in TBARS level, MPO and AChE activity and fall in GSH level. The histopathological study revealed severe infiltration of neutrophils. In the study, administration of AMBMP Hydrochloride/Donepezil (serving as a positive control) in *Swiss Albino* mice improved memory, reduced oxidative stress, inflammation and improved histological parameters via its Wnt activation property and probably through TLR-4 inhibitory action in a dose dependent manner and Palmitic acid, Toll-like receptor 4 agonist attenuated the neuroprotective effect of AMBMP Hydrochloride. It can be conferred that Wnt/TLR-4 can be an encouraging target for the treatment of dementia of AD.

PP-2311

A New Generation of DNA Vaccines Against Tuberculosis

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The Bacillus Calmette-Guerin (BCG) vaccine is well-known for its use in preventing tuberculosis (TB), although it has been shown to be ineffective in adults and protective only against the extra pulmonary form of TB in children. This is why there has been so much research and development on safe and effective TB vaccines for adults. A DNA vaccine is an effective method since it can protect against several infectious illnesses, is cheap to produce, can be made quickly, and has a desired stability. Similarly, the immunogenicity of DNA vaccines may be improved by using nanoparticle (NP)-based systems, which can shield naked plasmid DNA from nucleases and improve its transport to immune cells. This article summarizes research on several mycobacterial antigens and chimeric combinations in animal models, with an emphasis on their relevance to the creation and administration of innovative DNA-based vaccines against tuberculosis.

PP-2312

An Updated Review on Animal Models of Autism

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Autism is a neurodevelopmental disorder characterized by deficits in social communication, impaired social interaction and stereotype behavior. Despite the increasing incidence of prevalence, the evaluation criteria for development of anti-autistic drugs remain unclear. In general, the pathogenesis of autism includes alterations in brain neurochemicals & imaging and genetic mutations. Animal models are commonly employed to evaluate the drugs effective against autism. These models include use of inducing agents; alterations in behavioral parameters such as cognitive dysfunction, violations of social interactions, and qualitative disorders of communication; and use of knock-out animals. Prenatal or postnatal exposure of some drugs such as valproic acid can induce significant effects during neurodevelopment in fetus or in childhood. For the behavioral studies, the classic animal models (e.g. Morris water maze, T-maze, O-Maze for cognition, open field test and interaction test for social behavior) are used. The presence of co-morbid disorders like anxiety, depression, epilepsy, sleep disturbances etc. further support the hypotheses for use of these models. This review focuses on the recent advances in the evaluation of drugs effective against autism.

PP-2313

Cinnamon: From Kitchen to Clinic

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Due to its unique taste and aroma, cinnamon is a staple in every household's cooking. Since our forefathers first used it in 2800 BC for different ailments and anointing, embalming, and other uses, it has piqued the interest of numerous scholars. The positive benefits of cinnamon on Parkinson's, insulin, blood, and the brain have recently been the subject of numerous studies. Data were gathered regarding its anti-oxidant, anti-inflammatory, anti-lipemic, anti-diabetic, anti-bacterial, and anti-cancer impact after conducting a thorough search on PubMed and Google scholar. This comprehensive analysis highlights the additional health advantages of this secret ingredient and the potential for additional study in these therapeutic settings. The study emphasizes the importance of this frequently ingested flavor in relation to the hematological system, cardiovascular system, central nervous system, etc. This specific

palatable flavor can be used as an addition to the majority of patients' usual medicines due to its wide range of usefulness. In spite of all these pleiotropic effects, additional study is necessary to support the drug's clinical benefits in the dosage that is being used.

PC-2301

Design, Synthesis, *In vitro* Antimicrobial and Antioxidant Evaluation of New Pyrimidine Derivatives

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Pyrimidine is present in numerous biological moieties, e.g. antimicrobial, antioxidant, antidiabetic, anticancer, antiviral, and anti-inflammatory agents. Synthesized derivatives were followed for their *in vitro* antimicrobial activity and evaluated by the tube dilution method with respect to bacterial (*S. aureus, B. subtilis, E. coli*) and fungal (*A. niger, C. albicans*) strains. Against *S. aureus*, compound S1 was found to be most potent derivative with a MIC value of 16.26 µM/ml whereas S7 derivative was found to be most active against *B. subtilis* and *E. coli* with a MIC value of 17.34 µM/ml. Against *A. niger* and *C. albicans*, S11 and S7 derivatives were found to be most potent derivatives with a MIC value of 17.34 µM/ml. Antioxidant activity results indicated that S2 and S4 derivatives exhibited excellent antioxidant activity with IC_{50} values of 13.33 mol/L and 43.13 mol/L using DPPH assay. Although all synthesized compounds showed medium to remarkable activity, derivatives (S1, S2, S7, S4, and S11) have shown excellent antimicrobial and antioxidant activity in comparison with the reference drug. Synthesized compounds having electron-withdrawing and releasing groups in their structures have proved to improve antimicrobial and antioxidant activity.

