G. PULLA REDDY COLLEGE OF PHARMACY

Mehdipatnam, Hyderabad - 500028

Affiliated to Osmania University; Approved by PCI; Accredited by NAAC

Phone No: 8297511177 Email: gprcphyd@gmail.com Website:www.gprcp.ac.in

ABSTRACTS

ONE DAY SEMINAR ON

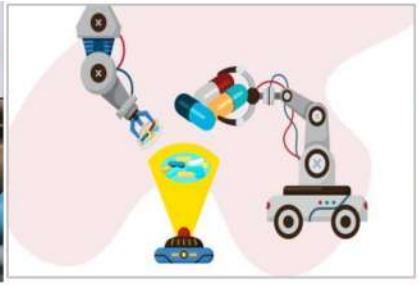
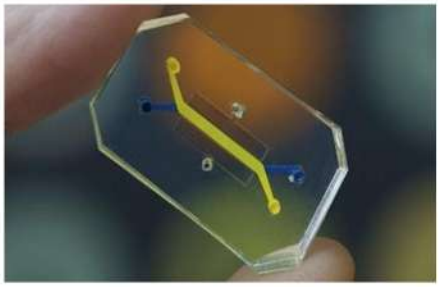
"INNOVATIONS IN PHARMACEUTICAL RESEARCH -2023

ORAL & POSTER PRESENTATIONS"

16TH December 2023





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VISION: G. Pulla Reddy College of Pharmacy envisages to become the centre of excellence for research in Pharmacy. It aims to contribute significantly to drug development and drug discovery..

MISSION: G. Pulla Reddy College of Pharmacy aims to be on forefront in imparting the disciplined and quality Pharmacy education. The Graduate and Postgraduate students shall be groomed as responsible & highly acclaimed professionals in the Pharmaceutical Arena

COURSES OFFERED:

B. Pharm

Pharm. D

M. Pharm: Pharmaceutical Chemistry

Pharmaceutics

Pharmacology

Pharmaceutical Analysis

Pharmaceutical Regulatory Affairs

ONE DAY SEMINAR ON

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16TH December 2023

SPEAKER PROFILE

Mr. Mohamed Masihuddin,
Assistant General Manager,
Regulatory Department,
Viatris Laboratories Limited,
Hyderabad.

Mr. Md Masihuddin is a Passionate Regulatory Affairs professional with 16 years of experience in managing various projects of different types of dosage forms (Tablets, Capsules, Oral Solution and Injections) for various markets like WHO, EU, South Africa, ASEAN, MENA and LATAM regions in different multinational pharmaceuticals companies. He has expertise in regulatory life cycle management, strategy, and risk mitigation. He is Instrumental in streamlining and improving processes, enhancing productivity, and implementing technology solutions.

He previously worked for Orchid HealthCare, Panacea Biotec Limited, AGEPHA GmbH, Mylan Laboratories Limited (Now Viatris), Montajat Pharmaceuticals and Klybeck Life Sciences. He has through Knowledge of WHO, ICH, USFDA and EMEA regulatory guidelines and is a conversant with different pharmacopoeia and its interpretation.

ONE DAY SEMINAR ON

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ORAL & POSTER PRESENTATIONS"

16TH December 2023

SPEAKER PROFILE

Dr. Katkam Srinivas
Senior Vice President,
Global head, Sales and Marketing – API,
MSN Laboratories Private Limited,
Hyderabad.

Dr. Katkam Srinivas is a well-recognized and appreciated business & technical leader in Pharma Industry. He is uniquely blended with deep expertise in both science and business skills. He is presently working as Head - Global Sales & Marketing for API Business at MSN Group. In the last 6 years, with his expertise in B2B sales, he has been instrumental in taking MSN API business to 600 mn USD presumably the largest pure-play generic API business in the world as of today. He has institutionalized several initiatives in MSN API business as key account management, customer service, portfolio management, IP-centric product customizations, Life cycle management, Sales team transformation etc.

In his earlier innings of 22 years at Dr. Reddy's, Dr. Katkam Srinivas was part of R&D leadership and had immensely contributed to developing complex API based on Chemistry platforms such as Peptides, Polymers, Prostaglandins, and Carbohydrates. He has dozens of patents granted for pharmaceutical development and is highly skilled at generating Novelty for new products such as co-crystal, solvates, novel polymorphs, alternate salts, premixes and amorphous. He has rich experience in framing regulatory strategies for peptides and complex products and associated deficiency management.

CONTENTS

G. PULLA REDDY COLLEGE OF PHARMACY, HYDERABAD

Organizing committees for One Day Seminar on "**Innovations in Pharmaceutical Research-2023 and Oral & Poster Presentations**"

16th December 2023

	Registration Committee	Abstract Committee	Scientific Committee	Oral Presentations Committee	Poster Presentations Committee	Hospitality Committee
Teachers	Dr. K. Latha Dr. P. Ravi Kumar Dr. T. Radhika Dr. N. Raghavendra babu Mrs. Saheli Ghosh Ms. S. Apoorva	Dr. R. Padmavathi Dr. D. Prasanthi Mrs. Gouhar Sultana Dr. V. Nagesh	Dr. PK. Lakshmi Dr. Trapthi Saxena Dr. SK Nasheeb Basha Ms. V. Abhishiktha	Dr. S. Venkatesh Dr. A. Ravi Kiran Dr.S.Sravanthi Mrs.K.Archana Reddy	Dr.Y.Padmavathi Dr.A.Lalitha Devi Mr.Y.Srihari	Dr.B. Veeresh Mrs. Ch. Rajeshwari Mr. Naveen Kumar Mr. Saravan Kumar

ORAL PRESENTATIONS

PCU-OP-001

FORMULATION DEVELOPMENT AND IN VITRO CHARACTERIZATION OF SODIUM VALPROATE SUSTAINED RELEASE MATRIX TABLETS

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In the present work, an attempt has been made to develop Sustained release tablets of Sodium valproate by selecting natural polymers Tragacanth, Acacia gum, Xanthan gum as retarding polymers. All the formulations were prepared by direct compression method. The blend of all the formulations showed good flow properties such as angle of repose, bulk density, tapped density. The prepared tablets were shown good post compression parameters and they passed all the quality control evaluation parameters as per I.P limits Among all the formulations F2 formulation showed maximum % drug release i.e., 98.19% in 12 hours hence it is considered as optimized formulation F2 which contains Tragacanth (100 mg). Optimized formulation F2 was followed Higuchi release kinetics mechanism.

Keywords- Polymers, Tragacanth, Acacia gum, Xanthan gum

PCU-OP-002

CARBON DOTS – A NOVEL TREND IN PHARMACY

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Carbon dots (C-dots) are emerging as a fascinating class of carbon-based nanomaterials with unique optical and electronic properties. These nanoscale particles, typically ranging from a few to several tens of nanometres in size, exhibit excellent photoluminescence and can be easily synthesized from various carbon sources, such as carbon nanotubes, graphene, or

organic compounds. The photoluminescent behaviour of carbon dots arises from their quantum confinement effect and surface state emissions. They can absorb photons of a specific wavelength and subsequently emit light at a longer wavelength, making them suitable for applications in bioimaging, sensing, and optoelectronics. They also exhibit remarkable electrochemical performance, making them promising candidates for energy storage applications. Furthermore, carbon dots can be functionalized with various surface groups, allowing for tailored properties and improved device performance. The synthesis and characterization of carbon dots involve techniques such as hydrothermal synthesis, solvothermal methods, and microwave-assisted synthesis. In conclusion, carbon dots represent a versatile and promising class of nanomaterials with significant potential in various fields. Their unique optical and electronic properties, coupled with their biocompatibility and tunability, make them attractive for applications ranging from bioimaging and sensing to energy storage. Continued research and development in this field hold great promise for advancing these nanomaterials towards real-world applications.

Keywords: Carbon dots, Nanoscale particles, Quantum, Photoluminescence, Hydrothermal synthesis

PCU-OP-003

BRAIN CHIP: A NOVEL DRUG DELIVERY SYSTEM

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Individuals with severe disabilities face challenges performing normal everyday tasks. Today researches are developing a technology that could conceivably alleviate many difficulties associated with physical handicaps. Now computer intellegency brought a ‘arms race’ for the solution named BCI (Brain Computer Interface). The brain acts as the command and control center for the human body. It’s ability to integrate numerous signals to and from various sources underlines the complex behavior of humans. The brain controls basic functions like breathing, tasting and moving. A BCI is a device that functions independently of the Brain’s normal out- puts. The primary goal of this system is to promote the paralysis patients to able their movements connecting directly to the brain. The primary motor cortex controls

voluntary movement signals which divided in to specific regions to control distinct parts of the body. So, the primary motor cortex is an ideal site for the BCI because of this distribution. Concludes that Brain Chip read's man thoughts. BCI an "arms race" gives an artificial thinking. Chip acts as a nerve cell to brain responses to stimuli. It makes disable recipient able to do things.

Keywords: Brain Computer Interface, NDDS.

PCU-OP-004

ELECTRONIC TATTOOS: A NEW GADGET TO REVOLUTIONIZE PATIENT MONITORING

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TATTOO is a form of body modification , made by inserting inedible ink into dermis of skin to change the pigment. ELECTRONIC TATTOO, An ultra-thin electronic device that attaches to the skin .tattoo can measure electrical activity of human body. In the medical diagnosis and health monitoring is an unimaginable feet achieved in the field of medical health monitoring. The use of electronic tattoos made the diagnosis of the health a very easy task emancipating all the difficulties that prevailed in terms of their performance. Miniature devices have become wearable beyond the form factor of watches and rings – functional devices can now directly affix to users skin unlocking a much wider canvas for electronics. This is the latest attempt to revolutionize medicine with devices that turn skin into a digital platform, reducing the need for painful needles or cumberstone equipments. Electronic tattoo could be an important advance in wearable electronics, to achieve something that is almost unnoticeable to the wearer. The technology can connect to the physical world in a very natural way that feels comfortable. Monitoring in a natural environment during normal activity is especially beneficial for continuous monitoring of health and wellness, cognitive state or during sleep. The vision is to exploit these concepts in systems that have self-contained, integrated functionality, perhaps ultimately working in a therapeutic fashion with closed feedback control based on integrated sensors, in a coordinated manner with the body itself.

Keywords: Electronic tattoos, Self-monitoring patient compliance.

PCU-OP-005

NANOROBOTICS AND ITS APPLICATIONS

G. Harshini, Fatima Mirza

G. Pulla Reddy college of pharmacy

Nanorobotics is emerging as a demanding field that combines nanotechnology with robotics. Nanorobots differ from macro-world robots, specifically in their nano-sized constructs. Practically these systems are nanoelectromechanical devices that are capable to carry pre-programmed functions in a reliable and accurate manner with the help of energy provided by a pre-installed nano motor and nano machine. It allows the placement of small structures with precision and improve the quality of life. A nanorobots would have special sensors to detect the target molecules, they can also be used for controlled drug release, tumor diagnosis, cellular as well as genetic repairing of biological system.

Keywords: Nanotechnology, Nanomedicine, Bionanorobots.

PCU-OP-006

3D PRINTING IN PHARMACEUTICAL INDUSTRY

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3D Printing of drugs uses computer aided designs to manufacture customised pharmaceutical drug products.Growing demand for customised pharmaceutics and medical devices makes the impact Of additive manufacturing increased rapidly in recent years, 3D printing is one of the most revolutionary and powerful tool serving as technology of precise manufacturing of individually developed dosage forms. It also allows the design and print of more complex designs than in traditional manufacturing processes. It could add a whole new aspect of possibilities to personalised medicine. A doctor or a pharmacist would be able to modulate the medication as per individual patients need. It may also allow single pills to have a combination of one or more drugs to treat multiple ailments. Many pharmaceutical researchers have been working hard towards the use of 3D printing to manufacture a

customised pharmaceutical product. The undeniable benefits of 3D printing are highlighted, however a critical view resulting from limitations and challenges of 3D printing is also included.

Keywords: 3D printing, personalised medicine, additive manufacturing.

PCU-OP-007

NOVEL VESICULAR CARRIERS: PRONIOSOMES

Konduru naveena

Sarojini Naidu Vanita Pharmacy Maha Vidyalaya

Vesicular systems have been receiving a lot of interest as a carrier for advanced drug delivery. Encapsulation of the drug in vesicular structures can be expected to prolong the duration of the drug in the systemic circulation and to reduce toxicity by selective up-taking. Drug delivery systems using colloidal particulate carriers such as liposomes or niosomes have proved to possess distinct advantages over conventional dosage forms because the particles can act as drug reservoirs, and can carry both hydrophilic drugs by encapsulation or hydrophobic drugs by partitioning these drugs into hydrophobic domains and modification of the particle composition or surface can adjust the drug release rate and/or the affinity for the target site. Although niosomes as a carrier have shown advantages such as being cheap and chemically stable, they are associated with problems related to physical stability such as fusion, aggregation, sedimentation, and leakage on storage**.** All methods traditionally used for the preparation of niosomes are time-consuming and many involve specialized equipment.

*Keywords****: Proniosome, Sufactant, Niosomes, Vesicular Drug Delivery***

PCU-OP-008

FOUNDATION AND APPRAISAL OF VERDANT TOOTH POWDER WIELD NATURAL EXTENDERS SPOTLIGHT WITH THREE FUSING ANTI INFLAMMATORY PROXY

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An anti-inflammatory is an agent that reduces inflammation (redness, swelling, and pain) in the body testing can be used for drug discovery, epidemiology and prediction of therapeutic outcome. In this research, we focused on the use of anti-inflammatory testing method for the in vitro investigation of extracts as potential anti-inflammatory agent. In the present study Vaccinium myrtyllus, Borago officinalis and Uncaria tomentosa plant leaves were selected to prepare verdant anti-inflammatory powder. Hydro-alcoholic extract of leaves were subjected to preliminary phytochemical screening for possible presence of bioactive anti-inflammatory compounds. Herbal powder formulations B1 -B9 were prepared using leaves fine powder Grinding the thermal decomposition of solids and the deposition of solids from the liquid or vapour phase. The optimized herbal toothpowder with chemical composition Uncaria tomentosa 20g, Anti Inflamatorty agent. Rosmarinus officinalis 10g, [cleansing agent]. Eryngium15g, Bactericidal agent. Schisandra10g, Antioxidant Achillea millefolium 20g, Astringent. Cane molasses 5g, Sweetning agent. Matricaria recutita 10g, Refereshing agent. Basil 10g, Whitening agent reduces inflammation, bad odor and plaque formation Evaluations Like Shade Test, Colour Dispersion Test, Pay-off Test, Pressure Test, Breakage Test, Flow Property Test, Particle Size Determination, Abrasive Character, Moisture Content, Flow Property, Determination of pH, Ash values, Extractive values and Irritancy test. Anti-inflammatory activity of all prepared sample B1-B9 was compared to standard. But the sample B3 shows more anti-inflammatory activity than Remaining formulations.

Keywords: Anti-inflammatory Verdant powder, Vaccinium myrtyllus, Borago officinalis and Uncaria tomentosa.

PCU-OP-009

PERSONALISED MEDICINE UTILISING GENETIC TECHNOLOGY

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Personalised medicine represents a transformative frontier in healthcare, where treatments are tailored to individual genetic profiles. This abstract delves into the pivotal role of genetic material in propelling pharmaceutical research and innovation forward. Advanced methodologies such as genomics, transcriptomics, and proteomics empower healthcare professionals to decode unique genetic codes, enabling tailored interventions and optimized drug responses. Genetic profiling not only identifies disease predispositions but also anticipates potential adverse reactions, fostering proactive and precision-based healthcare strategies aimed at revolutionising patient care. However, amidst these advancements, significant ethical considerations and operational challenges emerge, including issues surrounding data privacy and the seamless integration of genetic insights into established healthcare systems. Overcoming these complexities necessitates collaborative efforts across disciplines and a sustained commitment to ongoing research. Yet, the promise of integrating genetic insights into pharmaceutical research is transformative, holding the potential to usher in a future where treatments are intricately aligned with individual genetic profiles, elevating therapeutic outcomes, and reshaping the trajectory of pharmaceutical development toward a more personalised and effective paradigm**.**

Keywords: Personalised medicine, Genetic material, Pharmaceutical innovations, Genetic Profiling Data Privacy, Tailored interventions.

PCU-OP-010

FORMULATION AND EVALUATION OF MESALAMINE MICROSPHERES

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Mesalamine is an orally-administered chemotherapeutic agent used in the treatment of ulcerative colitis. The present research was to formulate and optimize Mesalamine loaded microspheres targeting to enhance bioavailability, reduce dose, minimize side effects and sustain drug release. The Mesalamine polymeric microspheres were prepared by solvent evaporation and Ionotropic gelation technique method. The drug excipient compatibility study of active drug (Mesalamine) and polymer performed by Fourier transform-infrared spectroscopy and differential scanning calorimetry confirmed that there was no interaction. The resulting microspheres were evaluated for partial size, surface morphology of Mesalamine microspheres. Formulation F2 showed the maximum entrapment efficiency. Formulation F-2 showed percent entrapment efficiency of 90.25%. Percent yield value was found to be 70.21%. The particle size was found 150.50 µm. A sustained release pattern was obtained from the microsphere and the drug's bioavailability was found to be enhanced. In vitro release study showed that Mesalamine release from both kinds of microspheres was slow followed by an increase to reach a maximum of 98.80%.

Keywords: Mesalamine, microspheres.

PCU-OP-011

FORMULATION AND EVALUATION OF PACLITAXEL NANOSUSPENSIONS

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Paclitaxel is a diterpenoid isolated from Taxus brevifolia. It is effective for various cancers, especially ovarian and breast cancer. Paclitaxel was formulated as a nanosuspension by high pressure homogenization. The formulated Nanosuspension was subjected to various evaluation parameters like particle size, zeta potential, drug content, In vitro release and

stability studies. Zeta potential ranged from -26 mV to -31 mV are the important evaluation parameters which are responsible for the stability of nanosuspensions. In this result, F4 shows spectacular drug content 90.25 % it is the maximum drug content. The general Nanosuspension formulations F4 shows 98.14% better controlled release in comparison with abundant formulation. Acceleration stability studies intermediate storage condition has been changed from 30°C ± 2°C and 60% RH ± 5% relative humidity. After a 90 days study it revolves that there's no change in drug content, In vitro drug release, and particle size.

Keywords: Paclitaxel, FTIR, homogenization, In vitro drug release, Stability studies

PCU-OP-012

TOP 9 INNOVATIONS AND TRENDS COMING IN THE PHARMACEUTICAL INDUSTRY

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The pharmaceutical industry has a long-term influence on human well-being and drives its constant evolution to meet the dynamic needs of an ever-changing environment. The context discusses the future and innovations in the pharmaceutical industry, which has a long -term influence on the human being and drives its constant evolution. It also highlights nine innovations and trends that are reshaping the landscape of medicine, such as precision medicine, sustainability and green initiatives, immunotherapy, digital therapeutics, continuous manufacturing, nanotechnology, 3D printing, partnerships and open innovation, and adaptive approval processes. These innovations are expected to enhance the quality, safety, efficacy, and sustainability of healthcare practices and products.

Keywords: immunotherapy, nanotechnology, green initiatives, healthcare.

PCU-OP-013

NANOTECHNOLOGY IN DRUG DELIVERY

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Efficiently delivering therapeutic compounds to afflicted areas is important for effective disease treatment. Nanotechnology facilitates the development of drug delivery systems, modifying both pharmacological and therapeutic impacts. Utilizing nanoparticles, particularly in targeted tumour drug delivery, showcases nanotechnology's potential with unique in vitro and in vivo properties. These nanoparticles offer advantages like improved delivery, enhanced product performance, reduced usage of costly drugs and more effective treatment with minimal side effects.

