



Apeejay Stya University
School of Pharmaceutical
Sciences

Sohna - Palwal Road, Gurugram



Science and Engineering Research Board (SERB)
Department of Science and Technology (DST)
Govt. of India

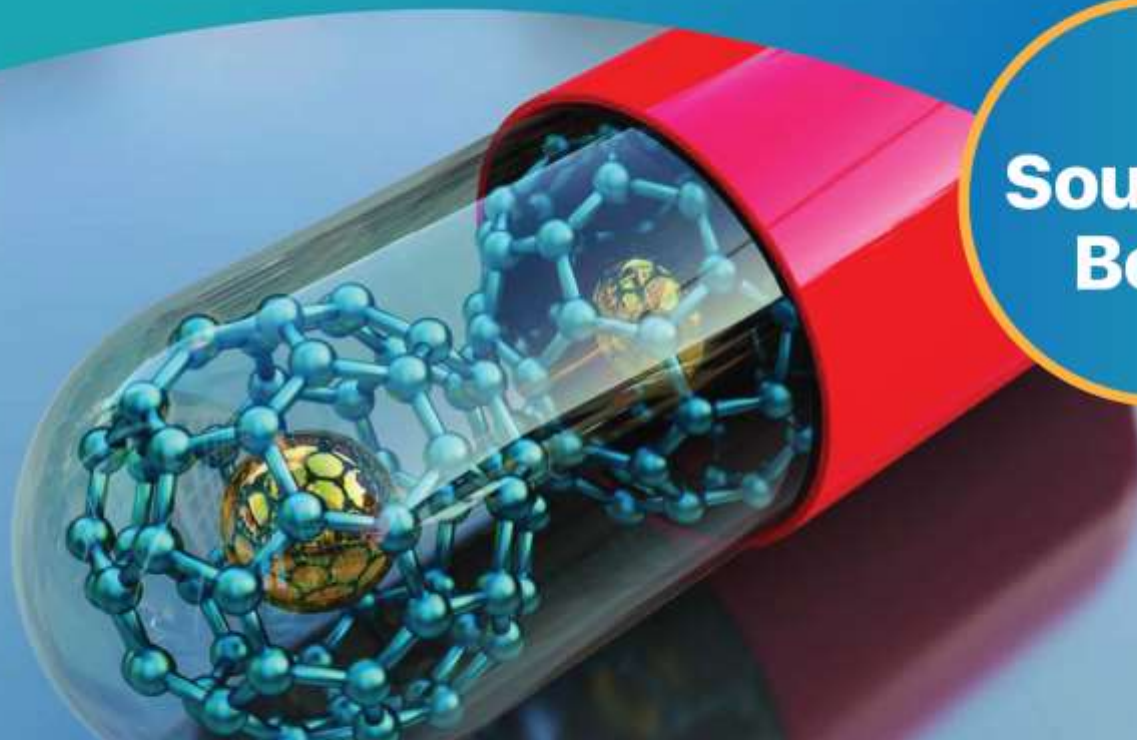
*India's 1st Industry-Centric Technology
& Liberal Arts University focused on
Research & Innovation™*

3rd National Seminar on

NANOMEDICINE & MEDICAL DEVICES IN HEALTHCARE

11th February 2022

**Souvenir
Book**



in collaboration with



Walter Bushnell



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PRIVATE LIMITED**

About School of Pharmaceutical Sciences



The programmes at the School of Pharmaceutical Sciences have been designed in collaboration with pharmaceutical organizations of repute. The R&D center for pharmaceutical research ensures

holistic and experiential learning for the students who are familiarized with the knowledge of formulation development from basic drug designing to the final stages of clinical trials.

About DST-SERB



Science and Engineering Research Board

Established through an Act of Parliament: SERB Act 2008

Department of Science & Technology, Government of India

SERB is a statutory body established through an Act of Parliament. Supporting basic research in emerging areas of Science & Engineering are the primary and distinctive mandate of the Board.

SERB supports research in frontier areas of Science and Engineering. A regular faculty / researcher in an academic / research institution can seek research support to carry out his/her research. Board also gives special attention to young scientists below the age of 35 years (relaxable by 5 years in the case of SC/ST/OBC, woman and physically handicapped category) to undertake independent research in newly emerging and frontier areas of science and engineering. High priority areas are supported in through the "Intensification of Research in

High Priority Area "(IRHPA) Program. The Board offers JC Bose National Fellowship to scientists and engineers for their outstanding performance and contributions and RAMANUJAN Fellowship for brilliant scientists and engineers from all over the world to take up scientific research positions in India, especially those scientists who want to return to India from abroad. Board also provides financial assistance for presenting research paper in international scientific event (conference/ seminar/ symposium/ workshop etc.) held abroad. SERB extends partial financial support, on selective basis, for organising scientific events (National as well as International) in the country.

Organizing Committee
3rd National Seminar on
“NANOMEDICINE & MEDICAL DEVICES IN HEALTHCARE”
11th February 2022



Message from Honorable Chair

Prof. Raj S. Dhankar

(Vice-Chancellor, Apeejay Styra University)



I am delighted to know that School of Pharmaceutical Sciences (SPS), Apeejay Styra University, Gurugram is going to organize 3rd National Seminar on 'Nanomedicine & Medical Devices in Healthcare' on 11th February, 2022 via hybrid mode funded by DST-SERB in collaboration with Martin & Harris Global, ASG BioChem, and Walter Bushnell.

School of Pharmaceutical Sciences has successfully organized in the past two consecutive seminars on the same theme, besides many other seminars and workshops via online and offline modes.

I am sure that this platform, which aims to bring in all stakeholders of pharmaceutical education, technology and industry, will be a

grand success and our students will be greatly benefited from the sharing of knowledge and experience by the domain experts. I hope that this commemorative souvenir, apart from being a broad-based subject publication, also serves as a gateway for all the aspiring pharma researchers.

I would like to congratulate all the members of School of Pharmaceutical Sciences for organizing this seminar on a highly relevant and contemporary topic. I am sure such a conference will create dynamic bond between the academia and industry.

My best wishes and good luck for the success of this seminar.

Message from Honorable Co-Chair

Prof. Sucharita

(Pro Vice-Chancellor, Apeejay Styra University)



Our vision at Apeejay Styra University is to provide a supportive and nurturing environment that produces young renaissance men and women who would be the leaders of today and tomorrow. The mission is to bring transformation in society by providing value-based education by the combination of technology and research with liberal art concept.

We at ASU provide hands-on experience for students, opportunities to students to get involved in research at all levels, and also organize various conferences, workshops, seminars, and industrial trips. Our School of Pharmaceutical Sciences is well-equipped with hi-tech infrastructure and highly trained faculty

members to provide expertise for training young minds. We are backed by the Group's own companies of repute like Martin and Harris Pharmaceuticals Private Limited, Walter Bushnell, and ASG Biochem Private Limited.

To inculcate compassion towards others, our students are regularly involved with various community services like health check-ups camps, educating adults, educating all for healthy living. We are associated with some of the nearby villages for these activities.

The 360-degree grooming of a student leads to a Pharmacist who has the ability to transform society as a whole.

Warm wishes for a bright future.

Message from Honorable Convener

Prof. Anupama Diwan

**(Dean, School of Pharmaceutical Sciences,
Apeejay Styra University)**



The phrase Pharmacy originated from the root word “Pharma” meaning the knowledge and procedure of manufacturing and administration of drugs. The Pharmacy profession requires a very complex and well-developed set of competencies for rewarding careers with opportunities for patient care, scientific research innovation.

We at SPS, believe in holistic development of students and to integrate with continuous development of education and research activities of School of Pharmaceutical Sciences; is organizing national seminar sponsored by DST-SERB on “Nanomedicines & Medical Devices in Healthcare” third initiative in the series in hybrid mode.

Looking at the seminar schedule having many wonderful and accomplished speakers, I am certain that it will be a remarkable weekend of learning, innovation and networking.

Some of the topics touched upon will be new and emerging opportunities in the medical devices including biomedical sector, their vigilance, pharmacists role and responsibilities will be elaborated. The other topic touched upon will be NanoCrySP, a novel spray drying based technology. The growing start up ecosystem and allied opportunities.

We are thankful to DST-SERB for sponsoring the seminar.

All of us are ambassadors and role models. Our decisions, achievements and guidance have the ability to influence the next generation. So, ignite your passion, and ignite passion in others. I promise you; the reward and the impact will be transformational.

My warmest wishes to you all.

Message from Honorable Co-Convener

Prof. Dipak Kanti Majumdar
(School of Pharmaceutical Sciences,
Apeejay Styia University)



Welcome

I am excited to learn that the School of Pharmaceutical Sciences, Apeejay Styia University, is organizing a National Seminar on “Nanomedicine and Medical Devices in Healthcare” on 11th February 2022 at the calm and pollution-free University campus at Sohna-Palwal road, Gurgaon, where experts from Pharma industry and academia will be talking.

We know nanoparticles (e.g. nanospheres /nanocapsules containing dispersed drug), due to their submicron size, allow injection by the intravenous route to target a drug to a particular organ or tissue, thereby reducing the side effects of the drug. Likewise, one may think of delivering a peptide like insulin through the oral route my best wishes for the Seminar's success.

by entrapping it in a nano/microcapsule or liposome and avoiding the daily prick in insulin-dependent diabetics. We live in an age of innovation. We have seen the success of a simple medical device like “Face mask” in our fight against the Coronavirus.

Based on the success of our previous Seminars, we look forward to listening to the best minds from Industry and academics and the Seminar would be intellectually stimulating to our students, the raw intellectual material for the pharma industry.

So, I invite all the students to interact at the Seminar and offer



Apeejay Styia University

School of Pharmaceutical Sciences

Sohna, Gurugram

Organizes

3rd National Seminar

on

“Nanomedicine and Medical Devices in Health care”

(Sponsored by DST SERB, Govt. of India)

Date: 11th February' 2022

Time: 9:30am to 5:00pm

Hybrid Mode: Offline/Online (Digital Platform: ZOOM)

Technical Program

09:00–9:30am (Registration and Network Tea)		
Time	Speaker's and Session Chair Details	Title
Inaugural function: Saraswati Vandana & Lamp lighting		
9:30am to 9:45am	Welcome address and Introduction to Day Events	Dr. Anupama Diwan Prof. and Dean School of Pharmaceutical Sciences Apeejay Styia University.
9:45am to 10:00am	Keynote address	Prof. Raj S. Dhankar Vice Chancellor Apeejay Styia University.

Scientific Sessions

Time	Events	Session
10:00am to 10:40am	Plenary lecture 1 Keynote Speaker- 1: Prof. Alok R. Ray , Ex-Consultant Professor, School of International Biodesign, All India Institute of Medical Science, New Delhi. Topic: New and Emerging Opportunities in the Medical Devices and Biomaterials sector in India Session Chair:Dr. Roop K. Khar , Director, B.S. Anangpuria Institute of Pharmacy, Faridabad, Haryana, India.	