PC-2302

Exploring Thymol Ester Analogues Interaction with 5HVX and 3F8E Involved in Antiepileptic Activity

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Epilepsy is a chronic neurological disorder that affects people of almost all age groups. It is mainly recognized by brief episodes of recurrent seizures which involve either a part of the body or whole body and sometimes the patient is unconscious due to epileptic seizures. Although various drugs are available in the market for the treatment of epilepsy, there is still a need to develop new drugs because every drug has its own limitations. For developing a new drug there is a need for huge money and it is a time-consuming process but molecular docking is one of the important methods by which we can do that work and estimate the probability of developing a new drug on the basis of dock score and glide energy. So, in our work we take thymol which is a dietary monoterpenoid and has potent neuroprotective activity, we make derivatives of thymol with an ester group using ChemDraw software and then docking was done with proteins such as PDBID 5HVX and 3F8E using Schrodinger software. The docking score and glide energy of these derivatives were better than standard drug ethosuximide, this may conclude that these derivatives may have more potent antiepileptic activity than ethosuximide.

PC-2303

Biomedical Applications of Schiff-Base Ligands and Their Metal Complexes

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Schiff bases are multifaceted ligands that are synthesized from the condensation of an amino compound with carbonyl compounds. These compounds and their metal complexes are very important as catalysts in numerous biological systems, polymers, dyes and medicinal and pharmaceutical fields. In azomethine derivatives, the C=N linkage is crucial for biological activity, several azomethines were reported to possess remarkable antibacterial, antifungal, anticancer and diuretic activities and other biological activities and applications in food industry, dye industry, analytical chemistry, catalysis, agrochemical. Schiff-base ligands have a significant role in the evolution of contemporary coordination chemistry. Therefore, a numerous number of complexes were synthesized by moving the metal ions in the salen-type ligand. The biological activity of the metal complexes is higher than that of their ligands. Such increased activity of the metal chelates can be explained on the basis of chelation theory. The complexes of the Schiff- bases are of great consideration due to their stability,

electron donating capacity, optical nonlinearity, catalytic, photochromic, and biological activity. Various complexes showed a wide range of biological activities and exhibited higher activity than the free ligand against the same organism under identical experimental conditions.

PC-2304

Metal Complexes: A New Era of Synthesis in Drug Discovery

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The coordination complexes have been studied since 1798 starting with the Tassaert studies, and till nowadays significant progress has been made in inorganic and organic chemistry concerning the synthesis, characterization, and application of this large group of metal complexes. Concerning their structure, complexes were considered those compounds which do not fit within the classical theory of valence, meaning that the combined ratio of the elements exceeded their valences. From the wide range of fields in which these coordination compounds find their application, many efforts were focused on the study of their importance in biological processes. Natural metal complexes consisting of a central metal atom or ion are involved in plenty of biological mechanisms among which photosynthesis, transport of oxygen in the blood, coordination of some metabolic processes, pathological states, enzymatic reactions, etc. Many biomolecules (amino acids, peptides, carboxylic acids, etc.) can form metal complexes with different stabilities having biomedical importance. Transition metal ions are also found in several bacterial species and are reported to play an important role in different physiological reactions. The structures were elucidated using different techniques i.e., electrical conductance, elemental, and thermal analyses as well as a series of spectroscopic techniques i.e., UV-Vis, IR, and 1H NMR.

PC-2305

Structure Activity Relationship of Heterocyclic Derivatives with Multi-Targeted Anticancer Activity

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Cancer became a serious health issue devastating the world by presenting a complicated condition of cell proliferation in which abnormal cells multiplicate in very uncontrolled and extreme manner. From the last decades, surgical as well as irradiation therapies are employed along with appropriate chemical agents as an effective treatment of cancer. In contrast, cancer can be eliminated in a more efficient manner by utilizing target-based chemotherapy including cell specific as well as receptor specific inhibition including tyrosine kinase receptors (TKIs) inhibitory action. Further, heterocyclic molecules whether isolated from natural diversity or synthetic heterocyclic derivatives explored their promising effect to eradicate different types of cancer. Whereas, promising treatment along with minimal cytotoxic potential associated with normal cells remains an enormous challenge. By considering these facts, we aimed to write with objectives like (1) To discuss current developments in the medicinal chemistry perspective of heterocyclic analogues with their ant-cancer action; (2) To present comprehensive correlation in between structure activity relationship (SAR) and anticancer effect including *in vitro*, *in silico* and mechanistic studies. We hope this correlation will help to afford the fruitful ideas for researchers regarding design and development of potent anticancer derivatives.