Keywords: nanotechnology

PCU-OP-014

LIQUIDNANOCRYSTALS: AN INNOVATIVE WAY IN NOVEL DRUG DELIVERY

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Liquid nanocrystals have been utilized as an efficient tool for drug delivery with enhanced bioavailability, drug stability, and targeted drug delivery. The liquid crystalline state has both the properties of liquid and solid. The liquid state is found to be associated with flow property whereas the solid state has structural properties of crystallinity in aspects of orientation and position. liquid crystalline phases represent intermediate states called mesophases. They have proven to be advantageous over traditional, dermal, parenteral, and oral dosage forms. Liquid crystals are thermodynamically stable and possess a long shelf life. They show bio-adhesive properties and sustained release effects. During the last two decades, many modern technologies have been established in the pharmaceutical research and development area. The

automation of the drug discovery process by technologies such as high-throughput screening, combinatorial chemistry, and computer-aided drug design is leading to a vast number of drug candidates possessing a very good efficacy. Unfortunately, many of these drug candidates are exhibiting poor aqueous solubility. The use of drug nanocrystals is a universal formulation approach to increase the therapeutic performance of these drugs in any route of administration. The biological effects of nanocrystals depend on the chemical nature of the hydrophilic coating molecules. These factors are responsible for drugs and drug delivery. Thus, liquid nanocrystals could be a potential gateway in drug and biomolecule delivery.

Keywords: Liquid Crystals; Novel Drug Delivery System; Sustained Release

PCU-OP-015

MICRONEEDLES: AS MUCOSAL VACCINE DELIVERY SYSTEM

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The mucosal immune system plays a crucial role in the defence against respiratory, gastrointestinal, and genitourinary infections, and it is an attractive target for vaccine delivery. Microneedles are a promising technology for the delivery of vaccines through mucosal surfaces. Microneedle patches, also called microarray patches (MAP), are an emerging technology for delivery and sampling of drugs, vaccines, and other materials. Microneedles have the potential to enhance immune responses, increase patient compliance, and reduce the risk of infection. Microneedles can be fabricated from a variety of materials, including metals, polymers, and ceramics, and they can be designed to dissolve or release their payload upon insertion into the mucosal tissue. They can also be coated with adjuvants to enhance the immune response or with mucoadhesive polymers to improve retention at the site of application. Microneedles can be administered through a variety of routes, including the nasal, oral, vaginal, and rectal routes. Recent studies have shown that microneedles can be effective for the delivery of a wide range of vaccines, including influenza, HPV, and rotavirus vaccines. Microneedles have also been shown to induce stronger and more durable immune responses compared to traditional needle-based vaccination, and they have the potential to increase vaccine coverage and reduce the cost of vaccination programs.

Keywords: Microneedles,Mucosal Vaccine delivery system.

PCU-OP-016

NANOFIBERS AS A DRUG DELIVERY TOOL

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Over the years, scientists have tried to develop innovative solutions to design and fabricate medicines with improved therapeutic potential. Dosage forms, such as tablets, capsules, and injections, are limited. To serve these limitations, nanofibers have emerged as novel nanomaterials to provide enhanced bioavailability, targeted and extended drug release profile, minimum toxicity, and reduced dosage frequency, which has improved patient adherence and compliance. Nanofibers have a large area of surface variable 3D topography, porosity, and adaptable surface functions. It manages cardiovascular disorders, infectious diseases, gastrointestinal tract-associated diseases, neurodegenerative diseases, pain treatment, contraception, and wound healing. Nanofibers can be formulated by various fabrication techniques under unique names and categories like top-down and bottom-up methods or physical, chemical, and biological approaches, or spinning and non-spinning methods. Nanofibers are manufactured using a variety of polymers such as natural, semi-synthetic, synthetic, carbon, nonporous materials, and core-shell structures. They are a good alternative for targeted gene, protein, peptide delivery, and growth factor delivery. Polymer nanofibers exhibit characteristics including easy preparation, adjustable features of wettability and elasticity, tailored surface and interface properties, and surface-to-volume ratio, and are used to develop new DDS. Different kinds of drugs can be incorporated into the polymer nanofibers. Thus, nanofibers have huge potential in drug delivery.

Keywords: Nanofibres, gene protein, drug delivery.

PCU-OP-017

NANOEMULSIONS AS OPHTHALMIC DRUG DELIVERY SYSTEMS

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Nanoemulsions are liquid-in-liquid dispersion with a droplet size of about 100 nm. They have a transparent appearance, a high rate of bioavailability, and increased shelf life. They mainly consist of oil, water, surfactant, and cosurfactant and can be prepared by high- and low-energy methods. They are characterized by various parameters such as globule size, zeta potential, polydispersity index, entrapment efficiency, and drug release, etc. Nano-emulsions formulated for ocular drug delivery have a good scope in pharmaceutical products due to transparency at enlarged droplet volume fraction. They are a part of multiple-phase colloidal dispersion where a heterogenous system has a fine oil in water or water in oil dispersion in addition to the surfactant and cosurfactants with droplet size of 20-600nm. They are applicable for the delivery of a wide variety of drugs, peptides, and vaccines. Further advancement in the field of nanoemulsion technology is to formulate nanoemulgel, nanoemulsion *in-situ* gel, and nanoemulsion in patches. Thus, nanoemulsions could be promising drug delivery carriers for the enhancement of solubility, permeability, and bioavailability and provide sustained drug release.

Keywords: Nanoemulsions, Opthalmic drug delivery.

PAQ - OP - 001

COMPARATIVE DETERMINATION OF LINEZOLID BY MICROBIOLOGICAL ANALYTICAL METHOD AND UV SPECTROPHOTOMETRIC METHOD IN BULK AND PHARMACEUTICAL DOSAGE FORM

Asma Begum

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Linezolid is in a class of antibacterial called oxazolidinones. A new microbiological method applying cup plate method was developed and validated for analysis of linezolid, as well as the evaluation of the ability of the method in determining the stability of linezolid in tablets using Staphylococcus aureus as test organism. A prospective validation of the method yielded good results and included linearity, precision and accuracy. A new UV Spectrophotometry method was developed and validated and used as a method for comparison of results obtained by microbiological assay. Results of both microbiological method and UV-Spectrophotometry method demonstrated good linearity, precise and accurate and the methods was compared with student t-test and the contents of linezolid determined by both methods, showed no significant difference between the two methodologies. The microbiological analytical method which was developed gives true indication of biological activity and can be used for routine quality control analysis of linezolid on dosage forms.

Keywords: Staphylococcus aureus, Diffusion agar method, Linezolid, UV Spectrophotometer,
Method validation

PAQ - OP - 002

METHOD DEVELOPMENT AND VALIDATION OF VISIBLE SPECTROMETRIC METHOD FOR THE DETERMINATION OF FAVIPIRAVIR IN BULK AND PHARMACEUTICAL FORMULATION USING CHROMOGENIC REAGENT

Koppera Sowmya

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Favipiravir, an antiviral drug widely used to treat SARS CoV-2 (The Novel Coronavirus), is a derivative of Pyrazine Carboxamide with activity against RNA viruses. Visible spectrometric

technique is designed to provide an estimation of Favipiravir in bulk and pharmaceutical dosage form using chromogenic reagent to develop a yellowish red colored chromogen with a maximum absorption at 609 nm in accordance with Beers law and region of 10 to 50 µg/ml. The method involves oxidation followed by coupling with 3-methyl-2- benzathiazolinone hydrazine (MBTH) with the drug in the presence of ferric chloride, yielding a determination coefficient (R2) of 0.998. The LOD and the LOQ considered to be 1.29 and 3.93µg/ml respectively. The developed technique has been given approval in accordance with ICH Q2R1 guidelines. The result demonstrates how precise and linear the approach is. Additionally, they have been successfully applied to determine Favipiravir in dosage forms such as tablets, showing good recovery and reproducibility.

Keywords: Favipiravir, Antiviral, MBTH, ICH guidelines, Correlation Coefficient and validation.

PAQ - OP - 003

DERIVATIVE SPECTROPHOTOMETRIC METHODS FOR THE ANALYSIS OF AMBRISENTAN IN PHARMACEUTICAL DOSAGE FORMS

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Two new derivative and difference spectrophotometric methods were developed for the determination of Ambrisentan in tablets by UV spectrophotometry. Both methods were developed and optimized using Phosphate buffer as solvent system. The difference spectrophotometric method was developed using difference in spectral characteristics of drug was observed in acid buffer pH 2 phosphate buffer solution and basic buffer pH 8 phosphate buffer solution as a solvent system. The derivative spectrophotometric method was developed by differentiating absorbance of a sample with respect to the wavelength of drug observed in 0.2M pH 6.8 phosphate buffer solution as a solvent system. All the determinations were carried out at 263 nm wavelength. The developed methods were validated as per ICH guidelines [ICH Q2 (R1)]. Linearity was observed over concentration range of 20-100 mcg/mL for Ambrisentan. The coefficient of determination was found to be 0.999 for two methods. The LOD and LOQ were found to be 3.75mcg/mL and 11.37mcg/mL for derivative

spectrophotometric method, 2.842mcg/mL and 8.613mcg/mL for difference spectrophotometric method. The methods were found to be precise and accurate. The validated methods were successively applied for the analysis of Ambrisentan in tablets. The results demonstrate that the method is precise, linear and accurate. The proposed methods were successfully applied for the determination of Ambrisentan in pharmaceutical dosage forms (tablets) with good recovery.

Keywords: UV spectrophotometric; derivative; difference; Ambrisentan; LOD; LOQ.

PAQ - OP - 004

DEVELOPMENT AND VALIDATION OF NOVEL FTIR METHOD FOR QUANTITATIVE ESTIMATION OF APIXABAN IN BULK AND PHARMACEUTICAL DOSAGE FORMS

Mundru Neha

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A new Fourier transform infrared (FTIR) spectroscopic method was developed for the quantitative assessment of apixaban in bulk and pharmaceutical dosage forms. This method involves the preparation of solid pellets of apixaban using KBr with the aid of geometric mixing. The spectra were measured in absorbance mode and the equipment was configured to take spectra at 8cm-1 resolution in IR range. With baseline correction, among which intense, clear and proportionate peaks were selected at 3483cm-1and 3310cm-1corresponding to carbonyl (C=O) and amine (N-H) functional groups for apixaban. Beer Lambert's law was obeyed over the concentration range of 20-120µg/mg for apixaban. The calibration curve was found linear with a R2 value 0.996 and regression equation y = 0.004x + 0.283.The approach was validated according to ICH guidelines. Results were compared with the UV method statistically by using t- test, which indicated that there is no significant difference between the methods at P=0.05. This method was applied for analysis of marketed formulations.

Keywords: Apixaban, FTIR, UV Spectrophotometer, Method validation, ICH guidelines.

PAQ - OP - 005

DEVELOPMENT AND VALIDATION OF NEW SPECTROPHOTOMETRIC METHOD FOR ANALYSIS OF SILODOSIN IN SOLID DOSAGE FORMS USING HYDROTROPIC SOLUBILIZATION AGENTS

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Silodosin is an alpha-adrenergic antagonist that is used in the treatment of benign prostatic hyperplasia. In the latest studies UV-spectrophotometric method was developed in derivative mode for analysis of silodosin using hydro-tropic solubilization agents. The solubility of sparingly soluble organic molecules in water can be enhanced by hydrotropes with an amphiphilic molecular structure. Urea and sodium acetate were used to improve the solubility of silodosin in the method development. The derivative spectrophotometric method was developed by differentiating the absorbance of a sample with respect to the wavelength of the drug observed in acetonitrile along with urea and sodium acetate as a solvent system. All the measurements were taken at 271 nm. The technique was validated according to ICH(Q2R1) guidelines. Linearity was observed over the concentration range of 40-200 mcg/ml for silodosin. The coefficient of determination was observed to be 0.999. The LOD and LOQ were found to be 16.81mcg/ml and 37.94mcg/ml respectively. The method was noticed to be precise, and accurate. The validated method was successively applied for the analyzing silodosin in solid dosage forms.

Keywords: Silodosin, Hydro tropic agents, ICH guidelines. Derivative spectrophotometric method.

PAQ - OP - 006

CHROMOGENIC REAGENTS IN DEVELOPMENT OF SPECTROPHOTOMETRIC METHOD

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Pharmaceuticals can be classified into inorganic, organic compounds as well as excipients. The need to have a readily adaptable method for the quality control of these compounds has led to the development of a wide range of reactions and procedures. Majority of these pharmaceuticals lack adequate chromophores which can permit analysis at wavelength regions beyond the nonspecific UV-region of the electromagnetic spectrum. Thus derivatization reactions are carried out to convert these pharmaceuticals to readily determinable compounds whose properties and concentrations can be related to the original compound. The need to have simple methods for the analysis of pharmaceuticals, in spite of the improvement in modern-day technology, will continue to make these derivatization methodologies relevant in the quality control of these compounds especially in poor-resource economies. The aim of present work is to find out a simple, specific, colorimetric or visible spectrophotometric method using analytical and chemical reagents in bulk and pharmaceutical formulations. In present work different reagents, their properties, uses,mechanism of action and applications are enlisted.

Key words: Pharmaceuticals, Chromophores, Colorimetric, Visible spectrophotometric.

PAQ - OP - 007

ESTIMATION OF MEMANTINE HYDROCHLORIDE BY SPECTROPHOTOMETRIC METHOD USING CHROMOGENIC REAGENTS

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Memantine hydrochloride is used in treating Alzheimer’s disease. Two simple spectrophotometric methods in pure and dose sizes using chromogenic reagents. The technique was validated according to ICH guidelines. Method I-A yellowish-red chromogen with a maximum absorption at 422 nm was created by employing the diazo coupling process with the chromogenic reagent, β-naphthol. Beer's law is followed when the concentration is between 100 and 500 µg/mL, and the coefficient of determination (r2) is 0.999. Limits of quantitation and detection are supposed to be 3.678 g/mL and 9.175 µg/mL, respectively. Method II was created utilising the chromogenic reagent α- naphthol to produce a yellowish-red colored chromogen with a maximum absorption at 536 nm. Beer's law is followed in the concentration range of 300 -700 µg/mL, with an R2 value of 0.992. It was

discovered that the limits of detection and quantitation were 41.85 µg/mL and 126.8 µg/mL, respectively.

Keywords: β-naphthol, α - naphthol , Memantine Hydrochloride, spectrophotometric determination, ICH guidelines.

PAQ - OP - 008

EXPLORING INNOVATIONS & UNLOCKING THE POTENTIALS IN PHARMACEUTICAL ANALYSIS AND FUTURE PERSPECTIVES

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The role of the analytical methods and their validations has been important in pharmaceutical sciences, it provides precise and accurate data supporting the processes include the purity of drug substances during synthesis, pharmacokinetic studies, drug stability, elucidation of the drug metabolic pathways, drug–protein interactions in recent years. However, in the last two decades, modern pharmaceutical analysis has capitalizing on hyphenation techniques, high-throughput technologies, chemometrics, and most recently miniaturization and nanotechnology. High-throughput technologies are having an increasingly important role in early-stage drug development in the frame of preclinical and clinical ADME (Absorption, Distribution, Metabolism, Excretion) studies. The interest in miniaturization technology has grown rapidly, where it has been fuelled by the need to speed- up the analysis in high-throughput screening applications. The combination of various techniques allows the modern pharmaceutical analyst to exploit the virtues of each technique and, in turn, to improve the overall quality of analysis with reduced cost, analysis time, and sample volumes. The recent roles of spectroscopy, chromatography and capillary electrophoresis, high throughput analysis have been explained here in this presentation.

KEYWORDS: Spectroscopy, Chromatography, Hyphenated Technique, High-throughput, Nanotechnology.

PAQ - OP - 009

ANALYTICAL METHOD DEVELOPMENT AND VALIDATION FOR SIMULTANEOUS ESTIMATION OF EMPAGLIFLOZIN AND LINAGLIPTIN IN BULK DRUG AND IN PHARMACEUTICAL DOSAGE FORMULATION BY HPLC

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The purpose of this study was to develop a novel, sensitive and accurate analytical method for the for simultaneous estimation of empagliflozin and linagliptin in bulk drug and in pharmaceutical dosage formulation by HPLC Separation was achieved on waters acquity C18 (100 X 2.1mm id) by using methanol and water in the ratio of 60:40 eluted at a flow rate of 0.5ml/min. The retention time of Empagliflozin and Linagliptin was found to 1.320 and 2.343 mins. Quantification was achieved with photo diode array detector at the wavelength of 270nm. The developed method was validated as per the international conference on harmonization (ICH) guidelines. Based on the peak area with the linear calibration curve at the concentration of 50-150 µg/ml for Empagliflozin and 25-75 µg/ml for Linagliptin % recovery was found to be 99.2% and 99.47% for Empagliflozin and Linagliptin respectively. The LOD were found to be 0.24 µg/ml and 0.734 µg/ml. and LOQ was found to be 0.090 µg/ml and 0.701 µg/ml for Empagliflozin and Linagliptin. The method was found to be specific and can be employed for the routine quality control analysis of both the drugs individually and in combined dosage form.

Keywords: Method development, Empagliflozin, Linagliptin, analytical validation.

PAQ - OP - 010

DERIVATIVE UV SPECTROSCOPIC CLEANING METHOD DEVELOPMENT AND VALIDATION OF DARUNAVIR API INCORPORATED INTO DISSOLVING ORAL FILM

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A new method was established for simultaneous estimation of darunavir by UV spectrophotometric method. The drug was analysed using UV spectrophotometric method and validated in terms of linearity, accuracy, precision, robustness, were determined using ICH recommendations. The solvent used was Acetonitrile and the wavelength corresponding to maximum absorbance of drug were found at 263nm.The linearity was found to be 2 to 10 µg/ml, and the %RSD for repeatability was 0.933, and the correlation was 0.999 and, the % mean recovery was found to be for the different concentrations for 50% was 99.8,100% was 100.7,150% was 99.4 for darunavir. Cleaning method done using Swab method was employed for collecting the residues on a stainless steel plate. Swabs are used to streak on the SS plate horizontally, vertically, and diagonally to collect the residue. Degradation studies were done for API and Synthetic mixture and the % degradation for Acid is 88.12%, Base is 90.6%, H2O2 is 91.9%, UV is 92.5%, heat is 93.1%. Developed method was applied to synthetic mixture of Darunavir API which has its application in formulating OSD. Assay of oral films were done which obeys the beers lambert law in the concentration of 3.27 µg/ml. The finding of the
analysis were statistically confirmed and supported by recovery studies.

Key words: Darunavir, ACN, UV-spectrophotometer, Cleaning method Development, Dissolving oral film

PAQ - OP - 011

CHEMOMETRICS METHODS FOR THE SIMULTANEOUS ESTIMATION OF SITAGLIPTIN AND SIMVASTATIN IN FIXED DOSE FORMULATION

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The present investigation was aimed to establish two chemometrics methods for the estimation of Simvastatin and Sitagliptin in a combined dosage form. The methods are based on mean centering of the values (RMC) and difference between the adjacent data points (DBADP) in the ratio spectra. Both the methods depend on the ratio spectral manipulation and since there are no derivative steps, there is no reduction in signal-to-noise ratio. The

economical method that uses eco-friendly solvent was developed. 0.1M Sodium lauryl sulphate solution is used as the solvent in both the methods. Beer's law was valid in the linearity range of 2-12 µg/mL for Simvastatin and 10-100 µg/mL for Sitagliptin. The correlation coefficients for Simvastatin and Sitagliptin were found to be 0.9993 and 0.9992 respectively for RMC method. The correlation coefficients obtained by DBADP method for Simvastatin and Sitagliptin are 0.9996 and 0.9991 respectively. The percentage recovery for RMC method was found to be in the range 99.43%-100.69% for Simvastatin and 100.22%-102.27% for Sitagliptin. The percentage recovery for DBADP method was found to be in the range of 99.21%-99.88% for Simvastatin and 99.72%-101.3% for Sitagliptin. Both the methods were validated as per ICH guidelines.