10:40am to 11:20am	Plenary lecture 2 Keynote Speaker-2:Dr. Vivekanandan Kalaiselvan , Senior Principal Scientific Officer, Indian Pharmacopoeia Commission, Ghaziabad, India Topic: "Materiovigilance Programme of India: Roles and responsibilities of Pharmacy professionals" Session Chair:Dr. Roop K. Khar , Director, B.S. Anangpuria Institute of Pharmacy, Faridabad, Haryana, India.	I
11:20am to 11:30am Release of Abstract Book		
11:30am to 12:10pm	Plenary lecture 3 Keynote Speaker-3: Dr. Manish Diwan , Head-Strategy Partnership & Entrepreneurship, Development BIRAC, Department of Biotechnology, Govt. of India. Title of the talk: Growing Startup Ecosystem and Allied Opportunities Session Chair: Prof. Dr. Harvinder Popli , Professor & Director, School of Pharmaceutical Sciences, Delhi Pharmaceutical Sciences & Research University (DPSRU), New Delhi.	II
12:10pm to 12:50pm	Plenary lecture 4 Keynote Speaker- 4: Dr. Arvind Bansal , Professor of Pharmaceutics, NIPER, Mohali, Chandigarh Topic: 'NanoCrySP technology for generation of drug nanocrystals'. Session Chair: Prof. Dr. Harvinder Popli , Professor & Director, School of Pharmaceutical Sciences, Delhi Pharmaceutical Sciences & Research University (DPSRU), New Delhi.	
12:50pm to 02:50pm Working Lunch & Poster Evaluation 1. Dr. Gaurav Jain , Associate Professor, DPSRU, New Delhi. 2. Dr. Arpana Rana , Principal,Advanced Institute of Pharmacy, Palwal.		
02:00pm to 02:40pm	Plenary lecture 5 Keynote Speaker- 5:Dr. Dhiraj Kumar Chopra , Vice President & Head Sterile R&D, Amneal Pharmaceuticals, Ahmedabad, Gujarat, India Topic: Biodegradable Polymers Based Depot Injections: Case Study Session Chair: Dr. Jitender Madan , Associate Professor, Department of Pharmaceutics, NIPER, Hyderabad	

02:40pm to 03:20pm	Plenary lecture 6 Keynote Speaker-6:Prof. Bansi D. Malhotra , DST-SERB (Science & Engineering Research Board, Govt. of India) Distinguished Fellow & Adjunct Professor, Department of Biotechnology, Delhi Technological University (DTU), Delhi Topic: “Nano-enabled Conducting Paper Based Bio(sensors) for Cancer Detection” Session Chair: Dr. Jitender Madan , Associate Professor, Department of Pharmaceutics, NIPER, Hyderabad	III
03:20pm to 04:00pm	Plenary lecture 7 Keynote Speaker- 7: Mr. Indu Bhushan , Chief Executive Officer & Director, SteerLife India Pvt Ltd., Bangalore Topic: “Hot Melt Extrusion-Applications In Development And Manufacturing”. Session Chair:Ms. Navita Srinet , Director, Soterius LifeSciences India Private Limited, Delhi. Session Co-Chair:Prof. D. K. Majumdar , Professor, School of Pharmaceutical Sciences, Apeejay Stya University, Sohna, Gurugram, Haryana.	
04:00pm to 04:40pm	Plenary lecture 8 Keynote Speaker- 8:Prof. Kanchan Kohli , Director (Research & Publication), Faculty of Pharmacy,Llyod Institute of Management and TechnologyKnowledge Park II, Greater Noida. Topic: Nanomedicine: Future Perspective Session Chair:Ms. Navita Srinet Director, Soterius LifeSciences India Private Limited, Delhi. Session Co-Chair:Prof. D. K. Majumdar , Professor, School of Pharmaceutical Sciences, Apeejay Stya University, Sohna, Gurugram, Haryana.	
04:40pm to 04:50pm	Felicitatation of Poster Winners & Committee Members	
04-50 pm – Vote of Thanks & Network Tea		

KS01

New and Emerging Opportunities in the Medical Devices and Biomaterials Sector in India



Dr. Alok Ray
(Head, Centre for Biomedical Engineering, IIT-Delhi, and AIMS, New Delhi)

About Keynote Speaker

Dr. Alok R. Ray was Professor and Head of Centre for Biomedical Engineering, Indian Institute of Technology, Delhi. He was also concurrently Professor at All Indian Institute of Medical Sciences, New Delhi, India.

He was a Fogarty Fellow of National Institute of Health, USA at Centre for Polymeric implants, University of Utah, USA. He was a fellow at University of Liverpool, UK. He was a visiting professor at All Union Cardiology Institute, Moscow, University of

Leiden, Netherlands and Max Planck Institute for Polymer sciences, Mainz.

He has developed 11 biomedical products and published over 150 articles in professional journals. 26 students have been awarded PhD degree under his supervision. He is a consultant to several medical device and diagnostic industries.

Prof. Ray has been awarded Tata Innovation Fellowship in recognition of his significant research contribution in the area of material used in Human Medicine and Surgery.

Talk Highlights:

The economic growth of a country mainly depends on its capacity for technological innovations. The technological advancement not only requires generation of new knowledge, but also how this acquired knowledge can be converted into marketable products. India's track record in this endeavor has been insignificant. Beside this, the Indian medical technology industry is still nascent compared to other Indian industrial sectors and as compared to the medical technology industry in the US and Europe. Given the very favorable demographics, the rapidly expanding technology base, and increasing venture capital flow into India, it is anticipated that a major 'medtech' industry will develop in India over the next twenty years; if suitable eco system is created.

Currently, almost all these devices are imported. At present, we are manufacturing majority of the base materials used for these devices but, we are not producing any of

these medical devices. One of the major lacunas is the trained manpower in this sector. USA and other European countries have well developed academic program in this area. This program requires people from several disciplines to work together. This interdisciplinary program will equip students of diverse disciplines equally well to take up innovation / entrepreneurship roles in private industries as well as in academia. a manufacturing hub for affordable medical devices by 2025.

KS02

Materiovigilance Programme of India: Roles and responsibilities of Pharmacy professionals



Dr. V. Kalaiselvan
**(Senior Principal Scientific
Officer, Indian Pharmacopoeia
Commission)**

About Keynote Speaker

Dr. Kalaiselvan, received his under graduate and post graduate degree in Pharmacy from the Tamil Nadu Dr. MGR Medical University Chennai and Ph. D from University of Delhi. He has 22 years of multitude experience in the pharmaceutical sector such as academic, drugs standards setting, clinical research, Pharmacovigilance and Medical devices. Currently, as Senior Principal Scientific officer at IPC is responsible to protect and promote quality standards, safety and rational use of drugs. He works towards establishment/implementation of medical products safety surveillance system such as Pharmacovigilance and Materiovigilance Programme of India. Also as a focal person for WHO collaborating centre's at IPC responsible in execution of work related to strengthening the Pharmacovigilance activities in WHO member states.

He has proved his ability to establish a robust system of Pharmacovigilance Programme of India (PvPI) which has been recognized by the WHO as a collaborating centre. He has instrumental in forging partnership with public health programmes, QCI, CSIR labs, academic institutions, CDSCO, WHO etc in enhancing the outreach of IPC services.

He has authored five books besides published 94 research/review article in peer reviewed journals. He has been the recipient of fellowship from DST and AICTE to pursue research projects. He has organized numerous national and international level training programmes for the professionals of pharmaceutical industries, academics, hospitals and regulatory authorities to enhance the knowledge, practice and compliance of Pharmacovigilance/Pharmacopoeial standards.

KS03**Growing Startup Ecosystem and Allied Opportunities****Dr. Manish Diwan****(Head – Strategic Partnership & Entrepreneurship Development, & Make In India Facilitation Cell for Biotech)****About Keynote Speaker**

He has about 27 years of global R&D experience in Pharma/ Biotech sector from discovery research to product development, Science Administration and Project Management for Industry and Academia. Before moving into public sector in 2017, he contributed to several Clinical Drug Candidates for global drug development at Daiichi Sankyo (India), Daiichi Sankyo (Japan), Ranbaxy, Wdabur and University of Alberta (Canada). Also developed

technologies during doctoral (ICGEB, NII India) and post-doctoral research (KAIST South Korea; University of Alberta) that were transferred to industry. Trained in Pharmaceutics, Molecular Pharmacology, Immunology, he has led large professional teams in First-In-Class and Best-In-Class Drug Discovery, Translational Preclinical Research and Early Clinical Development.

Talk Highlights:

Biotechnology Industry Research Assistance Council (BIRAC), is a not-for-profit PSU under the aegis of Department of Biotechnology (DBT). BIRAC a unique enabler for the biotechnology ecosystem, works as an industry-academia interface agency with the mandate of fostering and nurturing the Biotech Enterprises specially start-ups and SME's for enhancing their innovation research capacities and promoting affordable product development.

Over the last 10 years, BIRAC has been instrumental in creating and expanding

the Biotech Startup ecosystem in the country. This ecosystem requires careful handholding and timely response by enabling agency – BIRAC/DBT to immediate and long-term needs. In order to expedite the growth and reach full potential. BIRAC known for its agility and strategic initiatives, has improved existing schemes, operationalized a few new schemes and expanded the partnership network to bring new value-added opportunities for Biotech Startups and Entrepreneurs.

KS04

NanoCrySP Technology for Generation of Drug Nanocrystals



**Prof. Arvind Kumar
Bansal**

**(HOD, Deptt. of Pharmaceutics,
NIPER, Mohali)**

About Keynote Speaker

Dr Arvind Kumar Bansal is currently Professor and Head, department of Pharmaceutics at National Institute of Pharmaceutical Education and Research (NIPER) - SAS Nagar, Punjab, India. He earned his M Pharm (Pharmaceutics) (1988) and Ph.D. (1993) from University of Delhi, India. Prof Bansal worked as Senior Scientist and Group Leader in JK Pharmaceuticals and Ranbaxy Research Laboratories, for 8 years. Therein he conceptualised, evolved formulation strategies, developed and transferred the technology to production shop floor, for NCEs and generic drug products. Prof Bansal joined NIPER in 2000 and developed expertise in areas of pre-formulation and formulation development encompassing characterization and stabilization of the amorphous form, polymorphism, pseudo-polymorphism, particle engineering, screening salt forms, improvement of oral bioavailability and lyophilization. His research group works with the mission statement - 'developing science based industrially viable pharmaceutical technologies' and works closely with pharmaceutical industry to create opportunities for commercial exploitation of the products. Dr Bansal was conferred prestigious Fellow of American Association of Pharmaceutical Sciences in

2016. He is the only Indian, working in India, to be awarded this Fellow status. He has won prestigious awards like AAiPS Distinguished Educator and Researcher Award, Innocentive Award, OPPI Award and IPA-ACG Scitech Innovation Award 2018 for Best Innovative Development of Solid Dosage Form. Prof Bansal's research group has completed more than 550 industry-sponsored projects, granted 11 patents, filed 27 patents, and published 170 research articles and 27 review articles. He has total citations of 8011, with h-index of 47, in Google Scholar. He is an editorial board member of 'Journal of Excipients and Food Chemicals', 'Drug Development Research' and 'Pharmaceutics'. He is also an Advisor to the editorial board of 'Journal of Pharmaceutical Science' and 'Molecular Pharmaceutics'. Recently his lab has out-licensed a platform technology on "Nano crystalline solid dispersions-NanoCryS.

KS05

Biodegradable Polymers Based Depot Injections: Case Study



Dr. Dhiraj Chopra
(Vice-President, R&D, Amneal Pharmaceuticals Ahmedabad)

About Keynote Speaker

Dhiraj Chopra is an R&D Pharmaceutical Professional with Pharmaceutical Industrial experience of around 25 years while working in Novartis, Merck, Bharat Serums and Dr Reddy's Laboratories. Currently he is working as Vice President R&D in Amneal Pharmaceuticals. His core strength is in generic product development, scale up, regulatory submissions & approvals of parenteral products for regulated market, especially complex injections and ophthalmics. He completed his B.Pharm.

Talk Highlights:

Biodegradable polymers-based depot injections enjoy handsome global market of around 10 billion US Dollars and with limited number of players due to technical barriers. Such Depot injections address the unmet market need in clinical practice of long-term therapy for chronic ailments with one single injection offering treatment for month/s. Selection of right biodegradable polymer is the first key milestone for such depot injection development. This involves extensive reverse engineering of reference listed drug (RLD) while generic development of depot injection. Selection of

from DIPSAR, his Masters in Pharmaceutics from Punjab University, Chandigarh and PhD from SOA University, Bhubaneswar. Dhiraj is Six Sigma Black Belt certified by American Society of Quality and he also holds MBA degree. While being serving to Pharmaceutical Industry, in parallel he has also been associated with various universities, viz., Manipal University, NarseeMonjee University as a guest faculty, examiner, research guide and as member in board of studies.

right solvent casting technique is the other key milestone in this journey. Extensive and lengthy characterization is another challenge in development of such depot injections. Scale up of complex and multiple unit operations under aseptic conditions pose one of the major challenges during scale up of such technologies. Extensive clinical studies is another key milestone to be cleared before the project moves towards regulatory submission. It is only subsequent to detailed regulatory review that project gets the hope of seeing the light of market.