PC-2306

Synthesis, Antimicrobial and Molecular Docking Studies of N-(alkyl/aryl)-2-chloro-4-nitro-5-[(4-nitrophenyl) sulfamoyl] benzamide Derivatives

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A series of N-(alkyl/aryl)-2-chloro-4-nitro-5-[(4-nitrophenyl) sulfamoyl] benzamide derivatives (**S1-S25**) was synthesized and characterized by its physicochemical properties *viz.* IR and NMR (^{1}HNMR and ^{13}C NMR) spectroscopy. All the compounds were evaluated for

their antimicrobial potential by serial dilution method against Gram positive bacterial strains such as *Bacillus subtilis, Staphylococcus aureus* and *Staphylococcus epidermidis*, two Gram negative bacterial strains such as *Escherichia coli, Pseudomonas aeruginosa* and antifungal potential against *Candida albicans* and *Aspergillus niger*. Compound (**S17)** N-(2-chloro-4-nitrophenyl)-2-chloro-4-nitro-5-[(4-nitrophenyl) sulfamoyl] benzamide showed antibacterial potential against Gram positive and Gram negative bacterial strains. Compound (**S18)** N-(2-methyl-5-nitrophenyl)-2-chloro-4-nitro-5-[(4-nitrophenyl) sulfamoyl] benzamide showed excellent antifungal potential against *Candida albicans* and *Aspergillus niger*. All the synthesized compounds exhibited binding energy ranging -10.0 to -8.0 kcal/mol with active site residues of bacterial target protein 1AJ0. Compound **S17** displayed hydrogen bonding, hydrophobic and electrostatic interactions with active site residues of 1AJ0. In case of antifungal activity, all the synthesized compounds showed binding energy from -9.9kcal/mol to -8.2kcal/mol with target protein 5FSA. The compound **S18** demonstrated hydrogen bonding, electrostatic and hydrophobic interactions with active site residues of 5FSA.

PC-2307

Potential Role of 2-DG in Various Diseases

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Glucose analogues are under investigation because they show promising results as in case of many different molecules derived from glucose, for example, β-Methyl-D-glucoside and α-Methyl-D-glucoside are 11 C-labeled D-glucose analogues being used for PET imaging. The most recent advancement in investigative glucose analogues is 2-Deoxy-D-Glucose. These days it is used in treatment of SARS-CoV-2 as it has shown potential of healthy treatment. 2-Deoxy-D-Glucose is a structural analogue of glucose which differs from glucose due to presence of hydrogen group instead of hydroxyl group. Due to this unique modification, it possesses the capability to inhibit glycolytic pathway rather than promoting it, hence found to be useful in treating or managing various diseases. Now-a-days, scientists are also doing extensive research on 2-DG to gain their knowledge about this structural analogue. The key features of unique molecules include non-toxic, non-mutagenic, active against cancer and SARS-COV-2 and interacts with Viral Protease Enzyme. Besides this 2-Deoxy-D-Glucose also has a potential role in managing diseases like rheumatoid arthritis, HIV infection, epilepsy, and many more. In case of cancer, 2-DG is found to be useful in treatment of breast

cancer, lung cancer, sarcoma, etc. It can be concluded that 2-DG has different therapeutic applications for various ailments.

PC-2308

Flavonoids and Their Antimicrobial Effects: A Review of Mechanism and Structure Activity Relationship

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The bacterial resistance to well-known and extensively used antibacterial medications has grown to be a serious global health problem and to address this issue, a variety of approaches have been proposed forth, including the inhibition of bacterial biofilm formation and multidrug resistance pumps as well as establishment of new antibiotics with novel mechanisms of action. Flavonoids are a significant group of phytochemicals that have been thoroughly investigated for their antimicrobial effects. Flavonoids are hydroxylated phenolic substances and considered to be synthesized by plants as a consequence of microbial infection. Flavonoids are acquiring more attention from healthcare and pharmaceutical industries due to their antimicrobial potential against various pathogenic microorganisms. The plant derived flavonoids possess antibacterial activity via distinct mechanisms than those of traditional medicines, and thus may be important for improving antibacterial therapy. Structure activity relationship studies deduced the crucial structural features for antibacterial activity of flavonoids that might play a major role to synthesize improved antibacterial drugs that overcome challenges allied with resistance bacteria. The use of flavonoids with antibiotics i.e. multidrug therapy possessed multi-phased mechanism of action may lead to an increase in the effectiveness of antimicrobial drugs.

PC-2309

Anti-Diabetic Potential of Thiazolidinediones: A Review

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Diabetes mellitus refers to one of the leading causes of diseases that affect a large population of humans and is characterized by a high glucose level in the blood (also known as hyperglycemia). Thiazolidinediones or glitazones are an important class of insulin sensitizers

used in the treatment of Type-2 diabetes mellitus (T2DM). Thiazolidinedione (TZD), also known as glitazones, is a five membered heterocyclic compound consisting of three carbons, sulphur, and nitrogen at 1- and 3- position and two carbonyl groups at 2- and 4- positions respectively. TZD can only be substituted at the 3rd and 5th positions. TZD had derived from an acidic group possess more potent activity than the benzylated TZD. Glitazones can be used as potent hypoglycemic agents and also reduce many other cardiovascular risk factors including percutaneous coronary artherosclerosis. TZDs were reported for their antidiabetic effect through antihyperglycemic, hypoglycemia, and hypolipidemic agents. TZDs exert their antidiabetic effect by activating Peroxisomes Proliferator activated receptor-gamma (PPAR-Gamma) nuclear receptors, which controls glucose and fatty acids metabolism. TZD analogues have been found to be potent against various microbial strains such as *E. coli, S. aureus, B. subtilis, P. aeruginosa, A. niger, C. albicians, M. tuberculosis*. The most common side effect of antidiabetic drug troglitazone is hepatotoxicity but in further studies, in rosiglitazone and pioglitazone drugs no hepatotoxicity effect was observed. One class of antidiabetic drugs, TZDs, causes bone loss and further increases fracture risk, placing TZDs in the category of drugs causing secondary osteoporosis. TZD has an effective profile as a future investigational drug and can be processed in drug discovery because of its efficient antidiabetic potential.