Keywords: Simvastatin, Sitagliptin, Chemometrics, Ratio mean centering, Difference between adjacent data points.

PAQ - OP - 012

CHEMOMETRICS METHOD USING RMC FOR THE SIMULATANEOUS ESTIMATION OF MOXIFLOXACIN HYDROCHLORIDE AND KETOROLAC TROMETHAMINE IN FIXED DOSE FORMULATION

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The present investigation was aimed to establish chemometrics method for the simultaneous estimation of Moxifloxacin Hydrochloride and Ketorolac Tromethamine in a combined ophthalmic dosage form. The method was based on mean centering of the values (RMC) in the ratio spectra. RMC method depend on the ratio spectral manipulation and since there are no derivative steps, there is no reduction in signal-to-noise- ratio. The economical method that uses very less organic solvent was developed. 0.1N Urea solution is used as the solvent in the

method. Beer's law was valid in the range of 2-10 µg/mL for Moxifloxacin Hydrochloride and 2-10 µg/mL for Ketorolac Tromethamine. The correlation coefficients for Moxifloxacin

Hydrochloride and Ketorolac Tromethamine were found to be 0.999 and 0.9992 for RMC method. The percentage recovery for RMC method was found to be in the range 101.9 % - 102.7 % for Moxifloxacin Hydrochloride and 100.5 % - 101.8% for Ketorolac Tromethamine. The method was validated as per ICH guidelines.

Keywords: Moxifloxacin Hydrochloride, Ketorolac Tromethamine, Chemometrics, Ratio Mean Centering method.

PCL-OP-001

FECAL MICROBIOTA TRANSPLANTATION IN DISEASE THERAPY

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Fecal microbiota transplantation (FMT) is the transplantation of gut microbiota obtained from the faeces of a healthy donor into patient's gastrointestinal tract. Most often, such therapy is used the treatment of gastrointestinal diseases caused by the activity of pathogenic or conditionally pathogenic microorganisms. This review article presents the current knowledge regarding results of studies concerning the impact of FMT on weight gain, immunological response and treatment of neurological and gastrointestinal diseases and cancer. FMT for neurological and psychiatric disorders Gut microbiota dysbiosis has been proven to mediate or affect various disorders including central nervous system (CNS) disorders, specific microbial populations from the gut promote α- synuclein (α-Syn) overexpression, microglia activation. FMT for gastrointestinal disease Most often, FMT used mainly during treatment of recurrent or refractory Clostridioides difficile infection (CDI), which often occurs when intestinal flora is destroyed due to the use of antibiotics and that do not respond to antimicrobial therapy Fecal transplantation therapy and cancer FMT is safe and bring positive results in treatment of side effects of immunotherapy in oncological patients. Based on presented literature data can conclude that fecal microbiota transplantation in general is a safe therapeutic procedure and has recovery effect in treatment of gastrointestinal diseases caused by the activity of pathogenic/conditionally pathogenic microorganisms. The side effects of FMT are mainly related to inaccurate analysis of fecal donor material and exacerbation of chronic diseases in recipient.

Keywords: Fecal microbiota transplantation, α- synuclein, Immunotherapy

PCL-OP-002

NOVEL GENE-DELIVERY SYSTEMS

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Gene delivery system has an emerging role to develop clinically relevant vectors which combat elusive diseases such as Myocardial Infraction, cancer, Alzheimer's. Several non-

viral and viral gene transfer methods have been developed. Even though the viral agents have a high transferring efficiency, they are difficult to handle due to their toxicity. Shunning of possible immunogenicity and toxicity, and the feasibility of repeated administration are some of the advantages of non-viral over viral gene delivery systems. To overcome the drawbacks of viral and non-viral methods, the most favourable & latest systems include the polymer based non-viral gene carriers. miRNAs are endogenous post-transcriptional regulatory molecules that could be involved in the regulation of cardiomyocyte apoptosis.

Keywords: Gene transfer, non-viral gene delivery systems, miRNAs.

PCL-OP –003

A THERAPEUTIC APPROACH: CAN ZILEBESIRAN REVOLUTIONIZE HYPERTENSION MANAGEMENT?

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The World Health Organization recently stated: 'It has been estimated that (worldwide) 1.4 billion adults have hypertension, but less than 14% of these have their blood pressure (BP) controlled with antihypertensive drug therapy.' A high proportion of hypertensive patients exhibit uncontrolled blood pressure (BP), associated with poor adherence, linked to pill burden and adverse effects. Zilebesiran is a first-in-class, small interfering RNA (siRNA) that prevents the hepatic synthesis of angiotensinogen (AGT), a key precursor of angiotensin peptides, that play a pathogenetic role in hypertension. It is given subcutaneously twice a year. Dysregulation of the renin-angiotensin system increases BP through its primary effector, Angiotensin II, which results in tissue remodelling and end-organ damage. Silencing liver angiotensinogen (the sole source of Ang II) has been achieved using novel RNA therapeutics like the small- interfering RNA, zilebesiran. Conjugation to N-acetylgalactosamine enables targeted delivery to hepatocytes, where endosomal storage, slow leakage, and small-interfering RNA recycling (for zilebesiran) result in knockdown over several months. Indeed, zilebesiran has an impressive and durable effect on systolic BP and diastolic BP, reduced by up to 20 mm Hg and 10 mm Hg respectively; and sustained for 6 months after a single administration, likely due to its very effective knockdown of

angiotensinogen, without causing acute kidney injury or hyperkalemia. These changes were consistent throughout the diurnal cycle and also reduced night time blood pressure and were sustained at 24 weeks. An advantage of zilebesiran is the potential for bi-annual dosing, thereby reducing non adherence and improving control rates.

Keywords: Zilebesiran, siRNA , Hypertension, Silencing liver angiotensinogen.

PCL-OP 004

"ALPHA FOLD MANIA": PROTEIN STRUCTURE SOLVER

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Proteins are essential to life and understanding their structure can facilitate mechanistic understanding of their function. Through an enormous experiment years ranging to decades, the structure of an around 100,000 unique proteins have been determined. But this represents small fractions of the billions of known protein sequences. Hence, computational approaches are needed to address this gap and to enhance the large scale structure bio -informatics. Predicting the three dimensional structure that a protein will adopt based solely on its amino acids sequence. The structure component of 'protein folding networks' problem has been an important open research problem for more than 50 years. Despite recent development the existing methods short of atomic accuracy especially when no homolog structure is known. This issue has been almost sort out by an A.I computational tool called alpha fold developed by British company deep mind .It is the First computational method that can predict protein structure with atomic accuracy even in case in which similar structure is not know. Alpha fold greatly improves the accuracy of structure prediction by incorporating novel network architecture and training procedure based on the evolutionary, physical and genetic constraints of protein structure. The neural network alpha fold that was developed entered into the CASP14, under the name alpha fold 2. The CASP 14 assessment is carried out biennially using recent solved structure that have not been disclosed to public, so it's a blind test for the participating methods and has long served as gold standard for the accuracy of structure prediction. Alpha fold scored a median back bone accuracy of 0.96A root mean square at 95% which is a quantitative measure of similarity between two or more protein

structure .Hence it has been widely considered as one of the most innovative application of artificial intelligence in modern world.

Keywords: Alpha fold, Protein folding networks, Artificial intelligence

PCL-OP–005

CRISPR THERAPEUTICS

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CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats. CRISPR associated protein (Cas 9) is a powerful and efficient tool for genome editing that has shown innovative and significant promise in the development of new therapeutics. The study revolves around the principle of how small molecule inhibitors have changed the landscape of cancer treatment and prognosis. Durability to the response of therapy is limited due to varying factors like tumour heterogeneity, drug resistance, adverse effects and others on prolonged use of chemotherapeutic agents. Genome editing in which specific genes are targeted, cause or influence the course of the disease. CRISPR/Cas 9 has shown promising results in the preclinical cancer research, it's use in clinical setting is still in an early stage of development. A Cas9 protein and synthetic guide RNA form a complex of ribonucleoprotein (RNP)— a key to successful gene editing. Direct introduction of an RNP, rather than expression from a plasmid, offers many benefits: a functional nuclease is immediately available in the cell, then the complex is quickly cleared, making the editing activity short-lived. This reduces off-target effects and leaves no genomic footprint from DNA integration into the genome. Applications of CRISPR- Cas9 technology have been identified in the fields of basic and clinical research, therapeutics, drug development, agriculture and the environment. Clinical research has shown potential utilization for CRISPR in diseases such as sickle cell disease, cancer, AIDS, Huntington's disease, Duchenne muscular dystrophy, and more, leading to advancements in treating cancer in a better and innovative way.

Keywords: CRISPR, Cas 9, Duchenne muscular dystrophy

PCL-OP–006

DIGITAL THERAPEUTICS

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Digital therapeutics (DTx) deliver medical interventions directly to patients using evidence-based, clinically evaluated software to treat, manage, and prevent a broad spectrum of diseases and disorders. DTx products are held to the same standards of evidence and regulatory oversight as traditional medical treatments. DTx products are held to the same standards of evidence and regulatory oversight as traditional medical treatments. Digital therapeutics should adhere to all ten core principles to demonstrate product safety, efficacy, quality, patient centricity, privacy, and ongoing clinical impact. DTx products can address critical gaps in care for underserved populations, regardless of patient age, language, culture, income, disease state, or geography.

Keywords: Digital therapeutics, Evidence-based

PCL-OP–007

EVALUATION OF NSAID METAL COMPLEXES FOR ANALGESIC AND ANTI-INFLAMMATORY ACTIVITY

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In recent years, there has been a growing interest in the synthesis and evaluation of NSAID metal complexes as potential analgesic and anti-inflammatory agents. The present study aims to evaluate Diclofenac-metal complexes for analgesic & anti-inflammatory activity. Metal complexes were synthesised by refluxing a 1:1:3 ratio of Diclofenac, CuCl 2 .2H 2 O/ZnCl 2 .6H 2 O, Ethylene diamine and characterised by physicochemical evaluation, melting point determination, UV-visible spectroscopy, LC-MS, and elemental analysis. Adult Swiss albino mice and Wistar rats were divided into 7 groups (n=6). Acute pain was induced by heat stimulus and chemical stimulus in mice and mechanical stimulus in rats. Acute inflammation was induced by carrageenan in rats. Metal complexes significantly increased

the analgesic effect in the test animals. The anti-inflammatory activity was evaluated and the percentage inhibition was highly significant at the 2hr time interval for Di- Std, Di-Cu ED and Di-Zn ED 64.80% 76.00% and 71.20%. The present study demonstrates a notable analgesic and anti-inflammatory effect, establishing a proof-of-principle for the potential efficacy of complexing NSAIDs with metals and ethylene diamine as a lead for the development of new analgesic drugs. The Di-Cu ED complex stands out among the synthesized complexes, exhibiting the most significant analgesic and anti-inflammatoryactions when compared to the parent ligand. This finding suggests a promising direction for the development of enhanced therapeutic agents through metal complexation. However, a need for further research to comprehensively investigate potential adverse effects and the underlying principles responsible for the observed pharmacological activities.

Keywords: NSAID metal complexes, analgesic, anti- inflammatory activity.

PCL- OP–008

GENE EDITING MARVEL: CRISPR-Cas9's LEAP TOWARDS PRECISION MEDICINE

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The pace of scientific research has accelerated immensely. Precision medicine has become a reality, tailoring treatments to individual genetic profiles. Diseases are being understood at their molecular roots, leading to more accurate diagnoses, targeted therapies, and potential cures for once-incurable conditions. Imagine a world where genetic diseases are rewritten like lines of code and anomalies are rectified at their very core. CRISPR Cas9 emerges as a pen redefining the boundaries of medical possibilities. CRISPR-Cas9 is a powerful gene editing tool that works like molecular scissors that precisely cut DNA at chosen location. It seeks out and snips the DNA, prompting the cell's repair mechanisms to either introduce changes or add new genetic material. The methodology involves replacement of defective genetic sequences, precisely editing the genome. At its heart, this precision-based therapy offers promise of definitive cure for genetic disorders like sickle cell anemia rather than merely managing its symptoms. His relentless disease, characterized by distorted red blood

cells causing pain, organ damage and shortened lifespans, has long avoided comprehensive remedies. Gene editing by CRISPR-Cas9 has demonstrated successful correction of HBB gene mutation, leading to the production of healthy hemoglobin and a reduction in sickling of red blood cells. Scientists used this technology to engineer pigs with specific mutations to model human diseases like diabetes and also successfully corrected genetic mutation that caused hypertrophic cardiomyopathy in human embryos. These examples demonstrate the versatility and potential of this amazing technology. Despite persisting challenges, it has revolutionarised pharmaceutical research as it is used to study diseases, develop models for drug testing, and explore potential therapies by understanding genetic mechanisms underlying various diseases. Ultimately CRISPR-Cas9 holds a future where the once impossible becomes a possibility.

Keywords: Precision, CRISPR-Cas9 technology, molecular scissors.

PCL-OP–009

IS THIS THE END OF RANITIDINE?

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Ranitidine,sold under the brand name Zantac among others, is a medication used to decrease stomach acid production. It is commonly used in treatment of peptic ulcer disease, gastroesophageal reflux disease, and Zollinger–Ellison syndrome. In September 2019, the probable carcinogen N-nitrosodimethylamine (NDMA) was discovered in ranitidine products from a number of manufacturers, resulting in recalls. Briefly, NDMA is considered a probable carcinogen by the International Agency for Research on Cancer, given that several animal studies have demonstrated adverse effects with chronic exposure to NDMA, including tumors of the liver, lungs, and stomach. In April 2020, new FDA testing and evaluation prompted by information from third-party laboratories confirmed that NDMA levels increase in ranitidine even under normal storage conditions, and NDMA has been found to increase significantly in samples stored at higher temperatures, including those at which the product may be exposed during distribution and handling by consumers. The testing also showed that the level of NDMA increases as ranitidine

medication ages. The U.S FDA requested all manufacturers to withdraw all prescription and OTC Ranitidine drugs from the market immediately. Following a major recall and allegations that NDMA contamination in Zantac causes cancer, manufacturers have updated the Zantac formula to remove potentially dangerous ranitidine and replace it with another ingredient called famotidine. The new Zantac is being marketed with a new name- Zantac 360.

Keywords: NDMA contamination, Zollinger–Ellison syndrome.

PCL- OP-010

PHARMACOLOGY

ABSTRACT

Newer antibiotics effective against Staphylococcus aureus infection

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Abstract

In recent times,an investigation done regarding resistance of antibiotics infection.It says that newly use of different antibiotics like methicillin are developing resistance to the infection which is caused by gram positive bacteria Staphylococcus aureus.This staph cause a wide variety of clinical diseases which are common both in community -acquired,hospital-acquired settings.The treatment re mains challenging due to the emergence of MDRS.It does not normally cause infection on healthy skin,it enters into blood stream and cause variety of potentially serious infections.This activity describes new antibiotics drug information of Staphylococcus infections which help out against this bacterial infection.Based on results it can be concluded use about the newly accepted drug Ceftobiprole for this infection .

Keywords

Ceftobiprole,Methicillin,Staphylococcus aureus, community -acquired, hospital -acquired,Multi Drug Resistance,gram positive bacteria.

PCL- OP–011

OoC TECHNOLOGY

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The pharmaceutical industry has always been in hunt of innovative methods in order for the better development in drug discovery process. In that Organ-on-a-Chip, is a cutting-edge technology that can emulate the physiological environment and functionality of human organs on a chip for disease modeling and drug testing, which shows great potential in revolution of the drug development. This is the translation of novel engineering platform into routine pharmacological process. This technique plays critical roles at different preclinical

stages of drug development and highlights the current challenges in translation and commercialization for the pharmacological and medical users. More over this also emphasize on the future developmental trends. Organ-on-a-Chip platform built a bridge between animal studies and clinical trials for the pharmaceutical industry. Organs-on-chips (OoCs) are systems containing engineered or natural miniature tissues which are grown inside microfluidic chips. To better mimic human physiology, the chips are designed to control cell microenvironments and maintain tissue specific functions. Combining advances in tissue engineering and microfabrication, OoCs have gained interest as a next-generation experimental platform to investigate human pathophysiology and the effect of therapeutics in the body. Organ-on-a-Chip is a promising interdisciplinary technique emulating the in vivo physiology and pathology for in vitro disease modeling, drug screening, and precision medicine.

Keyworda: Organ-on-a-Chip, in vitro disease modeling'

PCL-OP–012

TEZEPELUMAB IN SEVERE ASTHMA

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Asthma is one of the most common chronic diseases, and the estimated prevalence of severe asthma is 3-10% of the total asthmatic population. There is a need for additional biologic treatments that have high efficacy across the spectrum of severe uncontrolled asthma. Currently available drugs inhibit one or two specific cytokines or IgE antibodies and thus only partially suppress the complex type 2 inflammation cascade. Tezepelumab is a human monoclonal antibody directed against the cytokine thymic stromal lymphopoietin (TSLP). It is the first marketed biologic against an epithelial-derivate cytokine, preventing the binding of TSLP to its receptor and reducing the immune stimuli that TSLP can perform in different endotypes of asthma. Tezepelumab reduces downstream biomarkers of inflammation. Tezepelumab provides a clinical benefit in severe asthma, reducing the annualised asthma exacerbation rate in patients with either high or low levels of T2 inflammation biomarkers, although the effect was greater among those with high levels, and it has been shown to

improve asthma control, quality of life and lung function and reduce airway hyperresponsiveness. Therefore, tezepelumab can be used in the whole spectrum of patients with severe uncontrolled asthma, especially in T2-high patients.

Keywords: monoclonal antibody, Tezepelumab.

PCL-O– 013

SAPANISERTIB: CANCER DRUG WITH POTENTIAL TO BE USED AGAINST MALARIA

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A cancer drug currently in clinical trials has shown the potential to protect from, cure and prevent transmission of malaria. The breakthrough finding by the University of Cape Town (UCT) researchers offers new hope against a disease that kills over half a million people annually, severely affecting children under five, pregnant women and patients with HIV. Anticancer therapeutic drugs as well as cancer prevention have become in the last decades important tasks of national and international systems. The anticancer human mTOR inhibitor Sapanisertib potently inhibits multiple plasmodium kinases and lifecycle stages. Some of the anticancer drugs are Docetaxel, Cyclophosphamide, 5-fluorouracil, Epirubicin and Sapanisertib. It describes the findings of a rational approach towards discovering a new use in malaria treatment for the investigational cancer drug Sapanisertib. The researchers also established the mechanism of action how sapanisertib kills the human malaria parasite and exhibits polypharmacology. Sapanisertib's multistage activity and its antimalarial efficacy, coupled with potent inhibition of multiple protein targets. It will evaluate the potential of repurposing sapanisertib to treat malaria. The approach used to identify sapanisertib is known as drug repurposing. It's about finding new uses for an existing drug approved by a regulatory agency in one disease area, in another disease.

Keywords: Drug repurposing, Sapanisertib, polypharmacology.