KS06

Nano-enabled Conducting Paper Based Bio(sensors) for Cancer Detection



Prof. Bansi D. Malhotra
(HOD, Delhi Technological University, Delhi)

About Keynote Speaker

Dr B.D. Malhotra received his PhD from the University of Delhi, Delhi in 1980. He has published 329 papers in refereed international journals with 23113 citations and 82 h-index, has filed 12 patents in India and overseas, and has co-authored text book on 'Nanomaterials for Biosensors: Fundamentals and Applications' and 'Biosensors: Fundamentals and Applications'. He is a recipient of the National Research Development Corporation Award 2005 for invention on 'Blood Glucose Biochemical Analyzer' and is a Fellow of the Indian National Science

Academy, the National Academy of Sciences, India and an Academician of the Asia Pacific Academy of Materials. His current research activities include Biosensors, Nano-biomaterials, Bio-fuel cells, Ordered Molecular Assemblies, Conducting Polymers, Langmuir-Blodgett Films, Self-assembled Monolayers, Nano-Biotechnology, Biomedical Engineering and Biomolecular Electronics. Dr. Malhotra is currently a DST-SERB (Govt of India) Distinguished Fellow and an Adjunct Professor with the Department of Biotechnology, Delhi Technological University, Delhi, India.

Talk Highlights:

Nano-material based biosensors have been predicted to significantly contribute to the emergence of new molecular diagnostic techniques for patients suffering due to cancerous diseases. A major problem preventing faster development of biosensors relates to the fact that cancer is a highly complex disease. The oncologists heavily rely on histological characterization using a few biomarkers of tumours. Some of the biomarkers include changes in gene expression, epigenetic and genetic signatures, protein profiles and post-translational modifications of proteins. These molecular the-art laboratory. I will talk about the results obtained on nanomaterial-

signatures offer new opportunities for development of biosensors for cancer detection. Besides this, these interesting bioelectronic devices have implications in drug delivery.

Biosensor is a bioelectronic device that can be used to detect a biological analyte by converting a biochemical reaction into an electrical signal. These biomolecular electronic devices have the potential to facilitate faster development of Point-of-Testing (POCT) devices, wherein molecular analysis can be carried out without requiring a state-of-enabled conducting paper biosensors for cancer detection.

KS07

Hot Melt Extrusion-Applications in Development and Manufacturing

About Keynote Speaker

Mr.Indu Bhushan, brings more than 2 decades of core pharmaceutical development experience to the table. With his contribution to more than 20 publications and patents, his current research activities in **STEERLife** focus on creating a difference to the way

Talk Highlights:

Melt extrusion processes have been used in industrial applications for many years. Starting from the polymer and plastic industry, hot-melt extrusion (HME) has found numerous applications in pharmaceutical manufacturing practice. Development of HME process and applications needs sound understanding of diversified areas such as polymer science, rheology, formulation and development, process engineering and design etc. Most common application of HME processes in solid orals drug product development and manufacturing involve fusion and structural modification of the drug substance and functional ingredients used in the composition to improve or modify performance of the drug products in terms of in-vitro release, bioavailability, shape and size, taste and stability.



Mr. Indu Bhushan
(COE & Director, **STEERLife**)

pharmaceuticals are manufactured and administered. Prior to **STEERLife**, he was associated with several leading multinational companies where he played a key role in setting up the facilities and resources for the development of generic and specialty pharmaceutical.

The speaker would explain fundamental principles and critical factors to be considered while developing melt extrusion processes using co-rotating twin screw technology. Various types of mixing principles and actions typically observed while using the processor to provide both thermal and mechanical energy to bring about material transformation dependent on physicochemical nature of the ingredients would also be presented. Additionally, a brief introduction of process design and advancement in technology to address multiple limitations would also be discussed based on speaker's own experience for a wider application and improved efficiency.

KS08

Nanomedicine: Future Perspective

About Keynote Speaker

She has completed her M. Pharm., Ph. D. (Pharmaceutics) and has a vast teaching and research experience. She was the former professor and Head in the Department of Pharmaceutics, Jamia Hamdard. She has supervised 45 M. Pharm. and 25 Ph.D. Thesis and has more than 215 papers published in high impact factor journals. She has 2 Indian Patents and 1 US patent to her credit. SNEC-30 her patent on curcumin has been included in the emergency kit of the Defense Research and Development Organization (DRDO). She has received several awards



Prof. Kanchan Kohli
(Director (Research & Publications), Llyod Institute of Management and technology)

P.G. Research Award from University Grant Commission; Best project award from Honorable Vice President of India on Technology Day 2003 IPA-ACG SCITECH Innovation Award at 69th Indian Pharmaceutical Conference, IPGA Fellowship Award for outstanding contribution towards the Profession of Pharmacy. She has been a dynamic resource person at various professional bodies of AICTE, DST, ICMR & UGC.

P01**Nanogel Based Transdermal Formulation of Cannabidiol for the Treatment of Severe Pain****Author(s)****Anupama Diwan^{1*},
Rani Mansuri¹,
Neha Bhamboo¹****Abstract**

Cannabidiol (CBD) is a schedule V drug which is highly soluble with log P (5.67) and therefore, poorly soluble in water. Oral bioavailability of cannabidiol in human is as low as 13 to 19%. The exact mechanisms of action of CBD and THC is not currently fully understood. However, it is known that CBD acts on cannabinoid (CB) receptor of the endocannabinoid system which are found in the numerous areas of the body including peripheral and central nervous system (CNS) and even including brain, that regulates many physiological responses of the body including pain, memory, appetite, and mood. CBD reduces the pain by activation of CB-1 and CB-2 receptors that inhibits the calcium influx that is

responsible for inhibition of the primary neurotransmitter (GABA), which decreased activity in the nervous system and produces the calming effect. The release of CBD from the formulation was high in buffer medium pH 7.4 as compared to plain drug formulation. In conclusion CBD, transdermal nanogel formulation prepared by novel manufacturing strategy showed various advantages to a satisfactory level in terms of use of optimum viscosity, increased in vitro release as well as ex vivo permeation and the formulation showed great compatibility of components. In conclusion, transdermal nanogel formulation of CBD shows better in vitro drug release profile, optimum particle size, pH, viscosity, nanogel strength, extrudability, shear strength.

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P02**Polymeric Micelles: A Versatile Platform for Targeted Delivery of Therapeutics for Brain Cancer Therapy****Author(s)****Mahima Chauhan¹,
Rahul Pratap Singh^{1*}****Abstract**

Nanomedicine approaches have gained significant attention worldwide for the treatment of all types of brain cancers. It encourages the combination of diagnostics with therapeutics in single platform. Because of the complexity of brain tumors, it is very difficult to cure completely. Therefore, to solve this problem it needs to develop receptor-targeted for the precise delivery of therapeutic cargoes for effective and safe cancer therapy. Polymeric micelles is one of the examples of nanomedicine platform, which is extensively being used to deliver therapeutic cargoes (especially poorly soluble chemotherapeutic agents) and other bioactive molecules for brain

cancers. Polymeric micelles are tremendous carriers with some distinctive features, such as high drug payload, excellent water solubility, bio-compatibility, and a wide range of block copolymers with the desired functionality and properties. They have significant attention due to their ability to surpass the physiological barriers and improve the delivery of therapeutic agents into the brain. Here, we emphasize key aspects of the design of polymeric micelles as therapeutic delivery systems which show significant potential to target cancer cells and could be used to deliver bioactive/therapeutic molecules to brain cancer therapy.

Keywords: Anticancer drugs, Brain cancer therapy, Nanotechnology, Polymeric micelles, Receptor-targeting strategies

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P03**Zinc, Vitamin D and Ascorbate: Unsung Heroes to Fight Against COVID- 19****Author(s)****Rani Mansuri^{1*},
Anupama Diwan¹,
Eva Verma¹,
Deendayal Swarnkar²,
Rubina Parween³****Abstract**

SARS- COV-2 which belongs to the corona virus family and is well known for its crown like spikes on their surfaces. Ironically should be crowned to cause largest pandemic which is on the list of biggest challenges that human beings have ever faced in modern history. The Novel coronavirus disease caused many deaths around the globe. The virus has caused a great havoc around the world. Once coronavirus gets inside the body, it comes in contact with cells of throat, nose or lungs. It is known that the virus causes maximum damage to the lungs if the person is immunocompromised. The immune system of our body is responsible for protecting body from microorganisms and produce

antibodies to kill them. Hence, immunity is the most important factor to fight against COVID- 19. Dietary supplements such as Zinc, Vitamin C and Vitamin D contributes to boost our immunity. This review describes the importance of such supplements to fight against this infection; their role in immunity boosting and their mechanism to fight against virus. The paper contributes market uptrends of nutraceuticals around the world as well as the analysis of immune response awareness in people during pandemic time is also discussed in the form of a survey report. Hence, the gathered information is depended on provision of collected data. The case study is based on the investigation done by an online survey.

Keywords: SARS-COV-2, Immunity, Zinc, Vitamin C, Vitamin D, Market Uptrends

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³Department of Dietetics, Ford Hospital and Research Centre, Patna, Bihar-800027, India

P04**A General Study on Mucormycosis in Covid-19 Pandemic****Author(s)****Yadav Abhinay¹,
Yadav Sanjay¹,
Parida Kumar Sambit¹,
Singh Chetan¹,
Heena^{1*}****Abstract**

Typhoid disease remains a significant threat to the health of the individuals in developing countries. To characterize the epidemiology of typhoid exposure, we conducted an on-line survey among Lucknow people via questionnaire based study. As it is an ongoing study but till 167 people of age more than 18years were actively participated. With this study we came to know that very recently (2-3 months ago) people (72.1%) were affected with this enteric disease. Most of the individuals experienced diarrhea (1.8%), vomiting (3%), and fever (32.5%) during the affected

phase of the disease. The data indicated that people were using RO or filter water and hence we may able to say that there is less chances of water borne typhoid disease. Out of all medicine systems allopathic was marked as more prominent medicinal system (92.2%) for the treatment of this disease but many of them were reported some side-effects related to the medicines they have taken such as nausea, vomiting, loss of appetite. An unacceptably high rate and/or an increase in the incidence of an infectious disease suggested that there is need for a greater effort to prevent the disease, such as a vaccine campaign.

Keywords: Mucormycosis, CAM, pulmonary disease, diagnosis, diabetes mellitus.

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P05

To Study the Prevalence of Typhoid in Lucknow: An Online Survey

Author(s)

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Singh Chetan¹,
Heena¹

Abstract

Mucormycosis has resurfaced as a result of the corona virus disease 2019 (COVID19) pandemic. In just three months, India recorded almost 47,000 cases of mucormycosis. We studied from various research papers that out of 273 COVID-19-associated mucormycosis (CAM) patients, through June 21st, 2021, 233 of which were reported from India and 42 from the rest of the world. In India, diabetes mellitus was the most frequent underlying risk factor for CAM compared to other nations. Due to the prevalence of rhino-orbital mucormycosis, the mortality rate of patients reported from India (36.5%) was lower than that of cases

reported internationally (61.9%). We studied that pulmonary or disseminated mucormycosis cases, as well as admission to the critical care unit, were linked to higher mortality, but combination medical treatment enhanced survival. The lack of pulmonary and disseminated mucormycosis instances in India showed that these cases were either not detected or recorded, which is backed up by a Google search data pattern. In this write-up or review we look at the reasons that have contributed to the significant increase in CAM cases as well as we focused on the treatment and diagnosis for the same conditions.

Keywords: Typhoid, allopathic medicines, vaccine, side-effects, awareness.