PC-2310

Future Trends Towards Drug Development

Raman Kumari

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The process of introducing a new pharmaceutical drug into the market after the identification of the lead compound by the process of drug discovery is known as drug development. Although the process of drug development is complex, for researchers it is necessary to determine where the drug is safe and effective for certain conditions. Modern medicine has its niche in India but along with that many plants which are used in the Indian system of medicine are being analyzed by various analytical techniques and their active components have been isolated. As drug discovery and development is a lengthy process nowadays, new tools and techniques are being introduced and studied to hasten the drug development process, to increase patient compliance, and to improve the process of clinical trials with advanced data management techniques. In drug development there is an increase in data digitalization and along with that comes the challenge of acquiring, scrutinizing, and applying that knowledge to solve complex clinical problems. So numerous techniques which are in

current trend like artificial intelligence, big data and analytics, flexible production, precision medicines, additive manufacturing, blockchain technology, extended reality, real-world data, digital therapeutics, and curative therapies can be used to speed up the process.

PC-2311

Role of Pyrazole Analogues in Treatment of Various Physiological Disorders

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Pyrazole is a 5-membered nitrogen-containing heterocyclic ring having three carbon atoms and two nitrogen atoms at adjacent positions with molecular formula $C_3H_4N_2$. Due to its distinct nitrogen atoms showing "pyrrole like" and "pyridine like " behavior, pyrazole may react with acids and bases as well. Pyrazole scaffold have been shown as activator or inhibitor for various enzymes in diabetic condition like activator for glucokinase and inhibitor for dipeptidyl peptidase-4, sodium glucose cotransporter-1, sodium glucose cotransporter-2, glycogen stimulated intracellular cAMP formation, glycogen synthase kinase-3-β, and 11β-HSD-1. It may also possess competitive antagonism for cannabinoid-1 receptor and agonism for peroxisome proliferator activated receptor-α and β. Pyrazole is the core structure of variety of drugs such as Celecoxib, Deracoxib, Lonazolac, Allopurinol, Mepirizole, Difenamizole, Betazole, Fomepizole, Fezolamine, Tepoxalin, Rimonabant, Pyrazofurin, Sildenafil, etc. Rimonabant acts as an antiobesity, Fomepizole as alcohol dehydrogenase inhibitor and Sildenafil inhibits phosphodiesterase. Various pyrazole analogues have been analyzed/developed using various computational approaches in order to save time for laborious reactions. This study summarizes different analogues of pyrazole reported recently which exhibit potent action against various disorders such as antimicrobial, antifungal, anti-tubercular, anticancer, antioxidant, anti-hyperglycemic, antihypertensive, anti-inflammatory, antidepressant, etc.

PC-2312

Benzoxazole Derivatives: QSAR and Molecular Docking Studies

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The increase of bacterial multidrug resistance, as well as a scarcity of new antibacterial agents, necessitate the research and development of novel antibacterial compounds that

escape resistance. The current work employed 46 benzoxazole derivatives to undertake both ligand-based molecular docking and receptor-based quantitative structure activity relationships modelling. On a series of benzoxazole derivatives, a quantitative structure-activity relationship study was first carried out, giving a robust model. According to QSAR models developed, topological parameters, Kier's molecular connectivity indices ($^{1}\chi$, $^{1}\chi^{v}$), and topological indices (R) are mostly relevant for the antimicrobial activity of benzoxazole derivatives. The results of molecular docking revealed that molecules **26, 14, 13, 10 and 3** and Ciprofloxacin had docking score -6.687, -6.463, -6.414, -6.389, -6.388 and -6.092 respectively. ADME Analysis results indicated that the compounds (**4, 5, 6, 8, 10, 16, 19, 20** showing 1 violation of Lipinski rule of five) all remaining derivatives did not violate any of the Lipinski rule of five and these compounds can be selected for further research.

PC-2313

An Overview of *in-silico* Approaches in the Development of Indole Bearing Scaffolds to Treat Cancer

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Indole is a ubiquitous scaffold in which two aromatic rings viz. benzene and pyrrole are fused together which generally elicit an electrophilic substitution reaction similar to that of benzene. Hereby, Indole bearing analogues exhibited a diverse range of pharmacological action including anticancer, antitubercular, antimicrobial, antidiabetic, and antiviral activity, etc. Indole is a substantively explored scaffold for treating various types of tumors. Sunitinib is an indole comprising FDA approved drug for the treatment of renal and gastrointestinal tumors which targets multi-kinase receptors. The diverse nature of indole fascinates researchers from industry and academic areas. Various *in-silico* drug discovery processes aimed to design a potential indole derivative to treat different pre-existing and emergency illnesses. On behalf of pharmacological activities associated with indole scaffold, we aimed to write with objectives like (1) To discuss current developments in the medicinal chemistry aspect of indole based molecules with their anti-cancer action; (2) To deliberate comprehensive correlation between *in-silico* investigation and anticancer effect of selected derivatives. We hope that these *in-silico* approaches will helps the researchers to design and develop the most potent anticancer derivatives within the least time and chemical/solvent consumption.