PCL- OP-014

SEEING THE WORLD WITH THE TOOTH
(A TOOTH FOR THE VISION ….OSTEO ODENTO KERATOPROSTHESIS)

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"Tooth in the Eye Surgery" was developed by Benedetto Strampelli in the early 1960s, using the patient's own tooth root and alveolar bone as vital support to an optical cylinder, for patients with the most severe type of corneal and ocular surface disease ,for whom other treatments would not be useful. The cornea is replaced by a polymethyl metha acrylate (PMMA) optical cylinder glued to a biological support made by human living tissue. A Keratoprosthesis is used to replace damaged cornea. OOKP is considered the only process capable of offering long term visual rehabilitation in patients with end stage ocular surface disease with severe deficiency and in people who are blind from birth .The surgical technique involves the removal of the canine tooth for the preparation of the osteo-dental acrylic lamina complex .OOKP was first tried in 2004 by a German specialist doctor.lyell syndrome An operation to graft the OOKP is undertaken in severe pemphigoid, chemical burns, stevens-johnson syndrome, trachoma, and multiple graft failure.

Keywords: OOKP PMMA, Keratoprosthesis pemphigoidlyell syndrome

PCL-OP–015

STEM CELL THERAPY FOR DIABETES MELLITUS: FDA APPROVED

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In the current scenario of the disease , diabetes mellitus (type 1) , that is said to be and autoimmune disease and also called juvenile diabetes as it occur at a early stage of life, below 20 yrs of age. (15-20% people can be included). In this disorder, the pancreas doesn't produce enough amount of insulin that the body requires due an autoimmune destruction of the beta cells of pancreas , this inturn leads to high amount of blood glucose in the body.

There is inherited predisposition ,with 10 fold increased incidence in first degree relatives of an index case, and strong associations with particular incompatibility antigen (HLA types). This requires a strick insulin therapy to be followed, along with regular glucose monitoring and managing to avoid other risk factors such as hypoglycemia. The challenges of current therapy includes excessive carbohydrate counting ,restricting food,and over and undereating. Initial symptoms are polyuria,polydipsia,polyphagia, weightloss,lethargyaccompanied by hyperglycemia. Stem cells have demonstrated the potential efficacy to treat type 1 diabetes by reconstitution of immunotolerance and preservation of islet beta cell function in recent researches.Stem cells have found to be a cure for diabetes type 1 in many researches , which would address the requirement for beta cell replacement amd also regulates the autoimmune response to the cells which produces insulin .They also have the ability to control Tcell autoimmunity also. A stem cell is a body's raw material – cells from which all other cells with specialized functions are generated . The types of stem cells include , hematopoietic stem cel,mesenchymal,neutral,epithelial,skin stem cells.The stem cells basically involves the transplant of lab grown insulin producing beta cells into people with type 1 diabetes mellitus. The stem cell researches have shown that the stem cells are able to make make new beta cells. Such cells have some stem cells properties and self – renew in large quatity. Clinical trials administered stem cell into diabetes mellitus type 1 patients takae advantages of 2 qualities that these stem cells have . First , they have the regeneration ability to repair the damaged neta cell , second , they can regulate the immune system by inhibition of the responses that causes autoimmune attacks on beta cells. LANTIDRA (donislecel) a cell therapy that helps to restore functional pancreatic islet cells in patients unable to produce insulin , this was the first stem cell therapy that was approved by FDA . Based on the results it can be concluded that stem cell therapy is good option for thepatients suffering from type 1 diabetes mellitus , as it resduce the stress of regular insulin injections and also is seen to be having less adverse effects compared to the regular drug regimen.

PCL-OP–016

ANTI-DEPRESSANT AND ANTI-AMNESIC ACTIVITY OF ETHANOLIC EXTRACT OF GERBERA JAMESONII

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The aim of our study is to evaluate the Anti-depressant and Anti-amnesic activity of the ethanolic extract of Gerbera jamesonii (EEGJ) flowers and determine the total phenolic, flavonoid, and alkaloid contents in this extract. The antidepressant effect of EEGJ (100, 200 mg/kg, p. o.) was tested in rats using the tail suspension (TST) and the forced swim (FST) tests. Its anti-amnesic effect was evaluated in the elevated plus-maze (EPM) test and the novel object detection tests (NODT). The total phenolic (TPC), flavonoid (TFC), and alkaloid (TAC) content was measured using standard methods. Antioxidant activity was determined using the DPPH radical scavenging assay. Acute toxicity studies were performed as per OECD-420 guidelines. The qualitative screening revealed the presence of Alkaloids, Carbohydrates, Reducing sugars, Saponin, Phytosterols, Phenolic compounds, and Flavonoids. The Total Phenolic, Flavonoid, and Alkaloidal contents were found to be 39.8 mg GAE /g, 25.39 mg RT/g, and 10 mg AT/g respectively. The IC 50 value for EEGJ was 3.974 µg/mL, which was comparatively higher than the IC 50 (2.439 µg/mL) of ascorbic acid. The acute toxicity studies revealed that the extract was safe up to 2000 mg/kg, bd. wt. EEGJ, at all doses, showed dose-dependent antidepressant activity in the TST and FST, EEGJ dose- dependently reduced the duration of immobility ((p<0.0001) compared to reserpine treated animals. Moreover, in learning and memory experimental models, the treated animals reversed scopolamine-induced amnesic effects as evident from improved transfer latencies (P< 0.0001 vs. scopolamine; elevated plus maze) and discrimination index (P<0.0001 vs. scopolamine; novel object recognition test).

Keywords: Ethanolic extract of Gerbera jamesonii (EEGJ), TST, FST, EPM, NODT

PCL-OP-017

CARDIAC IMPLANTABLE ELECTRONIC DEVICES FOR MONITORING CARDIOVASCULAR DISEASES

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The population of patients with heart failure continues to grow which introduced significant challenges in clinical practice related to the management of cardiac arrhythmia and heart failure. Cardiac vascular diseases are the major global health problems, living with diseases like cardiovascular diseases often require long term monitoring. Cardiac implantable electronic devices including pacemakers, implantable cardioverter defibrillator (ICD), biventricular pacemakers and cardiac loop recorder are designed to help in control heart rhythm disorders and heart failures. Implantable pulmonary artery pressure monitors are used to guide heart failure management and reduce hospitalisation.

Keywords: pacemakers, implantable cardioverter defibrillator,biventricular, pacemaker, cardiac loop recorder.

PCL-OP-018

DETECTION AND CLASSIFICATION OF GASTROINTESTINAL DISEASES

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Gastrointestinal diseases are a significant global health concern, affecting millions of people every year. Gastrointestinal diseases refer to a range of medical conditions that affect the digestive system. If left untreated, some gastrointestinal diseases can lead to serious complications. Early detection and accurate classification of these diseases are crucial for effective treatment and management. Endoscopy is a common diagnostic procedure used to examine the gastrointestinal tract and detect abnormalities. However, the interpretation of endoscopic images can be challenging and time-consuming, and requires a high degree of expertise. In recent years, deep learning techniques have demonstrated remarkable performance in medical image analysis tasks. The primary motive behind the detection of

gastrointestinal diseases is to improve patient outcomes by facilitating early diagnosis and effective treatment. Early detection and accurate diagnosis can also help in reducing the burden on the healthcare system. In addition, the use of deep learning techniques, such as Convolutional Neural Networks (CNNs), for the detection and classification of gastrointestinal diseases can potentially help in the development of new diagnostic tools and techniques. This can lead to more efficient and accurate diagnosis, improved patient outcomes, and better public health overall.

Keywords: Endoscopy, Deep learning, Convolutional neural network.

PCL- OP -019

FEMININE PADS

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Every women experiences menstrual cycle at some point during life time due to a biological mechanism. Therefore, maintaining healthy and hygienic menstrual connditions play an important role. There were various options in olden times like clothes or reusable pads were widely used to collect menstrual blood,where as current generation are using sanitary pads which are made of absorbent materials are frequently favoured. In some studies it has been observed, women are more susceptible to the negative effects of the chemicals and components in sanitary pads because they are exposed to them for an extended period of time. New studies have pointed, the product which is intended to give a better lifestyle now has raised concerns about causing cancer and infertility. Mostly, sanitary pads are safe to use but over the past several years there has been concern over exposure to dioxins using tampons and other sanitary products.

PCL- OP-020

INNOVATIONS IN THE DRUG DISCOVERY OF EPILEPSY

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Epilepsy is one of the most common serious brain conditions, affecting over 70 million people worldwide. It is a prevalent disorder characterized by seizures, which manifest in various forms and result from episodic neuronal discharges. The form of the seizure depends on the part of the brain affected. The drugs used in the treatment of epilepsy are known as convulsant or antiepileptic agents. Treatment of epilepsy has become more efficient nowadays due to the innovation of new drugs and agonists and antagonists for the receptors involved in the pathology of epilepsy. One of the recent innovations in antiepileptic drugs (AED) is Lamotrigine, which acts through multiple mechanisms. Other common drugs used in the treatment of epilepsy include Phenytoin, Phenobarbital, Carbamazepine, and others. Numerous preclinical and clinical trials are currently underway to develop novel drugs for the treatment of seizures.

PCL-OP–021

EXPLORING THE EMERGING INNOVATIONS AND TRENDS IN NUTRACEUTICALS

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Nutraceuticals are products derived from food sources that provide both nutrition and medicinal benefits. They are also known as functional foods, medical foods, designer foods, phytochemicals, and nutritional supplements. The global nutraceuticals market size was USD 291.33 billion in 2022 and is expected to grow at a compound annual growth rate (CAGR) of 9.4% from 2023 to 2030. One of the latest innovations in the nutraceutical industry involves the use of personalized nutrition apps and platforms. These tools leverage data from individual health profiles, including genetic information and lifestyle factors, to offer

customized dietary recommendations. This approach tailor nutraceutical products to meet specific health needs, enhancing effectiveness and addressing individual deficiencies.

Keywords: Nutraceuticals, customized dietary recommendations

PCG - OP – 001

BIOASSAY GUIDED ISOLATION OF ANTI-INFLAMMATORY COMPOUNDS FROM BAUHINIA VARIEGATA L : A KEY INGREDIENT IN HERBO-MINERAL FORMULATION, GANDMALA KANDAN RAS

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Medicinal herb Bauhinia variegata L. is the main ingredient in “Gandmala Kandan Ras” herbo

mineral medicine used in Ayurveda for the treatment of swelling, inflammation and tumors. This

study aimed to isolate the anti-inflammatory compounds from the methanolic extract of aerial parts of Bauhinia variegata. Through bioassay-guided isolation, three known flavonoids, namely kaempferol, ombuin and quercetin were identified from methanolic extract of aerial parts of Bauhinia variega. The primary screening by protein denaturation method revealed a significant percentage of inhibition of protein denaturation of compounds kaempferol and quercetin. The anti-inflammatory assays against COX-1/2 enzymes showed significant anti-inflammatory activity of these two compounds, compared to the standard drug, indomethacin. The results provided evidence that supports the Ayurvedic usage of Gandmala Kandan Ras formulation in the treatment of inflammation, which was attributed to the natural active kaempferol and quercetin. The results indicated that plant Bauhinia variegata could be considered as an excellent natural source of remedial medicine for inflammation.

Keywords: Bauhinia, protein denaturation method, cyclooxygenase enzymes, inhibitory assay

PCG - OP – 002

FORMULATION AND EVALUATION OF GEL LOADED WITH MORINGA OELIFERA

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The objective of the study is to formulate and evaluate a topical gel containing Moringa oleifera leaf extracts for their skin infections. Four gel formulations were prepared using gelling agents Sodium alginate (F1-F2) and carbopol (F3-F4) and they were evaluated for physical appearance, Drug content,viscosity, extrudability, pH, spreadability, in vitro diffusion profile. The formulated gel showed good physical characteristics. The formulation F3 (99.10%) show good drug content as the polymer concentration in them was higher. The spreadability of gel decreases with an increase in polymer concentration. The pH of the formulation was in the range of 6-8 which is considered acceptable to avoid the risk of irritation upon application to the skin. Among the formulations, F3 showed better release (98.55%) characteristics than other formulations. The stability study for the topical gel formulation was done as per ICH guidelines Formulated gels were homogenous, stable and complied with the guidelines.

Key words: Moringa oleifera, FTIR studies, Polymers, pH, In vitro drug release studies.

PHP-OP-001

PROMINENCE OF INNOVATIONS IN CLINICAL PHARMACY PRACTICE THAT ARE IMPROVING PATIENT CARE

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Background: Clinical pharmacy practice is changing as a result of innovation, and this is producing ground-breaking improvements in patient care. Technologies have surfaced in recent years that are revolutionizing the practice of pharmacy. The developments shape clinical pharmacy into a patient-focused field acknowledged for its contributions to bettering the results of pharmaceutical therapy.

Aim & Objective: To recognize the value of innovation in clinical pharmacy in order to attain the best results for patients.

Methodology: A systematic literature review was conducted using PubMed, Embase, and Google Scholar databases. General information regarding innovations, conceptual approaches and their importance was retrieved.

Summary: Innovations in the field of clinical pharmacy is crucial to improve the patient care outcomes and also to enhance the skills of clinical pharmacists as well as to make their work easier. Though these innovations are not fully established and utilized efficiently, according to the systematic review, these innovations are proved to be beneficial.

Conclusion: Clinical practice innovations are important because they can result in reduced healthcare costs, better population health, and better patient care. Innovations and technology in this field also helps the clinical pharmacist to save time, achieve optimized goals and reduce work-load.

Keywords: Clinical pharmacy, innovations, pharmacy practice, artificial intelligence and technology.

PHP-OP-002

RECENT ADVANCES IN MANAGEMENT OF SEPSIS

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Every year 13th September is celebrated as "world sepsis day". In 2017, The World Health Assembly and WHO made sepsis a global health priority and adopted a resolution to improve the prevention, diagnosis and management of sepsis. The theme for World Sepsis Day 2023 was "Stop Sepsis, Save Lives". It is defined as a medical emergency that impact multiple organs, has high probability of death systems when left untreated. It is of 3 stages 1. sepsis 2. severe sepsis 3. Septic shock. The most common anatomic source of infection that leads to sepsis is the lungs (40-42%), followed by intra-abdominal space (31% - 34%), and genitourinary tract (11% - 15%). There are various assessment tools to assess sepsis such as organ dysfunction using Sequential Organ Failure Assessment Score (SOFA) and quick sequential organ assessment (qSOFA). The cascade leading to development of sepsis is complex and multi-factorial,

involving causative pathogen, host characteristics, inflammatory responses. Loss of balance to control the local inflammatory process and to eradicate the invading pathogens, leads to sepsis and septic shock. Early identification, resuscitation, initiation of antibiotics and hemodynamic stability and treatment of gastric ulcers are undeniably four main pillars of treatment of sepsis. The prompt identification and management of the underlying source and cause of sepsis is imperative in improving patient outcomes. Untreated sepsis may lead to severe complications such as DIC, AKI, ARDS, low SVR, high CO and septic shock.

PHP-OP-003

UTILIZATION STUDY OF MESALAMINE IN PATIENTS WITH CROHN'S DISEASE

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Inflammatory bowel disease (IBD) is a term for two conditions (Crohn's disease (CD) and Ulcerative colitis (UC)) that are characterized by repetitive episodes of inflammation of

gastrointestinal tract (GIT) caused by an abnormal immune response to gut microflora. UC is confined to the rectum and colon, and affects primarily the mucosa and the submucosa, causing continuous lesions. CD can involve any part of the GIT, causing discontinuous (skip) lesions. It is a transmural process that can result in fistulas, perforations, or strictures. According to the Montreal classification of IBD, UC is classified based on extent and severity, while CD is classified based on age, location and behaviour. According to various guidelines following are the recommendations: European Crohn's and Colitis Organisation (ECCO) CD treatment guidelines (2019) suggest against the use of 5-ASA for induction of remission of CD and recommend against the use of oral 5-ASA for maintenance of remission of CD. In the British Society of Gastroenterology (BSG) IBD guidelines (2019) 5-ASAs are neither recommended for induction nor maintenance treatment of CD. According to the National Institute for Health and Care Excellence (NICE) CD management guidelines (2019) the use of mesalamine, olsalazine and balsalazide is off label since May 2019. Mesalamine is found to be used among majority of CD patients in day-to-day clinical practice even though it is not recommended for management of CD.

Keywords: Mesalamine, Chron's Disease, utilization.

PHP-OP-004

ARTIFICIAL INTELLIGENCE IN PHARMACY

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Artificial Intelligence (AI) focuses in producing intelligent modelling, which helps in imagining knowledge, cracking problems and decision making. Recently, AI plays an important role in various fields of pharmacy like drug discovery, drug delivery formulation development, polypharmacology, hospital pharmacy, etc. In drug discovery and drug delivery formulation development, various Artificial Neural Networks (ANNs) like Deep Neural Networks (DNNs) or Recurrent Neural Networks (RNNs) are being employed. Several implementations of drug discovery have currently been analysed and supported the power of the technology in quantitative structure-property relationship (QSPR) or quantitative structure-activity relationship (QSAR). In addition, de novo design promotes the invention of

significantly newer drug molecules with regard to desired/optimal qualities. In the current review article, the uses of AI in pharmacy, especially in drug discovery, drug delivery formulation development, polypharmacology and hospital pharmacy are discussed.

Key words: Artificial intelligence, Artificial neural network, Drug discovery, Drug delivery research, Hospital pharmacy.

PHP-OP-005

S1 BASED CHEMOTHERAPY FOR VARIOUS GATRO INTESTINAL MALIGNANCIES

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Gastrointestinal Cancers are one of the most common cancers occurring worldwide and is the most common causes of cancer mortality. 5-Flourouracil is one of the commonly prescribed antineoplastic agents against gastric and colorectal cancers. Continuous infusion would be the optimal way of its administration. Patients prefer oral to IV palliative chemotherapy, provided that oral therapy is equally effective. S-1 is a novel oral dihydropyrimidine dehydrogenase (DPD) inhibitory fluoropyrimidine (DIF) developed since 1980 for advanced gastrointestinal cancers, consisting three pharmacological agents (at a molar ratio of 1:0.4:1) tegafur (FT) and two types of enzyme inhibitor, 5-chloro-2,4-dihydroxypyridine (CDHP) and potassium oxonate (Oxo). FT is a prodrug converted to 5-FU by CYP2A6, then actively catabolized into inactive metabolites (90%) in liver by DPD, the remaining 10% is responsible for anti-tumor activity. CDHP is responsible for inactivation of 5-FU and potassium oxo found higher concentration in GI tract helps in decreased formation of 5- FU nucleotides (metabolites) thereby decreasing GI toxicity like diarrhea and stomatitis. Previous studies reveal the role of S1 chemotherapy in decreasing adverse effects such as hand-foot syndrome (27%) in comparison to capecitabine, replacement of 5-FU continuous infusion with oral administration of S1 avoiding risk of complications associated with central venous catheter placement and additionally S1 has some potential advantage including lower drug cost compared with UFT/LV. S-1 monotherapy and has shown promising efficacy with a

mild toxicity profile in patients with advanced gastrointestinal malignancies in clinical trials conducted in Japan, China and the data is sparse in India.