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P06**A Brief Study on Vinca Alkaloids in
*Catharanthus Roseus (Vinca rosea)*****Author(s)****Manpreet Singh Bedi^{1*},
Sahil Yadav¹,
Rupender Singh¹****Abstract**

Vinca alkaloids are a material of a class of organic compounds made up of carbon, hydrogen, nitrogen and oxygen that is often derived from plants is named alkaloid. Vinca alkaloids are a subset of drugs obtained from the Madagascar periwinkle plant. Although, the name represents alkali like some do not exhibit alkaline properties. Many alkaloids with having poisonous characteristics have physiological effects too that make them useful as medicines. The oldest group of the plant alkaloids groups that used to treat cancer are the vinca alkaloids.¹ They are naturally extracted from

the pink periwinkle plant, *Catharanthus roseus* G. Don and have a hypoglycaemic as well as cytotoxic effects. They have been used to treat diabetes, high blood pressure and have been used as disinfectants. The vinca alkaloids are also important for being cancer fighters. There are four major vinca alkaloids in clinical use: Vinblastine (VBL), vinorelbine (VRL), vincristine (VCR) and vindesine (VDS). VCR, VBL and VRL have been approved for use in the United States. Vinca alkaloids are the second-most-used class of cancer drugs and will stay among the original cancer therapies.²

Keywords: Vinca alkaloids, hypoglycaemic, alkaloids.

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P07

Cellulose Acetate Phthalate as Pharmaceutical Excipients

Author(s)

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Abstract

Cellulose Acetate Phthalate (CAP) is water soluble derivative of Cellulose. It is extensively used in pharmaceutical formulations, such as enteric coating of tablets or capsules and controlled release formulations. It's a free-flowing hygroscopic white to off-white powder, granules, or flakes.¹ It is a review work. An extensive search of CAP was conducted using such as Google Scholar; as a result, it was discovered that CAP is used as excipient in many formulations like in tablets, nanoparticles, capsules, films, etc. CAP is also mixed with other enteric polymers and coated on other drugs to come in use as immunosuppressive, gastrointestinal, inflammation, colon

specific delivery, etc. The formulation coated with the highest concentration of Eudragit-S, Eudragit-L and Cellulose Acetate Phthalate showed delayed release, resulting in reduced drug release.² For antiulcer assessments, omeprazole-loaded cellulose acetate phthalate nanoparticles are produced using the microfluidic nanoprecipitation method.³ CAP combined with Ethyl Cellulose was dissolved in an organic solvent to generate a homogenous polymer solution, which was then used to make aspirin microcapsules.⁴ Film of Cellulose Acetate Phthalate-Hydroxypropyl cellulose was prepared by dissolving CAP and HPC in different solvent mixtures.⁵

Keywords: Cellulose acetate phthalate, excipient, tablets, nanoparticles, capsules, films.

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P08**A Review to Analytically Screen the Viability of Nanomedicine Market****Author(s)****Sneha anand^{1*}
Dr. Hema Chaudhary¹****Abstract**

The arrival of the 21st century marked a standard shift in the healthcare sector with the advancement of automated, targeted medicines & technologies having diagnostic, protective and therapeutic effects. Nanomedicines attained large admiration in their early years, but the transfiguration from being the evidence of concept to flourishing marketed products seems daunting. The cause for this may be attributed to the slow but incremental character of many present-day technologies, the article discusses the challenges hindering clinical translation of

nanomedicines including scale-up challenges, in vitro in vivo cascade of toxicology assays, unrefined manufacturing guidelines, inadequate regulatory approvals, competitive conventional market, etc., leading to hesitant investments by pharmaceutical giants. The article also reviews the economic viability of the nanobiotechnology sector through an empirical investigation of the revenue data of various pharmaceutical industries manufacturing nano-based drugs, which indicates the minor commercial importance of these medicines.

Keywords: Nanomedicine, healthcare.

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P09

Nanoparticles Based Vaccines for Better Immunization and Less Side Effect

Author(s)

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Abstract

Infectious diseases are the tip of the iceberg in the economic burden of the developing countries, due to the resistance of the pathogens to antibiotics and the lack of vaccines. The vaccines have become a big challenge in the last decades, where the attention has been focused on scientific challenges such as new vaccine development and adjuvants or delivery systems. The classical vaccines were developed from live-attenuated or killed organisms, such as influenza, smallpox, and BCG, as well as subunits such as Hepatitis B. The attenuated vaccines carry the risk of regaining their pathogenicity under immunosuppression conditions. The development of subunit vaccines without risk are considered as an essential need in combination with adequate delivery systems to obtain desired cell and humoral immune responses against infectious diseases. In the last decades, the use of nanoparticles as a delivery system in vaccines has received special attention to improve vaccine efficacy. These

nanoparticles could be composed of lipids, metal and non-metal inorganics, several polymers, and virus-like particles, which have been tested in research; some of them have already been approved for human and animal use. The characteristics of the nanoparticles have allowed targeting desired antigen-presenting cells to improve immunization strategies to induce protection. The main characteristics of the nanoparticles are to protect the antigens from early proteolytic degradation, control antigen release, and help antigen uptake and processing by antigen-presenting cells, and they should be safe for human and veterinary use. In addition, the nanoparticles could be modified in their physicochemical properties to target specific cells and improve vaccine efficacy. Here the focus is drawn to nanoparticle-based vaccine formulations and the approaches used to realize efficient delivery of vaccines in order to induce host protective immunity against infectious diseases.

Keywords: Nanomedicine, Nanoparticles, immunization, Hepatitis B.

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P10**Risk Assessment Integrated QbD Approach for Fabrication of Targeted Nano-formulation of Natural Peptidyl-Prolyl Isomerase-B Inhibitors Against Bacterial Biofilm****Author(s)****Athar Shamim¹,
Zeenat Iqbal²,
Mohd Aqil³,
Asgar Ali^{1*}****OBJECTIVES**

Design, development, fabrication, and evaluation of novel nanoformulation as a tool for biofilm disruption via PpiB inhibition for treating recalcitrant nosocomial acquired infection caused by S.aureus, E. coli and Pseudomonas aeruginosa species

HYPOTHESIS

Biofilm formation has emerged as a significant reason for anti-biotherapy failure against most of the bacterial infections. Harnessing the potential of natural biofilm disruptors to manoeuvre the antibiofilm activity is the mainstay of the proposed therapeutic modality. Henceforth, using a drug delivery approach to salvage the defunct drugs, repurpose sure others(both synthetic and natural origin) and bring forth the rational antibiotic usage is a crucial objective of the study

METHODS

In-silico guided screening of drugs, antibiofilm agents, functional excipients would be followed by formulation and optimization of controlled release nanoformulation using state of the art QbD techniques

RESULT

Using design expert (Box-Behnken) and validated statistical models prognosticate and control levels of formulation variables viz, bile, cholesterol and span 60 required to design the novel carriers. (size:171.5 nm, PDI: 0.178, EE:60% and DL:12.4 %) Rutin and ciprofloxacin with good stability (DSC and FTIR) and improvement in the overall performance as evidenced by ex-vivo skin permeation study, confocal laser scanning microscopy and histological study.

Keywords: Nanoformulation, QbD, biofilm.

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P11**4-Aminoquinoline-Monastrol Novel Hybrids: In-Silico Design and Molecular Docking Studies for Their Anticancer Activity****Author(s)****Dr. Mukesh Kumar Kumawat^{1*}****Abstract**

A series of novel molecular hybrids comprising monastrol and 4-aminoquinoline derivatives for anticancer activity. These hybrids were designed and investigated by molecular docking studies in the binding site of target protein for anticancer activity (PDB- 1Q0B). Hybrid drugs may help in combat multi-drug resistance. The hypothesis suggests that this hybrid of monastrol and 4-aminoquinoline moiety have synergistic effects and also decrease risk of rapid resistance problems. N-Alkylation at 4-aminoquinoline ring also

improves lipophilicity which may promote the activity of hybrid drug. The molecular hybrids revealed the compounds showed good interactions with Kinesin Eg5. The binding energy of hybrid structure ranges from -6.96 to -10.66 Kcal/Mol. Molecular docking studies were performed using Autodock 4. The binding interactions were, the conventional hydrogen bond between hybrid and GLU 116 (active site). The target protein was downloaded from RCSB PDB. The visualization of docking results was done using Biovia Discovery Studio Visualizer 2020.

Keywords: 4-Aminoquinoline-Monastrol hybrids; Molecular docking studies; anticancer activity; Kinesin Eg5.

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P12**Improvement of Gradient Elution Resolution of Related Substances in Levalbuterol HCl Inhalation Solution****Author(s)****Rani Mansuri¹,
Anupama Diwan¹,
Surbhi Madan¹****Abstract**

A short-acting β_2 adrenergic receptor agonist, Levosalbutamol, or Levalbuterol, is used in the treatment of asthma and Chronic Obstructive Pulmonary Disease (COPD). The maintenance of pure form of Levalbuterol and determination of Related Substances (RS) as a part of impurities is critical aspect during in-house formulation. Till now, only USP method is available for determination of RS and that is also not suitable for the In-house formulation. There is urge to develop and validate a highly specific, reliable and cost effective HPLC-UV method for the determination of the related substances in Levalbuterol Hydrochloride inhalation solution, so that the new method may improve the resolution of individual peak and avoid the interference of the placebo peak responses with other peak responses.

Here, in this work we have developed method that is simple, rugged and selective for quantification of impurities and Levalbuterol HCl. The method is capable of separating all the known impurities with resolution more than 4.9. Key critical parameters like stationary phase, mobile phase pH, column, temperature and flow rate were effectively optimized. The method is equivalent to USP methods in terms of producing result during regular analysis and superior to USP methods in terms of selectivity. The developed method was validated as per the ICH guidelines and found to be selective, specific, precise, accurate, linear and robust. The developed method was user friendly and can be used for quality control and stability study analysis of Levalbuterol HCl drug substance and drug product.

Keywords: COPD, HPLC-UV, Levalbuterol

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P13**Probiotics in cosmetic landscape study, a qualitative and quantitative analysis****Author(s)****Aishwarya sharma¹,
Chandrani Das¹,
Gajendra kumar¹
Narender Yadav^{1*}****Abstract**

Probiotics are live microorganisms that are intended to have health benefits when consumed or applied to the body. Some most common probiotics are found in yogurt and other fermented foods, dietary supplements and beauty product. Common people often thinks that bacteria and other microorganisms are harmful and know them as a GERMS but many of microorganisms are actually helpful. these helpful microorganisms are known as probiotics Most common use of probiotics i.e. *Lactobacillus* *Acidophilus* and *Bifidobacterium Bifidum* Probiotics can helps in body to maintain a healthy community of microorganisms or help the body to return to a healthy condition after being disturbed. Produce substance that have desirable effects. Influence our body's immune response. Probiotics in cosmetic "Probiotic

Keywords: Probiotic, cosmetics.

cosmetics" are topical applications most frequently associated with skin hydration, anti-ageing, acne, spots and redness (rosacea). *L. Acidophilus*, or *L. Acidophilus*, is one of the best-known probiotic's strains. This strain has been tested and found to be beneficial in helping reduce acne BRANDS USE PROBIOTICS - CLINIQUE Clinique id dramatically different hydrating cleaning gelly, DOT AND KEY skincare hydrating gel, INNISFREE derma green tea probiotics cream, DECONSTRUCT beginners exfoliating serum, MURAD multicleanser, FCL PRE +PROBIOTIC BODY LOTION. While there are several potential applications for probiotics in personal care products, specifically for oral, skin, and intimate care, proper regulation of the labelling and marketing standards is still required to guarantee that consumers are indeed purchasing a probiotic product.