PC-2314

Synthesis and Characterization of Novel Anthranilic Acid Analogs

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Anthranilic acid (2-amino benzoic acid) is an aromatic acid with the formula C_6H_4 (NH_2) (CO_2H) and has a sweetish taste. The molecule consists of a benzene ring, *ortho*-substituted with a carboxylic acid and an amine. Anthranilic acid is a biochemical precursor of amino acid tryptophan, as well as a catabolic product of tryptophan in animals. The present research is based on the fact that organic acids were found to have good anti-microbial activity and also fenamic acid is derivative of anthranilic acid. Several NSAID's including mefenamic acid, tolfenamic acid, flufenamic acid and meclofenamic acid are derivatives of "fenamates". We synthesized anthranilic acid through copper catalyzed coupling of aniline and 2-chloro benzoic acid. A total of fourteen compounds were synthesized using substitution with electropositive & electronegative groups including aromatic rings. The compounds were then subjected to physical characterization by noting their melting point, R_f value, log P value etc. and chemical spectra's were recorded using FTIR, ^{1}H-NMR and Mass spectra's.

PC-2315

Microwave Assisted Synthesis, Global Reactivity Parameter Estimation, Molecular Docking, and Biological Evaluation of Hybrids of Methyl Piperazine and Nitro Mannich Bases

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Today, Alzheimer disease has spread its roots in every corner of the world. The noble causes of the disease include many components i.e. acetylcholinesterase, MAO enzyme, and amyloid proteins and several metals. Dual inhibitors like Donepezil-Flavonoid hybrids have also been reported against cholinesterase and many others had been reported against variegated enzymes responsible for Alzheimer. In this work, we describe Microwave assisted synthesis, global reactivity parameter estimation, molecular docking, biological evaluation of hybrids of methyl piperazine and nitro Mannich bases. In this study, we synthesized our compound using a microwave reactor and bolstered, docking, global reactivity parameter

estimation and *in vitro* evaluation of compounds against Acetylcholinesterase and metals like Cu, Fe, Zn, Al. Compound SB2 3-(4-methylpiperazin-1-yl)-N-(3-nitro-5-(piperidin-1-yl) phenyl) benzamide delineated potent activity against Acetylcholinesterase enzyme and also endowed to have potential to chelate various metals. Docking study of compound SB2 rendered potent hydrogen bond and hydrophobic interaction with the strenuous site of protein and which could be further exploited in generation of new molecules. The estimation of global reactivity parameters accentuated SB2 as a potent compound with maximum stability and low electrophilicity and low reactivity as compared to other compounds. The compound SB2 delineated the most potent results as compared to other compounds. In future, further compounds could be synthesized using SB2 scaffold that can target multiple receptors at a time.

PC-2316

Synthesis, Docking Studies and *in vitro* Anticancer Evaluation of 3-[4-(2-amino-6-(substituted-phenyl)-pyrimidin-4-yl)-phenylimino]-1, 3 dihydroindol-2-one derivatives

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Synthesis of 3-[4-(2-amino-6-(substituted-phenyl)-pyrimidin-4-yl)-phenylimino]-1, 3 dihydroindol-2-one (1-15) was accomplished using methods reported in literature. Melting points (m. p.) were determined in one end close capillary tubes and were uncorrected. The structures of synthesized compounds were confirmed by spectroscopic techniques like IR, ^{1}H NMR, ^{13}C-NMR, and Mass spectroscopy. IR stretching from 1715 to 1705 cm^{-1} shows the presence of a functional group (>C=O). IR stretching from 1639 to 1652 cm^{-1} shows the construction of the Schiff base. Further, the structures were ascertained with the data of ^{1}HNMR and ^{13}CNMR (δ value, ppm, and multiplicity) and Mass spectroscopy (*m/z* value in dalton). The anticancer activity compounds were determined by neutral red uptake assay using a 96 well plate on a breast cancer cell line (MCF7). The results of cytotoxicity activity demonstrate that compound 15 (percentage viability: 26.35 at a concentration of 80 µg/ml) was the most active compound, followed by compound 4 (percentage viability: 39.79 at a concentration of 80 µg/ml). Other compounds either had little or no activity. Docking study of the compounds was carried out to find possible correlations for anticancer activity. Protein thymidine phosphorylase (PDB ID: 2WK5) was chosen for molecular docking. The result of *in vitro* cytotoxicity was in agreement with docking study.