Key words: antineoplastic agents, chemotherapy, S1

PHP-OP-006

AUTISM: A BOON ON THE VERGE OF CESSATION

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Autism spectrum disorder is a term used to describe a constellation of early-appearing social communication deficits and repetitive sensory-motor behaviours associated with a strong genetic component as well as other causes. But to date, no justified pathology and actual treatment was not available in any guidelines. Till date, only drugs with symptomatic relief have been used. Ayurvedic drug Abhaya Ghrita is under trial and is believed that it could be a revolutionary drug in the treatment of autism. “Abhaya ghrita”, which contains Brahmi (Bacopa monnieri), Kushta (Saussurea lappa Clarke), Vacha (Acorus calamus Linn), Pippali (Piper longum Linn), etc herbs.

Key words: Autism spectrum disorder, Abhaya Ghrita.

PHP-OP-007

PRECISION MEDICINE: AN INNOVATIVE APPROACH TO PATIENT CENTRIC CARE IN CLINICAL PRACTICE

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Precision medicine is an innovative approach for tailoring disease treatment and prevention. It makes it possible for doctors and researchers to more accurately predict which treatments are more likely to work for a patient, taking into account individual genetic and molecular make-up, environment, and lifestyle. By unravelling the complex underlying biology of many diseases, and pioneering and applying advanced technologies, we are leading the way in the application of precision medicine. Our work, and our collaborations with partners across

industry, biotech and academia, are driving for better treatments for patients as well as a more sustainable future for healthcare systems. Precision medicine (PM) is an emerging approach for cancer treatment and prevention that takes into account inter- and intra-tumours variability in genes, tumours (immune) environment, and lifestyle and morbidities of each person diagnosed with cancer. PM aims for accurate measurement of molecular, environmental and behavioural factors contributing to health and disease thus leading to more precise diagnosis, rational disease prevention strategy, treatment selection and development of newer therapies. PM seeks to tailor therapy towards the oncogenic drivers of the tumours and modulate the tumours immune environment. This inherent variability of cancer lends itself to the growing field of precision and personalized medicine (PPM). It is expected that these efforts will create the foundation of a continuously evolving health-care system that is capable of significantly accelerating the advancement of PM technologies.

Keywords: Precision medicine, molecular make-up, personalized medicine, cancer

PHP-OP-008

ROLE OF ARTIFICIAL PANCREAS IN TYPE 1 DIABETES MELLITUS

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Pancreas is a gland located in abdominal cavity behind the stomach it functions in endocrine by producing important hormones such as insulin, glucagon, Samosata and pancreatic polypeptide which circulates in the blood. And exocrine by secreting pancreatic juice containing digestive enzymes that assist digestion and absorption of nutrients in the small intestine. These enzymes help to further break down of further carbohydrates, proteins and lipids in the chime.Insulin is a hormone made by the pancreas that allows the body to use sugar (glucose) from carbohydrates in the food that eaten for energy or to store glucose for future use insulin help to regulate the blood glucose level when it is too high (hyperglycemia).Each patient stayed overnight 22hrs for two different admissions with gap of 2-4 weeks of each admission. In conclusion, artificial pancreas can function similar to that of natural pancreas as it will react rising blood glucose level by combining monitoring technology with insulin pump to provide the sufficient amount of insulin at desired time.

Key words: Artificial pancreas, diabetes mellitus, Insulin, glucagon

PHP-OP-009

EFFICACY AND SAFETY OF NSAID FOR THE TREATMENT OF ACUTE PAIN AFTER ORTHOPAEDIC TRAUMA.

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Fracture is a common injury after a traumatic event. Usually, opioids have been traditionally used as analgesic after trauma however misuse and abuse of opioids have reached epidemic proportions. To reduce addictive effects in patients who are opioid abuse alternatively NSAID is used for pain management in trauma patients. Fracture non-union is the adverse event associated with NSAID use after orthopaedic event. Even opioids use also result adverse event of fracture non-union.

METHODOLOGY: A systematic review including literature research and meta-analysis was performed and quality of evidence was graded per the grading recommendations, Assessment, Development and Evaluation (GRADE) methodology.

RESULTS: A total of 19 studies were taken for analysis. Not all outcomes identified as critically important were reported in all studies, and the outcome of pain control was too heterogeneous to perform a meta-analysis. Nine studies reported on non-union (three randomised control trials), six of which reported no association with NSAIDs. The overall incidence of non-union in patients receiving NSAIDs compared with patients non receiving NSAIDs. Of studies reporting on pain control and reduction of opioids, the use of NSAIDs reduce pain and the need for opioids after traumatic fracture.

CONCLUSION: NSAID can significantly reduce pain and increase the quality of life for those with musculoskeletal illness. NSAID is use to treat traumatic event but show minimal risk of fracture non-union. Main side effect of NSAID is gastrointestinal toxicity, so physician should be careful while prescribing NSAID in patient with history of gastrointestinal disorders.

Keywords: NSAID, Fracture non-union, traumatic event

PHP-OP-010

BREAST CANCER – DIAGNOSIS AND IT'S TREATMENT AND ROLE OF PHARMACY IN IT

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Breast cancer – cancer that forms in the breast tissues. It is most common in females and rarely occurs in males. Early diagnosis can prevent the spread of cancer and a better Treatment can be done. Now-a-days ai (artificial intelligence) is playing Significant role in breast cancer detection. By ai diagnosis of breast Can be in better way and even stages of cancer are known. Well Knowledge about breast cancer should be given to public- especially to every woman so that they can aware of this and can be preventive, and early diagnosis can do if any problem arises and better Treatment can be and patient can lead a good life. Awareness program to conducted to educate people about it. In this doctor, especially Pharmacists and whole medical field related professionals can play Crucial role in it. Now-a-days by many clinical researches many anti-cancer drugs Are introduced for better outcomes of patients. Modern therapy Techniques are introduced by the help of clinical researches Performed by medical professionals in which pharmacists plays a vital Role and also advanced computer technology, is helping better Detection of cancer one of the tests is mammography. Breast cancer treatment involves: lumpectomy/mastectomy, then pathology and receptor status (hormone receptor status and Her2/neu status) are observed, then later based on that adjuvant Therapy is performed which can includes radiation, hormone, Chemotherapy and also targeted therapy and even immunotherapy. And then good care is required. In this mostly chemotherapy and Targeted therapy drug- trastuzumab one of effective drug in it. Pharmacist and pharma companies plays important for dispensing and development of anti-cancer drugs. We all whole come together to fight against cancer and develop good health care system to overcome it.

Keywords: breast cancer, chemotherapy, transtuzumab

OAP-OP-001

ARTIFICIAL INTELLIGENCE MEETS MENTAL HEALTH THERAPY

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AI meets mental health therapy. Discoveries of AI had huge impact in delivery of mental health care for thousands of patients with compelling results. Though people with depression are everywhere around but still unspoken and invisible. With a smaller number of therapists, I felt a need to talk on it via innovative technologies which can improve lives of those worth mental health challenges. A new study is using AI to stop trial and error trials of prescribing antidepressants to patients and in turn AI tracks brain activity and depicts how patients may benefit. It helps predict antidepressant pills and treat clinical depression by tracking brain activities.

Conclusion: There is devastating impact that mental health conditions such as depression and anxiety disorders have on patients and their families. This leads to improved quality of treatment within limited therapist via AI in emotional intelligence, helping diagnose medical disorders and relieve stress.

Keywords: AI brain trackers, artificial intelligence, innovative technologies, mental health therapy, medical disorders.

OAP-OP-002

STEM CELL THERAPY FOR DIABETES MELLITUS: FDA APPROVED

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In the current scenario of the disease, diabetes mellitus (type 1), that is said to be and autoimmune disease and also called juvenile diabetes as it occurs at an early stage of life, below 20 years of age. (15-20% people can be included). In this disorder, the pancreas doesn't produce enough amount of insulin that the body requires due an autoimmune destruction of the beta cells of pancreas, this in turn leads to high amount of blood glucose in the body. There is inherited predisposition, with 10-fold increased incidence in first degree

relatives of an index case, and strong associations with particular incompatibility antigen (HLA types). This requires a strick insulin therapy to be followed, along with regular glucose monitoring and managing to avoid other risk factors such as hypoglycemia. Stem cells have demonstrated the potential efficacy to treat type 1 diabetes by reconstitution of immunotolerance and preservation of islet beta cell function in recent researches. Stem cells have found to be a cure for diabetes type 1 in many researches, which would address the requirement for beta cell replacement and also regulates the autoimmune response to the cells which produces insulin. They also have the ability to control Tcell autoimmunity also. A stem cell is a body's raw material – cells from which all other cells with specialized functions are generated. The types of stem cells include, hematopoietic stem cell, mesenchymal, neutral, epithelial, skin stem cells. The stem cells basically involve the transplant of lab grown insulin producing beta cells into people with type 1 diabetes mellitus. The stem cell researches have shown that the stem cells are able to make make new beta cells. Such cells have some stem cells properties and self – renew in large quantity. Clinical trials administered stem cell into diabetes mellitus type 1 patients take advantages of 2 qualities that these stem cells have. First, they have the regeneration ability to repair the damaged neta cell, second, they can regulate the immune system by inhibition of the responses that causes autoimmune attacks on beta cells. LANTIDRA (donislecel) a cell therapy that helps to restore functional pancreatic islet cells in patients unable to produce insulin, this was the first stem cell therapy that was approved by FDA. Based on the results it can be concluded that stem cell therapy is good option for the patients suffering from type 1 diabetes mellitus, as it reduces the stress of regular insulin injections and also is seen to be having less adverse effects compared to the regular drug regimen.

Keywords: Diabetes Mellitus, stem cell therapy, hypoglycemia

OAP- OP – 003

TRANSFORMATIVE INNOVATIONS IN PHARMACEUTICAL RESEARCH: A CONVERGENCE OF AI, MACHINE LEARNING, MEDICAL 4.0 TECHNOLOGIES

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In the dynamic landscape of pharmaceutical research, a revolutionary convergence of Artificial Intelligence (AI), Machine Learning, and the principles of Medical 4.0 is reshaping the traditional drug discovery, development process and this abstract explores the transformative impact of this synergy, emphasizing the potential to accelerate drug discovery, optimize clinical trials, effectiveness of the treatment. AI, machine learning has been making significant contributions to pharmaceutical research, and this presentation also focuses on case studies that highlights the application of AI, machine learning in pharmaceutical research. This abstract explores the landscape of AI, machine learning, and Medical 4.0 in pharmaceutical research, shedding light on both the opportunities and complexities associated with their adoption, this presentation delves into real-world applications, illustrating how these innovations are reshaping the drug development pipeline. Medical advances will be swifter, better and more effective, quickly providing medications to patients. It will act as a leveller for healthcare services by making them available to everybody. Medical 4.0 principles in healthcare, through the integration of smart devices, Internet of Things (IoT), the integration of Medical 4.0 principles further extends this impact in pharmaceutical ecosystem. This study aims to delve into specific examples, case studies, and the broader implications of this convergence and ethical considerations within the pharmaceutical industry.

Keywords: artificial intelligence, machine learning, pharmaceutical research

OAP- OP - 004

ARTIFICIAL INTELLIGENCE IN DRUG DISCOVERY AND DEVELOPMENT

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Artificial intelligence (AI) has recently started to gear up its application in various sectors of the society with the pharmaceutical industry as a front-runner beneficiary. AI is useful in Drug development, drug repurchasing, improving pharmaceutical productivity, clinical trials etc. Thus, reducing the human workload as well as achieving targets in a short period. Artificial intelligence and deep learning advancements provide an excellent opportunity for rational drug design and discovery process which will eventually impact mankind. AI can

assist in structure-based drug discovery by predicting the 3D protein structure. In conclusion, AI has the potential to revolutionise the drug discovery process, offering improved efficiency and accuracy, accelerated drug development, and the capacity for the relevant of more effective and personalised treatments.

Keywords: Artificial intelligence, improving, productivity, drug discovery.

OAP- OP – 005

DECODING DISEASE X: PREPARING FOR THE UNKNOWN

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Disease X is a term that talks about possible pandemics caused by unknown pathogens. The World Health Organization created it to know the importance and why the world needs to be ready for future pandemics. Commencing with an effort to demystify Disease X elucidates its role as a placeholder for unidentified infectious threats. Drawing upon reputable sources such as the CDC and scientific journals, unrevealing the defining characteristics of Disease X and scrutinize ongoing global endeavors aimed at monitoring and countering potential risks. So many countries and health organizations are working together to learn about new diseases and protect everyone. In a world where new health threats can appear unexpectedly, the paramount importance of vigilance, research, and cooperation. The concept of Disease X reflects a commitment to continuous learning and improvement in global health security. It encourages the refinement of strategies and the development of innovative solutions to address emerging infectious threats. Concluding that enhancing our readiness should be high for a more resilient response to the ever-evolving landscape of infectious diseases. The important measures health organizations are taking to ensure we're prepared for whatever pandemic might come our way.

Keywords: Disease X, Global Preparedness, Emerging Pathogens, Pandemic Readiness, International Collaboration.

OAP-OP-006

ORGAN-ON-A-CHIP: A NEW PARADIGM FOR ALTERNATIVE ANIMAL MODEL IN DRUG DEVELOPMENT

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Organ-on-a-Chip technology provides a novel in vitro platform with the ability to more accurately replicate in vivo tissue functions than conventional cell models. Many diseases are caused by the interaction of many organs. By realizing several organs on a chip, the body-on-chip technology is very useful for modeling complex diseases. Recent developments in body-on-chip design have made it a highly sought-after tool for clinical researchers. Unlike animal models, organ models allow specialists to test drugs on human tissue, thereby negating errors in the relationship between animal and human genomes. Organs-on-a-chip technology is "a system that contains tissue or growing tissue in a microfluidic chip". Although incomparably complex, organ systems on a chip can be easily broken down into chips and organs. Microfluidic chips have tiny pores that only allow a milliliter of solution to pass through the channel. On the other hand, the long aspect of this biotechnology concerns the growth of tissues in a chip capable of simulating different types of tissues and their activities, thus allowing precise in vitro experiments. Based on previous models including Animal-on-a-Chip and Body-on-a-Chip, Organ-on-a-Chip is increasingly being developed in the biotechnology field due to research needs. This device can be modified in modifying the first culture process and reduces animal science in vivo. In recent years, organ-on-chip has found that technology has been improving growth and has done a lot of fat use. These developments have presented new challenges and new opportunities.

Keywords: organ-on-a-chip technology, conventional cell models, microfluidic chip, biotechnology field.

OAP-OP-007

MHRA's NEW AI-AIRLOCK: A NEW REGULATORY SANDBOX FOR AI DEVELOPERS

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The Medicines and Healthcare products Regulatory Agency (MHRA) is introducing the AI-Airlock, a regulatory sandbox aimed at facilitating the development and testing of advanced healthcare technologies. This virtual space, monitored by regulators, offers developers a collaborative platform to generate robust evidence for their Artificial Intelligence (AI) applications in healthcare. The initiative focuses on addressing challenges in traditional trial techniques, enabling faster access to emerging technologies in areas such as diagnostics and precision medicine. The partnership involves government, regulators, and industry, allowing advanced AI technology to be used in NHS settings with stringent safety controls before formal regulatory approval. The AI-Airlock aims to support innovators within the existing regulatory framework, fostering safe development and deployment of AI medical devices. Through a world-leading 'regulatory sandbox' model, the process ensures real-world viability, and shared learnings contribute to a broader understanding of challenges and solutions. This initiative reflects MHRA's commitment to leveraging regulatory expertise for innovative medical product development, expediting the introduction of cutting-edge products to UK patients without compromising safety and performance standards. The collaborative nature of the AI-Airlock involves expertise from innovators, regulatory organizations, government, the NHS, and academia. Government funding from the Department of Science, Innovation, and Technology and the Department of Health and Social Care supports the development of the AI-Airlock, scheduled to launch in April 2024.

Key words: Medicines and Healthcare Products Regulatory Agency (MHRA), Artificial Intelligence, Regulatory Sandbox

OAP-OP-008

RNA THERAPEUTICS.

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RNA therapeutics involve the use of coding mRNA as well as non-coding RNAs such as siRNA, antisense oligonucleotides (ASO) to target mRNA, aptamers, ribozymes, and CRISPR-associated endonuclease to target proteins and DNA. Due to their diverse targeting ability and research in RNA modification and delivery systems, RNA-based formulations have emerged as suitable treatment options for many diseases. Apart from mRNA as vaccines for viral diseases, they also have shown promising results as cancer vaccines, protein replacement therapies, to treat genetic disorders such as cystic fibrosis, muscular dystrophy, and hemoglobinopathies as well as HIV and β-thalassemia. RNA therapy approved by the USFDA is fomivirsen for the treatment of cytomegalovirus retinitis, siRNA-based therapeutics for acute hepatic porphyria (AHP). Patisiran, a lipid nanoparticle formulation of siRNA has been designed to specifically inhibit transthyretin synthesis in the liver. This approach may become more favorable than other existing approaches such as chemotherapy or radiation therapy which often harm neighboring cells in addition to target cells. RNA therapeutics treatment is designed to address specific individualized treatment specifically treating the root cause rather than symptomatic relief increasing success in treatment of disease as well reduce risks of unwanted side effects.

Keywords: RNAtherapeutics, Fomivirsen, Patisiran

OAP-OP-009

INNOVATIONS IN PHARMACY

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Cancer is a disease in which cells divide abnormal cells divide uncontrollably and destroy body tissue. In recent times there are many advancements in the field of cancer treatment some of them include the advancements in the immunological therapy recent innovations

include T-cell transfer therapy and immune checkpoint inhibitors. CAR T cell therapy has been efficient in treatment of cancer cell tumors. T cells having IL-15 and IL-21 antibodies on their surface are seen to be more efficiently killing cancer cells. Mice injected with T cells having both the antibodies had been cured more efficiently where- as mice injected with t cells having only one antibody had a short span of survival, mice with cranial cancer and neuroblastoma have been cured completely without any side effects. Colorectal Cancer patients administered with dostarlimab drug have seen rapid reduce in the cancer tumors. Dostarlimab binds to PD-1 receptors of the T cells which prevents the binding of PD-L1 and PD-L2 ligands of the cancer cell to bind with PD-1receptor of the T cell. Therefore, T cells are prevented from inactivation and now can kill cancer cells efficiently

Keywords: Cancer, CAR T-cells, Dostarlimab

OAP-OP-010

INVITRO ANTIOXIDANT ACTIVITY OF MEYNA SPINOSA

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A number of Indian medicinal plants have been used for thousands of years in the traditional system of medicine. The physiological and biochemical alterations in the human body may result in the overproduction of free radicals leading to oxidative damage to the biomolecules (e.g. lipids, proteins, DNA). Meyna spinosa is a thorny shrub or a small tree belongs to the family Rubiaceae. The whole plant Meyna spinosa of was successively extracted using Soxhlet apparatus with solvents as petroleum ether (60 0 C-80 0 C), chloroform, acetone, ethyl acetate and ethanol. The antioxidant activity was studied by using 2,2-diphenyl-p-picryl hydrazyl (DPPH) and free radical scavenging activity by hydrogen peroxide scavenging activity. The present study was designed to assess the phytochemicals and In vitro antioxidant activity and free radical scavenging activities of Meyna spinosa The flavonoids from the ethyl acetate and ethanolic extracts have shown good responses towards antioxidant activity compared with the other remaining extracts. The antioxidant activity of the extracts examined by using different biochemical assays namely diphenyl picrylhydrazyl (DPPH), hydrogen peroxide radical scavenging activity. The assays revealed that the ethyl acetate extract

exhibited stronger antioxidant activity than that of ethanolic extract. The IC 50 for ethyl acetate and ethanolic extracts were found to be 119.021±0.623 and 114.50±0.632 µg/ml respectively in the DPPH method. The IC 50 for ethyl acetate and ethanolic extracts were found to be 163.420±0.958 and 125.400±0.574 and µg/ml respectively in the hydrogen Peroxide method. The antioxidant activity of the Meyna spinosa extracts were found to be positively associated with the phenols and flavonoid content of the extracts and a positive, significant linear relationship with antioxidant activity of Meyna spinosa.