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P14

Micelles: An Emerging Nano-enabled Tool for the Delivery Bioactive Agents in Lung Cancer Therapy

Author(s)**Bhavna Yadav¹,
Rahul Pratap Singh^{1*}****Abstract**

Cancer remains to be one of the major health problems in every country. Every year number of deaths due to lung cancers is far more than the other types of cancers. The application of nanotechnology on lung cancer is expected to provide significant improvements for diagnosis, treatment and management of the disease, offering lower toxicity, specific targeting and reduced treatment cost. Micelles, which are core-shell nanoparticles generated by the self-assembly of block copolymers, are one of the most promising nanocarriers because their

critical properties, such as size, stability, drug incorporation efficiency, and release rate, can be controlled by the constituent block copolymers. Polymeric micelles have been shown to be useful in both experimental and therapeutic tumour models in mice. Furthermore, the next generation of polymeric micelles provide us as a platform with smart characteristics like targetability, environmental sensitivity, and imaging properties. As a result, polymeric micelles can enable safe and effective lung cancer therapy, as well as tailor-made medicines for specific individuals

Keywords:lung cancer, nanomedicines, clinical studies, micelles, polymeric micelles.

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P15**Naftifine Hydrochloride Formulation and Determination of Its In-Vitro Release & Permeation****Author(s)****Anupama Diwan¹,
Rani Mansuri¹,
Pooja Rana¹****Abstract**

Naftifine is a synthetic, broad spectrum, antifungal agent and allylamine derivative for the topical treatment of tinea pedis, tinea cruris, and tinea corporis. The in vitro release and permeation characterization of topical formulations is an important challenge for the assessment of the local cutaneous bioavailability of a topical dermatological drug. In this work, we determined the concentration of Naftifine hydrochloride from topical film forming dosage forms following in vitro release and in vitro permeation experiments. In vitro release rates and permeation characteristics of Naftifine hydrochloride from its gel and film forming solution were carried out according to recommendations of United States Food and Drug Administration and

the SUPACSS Guidance for non-sterile semisolid dosage forms. We observed Approximately 3 folds release rate for Naftifine gel in comparison to Naftifine film forming solution. The percent cumulative drug release was also found to be <30% for both formulations indicating release pattern following the Higuchi equation. We observed more permeation in receptor solution from gel than film forming. Highest recovery of Naftifine hydrochloride film forming solution was obtained from stratum corneum in comparison to its gel formulation. Slightly higher permeation of Naftifine was observed in epidermis samples for gel formulation in comparison to film forming solution, however in dermis samples recovery was found to be similar for both formulations.

Keywords: Naftifine, Gel and Film forming Solution, In-Vitro release and Permeation**Corresponding author: Anupama.diwan@asu.apeejay.edu**¹School of Pharmaceutical Sciences, Apeejay Stya University, Sohna-Palwal Road, Sohna, Gurugram, Haryana-122103, India*

P16

Holistic Study on Significance of Nanotechnology and Nanomedicine in Tackling Cancer

Author(s)

Saurabh Shekhar

Objective and Hypothesis: Currently, the only cancer therapies accessible are surgery, radiation, and chemotherapy. All three treatments include the risk of harming healthy tissues or resulting in insufficient cancer removal. Nanotechnology has the ability to focus chemotherapies specifically to malignant cells and neoplasms, direct tumour surgical excision, and increase the therapeutic efficacy of radiation-based and other current treatment modalities. All of these factors can reduce the patient's danger and increase his or her chances of survival. The creation of innovative medications based only on nanomaterial features is a goal of nanotechnology cancer treatment research.

Material and methods: Despite their tiny size in relation to cells, nanoparticles are large enough to incorporate a variety of small molecule compounds. Similarly, ligands such as small molecules, DNA or RNA strands, peptides, aptamers, or antibodies can be functionalized on the nanoparticle's relatively large surface area. These ligands can be used to control the fate

of nanoparticles in vivo or to treat diseases. These properties allow for the administration of many medications, multimodal treatment, and "theranostic" (therapeutic and diagnostic) action. In laser ablation and hyperthermia applications, physical features of nanoparticles such as energy absorption and re-radiation can be exploited to injure diseased tissue.

Result: The development of innovative nanoparticle packaging and active pharmaceutical compounds in tandem will enable the study of a wider spectrum of active chemicals, not just those with acceptable pharmacokinetic and biocompatibility properties. Immunogenic cargo and surface coatings are also being investigated as adjuvants to nanoparticle-mediated and traditional radio- and chemotherapeutic therapies, as well as stand-alone treatments. Innovative strategies include designing nanoparticles as artificial antigen presenting cells and in vivo depots of immunostimulatory chemicals that use nanostructured architecture for long-term anti-tumor effect.

Keywords: nanotechnology, nanomedicine, cancer.

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P17

Phytochemical Nanoformulations for the Treatment of Diabetic Nephropathy

Author(s)**Aruna Rawat¹,
Dr. Vikas
Jhawar¹****Abstract**

In most diabetic patients Albuminuria has a commonly associated problem with diabetes and this may lead to End-Stage Kidney Disease (ESRD) which is generally known as diabetic nephropathy. Diabetic nephropathy is generally associated with arterial hypertension. There are certain evolving therapies for the treatment of Diabetic nephropathy like RAS inhibition, ARB therapy is one of the popular therapies for the treatment of the said disease, Sodium-glucose cotransporter-2 inhibitors have also emerged as a recent therapy, many medicinal plants have also been shown to be effective like Curcuma Longa, Ocimum Sanctum, etc. Some of the drugs used in the advanced therapies like Cilostazol,

Canagliflozin, Telmisartan, and drugs from medicinal plants like Curcumin used for the treatment of diabetic nephropathy are poorly water-soluble drugs. Curcumin, a bioactive hydrophobic polyphenolic nutraceutical pigment, has a wide range of therapeutic efficacy. So, solid dispersion in combination with nanotechnology is the best approach. The effects of nanosizing on pharmacokinetic, biopharmaceutical and therapeutic profiles of plant-derived small molecules, such as curcumin, resveratrol, naringenin, quercetin, apigenin, baicalin, luteolin, rosmarinic acid, berberine, gymnemic acid, emodin, scutellarin, catechins, thymoquinone, ferulic acid, stevioside, and others have been shown in the literature.

Keywords: Bioavailability; diabetic nephropathy; drug delivery; nanotechnology; natural products; nutraceuticals.

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P18**Online-Survey of Common-Cold on Home-Remedies and Allopathic Medicines****Author(s)****Kesharwani Ankur^{1*},
Yadav Sanjay¹,
Parida Kumar Sambit¹,
Singh Chetan¹,
Heena¹****Abstract**

It is an ongoing study which aims to find out the differences between the home remedies and allopathic medicines which are being used by the common-cold infected patients in Lucknow. In this study, online and partially in-person survey interviews were carried out among Lucknow people who were required to fill the questionnaire. Based on the questionnaire google survey we found that individuals above 18 years were actively participated (53.8%). With this survey we come to know that out of 157 individuals 46.1% responded that allopathic medicines are the best remedy for curing common cold. Similarly, if we compared various home remedies preparations for common-cold like kadha, honey, turmeric milk, out of them 56.8% people preferred that kadha is the best remedy for curing the same. If we were concerned about the

pharmacological treatment we found that major of the individual (28.6%) only knows that cetirizine tablet is useful in curing the common-cold infection where as many of them 27.3% do not preferred medicines like phenylephrine, dextromethorphan, cetirizine.

Conclusion: Senior family members have a better knowledge about certain aspects of self-medication, home remedies which reflects the influence of medical training. But, even the other members who are not exposed to the knowledge of drugs and disease are well aware about most of these which may be due to easy availability of information such as home-made remedies recipe, online drug information etc. So, don't be distracted from the various sources of advices therefore, here the Pharmacist play a role model for better treatment.

Keywords: Home-remedies, allopathic medicines, common-cold, pharmacist role, drug-information.

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P19**Nanomedicine in Neurodegenerative Disorders****Author(s)****Ashwani Sharma¹****Abstract**

Millions of people are affected by neurodegenerative disorders (NDs), which are a leading cause of disability. NDs are treated by a variety of medications, having certain limitations. There are complications for the treatment of NDs. The blood-brain barrier (BBB) protects the brain from hazardous chemicals, agents and transportation of drugs across the BBB is the critical issue for targeting and, treating NDs. BBB makes it much more difficult for drug distribution to target cells in the brain. The use of nanotechnology or nanomedicine is providing interesting biomedical tools. Nanotechnology involves the use of engineered devices and materials that interact with biological systems at the molecular level. They also have the capability of reacting, inducing, and interacting with target sites to stimulate physiological responses while reducing side

effects. Their physicochemical properties and ability to cross the blood-brain barrier are potentially able to act as problem-solving techniques. Therefore, the state-of-art of nanomaterials that can be used in the treatment of NDs therapy as well as neuroprotection has been discussed. The types of nanocarriers are being explained with their merit and demerit. Therefore, an overview of nanotechnology-based pharmacotherapy for depression, anxiety, bipolar, schizophrenia, Alzheimer's disease has been discussed. In general, nanoparticles can significantly improve medication delivery by increasing BBB permeability, bioavailability, and pharmacodynamics of administered drugs. As a result, nanotechnology is expected to overcome the limitations of existing drug therapy and to effectively combine multiple treatment methods.

Keywords:Anxiety, Blood-brain barrier, Depression, Nanomedicine, Nanotechnology, Neurodegenerative disorders, Schizophrenia.

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P20**Repurposing - The Panacea in CoVID-19****Author(s)****Radhika Bhatnagar¹,
Rajat Pal¹,
Dr. Rani Mansuri¹,
Lopa Mudra Roy¹****Abstract**

The process of discovering new therapeutic uses for old / existing / available medications is known as drug repurposing. It's a good way to find or create novel drug compounds with different pharmacological/therapeutic applications. This technique is extremely efficient, saves time, is low-cost, and has a minimal chance of failure.^{1,2} It raises the success rate by increasing the therapeutic value of a medicine. As a result, drug repositioning is a viable alternative to the standard drug development procedure. To develop/identify novel applications of pharmacological molecules on a rational basis, drug repositioning combines the efforts of activity-based or experimental and in silico-based or computational methodologies. It is therefore seen to be a developing method in which current drugs, which have previously been shown safe in people, are redirected to tackle uncommon,

difficult-to-treat diseases and neglected diseases based on a viable target molecule. The goal of drug repurposing is to uncover new uses for an authorized or experimental medicine that aren't related to its original use. Various ways of medication repurposing are used to achieve this goal. COVID-19 epidemic, as well as the benefits and drawbacks. Several medicines, including remdesivir, favipiravir, etc. have exhibited inhibitory effects against SARS-CoV2 both in vitro and in clinical settings. These medications either target virus-related targets or they target host-related pathways such as ACE2 receptors and inflammatory pathways. Many medications are now in the process to be repurposed utilizing fundamental understanding of viral pathogenesis and pharmacological pharmacodynamics, as well as computational methods. In the current situation, repositioning of drug may be considered a novel option for CoViD-19.

Keywords: Repurposing, Covid-19**References:**

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P21**Impact of Green Nanotechnology on Drug Delivery****Author(s)****Khushi Goyal¹****Abstract**

The impact of environmentally friendly and environmentally safe chemistry on nanotechnology-driven drug delivery in a new field known as green nanomedicine. Green nanotechnology is the product of a synthesis of green chemical and engineering research. For the manufacture of different nanoparticles, hazardous compounds such as

THPC-tetrakis(hydroxymethyl)phosphonium chloride, PVP- poly-N-vinyl pyrrolidone and hydroxylamine are replaced by fungus, bacteria, actinomyces, and plants for synthesis of various nanoparticles such as liposomes (significant and first NP as vehicle in Nanotechnology drug delivery system), SPION- supermagnetic iron oxide NPs,

Keywords: Nanotechnology, Drug delivery

fullerenes, dendrimer, green quantum dots, liquid crystals with an idea of biomineralization.

Its goal is to create nanomaterials that are safe for the environment and human health while also solving environmental issues. Green nanotechnology has had a lot of success, as proven by recent mango peel extraction reduced gold nanoparticles showing no biological harm on normal human foetal lung fibroblast cells (WI-38), despite several challenges. Many ancient civilizations considered gold to be the elixir of life. Imaging, labelling, sensors, medication administration and cancer therapy are examples of biological applications of green NPs.