PC-2317

Dissolution Method Development and Validation for Dapoxetine Tablets by RP-HPLC

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Dapoxetine hydrochloride is a selective serotonin reuptake inhibitor widely used in the management of premature ejaculation. According to the BCS classification system, it is classified under BCS class II drugs, showing low solubility and high permeability. The dissolution profile and thus the in vivo performance of this class of drugs widely depend on their solubility and hence their behavior in dissolution medium. Dapoxetine hydrochloride has not official dissolution method available. The present work is mainly focused on development and validation of a dissolution test that can be used as a quality control test for Dapoxetine hydrochloride tablets and formulations. Saturation solubility and sink conditions that can be achieved in different media suggested that 0.1 N HCl, acetate buffer pH 4.5, and phosphate buffer pH 6.8 can be used as a dissolution medium. Dissolution tests of Dapoxetine hydrochloride tablets were carried out in these different media at different rotation speeds using a USP type II (paddle) apparatus. The most suitable dissolution conditions were 0.1 N HCl pH 1.2 (900 ml at 37 ± 0.5 °C) as a dissolution medium and a paddle apparatus at 50 rpm for 30 min. The analysis of released Dapoxetine hydrochloride was done by HPLC. The developed method was validated according to ICH guidelines. This method showed linearity with an $r^2$of 0.998 within the concentration range of 15-45 ug/mL. The interday and intraday precision was below RSD 2%. The developed method can effectively be used for quality control evaluation of Dapoxetine hydrochloride tablets.

PC-2318

Preparation, Characterization, and Antibacterial Studies of Chalcone Derivatives

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In this study, we have synthesized a new series of chalcone based derivatives (M1-10). The synthesized derivatives were characterized by physicochemical and spectral mean and were

found to be consistent with the respective molecular structures. All the synthesized derivatives were evaluated for their *in vitro* Antibacterial activity and antioxidant activity. Antibacterial activity was performed against gram-positive bacteria (*S. aureus,* and *B. subtilis*) and gram-negative bacteria (*P. aeruginosa,* and *E. coli*) by serial dilution method. Antioxidant activity was evaluated by DPPH free radical scavenging assay. The results of antimicrobial and antioxidant studies indicated that compounds M2 and M8 showed broad-spectrum antibacterial strains and good free radical scavenging activity as compared with standard reference drugs.

PC-2319

Synthesis and Antibacterial Screening of Menadione Derivatives

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Quinones are derived from aromatic compounds like naphthalene or benzene by converting an even number of -CH= groups into -C=O groups, with some double bond alterations, if necessary. It has the structure of a cyclic dione and is fully conjugated. Menadione (known as 1,4-Naphthoquinone) is a member of the quinone class and has diverse pharmacological effects. In the present study, naphthoquinone derivatives (M1-M10) were synthesized with good yield. Physicochemical properties, FTIR, and ^{1}HNMR spectral data confirmed the molecular structure of all compounds. All the compounds were screened for in-vitro antimicrobial activity against four bacterial strains *S. aureus, B. subtilis, P. Putida,* and *E. coli*. Compound M1 and M2 were found significantly active against all four bacterial strains as compared to standard drug ciprofloxacin. Compounds M1 and M2 can be considered as lead compounds to discover a potent molecule with broad-spectrum antibacterial activity. Structural changes in these lead compounds along with in silico studies can speed up the discovery of active biological drug candidates.

PC-2320

Nitrosamine Impurity in Drug substance and Drug Product

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Since it was a surprise to find nitrosamine impurities in human medicines, regulatory bodies around the world have been working to figure out what risks these contaminations pose to

patients and to limit their presence. Over 300 nitrosamines are known, many of which are highly potent mutagenic and carcinogenic in small concentrations. These impurities may be formed and get incorporated into drug substance or drug product through catalyst, reagent, solvent or raw materials used in the process of manufacturing. Further, nitrosamine impurities were subsequently detected in other medicines belonging to the sartan family, including: N-nitrosodiethylamine (NDEA), N-nitrosodi-isopropylamine (NDIPA), N-nitroso ethylisopropylamine (NEIPA) and N-nitroso-N-methyl-4-aminobutyric acid (NMBA). The various regulatory authorities have published press releases or notices regarding the control of these impurities with the interim limit. Nitrosamine impurities can be avoided by taking precautions in the manufacturing of drug substances and drug products. Validated analytical methods are to be used to identify and quantify these impurities; hence, it needs a highly sensitive instrument that can detect these impurities to the trace level at a given interim limit. Liquid chromatography or Gas chromatography, along with mass detectors, is primarily used for their determination.

PC-2321

Assay Method Development and Validation of Metronidazole Tablets by HPLC

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A new simple, accurate, precise and reproducible reverse phase high performance (RP-HPLC) method has been developed of Metronidazole in tablet dosage forms using C18 column (Phenomenex, 250 x 4.6 mm, 5 µm) in isocratic mode. The mobile phase contains a combination of Acetate buffer (ammonium acetate & glacial acetic acid) and methanol in the ratio of 40:60% (v/v). The flow rate was 1.0 ml/min and detection wavelength was carried out at 210 nm. The retention times of Metronidazole were 5.0 min, respectively. The validation of the method was carried out utilizing ICH guidelines. The described HPLC method was successfully employed for the analysis of pharmaceutical formulations containing Tablet dosage form.