Keywords: Meyna spinosa, Flavonoids, DPPH, Hydrogen peroxide radical scavenging activity.

OAP-OP-011

PH MODULATION-LATEST APPROACH TO TREAT LEUKEMIA

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Leukemia, a group of haematological malignancies, remains a formidable challenge in the field of oncology, with treatment outcomes often necessitating ongoing management. These abstract highlights a novel approach to addressing leukemia by focusing on pH modulation as a potential avenue for permanent remission. The current standard of care primarily involves chemotherapy, radiation, and stem cell transplantation, which can lead to remission but frequently results in adverse side effects and relapse. In recent years, there has been growing interest in the relationship between pH levels and cancer cell proliferation. Research suggests that an acidic microenvironment can promote cancer growth and resistance to therapy, making pH regulation a compelling target for leukemia treatment. Several studies have shown that alkalizing agents, such as bicarbonate and dietary changes, may inhibit leukemia cell proliferation and enhance the efficacy of traditional treatments. These abstract reviews the existing literature on pH-based therapies for leukemia, discussing the potential mechanisms through which pH modulation can influence leukemia cells. It also highlights promising preclinical and clinical studies, where pH-focused interventions have demonstrated significant potential in reducing leukemia cell growth and enhancing the effectiveness of chemotherapy. However, while the concept of pH-based leukemia treatment shows promise,

further research is required to optimize protocols, understand the underlying mechanisms, and evaluate long-term safety and efficacy. The ultimate goal of this approach is to achieve permanent leukemia remission with reduced reliance on conventional, often toxic treatments. In conclusion, this abstract underscore the evolving landscape of leukemia therapy by introducing the concept of pH modulation as a potential strategy for achieving lasting remission. This review paper is to improve the quality of life for leukemia patients and reduce the burden of treatment-related side effects. Future research will be instrumental in advancing our understanding of pH-based therapies and their applicability in clinical settings.

Keywords: Leukemia, pH regulation.

OAP-OP-012

ARTIFICIAL CELL EVOLVES INTO NANOTECHNOLOGY

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It is only in the last 20 years that many of the original ideas on artificial cells are being increasingly applied and extended by researchers around the world. The artificial cell has now evolved into nanomedicine, biotherapeutics, blood substitutes, drug delivery, enzyme/gene therapy, cancer therapy, cell/stem cell therapy, nanoparticles, liposomes, encapsulation, replicating synthetic cells, cell encapsulation/scaffold, biosorbent / immunosorbent haemoperfusion / plasmapheresis, regenerative medicine, encapsulated microbe, nanobiotechnology, nanotechnology, and other areas. More futuristic research includes nano-computers, multimodal locomotion delivery robots, and others. This review starts with a general overview followed by specific examples in more detail.

Keywords: nanomedicine; encapsulation; blood substitutes; biotherapeutic; artificial cell; liposome; nanoparticles;

OAP-OP-013

IMPROVING MEDICATION MANAGEMENT WITH DIGITAL TOOLS

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Medication management is a critical aspect of healthcare, and significantly improve patient outcomes. This abstract submission is aim to explore benefits and challenges of implementing a digital medication management system. There are many benefits like improving accuracy and efficiency in medication administration, reduced medication errors and adverse drug reactions, increased patient engagement and adherence to medication regimens. By improving medication management with digital tools, the many challenges exists ,costs associated with implementing and maintaining a digital systems, potential for technical difficulties and system failures, Resistance to change among healthcare providers and patients. As digital tools continue to evolve, there are several potential future directions for medication management. On such direction is the incorporation of artificial intelligence [AI]and machine learning [ML] to enhance the accuracy and efficiency of medication management. AI and ML Can be used to analyses patient data and predict potential medication interactions or side effects. This can help healthcare providers make more informed decisions about medication management and improve patient outcomes.

KEYWORDS: Artificial intelligence [AI], Machine learning [ML], Patient privacy, Data security.

OAP-OP-014

GENOME EDITING TECHNIQUES

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CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is a revolutionary gene-editing technology that has transformed the field of molecular biology. Originating from a natural defense mechanism in bacteria, CRISPR, along with CRISPR-associated (Cas) proteins, allows for precise and efficient modification of DNA within organisms[1]. This technique has broad applications, including the potential to correct genetic defects, treat

diseases, and improve crop resilience. Despite its promise, CRISPR also presents challenges. Ethical considerations arise regarding its use in human embryos and the potential for unintended consequences. Additionally, delivery methods for the CRISPR/Cas9 system to targeted cells remain a critical area of research, with nonviral vectors showing promise for safer and more efficient delivery compared to traditional viral vectors. Recent clinical trials have begun to explore the therapeutic potential of CRISPR, but the technology's limitations, such as off-target effects, must be addressed for safe clinical application. As research progresses, CRISPR continues to hold significant promise for advancing gene therapy and precision medicine.

Keywords: CRISPR, genome editing, DNA.

POSTER PRESENTATIONS

PCU-PP-001

HYDROGELS: A PROMISING DRUG DELIVERY CARRIER FOR OPTHALMIC APPLICATION

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Hydrogels are water-swollen networks, which are cross-linked structures consisting of hydrophilic polymers. They are made three-dimensional by the creation of the cross-links by joining them through covalent or ionic bonds. Hydrogels have been used in various areas including industry and medicine due to their excellent characteristics such as high swelling capacity, high content of water, compatibility with other biological molecules, controlled chemical and physical properties, high mechanical integrity and biodegradability. They have been the center of attention of researchers from the past 50 years because of their promising applications in industries and other areas. They are used in different fields, in medicine, in the diagnosis of the diseases, in culturing of cells, in injuries as wound healers, in cosmetics, in skin diseases like pruritis, in environmental pollution reduction and other miscellaneous applications such as in diapers for babies and sanitary products. Extensive literature can be found on the subject of hydrogels. The present review discusses the Promising Drug Delivery Carrier for Opthalmic Application.

Keywords: Biodegradable hydrogels, PEG, Chitosan

PCU-PP-002

RESEALED ERYTHROCYTES: A NOVEL DRUG DELIVERY SYSTEM

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Among the various carriers used for targeting drugs to various body tissues, the cellular carriers meet several criteria desirable in clinical applications, among the most important being biocompatibility of carrier and its degradation products. Leucocytes, platelets, erythrocytes, nanoerythrocytes, hepatocytes, and fibroblasts etc. have been proposed as

cellular carrier systems. Among these, the erythrocytes have been the most investigated and have found to possess greater potential in drug delivery. Biopharmaceuticals, therapeutically significant peptides and proteins, nucleic acid based biological, antigens, anticancer drug and vaccines, are among the recently focused pharmaceuticals for being delivered using carrier erythrocytes. Erythrocytes, also known as red blood cells, and have been extensively studied for their potential carrier capabilities for the delivery of drugs. The biocompatibility, non pathogenicity, non-immunogenicity and biodegradability make them unique and useful carriers. Carrier erythrocytes are prepared by collecting blood sample from the organism of interest and separating erythrocytes from plasma. By using various methods the cells are broken and the drug is entrapped into the erythrocytes, finally they are resealed and the resultant carriers are then called "resealed erythrocytes". So many drugs like aspirin, steroid, cancer drug which having many side effects are reduce by resealed erythrocyte. Current review highlights isolation, drug loading methods, Evaluation methods and applications of resealed erythrocytes for drug delivery.

Keywords: Resealed Erythrocytes, NDDS

PCU-PP-003

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN PHARMACY

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Artificial intelligence relates to the usage of computer systems to execute functions that have historically depended on human brains. To process large amounts of data, and to identify alternative solutions for various symptoms artificial intelligence has made it simpler than ever. Artificial intelligence enhances various phases of the drug development process: in the early stages of drug discovery, whether it is an initial screening of medicinal compounds or estimation of rate of success based on a biological factor. Artificial intelligence has immense potential for different applications such as in different stages of drug discovery, patient treatment, bioinformatics, cancer detection,predicting epidemic etc.,The application of AI in medicine and medical research has the potential toincrease patient care and quality of life. For medical research, AI is an important tool for processing and integrating Big Data. To

overcome discrepancies in funding allocated to different fields of research, such as cardiovascular research AI has been suggested.

Keywords: Artificial Intelligence (AI), Bioinformatics, Drug discovery, Big data.

PCU-PP-004

NANOMEDICINE

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The field of nanomedicine, which is emerging at the nexus of nanotechnology and medicine, has completely changed the pharmaceutical applications market. This abstract explores the multifaceted applications of nanomedicine in pharmacy, highlighting how they have revolutionized drug delivery, diagnostics, and therapeutic interventions. Nanoparticles with sizes ranging from 1-100nm, provides unique attributes enhancing drug stability, solubility and bioavailability. Nanomedicines in drug delivery allow for the targeted and regulated release of therapeutic agents, diminishing side effects and enhancing efficiency. Drugs can now be encapsulated in various nanoformulations, such as liposomes, polymeric nanoparticles, etc., offering an adaptable framework for tailored healthcare. Furthermore, site-specific targeting is made possible by surface modifications, which direct these nanostructures to diseased tissues or cells. Due to their ability to provide sensitive and accurate imaging modalities, nanomedicines are also essential in diagnostic applications. Moreover, theranostic nanomedicines combine therapeutic and diagnostic properties, enabling real-time treatment response monitoring. Notwithstanding the encouraging progress, issues like scalability, biocompatibility, and regulatory concerns still exist. The abstract underscores the need for interdisciplinary collaboration among researchers, physicians and regulatory agencies to surmount these hurdles and unlock full potential of nanomedicines. In summary, the application of nanotechnology in pharmacy marks the beginning of a new era in precision medicine by providing creative ways to improve therapeutic results, drug delivery, and diagnostics

Keywords: Nanomedicine, Nanoformulations, Pharmaceutical market, early diagnosis, Theranostics.

PCU-PP-005

LONG ACTING PARENTERAL FORMULATION{LAPF's}

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The need for long-term treatments of chronic diseases has motivated the widespread development of long-acting parenteral formulations (LAPFs) with the aim of improving drug pharmacokinetics and therapeutic efficacy. LAPFs have been proven to extend the half-life of therapeutics, as well as to improve patient adherence; consequently, this enhances the outcome of therapy positively. Longacting parenteral drug delivery systems have the potential to improve the treatment of chronic conditions. These systems use various technologies, such as oil-based injectables, PLGA-based microspheres, and Insitu gel based depots. Over past decades, considerable progress has been made in designing effective LAPFs in both preclinical and clinical settings. Here we review the latest advances of LAPFs in preclinical and clinical stages,the clnical significance of long acting formulations and recent advances in the field,such as long-acting nanoformulations and long acting products currently in clinical trials,have also been highlighted, focusing on the strategies and underlying mechanisms for achieving long acting. Existing strategies are classified into manipulation of *in vivo* clearance and manipulation of drug release from delivery systems, respectively. And the current challenges and prospects of each strategy are discussed. In addition, we also briefly discuss the design principles of LAPFs and provide future perspectives of the rational design of more effective LAPFs for their further clinical translation.

Keywords: Long Acting Parenterals, microspheres.

PCU-PP-006

FORMULATION AND EVALUATION OF HERBAL TOOTH POWDER USING 3 ANTI INFLAMATORY NATURAL DISINTEGRANTS

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An anti inflammatory is an agent that reduces inflammation (redness, swelling, and pain) in the body testing can be used for drug discovery, epidemiology and prediction of therapeutic outcome. The optimized herbal toothpowder with chemical composition Uncaria tomentosa 20g, AntiInflamatorty agent. Rosmarinus officinalis 10g, cleansing agent. Eryngium15g, Bactericidal agent. Schisandra10g, [Anti-Oxidant] Achillea millefolium 20g, Astringent. Cane molasses 5g, Sweetning agent. Matricaria recutita 10g, Refreshing agent. Basil 10g, Whitining agent] Evaluations Like Shade Test, color Dispersion Test, Pay-off Test, Pressure Test, Breakage Test, Flow Property Test, Particle Size Determination, Abrasive Character, Moisture Content, Flow Property, Determination of pH, Ash values, Extractive values and Irritancy test. Anti inflammatory activity of all prepared sample B1-B9 was compared to standard. But the sample B3 shows more anti inflammatory activity than Remaining formulations. Oral hygiene can be maintained in a reliable, safe and inexpensive way by using herbal tooth powder. The optimized formulation of [B3] has good quality and purity of the verdant (herbal) toothpowder has met with almost all the parameters and comes under the specified limits.

Keywords: Anti-inflammatory Verdant powder, Vaccinium myrtyllus, Borago officinalis and Uncaria tomentosa.

PCU-PP-007

NEEDLE FREE INJECTION SYSTEMS

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Needle free injection systems are novel ways to introduce various medicines into patients without piercing the skin with a conventional needle. Needle free technology offers the very obvious benefit of reducing patient concern about the use of needle. Needle free injection gives very effective injections for a wide range of drugs and bioequivalent to syringe and needle, results in less pain, and is strongly preferred by patients. Additional benefits include very fast injection compared with conventional needles and no needle disposal issues. Not only it can benefit the pharmaceutical industry in increasing product sales, it has the added potential to increase compliance with dosage regimens and improved outcomes. Today, they

are a steadily developing technology that promises to make the administration of medicine more efficient and less painful. The present paper emphasizes in detail about the different techniques in needle free injection systems.

Keywords: Needle free injection systems, injection, novel drug delivery systems.

PCU-PP-008

MULTI-DRUG RESISTANT 'SUPER BUGS': A GLOBAL THREAT IN HEALTHCARE SYSTEM

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The rapid spread and dissemination of the multidrug-resistant bacteria worldwide represents a major public health problem. The development of antibiotics decreased the mortality among the human and animals leading to a better life expectancy. But the injudicious use of antimicrobials and selection pressure the microbes have developed resistance which became more prominent during last few decades. With the evolution of Methicilin-resistant Staphylococcus aureus (MRSA), Hospital-acquired MRSA, Community acquired MRSA and MDR TB (Multidrug resistant tuberculosis) challenge for the clinicians have increased to a greater extent. The global emergence and dissemination of acquired carbapenemases among gram negative bacteria are considered a major public health problem. Gram-negative bacteria, most notably Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, and Acinetobacter baumannii, are among the most important causes of serious hospital-acquired and community-onset bacterial infections in humans, and resistance to antimicrobial agents in these bacteria has become an increasingly relevant problem. Recent development in nanotechnology based drug delivery system may prove to be solution for combating these resistant bacteria. However policies and regulations for antibiotic use should be formulated to control the further development of resistance among the microbes. Although there is a lot of talk about antibiotic resistance in the future, it is important to realise that we are already seeing the impact of resistance infections in every day life. In this review we emphasized the microorganisms primarily reported of being resistance, referred as ESKAPE pathogens (*Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter*

baumanii, Pseudomonas aeruginosa, and Enterobacteriaceae) accentuating their capacity to "escape" from routine antimicrobial regimes and steps taken by Central Drugs Standard Control Organisation (CDSCO) to curb and control indiscriminate use of antibiotics.

Keywords: Resistant Bacteria, MRSA, Antimicrobial, misuse, Stewardship, CDSCO.

PCU-PP-009

FORMULATION AND EVALUATION OF GASTRO-RETENTIVE DRUG DELIVERY SYSTEM OF TELMISARTAN

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Microspheres are free-flowing spherical particles made up of proteins or synthetic polymers that are having sizes ranging from 1-1000µm. Microspheres are prepared to obtain prolonged or controlled drug delivery to improve bioavailability and action at the specific site to a predetermined rate. Aceclofenac is a non steroidal anti inflammatory drug. Floating drug delivery systems retain in the stomach for a longer period and avoid the first-pass effect. The aim of the present study is to achieve oral sustained release of Aceclofenac and to enhance the gastrointestinal resident time, for this purpose the Aceclofenac floating microspheres were formulated by employing the ionic gelation method. The formulation of microspheres includes Aceclofenac, Carbopol940, calcium carbonate, Sodium alginate, and Calcium chloride. Preformulation studies were conducted to evaluate drug excipient compatibility studies by FTIR. Formulated microspheres were evaluated for particle size, percentage yield, entrapment efficiency, buoyancy studies and % drug release. Among all F6 formulation has shown the best % drug release, so selected as optimized formula.

Keywords: Microspheres, Floating drug delivery system, Aceclofenac, Ionic gelation method.

PCU-PP-010

DEVELOPMENT AND CHARACTERIZATION OF FAT-WAX MATRIX TABLETS OF FLURBIPROFEN

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The Fat wax matrix tablets of Flubriprofen were prepared by melt granulation technique using various compositions like oleic acid and carnauba wax, bees wax, Magnesium sterate, Talc, micro crystalline cellulose, with different concentration. Total number of nine formulations was prepared and evaluated. The direct correlation between, dissolution profile for the optimized formulation F3 containing oleic acid and carnauba wax as a disintegrating agent. After evaluation it has been noted that Batch F3 containing oleic acid has shown good results in powder characteristics, post formulation evaluation and hence it was considered as an optimized formulation. Disintegration of batch F5 was less than all other batch. Hardness and Friability of batch F3 were also good. Stability study indicated that there was no change after one month.

Keywords: Flubriprofen, Melt granulation technique, Starch, Talc.

PCU-PP-011

DEVELOPMENT, CHARACTERIZATION OF SOLID DISPERSON OF IRINOTECAN BY SOLVENT EVAPORATION METHOD

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At phosphate buffer pH 6.8, 247 nm grew to become located to be Irinotecan's maximal wavelength. The prepressure combination of the many clusters exhibited incredible to honest flowability with elastic modulus on the element of rest, with Carr's listing values ranging from 10 to 17. Hausner's fraction used to be smaller than 1.2 for every and each organisation with most suitable transportation assets. Every capsule in each and every cluster fulfilled the authority's weight version want so lengthy as its vary modified grew to become above the

cutoff variables. A hardness upward thrust structure two to three kg with friability ranges under 1% point out that the drugs are each minimal and difficult to work with. The tablets' thickness used to be 3.1–3.8 millimetres. Each thing matched the medication's composition for the reason that it contained between 96% and a hundred percent Irinotecan, and a very excessive diploma of uniformity in drug content material used to be discovered. Thus, we regarded the proper characteristics of the organized capsules and made positive they had been underneath strict ample regulation. Irinotecan capsule disintegration was once studied in view that it used to be one of the most strong scattering tablets. When positioned in a phosphate buffer at a pH of 6.8, the Irinotecan switch drugs have been greater quite simply introduced, with F2 exhibiting exquisite drug launch & nbsp;The thought of F2 used to be prolonged to encompass "optimised strategy."

Keywords: Irinotecan, Steady pills that disperse, Irinotecan, Friability

PCU-PP-012

DESIGN AND INVITRO EVALUATION OF NIOSOMAL TRANSDERMAL PATCHES OF CLONAZAPINE

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Niosomes are the non-ionic surfactant vesicles obtained on hydration of synthetic non-ionic surfactants. These are the promising vehicles for effective transdermal drug delivery. The present research work was aimed to develop niosomal-based transdermal Clozapine patch containing a stable formulation with improved drug permeation. Niosomes were prepared by solvent casting method. All the formulations were evaluated for vesicle size, zeta potential and percent entrapment efficiency. All the patches were then characterized for thickness, folding endurance, drug content determination, Flatness, and *in vitro* permeation studies. F3 formulation having optimum vesicle size (2.9m), highest zeta potential (-30.91 mV) and maximum percent entrapment efficiency (95.22 %) was selected as optimized formulation. The transdermal patch was prepared using solvent casting method from the optimised niosomes formulation F3 formulation. The prepared optimised niosomes F3 formulation were loaded into the patch formulation. Patches loaded with Niosomes (F3NT3) showed 91.76 %

cumulative amount of drug permeated. The optimized formulation (F3NT3) followed first order release kinetics.