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P22**An Overview of Nanomedicine's Role in The Treatment of Melanoma: Technical Challenges and Troubleshooting Measures****Author(s)****Iqra Zai¹,
Dr. Yasmin Sultana¹****Abstract**

Melanoma is a prevalent malignant disease and it is commonly known as malignant melanoma. Currently, surgical resection leads to cause the large skin defects and pain in the course of skin tumor treatment which impact on patients quality of life. It is significant important to develop a versatile system with an inventive approach to develop a nanomedicine, which has been extensively explored during the last decade, particularly in the development of carriers for cytotoxic drugs. These carriers include vesicular and particulate systems such as liposomes, niosomes, transfersomes,

ethosomes, micelles, dendrimers, and polymeric, protein and lipid nanoparticles. Hence the co-delivery of several bioactive using functionally targeted nanocarriers shows promising improvement in the therapeutic efficacy while reducing the toxicity of drug combination by specific targeting and controlled release of the drug. In this review, skin cancer with its sub-types is explained in nutshell, followed by compendium of specific nanotechnological tools presented, in addition to therapeutic applications of drug-loaded nano systems for skin cancer.

Keywords: Chemotherapy, Melanoma skin cancer, Nanocarrier, Drug delivery systems, Targeted drug delivery.

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P23**Formulation of Mucoadhesive *Abelmoschus Esculentus* – Brivaracetam Based Nanogel for Nasal Drug Delivery System****Author(s)****Shivani Agarwal^{1*},
Prashant Upadhayay¹****Abstract**

Nanomedicine is branch of science which deals with the combined study of nanotechnology, biology & medicine. The work describes the preparation and evaluation of mucoadhesive nanogel, using different natural polysaccharide as a novel carrier for safe and effective delivery of *Abelmoschus esculentus* into nasal cavity. The polysaccharide was extracted from the fruit of *Abelmoschus esculentus* and mucoadhesive nanogel were prepared by solvent emulsification method, followed by crosslinking method with different polymers. Prepared nanogel were evaluated for size, morphology, swelling properties,

mucoadhesive strength, encapsulation efficiency and drug release. The gel formulations prepared with Carbopol 934, HPMC K 100 M and chitosan gum and okra gum showed good homogeneity, no skin irritation, good stability and anti-inflammatory activity. However, the *Abelmoschus esculentus* gum-based gel proved to be the formula of choice, since it showed the highest percentage of extrudability, good spreadability and rheological properties. Formulation of *Abelmoschus esculentus* based polysaccharide showed the best formulation with significant anti-depressant activity.

Keywords: Mucilage, *Abelmoschus esculentus*, Nasal gel, Brivaracetam.

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P24

Online-Survey of Comparative Study of N-95 and Regular Face Mask in The Present Era of Covid-19

Author(s)

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Yadav Sanjay¹,
Parida Kumar Sambit¹,
Singh Chetan¹,
Heena¹**

Abstract

During the course of the COVID-19 pandemic, the importance of face mask fit has become important critical piece of protective equipment for healthcare workers and civilians. While the importance of wearing face masks has been acknowledged, there remains a lack of understanding about the role of good fit in rendering protective equipment useful. As it is an ongoing online questionnaire-based survey which showed 120 participants till date with age more than 18 years were using N-95 masks about 49.5% while 33.3% individuals were reported of using normal

cloth masks. But 58% of the population experienced breathing difficulties while using N-95 mask. Apart from this the data indicated that the social sites were playing vital role in giving general awareness regarding the use of mask. Based upon an activity which was performed during the survey we found that around 43.1% individuals reported their breathing rate above 12 breaths per minutes. We aim to interpret importance of fit for protecting the wearer how well a simple fit check predicts fit, and the relative degree of protection offered by each mask type.

Keywords: COVID-19, N-95 face mask, awareness, breathing rate.

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P25**Nanomedicine: Therapeutic Applications****Author(s)****Vivek Kumar mehta¹,
Deepak rawat¹,
Rahul singh¹****Abstract**

Nanoparticles are organic or inorganic structures (sizes 1–100 nm) similar to antibodies and DNA plasmids. Therapeutic nanoparticles (NPs) are used in nanomedicine as drug carriers or imaging agents, providing increased specificity for diseased tissues. Due to the advantage of their size, nanospheres have been shown to be robust drug delivery systems and may be useful for encapsulating drugs and enabling more precise targeting with a controlled release. The most promising application of nanomaterials is the promise of targeted, site-specific drug delivery and poor bioavailability. Because of their immense

potential for application in business and medicine, nanotechnologies have generated worldwide attention. The biocompatibility of therapeutic NPs components must be ensured and managed to ensure that they are fundamentally safe. The risks of toxicity do not outweigh the benefits. Polymeric nanoparticle are biodegradable with diameter ranging from 10- 200 nanometers. This poster focuses on the introduction of nanomedicine in the pharmaceutical market along with their mechanism and therapeutic benefits, discuss the detail about how it is better than conventional dosage form. Its current and future clinical application.

Keywords: Nanomedicine, drug carriers, imaging agents

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P26

To Study the Prevalence of Kidney Stone and Gall Bladder Stone in Lucknow: An E-Questionnaire Based Study

Author(s)

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Yadav Sanjay¹,
Parida Kumar Sambit¹,
Singh Chetan¹,
Heena¹

Abstract

In the context of India, kidney stone is prevalent, with an expectancy of 12% in a total population reported to be prone to urinary stones. Whereas Gallstones constitute a significant health problem in developed societies, affecting 10% to 15% of the adult population, meaning 20 to 25 million have (or will have) gallstones. The study involved online questionnairebased survey among Lucknow population of age above 18 years out of 127 individuals 75.2% were presently suffering from the stone conditions and out of them 42.1% were suffering from kidney stone, similarly 31.7% from that of gall bladder stone. If we considered medicine system then 52.4% population preferred allopathic medicines and about 75.4% were using various

homeopathic preparations. With this study we came to know that most of the individual experienced very common side effects that were constipation, nausea and vomiting. Whereas after removing a gall bladder many individuals reported that difficulty in digesting (11.2%) and jaundice (8%). This population survey has better defined important risk factors, both unchangeable and modifiable. The implications of changing environmental risk factors predict an increase in the numbers of individuals with gallstones as well as kidney stones. Identifying risk factors that can be altered (i.e., extreme obesity, rapid weight loss, sedentary lifestyle, and key dietary factors) should provide an opportunity to prevent stones.

Keywords: Kidney stones, gall stones, side-effects, medicine system, urinary-infection.

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P27**A Review on Advancement of Nanotechnology in Nephrology****Author(s)****Ritu Rani^{1*},
Dr. Hema Chaudhary¹****Abstract**

The term "nanotechnology" refers to the creation of new objects with nanoscale dimensions between 1.0 and 100.0 nm. The application of nanotechnology to medicine is called nanomedicine. Nanomedicine subsumes three mutually overlapping and progressively more powerful molecular technologies: nanoscale structured materials and devices; and medical nanorobots; genomics, proteomics and artificial engineered microbes. It also holds tremendous potential as an effective drug delivery system. Nanoparticles can be used

in targeted drug delivery at the site of disease to improve the uptake of poorly soluble drugs, targeting of drugs to a specific site, and increasing the drug bioavailability. Physicochemical properties of nanoparticles such as their small size, large surface area, surface charge and ability to functionalize them makes them potential delivery systems for effective therapies. The purpose of this review is to throw more light on the recent advances on Nephrology, where it gives the information of impact on nanotechnology in diagnosing and curing the renal failure.

Keywords: Nanomedicine, nanoscale structured materials, medical nanorobots

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P28**Role of Nanotechnology in AMR****Author(s)****Dhruv Malik¹,
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Palak Jain¹,
Mohammad Jilani¹****Abstract**

Anti microbial resistance (AMR) has been a global cause of concern. Nanoparticles have been shown to enhance the therapeutic activity of antimicrobial drugs by providing synergistic effect against infectious pathogens. Antimicrobial peptides (AMPs) have shown prospects as possible diagnostic and medicinal agents in biomedical applications. Till date, above 3000 AMPs have been recognized but only a small percentage of these have been approved for clinical trials. The objective of present study was to evaluate the role of nanotechnology in AMR. A systematic review of published literature on evaluation of antimicrobial resistance using adoption of functional materials was performed. *Akbari et*

al. assembled three distinct models for characterization of graphene-based biosensor for *E. coli* bacteria. These models consisted of Artificial neural network (ANN), support vector regression and an analytical approach. When exposed to *E. coli* bacteria at concentrations ranging from 0 to 105 CFU/ml, the graphene device's conductivity increases dramatically. The simplicity, rapid reaction time and high sensitivity of this nano electronic biosensor make it a efficient device for sensitive testing of antibacterial drugs. Microbes evolve at a greater pace as compared to discovery and execution of antibiotics. Nanotechnology is now being used to enhance drug efficacy and reduce side effects.

Keywords: Nanoparticles, therapeutic, antimicrobial, biomedical, antimicrobial peptides, drug efficacy, side effects.

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P29

An Ongoing E-Survey on Different Brands of Paracetamol Including It's Nanogel Preparations

Author(s)

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Parida Kumar Sambit¹,
Singh Chetan¹,
Heena¹**

Abstract

The study involves comparative evaluation of four different brands of Paracetamol which are widely used all over the country. Based on the questionnaire goggle survey we found that individuals above 18years were actively participated (80%). With this survey we come to know that out of 180 individuals 58.6% responded that DOLO brand is widely used to treat fever. And 62.6% individuals responded that they took 500mg of paracetamol twice a day. Similarly, if we compared DOLO and CALPOL brands for the identification 29.7% people responded that they were identified them on the basis of strip color. Many of them were also know about paracetamol nanogels as

well as its health consequences. This study aimed to check the general knowledge regarding the uses and marketing of paracetamol preparations as during the Covid-19 era each member of the family is now familiar about the same medicine, but many few of them knows their actual use, its safety and reason for using it. It would be safe, if the people, who are using it, have sufficient knowledge about its dose, time of intake, side effect on over dose, but due to lack of information it can cause serious effects. There is need to increase awareness and implement legislations to promote judicious and safe practices.

Keywords:Paracetamol, Covid-19, drug-information, fever.

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P30

Pharmaceutical Applications of Rice Straw: An Overview

Author(s)**Surekha Sehrawat¹,
Narender Yadav^{1*},
Anupama Diwan¹****Abstract**

India is one of the largest rice producing country in world with estimation of approximate 104 million tones and generate a large amount of crop residues (Rice Straw) as agricultural waste. Due to absence of adequate sustainable management practices, approximately 70-80% of rice crop waste is burned every year in India. Burning of rice residue is major source of gaseous as well as particulate matters pollutants that are hazardous to human health and the environment. Rice Straw (RS) is a significant by-product from rice field that is not utilized appropriately. RS is one of the most abundant resources for renewable lignocellulose biomass materials that composed of cellulose (38%), hemicellulose (25%), lignin (12%) and silica (14%). In last few decades, application of RS

has been explored in various industries like agricultural, Energy, construction, and pharmaceutical industries. RS have been used for production of bioplastic, bio-composites, biofuels, silica, activated charcoal, nanocellulose, microcrystalline cellulose, packaging material, etc.⁴ In this review, we have highlighted the application of RS-based biomaterials in pharmaceutical industries. Various RS-based biomaterials are reported as antimicrobial, antioxidant, biosorbant, disintegrants, filler and stabilizing agent in solid dosage formulation. Other potential application of RS derived materials has also been explored in targeted-, controlled-, sustained- and rapid-drug delivery system and cell culture/tissue engineering due to its renewable and sustainable environmental properties.

Keywords: Rice straw, cellulose, antimicrobial, antioxidant, biosorbant, disintegrants.