PC-2322

Dissolution method development and validation of Piracetam tablets using RP-HPLC

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Piracetam acts as a cognitive enhancer to improve memory, attention. It acts on acetylcholine via Muscarinic cholinergic receptors which are implicated in the memory process. Simple, sensitive and rapid dissolution method was developed and validated for Piracetam tablets by RP-HPLC for the determination of Piracetam used as Nootropic drug in the pharmaceutical dosage form. The sample preparation process was accomplished by placing one intact tablet that was dropped in each jar containing 900ml of dissolution media(Water) previously maintained at 37 ± 0.5°C temperature. USP apparatus II (Paddle) was used at 50 rpm and the sample was collected after 45 minutes and injected on a Phenomenex C18 (250*4.5, 5µ) column at 40 º C temperatures using a mobile phase consisting of Dibasic potassium phosphate (K_2HPO_4) of pH 5.0: ACN (90:10). The analyte was detected at 205 nm and differentiated in <10 minutes. This method was validated for System Suitability, linearity, precision, robustness (RPM Variation, Wavelength, Flow rate) and Solution Stability. Both intra-day and inter-day precision (in terms of % RSD) were lower than 5% and the regression coefficient of linearity was found to be 0.9999. This method was successfully used for the quantification of Piracetam.

PC-2323

Development and Validation of a New HPLC Analytical Method for the Determination of Amodiaquine in Pharmaceutical Dosage Form

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Amodiaquine, a 4-aminoquinoline similar to chloroquine in structure and activity, has been used as both an antimalarial and an anti-inflammatory agent for more than 40 years. Simple, sensitive and rapid liquid chromatography method was developed and validated using UV detection for the determination of Amodiaquine in the pharmaceutical dosage form. The sample was subjected to automatic injection on a Phenomenex C_{18} (250×4.5, 5µ) column at room temperature using a mobile phase consisting of monobasic potassium phosphate (KH_2PO_4) of pH 3.0 + H1SA: ACN (70:30). The mobile phase flow rate was 1.0 ml/min and the eluent was estimated using a UV-visible spectrometric detector. The analytes were

detected at 223 nm and differentiated in <10 minutes. This method was validated for linearity, precision, robustness and Stability of solution. Both intra-day and inter-day precision (in terms of % RSD) were lower than 2% and the regression coefficient of linearity was found to be 0.9992. This method was successfully used for the quantification of Amodiaquine in pharmaceutical formulation.

PC-2324

Pharmacophore Modeling in Drug Discovery

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A pharmacophore describes the structural framework of molecular features that are important for the biological activity of a compound. Pharmacophore models are built by knowing the structural information of active ligands or target even when the structure of target is unknown to the researchers by ligand based pharmacophore modeling and these models are used to identify the novel compounds fulfil the requirement of pharmacophore and thus expected to be biologically active. Pharmacophore modeling has been used in various stages of the drug discovery process. The major application regions are virtual screening that helps to find a promising lead compound, docking, drug target finishing, ligand profiling and ADMET prediction. Pharmacophore modeling has been integrated with molecular dynamics simulations for ew developments. Pharmacophore modeling has contributed to a faster, cheaper and more effective drug discovery process. With the association of pharmacophore modeling with the other computational methods and advances in the latest algorithms, programs that have better performances are emerging, Thus, improvements in the quality of the pharmacophore models generated have been achieved with these new developments.

PC-2325

Molecular modeling: A tool in drug discovery and development

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Keeping in mind, a very large expenditure of time is required for launching a drug to the market according to the traditional methods, there is a strict requirement for the methods that require less expenditure of time for launching a drug. So, molecular modeling has been rising as a powerful approach in the drug discovery process over the last decade. Three main key components of molecular modeling (Molecular docking, Molecular Dynamics and ADMET

modeling) are currently used by the researchers to lower the cost and time required for the discovery of an effective drug. These computational methods have an advantage for finding an effective drug with minimum or fewer side effects by knowing the correct binding pose of a protein-ligand complex and by evaluating its strength using various scoring functions through the approach of molecular docking. Eventually, an important factor that determines the success of drug candidate for approval is ADMET profile. A number of bioassays can also be conducted to evaluate the ADMET profile of a compound but they are very expensive. Hence, this highlights the importance of the use of in silico ADMET predictions.

PC-2326

Effect of Hydrophobic Chains on Anti-fungal Activities of Bile Acid Amphiphiles

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Infections caused by fungal species via their existence as biofilms on medical devices can cause organ damage via candidiasis and candidemia. Different *Candida species* like *Candida albicans* can pose a serious threat by resisting host's immune system and by developing drug resistance against existing antimycotic agents. Therefore, targeting of fungal membranes can be used as an alternative strategy to combat the fungal infections. Here, we present screening of different amphiphiles based on cholic acid against different *Candida* strains as these amphiphiles can act as potent membrane-targeting antimycotic agents. The efficient synthesis of some bile acid-derived cationic amphiphiles with a flexible long hydrocarbon tail was investigated. Firstly, the modification on the side-chain carboxyl of bile acids was carried out efficiently of bile acids and a long-chain aliphatic amine. In-depth biophysical and biomolecular simulation studies suggested that the amphiphile with a octyl chain executes more effective interactions with bacterial membranes as compared to other hydrophobic counterparts. Therefore, amphiphiles derived from cholic acid provide suitable alternatives for inhibiting the fungal infections.