Keywords: Transdermal patches, clozapine and Niosomes, Patch formulation, niosomal

PCU-PP-013

DEVELOPMENT OF DASATINIB LOADED NANO CARRIER FOR SOLUBILITY AND BIOAVAILABITY ENHANCEMENT

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In the current review, Dasatinib (DST) stacked nanoparticle were ready and assessed to work on the dissolvability and disintegration rate. The DST stacked nanoparticle was ready by twofold emulsion dissolvable vanishing method and poloxamer 188 as stabilizer. Portrayal of DST nanoparticle was done by infrared spectroscopy (FTIR), transmission electron microscopy (TEM), molecule size and zeta potential, ensnarement proficiency, drug content and in vitro drug discharge. The nanoparticle was lyophilized utilizing mannitol (2%) as cryoprotectant. The plan of nanoparticle showed a molecule size of 185.2 nm which was dissected by Zetasizer. The polydispersity record (PdI) of definition was 0.207 that demonstrated a tight size dissemination of particles and the zeta potential worth was - 19.9 mV which shows the moderate soundness of the arranged nanoparticles. Transmission electron microscopy (TEM) results showed circular in shape. The ensnarement proficiency of nanoparticle was viewed as 81.27% and the medication content was 72.88%. In vitro drug arrival of DST nanoparticle and DST answer for 12hrs is 55.72 and 41.40%. Expansion in drug discharge is because of abatement in molecule size of DST stacked nanoparticle. From the acquired outcomes, it was inferred that the innovation is a powerful strategy to work on the dissolvability and disintegration pace of ineffectively dissolvable medication Dasatinib by utilizing twofold emulsion dissolvable dissipation procedure.

Keywords: DST Polydispersity, TEM, Ensnarement Proficiency, Dissipation, Dissolvable vanishing method.

PCU-PP-014

FORMULATION AND EVALUATION OF TELMISARTAN FAST DISSOLVING TABLETS

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The patients with sudden increase blood pressure have markedly reduced function ability and extremely restless, in such cases rapid onset of action is of prime importance. So the patients would be benefited from acute treatment by using fast dissolving drug delivery system. Telmisartan is an anti-hypertensive drug which is insoluble in water; hence the drug may be slowly or incompletely dissolves in the gastro-intestinal tract. So the rate of dissolution and therefore its bio availability is less (bio availability 42%). In the present study an attempt has been made to prepare fast dissolving tablets of telmisartan by using superdisintegrants– crosscarmellose sodium, sodium starch glycolate, level of addition to increase the rate of drug release from dosage form to increase the dissolution rate and hence its bio availability. The tablets were prepared by direct Compression methods and the prepared blend and tablets were evaluated for their physicochemical properties and *in-vitro* dissolution study. The prepared tablets were assessed using FTIR spectroscopy, SEM, Pre-formulation and Post-formulation evaluations are conducted for all the formulations F1-F6. Importantly, the Post-formulation parameters of all formulations met the established criteria for quality. The evaluation studies were performed such as weight Variation, thickness, hardness, disintegrating time, and *In vitro* drug Release. The disintegration time of fast dissolving tablets were increased by the addition of concentration of superdisintegrants.

Keywords: Telmisartan, Fast Dissolving, Disintegration, Anti-hypertensive

PCU-PP-015

A REVIEW ON NOVEL DRUG DELIVERY SYSTEMS FOR TARGETING METABOLIC DISORDERS ASSOCIATED WITH INFLAMMATION USING PHYTOCHEMICALS

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The global incidence of metabolic disorders is on the rise, posing a significant challenge to public health. With remarkable advancements in diagnostic tools and clinical procedures, our understanding of the etiology and underlying pathophysiology of these disorders has expanded considerably. Natural compounds isolated from various sources have garnered extensive attention as prospective drug candidates for the treatment of conditions such as diabetes, obesity, heart-related diseases, and cancer. This interest is partly attributed to their inherent antioxidant and anti-inflammatory properties. Concurrently, intensive research efforts have been directed towards enhancing the bioactivity and bioavailability of these compounds through selected drug delivery strategies. The extensive array of molecules derived from natural products that have undergone clinical trials highlights the ongoing promise of natural products as a source for the development of innovative therapeutics. Metabolic disorders are complex conditions that often necessitate the use of multiple medications to achieve an effective pharmacological response. In this context, the utilization of pharmaceutical preparations derived from natural products holds promise as a safer option. Natural products are widely recognized for their lower risk of triggering harmful adverse effects, making them a viable choice for addressing metabolic disorders. Therefore, it is imperative to address this issue promptly and decisively to narrow the gap in providing scientific evidence supporting the benefits of phytochemicals derived from plants in the management of metabolic disorders. Such efforts are crucial for providing substantial support in the ongoing fight against the rising incidence of diseases associated with metabolic disorders.

Keywords: inflammation, phytochemicals, advancement, metabolic disorders, diabetes, obesity, treatment.

PCU-PP-016

NANOPARTICLES IN DIAGNOSIS OF TARGETED DRUG DELIVERY SYSTEM IN CANCER

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Cancer's persistent challenge demands refined therapeutic approaches, prompting the exploration of nanoparticles' distinct attributes in cancer treatment. This summary offers a comprehensive overview of nanoparticles' dual role in diagnosing cancer and facilitating targeted drug delivery systems. Nanoparticles possess unique physical and chemical characteristics that make them promising tools for targeted drug delivery in cancer treatment. Their size and customizable surface enable tailored modifications, allowing selective binding to specific cancer cells or tissues. This targeted approach enhances drug concentration at the site of action while mitigating systemic toxicity. Additionally, nanoparticles' capacity to encapsulate diverse therapeutic agents, from chemotherapeutic drugs to imaging agents, further augments their usefulness in cancer therapy. In cancer diagnostics, nanoparticles function as adept imaging agents, aiding in early tumor detection and accurate localization. Engineered nanoparticles can target cancer-specific biomarkers or receptors, facilitating precise imaging through modalities like MRI, CT scans, or fluorescence imaging. This abstract emphasizes nanoparticles' role in advancing personalized medicine through tailored targeted drug delivery systems, catering to individual patient requirements. The amalgamation of diagnostics and therapeutics using nanoparticles holds significant potential for transforming cancer treatment, promising heightened efficacy, minimized side effects, and improved patient outcomes. This review focuses on the research progress of various receptors overexpressed on the surfaces of cancer cells and different Nano- delivery systems of anticancer drugs targeted on the surfaces of cancer cells. We believe that through continuous research and development, actively targeted cancer Nano-drugs will make a breakthrough and become an indispensable platform for accurate cancer treatment.

Keywords: Nanoparticles, Targeted Drug Delivery, Cancer Detection, Therapeutic Nanotechnology, Personalized Medicine, Biomarker Targeting.

PCU-PP-017

ARTIFICIAL INTELLIGENCE IN PHARMACEUTICAL TECHNOLOGY AND DRUG DELIVERY DESIGN

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Over recent years, Artificial Intelligence (AI) has made a profound impact on pharmaceutical practices. By leveraging AI's sophisticated algorithms and machine learning capabilities, researchers can navigate extensive biological data like genomics and proteomics. This facilitates precise identification of disease-specific targets and accurate prediction of interactions with potential drug candidates. These innovative strategies expedite the discovery of promising compounds while substantially reducing research costs by optimizing the research and development (R&D) process and decreasing reliance on extensive animal testing. Furthermore, AI-driven personalized medicine, using real-time patient data, holds the promise of tailored treatments and improved patient outcomes. This comprehensive review explores AI's wide-ranging applications in pharmaceutical technology, covering areas such as drug discovery, dosage form design, process optimization, testing, and pharmacokinetics/ pharmacodynamics (PK/PD) studies. It highlights the strategic implementation of AI methodologies, acknowledging their strengths and limitations. This emphasizes the transformative potential of AI in reshaping drug development and patient-centered care in the dynamic pharmaceutical landscape. The strategic use of AI methodologies underscores their potential to refine drug development processes and enhance patient care. Continuous investments in AI-powered initiatives drive the industry towards optimized drug development, fostering innovation, and ultimately enhancing patient well-being. AI's integration continues to reshape pharmaceutical practices, promising a future marked by more efficient drug development and improved patient-centric care.

Keywords: Artificial Intelligence, Pharmaceutical Technology, Dosage Form Design, Patient-centered care.

PCU-PP-018

ECO-FRIENDLY PRODUCTION OF BIO-GAS FROM SOLID STATE ANAEROBIC DIGESTION OF LIGNIN CELLULOSIC

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Currently, our primary energy sources are non-renewable, leading to depletion and environmental concerns. However, a promising alternative exists: converting waste from agriculture, wood, and the pulp & paper industry into biogas. This waste, often discarded due to its limited economic viability, significantly contributes to environmental pollution and health issues. Fortunately, through anaerobic bacteria treatment, this lignin cellulosic waste can be transformed into biogas. This process, known as solid-state anaerobic digestion (SSAD), offers several advantages over liquid-state anaerobic digestion (LSAD), including higher productivity. During SSAD, complex organic matter undergoes a series of transformations: first, hydrolysis converts it into soluble organic matter; then, acidogenesis converts it into volatile fatty acids; and finally, Acetogensis and methanogenesis convert it into either acetic acid/hydrogen gas/carbon dioxide or methane gas, respectively. This renewable and environmentally friendly process holds great promise for the future. It addresses not only energy production but also economic and commercial viability through high yield. In this presentation/poster, we will delve into the process of waste-to-biogas conversion through SSAD, including key parameters like biogas yield, composition, volume, heating requirements, water requirements, total solids used, wastewater and compost production, and volatile solids loss. We will also discuss the process challenges and potential solutions.

Keywords: lignin cellulosic, on renewable, SSAD(solid state anaerobic digestion), LSAD(liquid state anaerobic digestion)

PCU-PP-019

A REVIEW ON SMART MICRONEEDLE ARRAY: FINE-TUNING INSULIN RELEASE FOR PAINLESS ANTI-DIABETIC THERAPY

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Microneedle(s) is/are micro-sized needle-like structure that has the ability to pierce the skin in a non-invasive and painless way. Transdermal delivery is a potentially effective way to distribute medications that penetrate the epidermis and reach deep into the systemic circulation. Research and product development have increased dramatically as a result of this. In comparison to injection and oral preparation, microneedles (MNs) are a revolutionary transdermal drug delivery technology that penetrates the stratum corneum of the skin and delivers medications to the target region more safely and effectively. Diabetes is a chronic disease with a high incidence that requires persistent therapy with accurate drug administration. Pain and other side effects are among the restrictions associated with oral, hypodermic, through-the-nose, and other delivery methods. By combining diagnostics and therapeutics, automated diabetes therapy systems employ microneedles; these sophisticated bioengineered systems can potentially become "smart" diabetes treatment systems. There are currently four varieties of microneedles. Microneedles that are coated, hollow, solid, and dissolvable. insulin-loaded dissolving Microneedles were made on a chip. Through this lesson, we can gain optimal relative bioavailability for insulin delivery using a gelatin/CMC Microneedles patch compared to traditional hypodermic injection. The microneedle sensor's ability to diagnose hyperglycaemia was tested using stable, continuous glucose monitoring in a rat under anaesthesia. For continuous measurements, wearable microneedle electrochemical sensors need to integrate physically and electrically with the skin using skin adhesives and gel electrolytes. Unfortunately, it is difficult to use the current patterning techniques for these materials for a variety of devices because they are laborious, time-consuming and have low process compatibility.

Keywords: microneedle, transdermal, insulin, diabetes mellitus, glucose sensor

PCU-PP-020

FORMULATION AND CHARACTERISATION OF POSACONAZOLE BI LAYER DELAYEDRELEASE TABLETS USING SOLID DISPERSION TECHNIQUE

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Fungal infections is also called as Mycosis which is usually caused by fungi. Antifungal agents are drugs used to treat fungal infections. Antifungal drugs act by either fungicidal or fungistatic action i.e. By killing of fungal cells or by inhibiting growth and multiplication of fungal cells. Antifungal agent's acts on protective parts of fungus like fungal cell wall or fungal cell membrane and cause leakage of cell contents and ultimate death. Bilayer tablet technology provides extensive solutions to various challenges encountered in convention oral drug delivery systems. Bilayer tablets are used to produce biphasic drug release, combine incompatible drugs or to produce synergistic action. Solid dispersion technique no only improves solubility of drugs it therefore enhances many properties of drugs like dissolution rate, absorption, bioavailability, stability and wettability. The aim of present investigation to formulate bilayer tablets of posaconazole by using solvent evaporation technique. Posaconazole belongs to BCS class 2 which has high permeability and low solubility. In order to enhance the solubility of posaconazole solvent evaporation technique was applied where HPMC AS was used as carrier. This tablet consist of two layers of which first layer serves as loading dose which produce immediate release of drug and second layer servesas maintenance dose that provide controlled release of drug. Posaconazole is a member of BCS class II. In nature, it is essentially insoluble. In order to increase Posaconazole's solubility, HPMC AS is combined with the drug using a solid dispersion process. Posaconazole has a daily dose of 300 mg.

Keywords: Antifungal agents, bilayer tablet technology, posaconazole, HPMCAS, BCS class 2,Eudragit L30D55.

PCU-PP-021

FORMULATION AND EVALUATION OF ESOMEPRAZOLE DELAYED-RELEASE TABLETS USING MULTIPLE UNIT PELLET SYSTEM.

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Esomeprazole is a medicine used to treat GERD, peptic ulcers, heartburn, duodenal ulcers, and Zollinger-Ellison syndrome; it is among a class of pharmaceuticals called proton-pump inhibitors (azoles) and can be used orally. The purpose of this research was to develop and test a delayed-release MUPS tablet formulation of esomeprazole. To combat the effects of stomach acid and prevent unwanted "dose dumping," MUPS were developed as delayed-release particles. One of the pelletization procedures, the solution-dispersion layering approach with Wurster technology, was used to create MUPS. The inert core (sugar spheres #45-60) in the prepared Multiple Unit Pellets has four coating layers: pre-coating, drug-loading, seal-coating, and enteric-coating. Hypromellose AN3, talc, PEG 6000, magnesium stearate, Eudragit L30 D, and titanium dioxide are among the inert components used in these coatings. To prevent the medicine from being destroyed by stomach acids between 1.2 and 3.5, an enteric-coating polymer called Eudragit L30 D was put on the seal-coated pellets. The half-life of esomeprazole in the body is around 1 to 1.5 hours. The in-vitro drug release and fluid dynamics of MUPS were studied. Pre-compression settings for MUPS and a number of Tableting excipients (including MCC Ph 102, PEG 6000, Colloidal silicon dioxide, LHPC-LH 11, Crospovidone, and Magnesium stearate) were studied.

Keywords: MUPS, Esomeprazole.

PCU-PP-022

FORMULATION AND EVALUATION OF ETHOSOMES GEL TRANSDERMAL DRUG DELIVERY CARRIERS

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Diabetes that includes risk factors for noncommunicable diseases like hypertension are only one example of the various situations in which chronic disease is connected with other conditions. Due to the challenges in overcoming the adverse effects of a complicated therapeutic treatment regimen, the treatments available for such chronic comorbid disorders are restricted and tough. The purpose of this research was to create and refine Dapagliflozin nano vesicular ethosomal gel for use in the treatment of patients with diabetes and cardiovascular disease. Different parameters, such as in-vitro skin permeation, skin irritation, in-vivo antidiabetic, and antihypertensive activities, were used to characterise the developed formulations. Dapagliflozin is a potent, oral, reversible, highly selective, and competitive inhibitor of human SGLT2 used to treat type 2 diabetes. The ethosomes that contain dapagliflozin are the focus of our current study. By incorporating this medication inside lipid nanocarriers, we were able to generate ethosomes, where the vesicular size and lipid used for formulation controlled the sustained release of medicines. The purpose of this study is to create Dapagliflozin-loaded ethosomes for the management of diabetes, and then to statistically optimise and characterise them. For ethosome improvement, we used a 3^3-level factorial design with three factors.

Keywords: Dapagliflozin, Diabetes, SGLT2, in-vitro release, and ex-vivo, phosphatidylchloride Topical administration.

PCU-PP-023

RECENT APPROACHES AND TECHNIQUES FOR THE DEVELOPMENT OF INTRA NASAL DRUG DELIVERY SYSTEM (INDDS)

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The nasal drug delivery system (NDDS) has used it as an important alternative to the availability of essential drugs. The intranasal segment contains a large area, high pressure, fast acting septum, preventing the first aspiration, the invasive layer of the endothelial and pericardial layers. It has been widely used in recent years for a variety of drugs, including peptides, protein supplements, and simple solutions for nasal congestion. This research article covers the importance, technology, and benefits of nasal mail. Here, several systems are tried to make the building at the time of intranasal injection to produce further absorption of the intranasal drug. In this research article, we discuss the benefits of bio adhesive drugs submitted to the Nasal Medical Association. The transporter (eg, Nano emulsions, microspheres, liposomes, and gels) contains a highly bio adhesive material which improves contact with the nasal mucosa. This mode of transport prevents the medicine from damaging nasal secretions and controls the rate at which the medicine is secreted from the nose.

Keywords: INDDS, Protein, Peptides, Intranasal drug delivery, Permeation enhancer, Bioavailability

PCU-PP-024

MICROFLUIDICS IN LNP-BASED DRUG DELIVERY

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In recent years, there has been a significant transformation in drug delivery technologies, particularly focusing on the utilisation of Lipid Nano-Particles (LNPs). LNPs have demonstrated versatile applications, including the encapsulation of RNA for mRNA vaccines, delivering water-insoluble drugs, facilitating gene editing, and introducing innovative

diagnostic methods such as cancer detection using fluorescent LNPs. To address the issue of conventional LNPs being easily removed from the bloodstream due to mononuclear phagocyte system uptake, PEGylated/stealth LNPs are now commonly employed. These LNPs exhibit high efficiency in drug delivery, demonstrating target-specific (theranostic) capabilities. A notable challenge in LNP production has been achieving a consistent particle size. Microfluidic devices, specifically microreactors, have emerged as pivotal tools in overcoming this obstacle. Resembling circuits with intricately designed channels ranging from 1 to 100 microns in diameter, microreactors present a revolutionary approach to LNP production. Beyond addressing particle size uniformity, microreactors offer additional advantages, including improved mass transfer, leading to reduced mixing times, a high surface-to-volume ratio that enhances heat exchange, and precise control over fluid flow.

Keywords: Lipid Nanoparticles, Microfluidics.