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P31**Identification of BKCa Channel Openers by Molecular Field Alignment and Patent Data-Driven Analysis****Author(s)****Yaseen Gigani^{1,2},
Andrew Lynn³****Abstract**

In this work, we present the first comprehensive molecular field analysis of patent structures on how the chemical structure of drugs impacts the biological binding. This task was formulated as searching for drug response components across multiple cancers to reveal shared effects of drugs and the chemical features that may be responsible. The challenge structural identification by the available descriptors differs from the existing needs in the sense that the potential 'bioactive molecules' with different lead/scaffolds structures which share lower chemical similarity but also be equally potent in terms of biological activity and should also be retrieved during the database search. In this work, the SureChEMBL patent database,

which provides search of the patent literature using keyword-based querying functionality, was used as a query engine. The extraction of data of the BKCa channel openers and aligning them for molecular field similarity with our in-house designed structures to investigate a probable validation method.

Results

In an attempt to increase the true positives during drug repurposing, we report a procedure that functions on a multiple analysis modeled on molecular field similarity and Maximum Common Sub-structural (MCS) search with consensus scoring and high confidence values to obtain greater accuracy during virtual screening.

Keywords: BK_{Ca} Channel, Molecular Field Alignment, SureChEMBL, Chemical Curation

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P32**Pegylated Liposomal Doxorubicin****Author(s)****Koshtika Chaudhary¹****Abstract**

CaelyxTM, Doxil[®]) is a pegylated liposomal doxorubicin formulation that has lower cardiotoxicity and a better pharmacokinetic profile than traditional doxorubicin. This article summarises the pharmacological features of pegylated liposomal doxorubicin, and its efficacy and tolerance in metastatic breast cancer, progressive ovarian cancer, relapsed or refractory multiple myeloma, and AIDS-related Kaposi's sarcoma.

Monotherapy with pegylated liposomal doxorubicin was as effective as doxorubicin

or capecitabine in the first-line treatment of metastatic breast cancer, and as effective as vinorelbine or the combination mitomycin plus vinblastine in taxane-refractory metastatic breast cancer, according to three randomized, open-label, multicentre trials.

According to the findings of three randomized multicentre trials, pegylated liposomal doxorubicin alone was as effective as topotecan or gemcitabine alone in patients with progressive ovarian cancer who were resistant or refractory to platinum- or paclitaxel-based therapy.

Keywords: Pegylation, liposome, doxorubicin

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P33**Role of Nanotechnology in Cancer****Author(s)****Bhawna Rani¹****Abstract**

Inorganic nanoparticles, such as carbon nanotubes, quantum dots and gold nanoshells, have been adopted for biomedical use, due to their unique optical and physical properties. Compared to conventional materials, inorganic nanomaterials have several advantages such as simple preparative processes and precise control over their shape, composition and size. In addition, inorganic porous nanomaterials are fundamentally advantageous for developing multifunctional nanomaterials, due to their distinctive inner and outer surfaces. In this review, we describe recent developments of hollow and porous inorganic nanomaterials in nanomedicine, especially for imaging/diagnosis and photothermal therapy. Cancer is a leading cause of death and poor quality of life globally. Even though several strategies are devised to reduce deaths, reduce chronic pain and improve the quality of life, there remains a shortfall in the adequacies of these cancer therapies. Among the cardinal steps towards ensuring optimal cancer treatment are early detection of cancer cells and drug application with

high specificity to reduce toxicities. Due to increased systemic toxicities and refractoriness with conventional cancer diagnostic and therapeutic tools, other strategies including nanotechnology are being employed to improve diagnosis and mitigate disease severity. Over the years, immunotherapeutic agents based on nanotechnology have been used for several cancer types to reduce the invasiveness of cancerous cells while sparing healthy cells at the target site. Nanomaterials including carbon nanotubes, polymeric micelles and liposomes have been used in cancer drug design where they have shown considerable pharmacokinetic and pharmacodynamic benefits in cancer diagnosis and treatment. In this review, have outlined the commonly used nanomaterials which are employed in cancer diagnosis and therapy and highlighted the suitability of these nanomaterials for cancer management based on their physicochemical and biological properties. We further reviewed the challenges that are associated with the various nanomaterials which limit their uses and hamper their translatability into the clinical setting in certain cancer types.

Keywords: nanomaterials, nanotechnology, cancer, diagnosis, treatment

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P34

Computational Epitope Based Vaccine Delivery System Against Human Astrovirus (Hastv) Causing Gastroenteritis in Children

Author(s)

Ganesh Chandra Sahoo¹,
Asish Kumar¹,
Maneesh Kumar¹,
C. S. Lal³,
VNR Das²,
Krishna Pandey²

Abstract

There are reports that astrovirus causing gastroenteritis in children less than five years age. Except rotavirus there is no other vaccine available for children to be vaccinated against gastroenteritis causing viruses. Human astrovirus (HAsV) infection normally causes acute gastroenteritis characterized by diarrhea, vomiting, fever, anorexia, and a variety of constitutional symptoms. Volunteer studies and epidemiological analysis indicate that the incubation period for astrovirus-associated illness is 24 to 36 hours (Kurtz et al., 1979). HAsV infection induces a mild, watery diarrhea that lasts 2 to 3 days, associated with vomiting, fever, anorexia, and abdominal pain. Vomiting is less prevalent in astrovirus infection than in rotavirus or calicivirus infection, and HAsV infections also show a longer incubation period (Cruz et al., 1992, Kotloff et al., 1992, Marie-Cardine et al., 2002). The proportion of diarrheal cases associated with astrovirus shedding ranged from 2.3% to 7%. In Bihar Patna region astrovirus has been found to be infecting children below five years age. Cell mediated immunity is important for the control of astrovirus infection. We hypothesized that those HLA A0201 and

HLA B40 restricted epitopes derived from astrovirus proteins would surcharge a good antigenic response. Immunoinformatics method has identified specific 9mer amino acid which may be capable of inducing cell mediated immune response in humans. A set of several epitopes that had no homologs in humans have been identified specifically the epitopes derived from different structural and non-structural proteins such as capsid and RdRp regions share high coverage. Six most promiscuous epitopes were identified from capsid and RdRp regions having coverage were found to be useful candidates for vaccine design. Epitope conservancy analysis suggested that most of the peptides are highly conserved (100%) among different genotypes of astrovirus. The nine mer amino acids are QSSQVRNI, VNSRNRARR, AANPNLVNL, GVNEFVVIK, WYVNNLLNR and AYDWIVRGL. No drug has yet been found to be beneficial for astrovirus diarrhea. Hence a pool of these peptides encapsulated PLGA-PEG nanoparticles will be more effective than free peptides alone in terms of therapeutic efficacy which can then further be confirmed in vitro and in vivo study.

Keywords: Vaccine Delivery System, Human Astrovirus

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P35**Review of Phytopharmacology of
Barleriaprionitis Linn.****Author(s)****Aditya Raj¹****Abstract**

Barleriaprionitis, is a perennial, thorny shrub in the Acanthaceae family that is commonly referred to as "porcupine flower" or "Vajradanti," among other names.¹ Southern Asia and parts of Africa are home to this plant.² Ayurvedic and other conventional medical systems recognized the therapeutic use of *B.prionitis* leaves, flowers, stems, seeds, shoots, roots, and in some instances the entire herb for a variety of ailments such as cough, fever, jaundice, asthma, severe pain, acne, and cut wounds. An extensive bibliographic search of this plant was conducted using scientific engines and databases such as Google Scholar,

PubMed, and Science Direct; as a result, it was discovered that this herb has a high Phytochemical content as well as a wide range of pharmacological activities such as antimicrobial activity, anthelmintic activity, antidiarrheal activity, antioxidant activity, antifertility activity, anti-diabetic activity, anti-inflammatory activity, and anti-fungal activity. Tannin, saponin, flavonoid, glycoside, alkaloid, and Phenolic chemicals have all been found in the plant³. It's also where secondary metabolites like-sitosterol, lupeol, syringic acid, and vanillic acid come from. Despite its potential therapeutic value, it remains underused.

Keywords: *Barleriaprionitis*, antidiabetic, anthelmintic, antifertility, antiviral.

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P36**Design, Synthesis and Evaluation of RS-Based pH Sensitive Coating Materials and Its Application in Tablet Coating****Author(s)****Dr. Narender Yadav^{1*},
Dr. Anupama Diwan¹****Abstract**

India is one of the largest rice producing country in world with estimation of approximate 104 million tones and generate a large amount of crop residues (Rice Straw) as agricultural waste.¹ Due to absence of adequate sustainable management practices, approximately 70-80% of rice crop waste is burned every year in India. Burning of rice residue is major source of gaseous pollutants such as, carbon dioxide (CO₂), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur oxides (SO_x), and methane (CH₄) as well as particulate matters (PM₁₀ and PM_{2.5}) that causing serious damage to human health and the environment.^{2,3} Rice straw (RS) is one of the most abundant resources for renewable lignocellulose biomass materials that composed of cellulose (38%), hemicellulose (25%), lignin (12%) and silica (14%). In recent years, extensive research has been done through out world for the management of crop waste so that its various components can be used effectively in various industries. Many in-field (Burning (not preferred), Mulching, incorporation, etc.) and off-field

option available for Rice Straw (RS) management. However, in-field management (Burning (not preferred), Mulching, incorporation, etc.) not practically useful due to above health and environmental issues. Therefore, more emphasis on off-field option need to done. Till now various off-field option such as agricultural uses (composting, mushroom, livestock feeding and bedding, etc.), Energy (Thermal- combustion, gasification, pyrolysis, Carbonization- heat, electric power, syngas, Biochemical- fermentation, biogas, biofuel, hydrogen, etc.), Industrial uses (Building materials- fibers board, brick etc., Hi-end materials- Silica, biofibers, cellulose, lignin, etc.). Through our literature search, we have found that despite extensive research on management of RS and its application in various industries, very few reports have been available for its pharmaceutical application. In this study, we have design, synthesized and evaluate the RS-based pH sensitive coating materials and its application in tablet coating.

Keywords: Rice straw, tablet, coating**Corresponding author: narender.yadav@asu.apeejay.edu*¹School of Pharmaceutical Sciences, ApeejayStya University (ASU), Sohna-122103, Gurugram, Haryana, India

P37**Formulation, Optimization and Evaluation of Borage Oil Based Nano Emulsion Loaded With Docetaxel for Improved Anticancer Efficacy****Author(s)****S. M. Kawish¹,
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Mohd. Aqil⁴,
Farhan J. Ahmad^{1*}**

Objective: The objective of the present studies were the development of a Nanoemulsion formulated using Borage oil for the delivery of Docetaxel as an implication for passive drug targeting and improved anticancer effect.

Hypothesis: Nanotechnology based therapies have emerged to be the most novel form of targeted therapy for better cancer management. Therefore, in present study, well known anticancer drug Docetaxel has been formulated as Nanoemulsion using Borage oil as functional excipients, known to possess GLA (Gamma Linolenic Acid) with reported anticancer activities for a synergistic anticancer effect.

Methods: Formulation was optimized using statistical design to get final formulation. Size of particle, shape, morphology, interactions and drug solubilization were

confirmed using Dynamic light scattering, TEM, SEM, FTIR, XRD and DSC. In-vitro release study and cell viability studies were also performed. Safety of formulation was accessed by Hemocompatibility studies.

Results: The average particle size & PDI were found as 180 nm & 0.210, all within limits. TEM & SEM analysis confirmed the spherical shape. Complete molecular dispersion of drug in core was confirmed using DSC and XRD. FTIR confirmed absence of any visible interaction of drug with excipients. In vitro release studies showed sustained pattern of release. In vitro cell viability assay displayed significant killing ability of Nanoemulsion against (MCF-7) cells. Hemocompatibility studies showed within the limit hemolysis.