PC-2327

Effect of Hydrophobic Chains on Anti-bacterial Activities of Bile Acid Amphiphiles

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Inappropriate and uncontrolled use of antibiotics results in the emergence of antibiotic resistance, thereby threatening the present clinical regimens to treat infectious diseases. Therefore, new antimicrobial agents that can prevent bacteria from developing drug resistance are urgently needed. In this work, we tested cholic acid (CA) derived amphiphiles with different alkyl chains for their ability to combat bacterial infections. The efficient synthesis of some bile acid-derived cationic amphiphiles with a flexible long hydrocarbon tail was investigated. Firstly, the modification on the side-chain carboxyl of bile acids was carried out efficiently of bile acids and a long-chain aliphatic amine. This strategy offered a very straightforward and efficient method for access to the designed amphiphiles in good overall yields. We have also shown that cholic acid derivatives with three charged head groups are more potent and selective than lithocholic and deoxycholic counterparts, against bacterial infection. In-depth biophysical and biomolecular simulation studies suggested that the amphiphile with a heptyl chain executes more effective interactions with bacterial membranes as compared to other hydrophobic counterparts.

PC-2328

A Study on Physicochemical Parameter of Dumping Site Soil of Haridwar

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The present study make analysis for the physicochemical parameters of four different soil sample collected from different dumping sites of Haridwar. These dumping sites contain different types of garbage but major contaminate of these garbage is plastic and polyethylene which is non-biodegradable. These types of soil contain different nutrient and contaminate which may be affect the physicochemical properties of soil. Various physicochemical parameters i.e pH, Temperature, Conductivity, Total alkalinity, Organic Matter, % Chloride, Moisture Content and Phosphorus were tested and these results pH (6-9), Temperature (25-37), Conductivity (0.2ms-1.53ms), Total alkalinity (30-60 mg/l), Organic Matter (0-1.23%), % Chloride (0.01-0.09%), Moisture Content (11-49%) and Phosphorus (180-290mg/l) but in

control soil these parameters are pH 8.2-7.8, Temperature, Conductivity (0.758- 0.013), Total alkalinity(180-140), Organic Matter, % Chloride (32.04-28.02), Moisture Content and Phosphorus(0.041-0.016).

JAN NAYAK CH. DEVI LAL MEMORIAL COLLEGE OF PHARMACY

Jan Nayak Ch. Devi Lal Memorial College of Pharmacy, a constituent college of JCD Vidyapeeth, an integrated campus providing high-quality education in areas of medicine, engineering, management and education, spread over lush green 200 acres of land in the heart of Sirsa district, founded in 2002 by Ch. Devi Lal Memorial Trust, has established itself as a pioneer institute in providing Pharmaceutical education in India. The best-in-class facilities with pollution-free surroundings and a peaceful atmosphere make it an ideal place for academic pursuits. The Pharmacy programs at JCDM College of Pharmacy are grounded in continuous quality improvement with greater emphasis on the integration of a strong science foundation with the professional skills required for successful pharmacy practice Currently,the college is offering D. Pharmacy, B Pharmacy, and M Pharmacy (Pharmaceutics, Pharmaceutical Chemistry, and Pharmaceutical Regulatory Affairs). The college has excellent infrastructure with a total build-up area of more than 2.5 acres, and state-of-the-art research facilities like a Nanomedicine center with HPLC (Shimadzu LC-2010 HT with UV and PDA Detectors), FTIR (Shimadzu IR-Affinity), UV-VIS spectrophotometer (UV-1800), Flash Chromatography, Lyophilizer (Martin Christ GmbH), Differential Scanning Calorimeter (Perkin Elmer), Motic Microscope (Biovis), Refrigerated Centrifuge, Deep Freezer, Heidolph High-Speed Homogenizer, Ultrasonicator, Eight-Basket Dissolution Apparatus, Millipore, Rotary Evaporator, etc. Molecular modeling Lab with tools for Docking, QSAR, and Pharmacophore Modeling, Molecular Dynamics Chemoinformatics. The college has developed a The college has also developed an antimicrobial facility to screen the antibacterial and antifungal activity of organic compounds and phytoconstituents.

The major thrust areas of research activities being carried out in the college are Nanotechnology Drug Delivery, Molecular Modeling in Drug Design, Medicinal Chemistry, and Phytochemistry. The other major areas of emphasis include intellectual property rights, regulatory aspects, and management skills. In the last five years, the college has made a significant contribution to academic research by publishing fifty articles in peer-reviewed journals with high impact factors.