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P38**Melaleuca alternifolia- A potent Antidandruff Essential Oil****Author(s)****Ruchika Kalra^{1*},
Arpana Rana^{1*},
Arun Garg²****Abstract**

Tea Tree oil is a pale yellow essential oil extracted from the leaves of *Melaleuca alternifolia* plant of Myrtaceae family. It is well known for its medicinal and cosmetic uses and is used for its Antiseptic, Antifungal and Antiviral properties. It is a very complex mixture of hydrocarbons and terpenes consisting of approximately 100 components. Tea Tree oil has Antifungal properties with activity against *Malassezia furfur* and therefore useful in the treatment of dandruff. 5% tea tree oil appears to be effective and well tolerated in the treatment of dandruff. There is a strong demand for

natural therapies and it has been increasing. Tea tree oil has been popular choice for many years and is marketed in variety of preparations like shampoos, gels, lotions, oils etc. This oil has also been used to treat acne, nail fungus or athlete's foot. It is poisonous when taken orally so can be used for topical application only.

The current review compiles the data related to Antidandruff activity of *Melaleuca alternifolia* and its effectiveness.

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P39

Agricultural Biomass Derived Nano-Materials for Various Improved Pharmaceutical Applications

Author(s)

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Objective:

The objective of the present study was the development of nanoor micro-materials that are derived from agriculture waste like coconut & rice husk, sugarcane bagasse using extraction, purification, latest analytical techniques, by exploring their technical applicability including pharmaceuticals.^{1,2}

Hypothesis& Methods:

Converting the waste to valuable materials in different products for the pharmaceutical industry is an ecofriendly approach for waste management. It will prove to be a promising option to conserve our natural resources. On utilizing the agro-residue at low cost to the Pharma industry, farmers can get rid of burning the residue onsite which will reduce the environmental pollution as well as our dependency on chemical pharmaceutical excipients.

Different isolates and their derivatives (microcrystalline cellulose, nanocellulose & methyl cellulose etc.) were extracted, purified and characterized by different physico-chemical (pH, Solubility, Swelling index, density, Carr index, Hausner ratio) and spectral analysis (SEM, FTIR). Later, these cellulose derivatives will be evaluated for the utilization in various technical applications like pharmaceutical excipients.

Conclusions:

The current research project has a direct impact on the industrial application in pharmaceutical as well as in several other industries viz. agricultural, paper, textiles sectors. This work may provide new horizons for the efficient technical utilization of the agriculture residue/biomasses derivatives.

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P40

Using Nanoscience to Develop Nanoformulation

Author(s)

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Bhawna Jha¹

Abstract

Nanoscience has potential application in the development of nanoparticles as delivery systems, which exhibit several advantages such as low toxicity, sustained and controlled release, capacity for targeting, encapsulation, and delivery of poorly soluble drugs. Various types of nanocarriers such as nanogel, metallic, lipidic, polymeric, and carbon-based nanoparticle have been

used as a nano-delivery system. This chapter provides an overview about the different types of nanomaterials, which are used in pharmacy as a suitable delivery system. Also, nanomaterials that have been successfully commercialized or undergone clinical trials to overcome different obstacles associated with free drug or nucleic acid administration in the desired site will be discussed.

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P41**The current prospect of repurposed immunomodulators as adjuvant drugs against tuberculosis****Author(s)**

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Pradeep Kumar Rai^{3*},
Prem Kapur^{4*},
Khalid Umer Khaiyam⁵
Manju Sharma¹**

Background: Tuberculosis (TB) is a disease that kills people all over the world. The study's goals were to determine the impact of metformin on the safety and efficacy of antitubercular medication, as well as the mechanisms by which it works (ATT).

Methodology: The study included TB patients with Type 2 diabetes mellitus (T2DM) who were treated at the HAH hospital in New Delhi, India. Metformin users and non-users were divided into two groups based on the presence of metformin in their prescriptions. Through flow cytometry, total T Cells (CD45+CD3+), Helper T Cells (Th) (CD45+CD3+ CD4+), and Cytotoxic T Cells (Tc) (CD45+CD3+CD8+) were immunophenotyped. For sample

acquisition, BD FACS Verse and BD LSR II techniques were applied.

Results: Estimation of CD3, CD4, and CD8 levels at the second visit demonstrated that metformin users had higher CD3 (p=0.001), CD4 (p=0.004), and CD8 (p=0.001) cell percentages than metformin non-users. Metformin users requires less time to convert sputum smears than metformin non-users (p = 0.0318, unpaired t-test).

Conclusion: Metformin has a beneficial effect on TB and T2DM, and it may be used as an adjuvant antitubercular medication in TB patients with T2DM co-morbidity.

Keywords: Metformin, Tuberculosis; Host directed adjuvant therapy; Drug repurposing

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Safety Concerns and Regulatory Issues of Nanomaterials in Food and Agriculture: An overview

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Mukesh Dhawan¹,
Monu Thakur¹**

Abstract

In last few decades nanomedicine has been growing at a very high rate due to having unique chemical and physical nature; inspite of it the risk factor also associated with this growing technique by virtue of which ample attention has towards this issue. The major cause is nanotoxicity that contributed is large surface area and small size of nanomaterials, that allow fast dispersion and invasion of barriers in human organ system. These different kind of physical and chemical properties of nanomaterial make detection of their toxic effect twisting and challenging. For this we have a very depth knowledge of various mechanism involved in nanomaterials toxicity and action. Respiration, dermal and g.i.t are the various route to entering of nanomaterial and showing its nano- toxicity on human body.

That's why we have limited role of nanomaterial as diagnostic tool and therapeutic. In this review main focus on nanomaterial cell interaction that leads to toxicological effect. Oxidative stress, carcinogenic potential, and genotoxic are various mechanism involved in nanomaterial mediated toxicity. Nanotoxicity on different organ with major effects are respiratory system and cardiac system. As conclusion the risk management of toxicity is also summarized. This review gave us a good understanding of recent scenario of nanotoxicology study, disease progression and its use in medical therapeutics and food industry. In short, regulation and rule required are basic component of policy makers has been discussed seriously.

Keywords : Nanotoxicity, Nanomedicine, Diagnostic tool and Therapeutic, Oxidative stress, Carcinogenic potential, and Genotoxic

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P43**COVID-19: Nanomedicines an Asset for Development of Vaccine****Author(s)****ShivaliRahi*,
Arpana Rana****Abstract**

Vaccine is a biological preparation that provides active acquired immunity to a particular infectious disease. Unparalleled consequences and high transmission rate of Covid -19 made it challenging and urgent for the health sector to identify viral pathogens and understand their integral or basic resistance mechanisms. This precedes the way for new approaches to combat severe acute respiratory syndrome coronavirus-2 (SARS CoV-2). Nanomedicine is fast providing solutions to the problem of designing new vaccines for coronavirus because nanomaterials are perfect vehicles for delivering antigens, and they can mimic the structure of the virus and play the role of adjuvant perfectly. Nanomaterials, including dendrimers, liposomes, polymeric

nanomaterials, various organic and inorganic and hybrid NPs and many other self-assembled nanostructures, are being explored for their possible role as delivery vehicles/antiviral agents against many diseases, and COVID-19 is no exception. Nanomaterials not only aid in the design of novel vaccines against coronavirus, but they also enhance the efficacy of repurposed drugs.

This review highlights the recent advances in COVID-19 infection, with a particular emphasis on nanomedicine applications that can help in the development of effective vaccines or therapeutics against COVID-19. Nanomedicine-based approaches could open new opportunities for anti-coronavirus therapies

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***Withania somnifera* Extract Improve Cognitive, Behavioral and Mood Disorder in Animal Model of Bipolar Disorder**

Author(s)**Mohammad Rashid****Iqbal^{1,2*}****Satish Kumar Sharma¹****Objectives**

In this paper we examined the *Withania somnifera* extract improve cognitive, behavioral and mood disorder in animal model of Bipolar disorder.

Hypothesis

The present study was undertaken to investigate the effects of WS extract on cognitive, behavioral and mood disorder associated with Bipolar disorder in adult female Wistar albino rats. Various behavioral parameters, memory function test, Biochemical estimation, Histopathology and radiological tests were performed to analyse the effects of WS extract in animal model of bipolar disorder.

Method

Amphetamine model of bipolar disorder was used in the present study. The duration of study was 14 days. Female Wistar albino rats, weighing 200-230 gm was divided into six group. After 24 hours of last dosing Various behavioral, memory function test followed by estimation of markers of oxidative stress such as Glutathione estimation, TBARS, SOD, Protein estimation was performed. Histopathology of brain was study and was

observe various neurological changes in various parts of brain of rat which control emotion thought and memory, Radiological study such as PET and MRI of brain was performing to see the various anatomical changes in different part of brain of rat. In order to correlate the extent of cerebral infarction assessed in in-vitro TTC staining, the in-vivo Single Photon Emission Computerized Tomography (SPECT) imaging using ^{99m}Tc-ECD as radiopharmaceutical was carried out in bipolar disorder.

Result

Our results showed that *Withania somnifera* extract (WSE) improved learning and memory in elevated plus maze, Spontaneous alteration behaviour, locomotor activity, enhance cognitive effect by decreasing AchE and reduced oxidative stress. Thus, it may be concluded that *Withania somnifera* extract (WSE) may have neuroprotective and antioxidant effect. Our result needs further confirmation by doing multiple dose dependent studies in different animal models with the estimation of neurotransmitters to confirm its role in bipolar disorder.

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Meloxicam Loaded Colon-Specific Mucoadhesive Microspheres for the Treatment of Rheumatoid Arthritis in CFA-Induced in Rats

Author(s)**S S H Abadi ¹****Abstract**

To fulfill the multi-task functions like enhanced solubility and bioavailability of poorly soluble drug, reduce dosing frequency, avoid acidic degradation, etc., hence uncoated meloxicam (MLX)-loaded colon-specific mucoadhesive microspheres (MLX-Na-AGP) were prepared by ionotropic gelation method (crosslinking technique) using sodium alginate and aloe vera gel powder as a drug release modifiers to achieve controlled and prolonged release pattern with maximum bioavailability and Calcium chloride (CaCl_2) as crosslinking agent. A fixed drug concentration and various ratios blend of polymeric matrix were used in the preparation of microspheres. The combinative therapeutic effect of MLX with well-known anti-inflammatory medicinal value of AGP, while AGP is used as a carrier to the colon-specific microspheres for the treatment of "complete Freund's adjuvant" (CFA) induced rheumatoid arthritis (RA) in Wistar rats. Various parameters and drug release potential were evaluated for developed microspheres, which showed satisfactory results. In FTIR studies, no substantial drug-polymer interactions were found. In vitro drug release of MLX-Na-AGP microspheres of all batches was carried out at progressive pH using different buffer solutions (0.1 N HCl pH 1.2 and pH 4.5, pH

6.8, pH 7.4 PBS buffers) at different time intervals for 24 h, and it was found that drug release followed zero-order kinetics with super case II transport drug release mechanism. All microspheres exhibited much slow drug release at acidic pH and that was increased progressively with increased pH and maximum drug release was found for all batches at pH 7.4 PBS at the end of 24 h. The prepared microspheres exhibited satisfactory micromeritic flow attributes which evaluated in terms of angle of repose (24.87 ± 0.45 – $32.05 \pm 0.19^\circ$), bulk density (0.528 ± 0.007 – 0.731 ± 0.032 g/cc) and tapped density (0.684 ± 0.009 – 0.949 ± 0.037 g/cc), Compressibility index ($10.62 \pm 0.42\%$ – $23.03 \pm 0.423\%$) and Hausner's ratio (1.118 ± 0.005 – 1.299 ± 0.007). Mean particle size of different batch of formulations (F1–F14) was found in a range of 109.16 ± 0.96 – $1,025.12 \pm 0.29$ μm , respectively. Drug entrapment efficiency of the formulations was found in the range of $51.02 \pm 0.19\%$ – $91.44 \pm 0.1\%$. In pharmacokinetic study optimized formulation (F12) showed 2.29 times higher bioavailability over the free drug, and also showed significant results in pharmacodynamic studies and AGP in CFA-induced RA in animal model of male albino Wistar rats.

Keywords: Colon-specific, Rheumatoid arthritis, Higher bioavailability, Prolonged release

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