PCU-PP-025

NOVEL DRUG DELIVERY SYSTEMS FOR TARGETING METABOLIC DISORDERS ASSOCIATED WITH INFLAMMATION USING PHYTOCHEMICALS

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The global incidence of metabolic disorders is on the rise, posing a significant challenge to public health. With remarkable advancements in diagnostic tools and clinical procedures, our understanding of the etiology and underlying pathophysiology of these disorders has expanded considerably. Natural compounds isolated from various sources have garnered extensive attention as prospective drug candidates for the treatment of conditions such as diabetes, obesity, heart-related diseases, and cancer. This interest is partly attributed to their inherent antioxidant and anti-inflammatory properties. Concurrently, intensive research efforts have been directed towards enhancing the bioactivity and bioavailability of these compounds through selected drug delivery strategies. The extensive array of molecules derived from natural products that have undergone clinical trials highlights the ongoing promise of natural products as a source for the development of innovative therapeutics. Metabolic disorders are complex conditions that often necessitate the use of multiple

medications to achieve an effective pharmacological response. In this context, the utilization of pharmaceutical preparations derived from natural products holds promise as a safer option. Natural products are widely recognized for their lower risk of triggering harmful adverse effects, making them a viable choice for addressing metabolic disorders. Therefore, it is imperative to address this issue promptly and decisively to narrow the gap in providing scientific evidence supporting the benefits of phytochemicals derived from plants in the management of metabolic disorders. Such efforts are crucial for providing substantial support in the ongoing fight against the rising incidence of diseases associated with metabolic disorders.

Keywords: inflammation, phytochemicals, advancement, metabolic disorders, diabetes, obesity, treatment.

PCU-PP-026

3D PRINTING IN DRUG DEVELOPMENT

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The concept of 3D printing in pharmaceuticals emerged as a novel approach to drug manufacturing. Aprecia pharmaceuticals pioneered the development of 3D printed tablets and gained attention with the approval of Spritam(levetiracetam) by the US food and drug administration(FDA) in August 2015.The technology used by Aprecia pharmaceuticals is Zipdose technology, a 3D printing technology that allows for the layer by layer assembly of Pharmaceuticals. This enables the creation of porous,rapidly disintegrating tablets that can be particularly beneficial for patients who face difficulties in swallowing traditional solid oral dosage forms. The 3D printing process involves depositing layers of powdered medication and a liquid binding agent to build up the desired structures,the result is a tablet with a high drug loading capacity and precise dosage control. This technology not only offers advantages in terms of personalized medicine but also allows for the production of drugs with unique release profiles and complex structures. The flexibility of 3D printing in pharmaceuticals is particularly beneficial for personalized medicine and the development of unique drug delivery systems. Overall, 3D printing in the pharmaceutical industry contributes to

innovation, efficiency and the potential for more patient-centric approaches to drug development and manufacturing. This method allows for the precise control over the dosage, facilitates incorporation of multiple drugs into a single tablet and enables the creation of complex structures that may not be feasible with the traditional tablet manufacturing method.

Keywords: 3D printing, Zipdose technology.

PCU-PP-027

A REVIEW ON MICRONEEDLE BASED TRANSDERMAL DRUG DELIVERY SYSTEMS

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Transdermal drug delivery system (TDDS) is preferred over conventional dosage forms as it avoids first pass metabolism of administered drugs, improve patient compliance and avoids gastric irritation. Stratum corneum (SC), the upper layer of skin works as a barrier property by limiting the permeation of many drugs. To bypass this barrier, physical and chemical approaches are generally used. When compared with chemical approaches physical seems to be better as it does not involve use of chemicals during the formulation process. Microneedles are introduced into Transdermal drug delivery system allows the drug to reach the epidermis effectively. Microneedles used in this technique produces little or no pain. The current review mainly focuses on mechanism of action, preparation, types of Microneedles, commercial products and safety aspects of microneedles.

Keywords: Microneedles, Hydrogel-forming, Two-photon polymerization, Micromolding process.

PCU-PP-028

THE TOOL FOR NOVEL DRUG DELIVERY-TRANSDERMAL DRUG DELIVERY SYSTEM

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A transdermal patch is a medicated adhesive patch that is placed over a skin to deliver a specific dose of medication through the skin and into the blood stream.It cannot give desired therapeutic activity,in the case of a drug under the Trandermal drug delivery system it can give systemic activity for a prolonged period of time and maintain its therapeutic activity. Chewing is an abvious drug delivery system for a local treatment of diseases in the oral activity and in the throat, as sustaining the release of active substances may deliberately prolong exposure. TDDS are self-contained. Discrete dosage form called “patches”, when it applies to intact skin, delivers drugs through skin at controlled rate to systemic circulation. It works very simply in which a drug is applied inside the patch and it is worn on skin for a long period of time. Transdermal drug delivery is a recent technology which promises a great future it has a potential to limit the use of needles for administering different kinds of drugs cost factor is an important thing to consider since developing nations like INDIA have second highest population, but due to higher cost TDDS are the hidden part of therapy used in general population.

Keywords: TDDS, NDDS

PCU-PP-029

ETHOSOME: A NOVEL DRUG DELIVERY CARRIER

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Ethosomes are newer lipid vesicular carriers that have been around for 20 years, but over that period they have grown significantly as a means of transdermal drug delivery. They have a sizable amount of ethanol in them. These nanocarriers carry medicinal substances with various physicochemical qualities throughout the skin and deep skin layers. Ethosomes have undergone substantial investigation; new substances have been added to their original

composition, creating new varieties of ethosomal systems. Ethosomes can encapsulate and distribute extremely lipophilic molecules through the skin, as well as cationic drugs, due to their unique structure. They are non-invasive delivery carriers that enable drugs to reach deep skin layers and systemic circulation. These innovative carriers, which can be added to gels, patches, and lotions, are prepared using several novel methods. In addition to clinical trials, many *in vivo* models are employed to assess the effectiveness of dermal/transdermal administration. Ethosomal systems are categorized based on their constituents and divided into three types Classical ethosomes, Binary ethosomes, and Transethosomes. Transethosomes are superior in all the responses as compared to other vesicular formulations with improved stability and highest elasticity. The differences among these systems are discussed from several perspectives including the formulation, size, ζ-potential (zeta potential), entrapment efficiency, skin-permeation properties, and stability studies.

Keywords: Ethosomes, transdermal, lipid-based vesicles, delivery systems

PCU-PP-030

THE FUTURE OF MEDICINE: PERSONALIZED DRUG DELIVERY SYSYTEMS

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To improve the quality of life of people, many advanced medical technologies have emerged. Among these, Personalized drug delivery systems (PDDS) has been proven to play an important role in the healthcare sector. In conventional drug delivery system where all patients are given a common treatment for a condition but do not react equally to same line of drug treatment. So, the future of medical treatments will be focused towards the use of personal medication. This implies the use of dose and dosage form, frequency of administration and drug release kinetics; tailored to a patient resulting in better therapeutic outcomes and reduced adverse effects. PDDS include fields like artificial intelligence, customized medicines, 3D printing etc. which are now considered to be the future of medical treatments. PDDS has also seen significance in the paediatric delivery through Mini-tablets and granules; and in geriatric treatment innovations have been done to include physiological, psychological and multiple drug requirements of individual elderly patient. Therefore, such advanced design solutions for new products such as interactive personalized treatment that

would interconnect the pharmaceutical and digital worlds is very much needed for better patient care, treatment and disease prevention.

Keywords: Personalized drug delivery systems, customized medicines.

PAQ - PP - 001

STABILIZATION OF PHARMACEUTICALS

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The application of pharmaceuticals, therapeutic molecules of biological origin, are increasing everyday. The major reasons for this preference are target specificity and lower side effects. Production and downstream processing of pharmaceuticals have their challenges that raise their final cost. The instability of proteins, during expression, purification, formulation, storage and administration is an issue that needs to be addressed if biopharmaceuticals are to achieve their full clinical potential. This requires a thorough understanding of the protein structure and changes that it undergoes when exposed to physical and chemical stressors.

Key words: Pharmaceuticals, proteins and therapeutic molecules.

PAQ - PP – 002

IMPLEMENTATION OF HYDROTROPIC SOLVENTS FOR UV SPECTROPHOTOMETRIC ASSESSMENT OF ESOMEPRAZOLE LOADED MICROSPHERES: GREENNESS EVALUATION

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Current framework overlays a simple UV-spectrophotometric technique was developed and validated for measuring esomeprazole in bulk and in various dose forms. Numerous hydroptropic reagents were tried upon for improving the solubility of ESM in order to enhance the same. Esomeprazole has the highest absorbance at 299nm in 1MUrea solvent for stock solution and subsequent dilutions. Many analytical performance criteria, such as linearity, precision, accuracy, and robustness, were determined using ICH recommendations. The linearity range was found to be 2-10µg/ml, and the %RSD for repeatability was 0.470, and the correlation coefficient (r2) was 0.998, % mean recovery was found to be for the different concentrations for 50% was 101.9%, 100% was 100.1%, and 150% was 99.79% for

esomeprazole. Analytical Greenness report was found to be 0.64. The findings of the analysis were statistically confirmed and supported by recovery studies.

Key words: Esomeprazole, 1MUrea, UV- spectrophotometric method.

PAQ - PP – 003

PHARMACOGNOSTIC AND PHYTOCHEMICAL STUDIES OF HYDROLEA ZEYLANICA VAHL. LEAVES (HYDROPHYLLACEAE)

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In recent years, there has been rapid increase in the standardization of selected medicinal plant ofpotential therapeutic significance. Despite the modern techniques, identification of plant drug byPharmacognostic study is more reliable. Hydrolea zeylanica Vahl, family Hydrophyllaceae, commonly known as Koliary is one such plant found in Indian to China and through Malaya to tropical Australia. By looking the high traditional use of the plant Hydrolea zeylanica, the present investigation was undertaken for research with the purpose of drawing the pharmacopoeial standards for this species. The present study deals with pharmacognostical parameters for the leaf of Hydrolea zeylanica which mainly consists of macromorphology, microscopical characters and phytochemical screening. This information will be of used for further pharmacological and therapeutical evaluation of the species and will assist in standardization for quality, purity and sample identification.

Key words: Hydrolea zeylanica, phytochemical and pharmacological

PCH - PP - 001

DESIGN, SYNTHESIS AND BIOLOGICAL EVALUATION OF NEW 1,2,3 TRIAZOLYL TETHERED CARBOHYDRAZIDES AS GLUCAGON LIKE PEPTIDE-1 RECEPTOR AGONISTS FOR ANTIDIABETIC ACTIVITY

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Blood glucose imbalances are typically the result of diabetes mellitus. It is necessary to design medications that can sustain blood-glucose levels since the body's insulin levels are altered. There have been several medications produced that target specific targets, however nearly all of them have a duration of action as a downside. Studies on agonists of the glucagon-like peptide-1 receptor were conducted in order to get around this problem. This project involved the design and synthesis of a series of fused heterocyclic rings. Together with synthesis, in vitro investigations, and in silico investigations such as molecular docking and ADMET characteristics, this research could serve as a helpful framework for the discovery of small compounds that function as the Glucagon Like Peptide-1 receptor and are therapeutically efficacious.

Key words: ADMET, Glucagon, Glucose and diabetes.

PCH - PP – 002

SYNTHESIS AND CHARACTERISATION OF PYRROLE CONTAINING THIAZOLIDINE-2,4- DIONE DERIVATIVES AS ANTI-MICROBIAL AGENTS

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This study aims to synthesize and evaluate a new pyrrole containing thiazolidine 2,4- dione derivatives with antimicrobial agents. Three steps in the synthetic procedure, first step to synthesis (R1 and R2) substituted 4-(2,5-dioxopyrrolidin -1-yl) in the second step benzaldehyde compound contain chloroacetic acid with thiourea to form thiazolidine-2,4-dione, (R2) is treated with the thiazolidine-2,4-dione will get the final product R2 substituted 5-(4-(2,5 dioxopyrrolidin-1-yl) benzylidene) thiazolidin-2,4- dione in the third step. (FT-IR, mass and H^1 NMR) in spectral and physical approaches used to synthesized substances. The synthesized compounds were evaluated for their antimicrobial activity. Two Gram -positive bacteria (Staphylococcus aureus and Bacillus subtilis) and two Gram -negative bacteria

(E.coli and Pseudomonas aeruginosa) were used for antibacterial activity. Candida albicans was used for antifungal activity. The cup and plate technique is used to synthesize compounds with antimicrobial activity. The data confirmed compounds I and II (-H AND -CH 3) having mild antimicrobial activity and compound III (-C 2 H 5) having antimicrobial activity compared with the standard drug.

Key words: Pyrrole, thiazolidine-2,4, FT -IR ,mass and H¹NMR,anti-bacteerial and anti – fungal.

PCH - PP – 003

PRELIMINARY PHYTOCHEMICAL INVESTIGATION AND ANTHELMINTIC ACTIVITY OF SPILANTHES FILICAULIS

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Spilanthes filicaulis is a medicinal plant widely used in traditional herbal medicine for its various therapeutic properties. This study aimed to conduct a preliminary phytochemical investigation of Spilanthes filicaulis and evaluate its potential anthelmintic activity against parasitic worms. The plant material of Spilanthes filicaulis was collected, dried, and subjected to extraction using suitable solvents. The results revealed the presence of these bioactive constituents in the crude extracts of Spilanthes filicaulis. Furthermore, the anthelmintic activity of the crude extracts was evaluated using in vitro assays against parasitic worms. The extracts were tested at different concentrations, and their effects on the survival and motility of the worms were recorded. In conclusion, this preliminary phytochemical investigation of Spilanthes filicaulis confirmed the presence of various bioactive constituents, which may contribute to its medicinal properties. Additionally, theevaluated anthelmintic activity suggests its potential as a natural anthelmintic agent.

Keywords: Spilanthes filicaulis, phytochemical investigation, anthelmintic activity, bioactive compound, alkaloids, parasitic worms, dose-dependent response.

PCH - PP – 004

SYNTHESIS AND BIOLOGICAL EVALUATION OF NOVEL TRIAZOLYL BENZENESULPHONAMIDES AS ANTI-TUBERCULAR AGENTS

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Novel triazolyl benzene sulphonamides (VIa-e) were synthesized and evaluated for anti tubercular activity. The compounds were synthesized by the condensation of 4-(4-acetyl-5-methyl-1H-1, 2, 3-triazole-1-yl) benzene sulphonamide and pyrazole aldehyde which gives chalcone. The obtained chalcone was reacted with thiosemicarbazide which gives 5-(1,4-diphenyl-1H-pyrazol-3-yl)-3-(5-methyl-1-(4- sulfamoylphenyl)-1H-1,2,3-triazol-4-yl)-4,5-dihydro-1H-pyrazole-1-carbothioamide (VIIa-e). All the synthesized compounds were characterized based on spectral and elemental analysis data. The anti tubercular activity was performed against the M.tuberculosis H37RV strain using micro plate alamar blue assay (MABA). Antibacterial activity was performed using the cup plate method. The in-silico pharmacokinetic profile(ADME) and molecular docking studies were conducted using the enzyme Crystal structure of Burkholderia cenocepacia dihydropteroate synthase complexed with 7,8-dihydropteroate(PDB ID: 2Y5S). The synthesis of fifteen novel derivatives, followed by the characterization and anti-tubercular screening of those compounds. Physical (MP and TLC) and spectral (FTIR, 1HNMR, and mass) approaches were used to characterize the compounds. The H37RV strain was tested for anti-tubercular activity using the Micro Plate Blue Assay (MABA) method, and the anti-bacterial activity was tested using the cup plate method. When tested for anti-tubercular activity, compounds VIa, VIb, and VIc showed substantial activity at 50 g/ml concentrations, whereas other substances showed action at 100 g/ml concentrations. None of the compounds have demonstrated antibacterial activity in testing. The compounds were synthesized in quantitative yields and possessed anti- tubercular activity.

Key words: Triazolyl benzene sulphonamide, anti-tubercular activity and antibacterial activity.

PCH - PP – 005

MOLECULAR DOCKING IN ANTI CANCER DRUG DISCOVERY

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The incessant pursuit of novel anti-cancer therapies necessitates innovative methodologies that expedite drug discovery processes. Molecular docking, a computational technique, has emerged as a pivotal tool in the rational design and optimization of anti-cancer drugs. In simple terms docking is a molecular modeling technique that is used to predict how a protein (enzyme) interacts with small molecules (ligand). This abstract provides an overview of the application of molecular docking in anticancer drug development. The process begins with the identification of specific molecular targets crucial to cancer pathogenesis, involved in apoptosis. Experimental determination or computational prediction of the 3-Dstuctures of these targets sets the stage for virtual screening. Various potential drug molecules are subjected to docking simulations. The results of docking simulations yield ranked lists of potential drug candidate, where compounds with higher scores are considered as promising leads. Molecular docking stands as an indispensable computational approach in the quest for anti-cancer therapeutics. Its ability to predict and analyze molecular interactions expedites the identification of lead compounds, there by contributing significantly to the development of targeted and efficacious drugs for combating cancer.

Key words: Anti-cancer, molecular docking and lead.

PCL-PP-001

WHITE LUNG SYNDROME: A MYSTERIOUS PNEUMONIA

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An outbreak of a respiratory illness in northern China and Ohio in the US — the White Lung Syndrome as people are calling it — has sparked speculation online of a new pandemic threat after COVID-19. In China, authorities have attributed the respiratory disease to the circulation of various pathogens, viruses and bacteria like mycoplasma pneumoniae. In Ohio, the health authorities are attributing therising cases of pneumonia among children to familiar pathogens with no connection to pneumonia clusters in China and parts of Europe. When you see the X-ray or CT scans of the lungs, know that theyappear black. This indicates air in the lungs. Whenever there is an inflammation or collection of fluid inthe lungs, which restrict the air sacs, the lungs show up white. The white patches could be because of a bacterial or viral infection. It's not a new phenomenon but because China has reported an outbreak of mycoplasma pneumoniae, which is a bacterial infection that shows up as white patches in a lung scan, it has probably been given a more colloquial name. Otherwise "White Lung Syndrome" is not a scientific terminology. The lung X-ray shows white patches even when you are battling any flu. The present review article focuses on sign and symptoms, treatment and preventive measures for this disease.

Keywords: White Lung Syndrome, COVID-19, Mycoplasma pneumoniae

PCL-PP-002

BIOELECTRONIC MEDICINE: A NEW VISTA FOR CHRONIC DISEASES

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The advancement of technology is continuing to change the world. Bioelectronic medicine, the convergence of molecular medicine, neuroscience, engineering and computing to develop devices to diagnose and treat diseases, is at the forefront of a potential revolution in disease management. The discipline bioelectronic medicine arose from groundbreaking discoveries

of mechanisms for neural control of biological processes that underlie disease, and the development of devices to modulate these specific neural circuits as therapy using electrons instead of drugs. Bioelectronic medicine has emerged at a convergent epicentre in health care, technology and science. Development of new therapies relies on detailed understanding of the molecular mechanisms of disease. Pharmaceutical drugs are optimized to target defined molecular mechanisms, but often lack anatomical and cellular specificity, which inevitably causes toxicity from off-target effects. Drugs are not inherently designed to adapt to individual treatment, so both under- and overdosing are common, resulting in therapy failure or unwanted side effects. Advances in bioelectronic medicine hold promise to address some of these challenges and provide personalized treatment of disease. Bioelectronic medicine is increasingly becoming applied in clinical trials. Patients suffering from rheumatoid arthritis that were implanted with a vagus nerve stimulator to activate the inflammatory reflex showed significant improvement of clinical signs and symptoms.

Keywords: Bioelectronic medicine, Personalized treatment, Rheumatoid arthritis

PCL-PP-003

OPTOGENETICS: CONTROLLING NEURONS WITH LIGHT OR BRAIN DISORDERS

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Optogenetics is a biological tool used in the field of neuroscience that encompasses a combination of techniques from optics and genetics to study the functioning of individual neurons in a living tissue. Spatio-temporal precision in neuronal control can be achieved using optogenetic actuators or reporters and sensors or indicators. The present review highlights the brief history of optogenetic s, opsins- the functional unit in optogenetics, and the design of optogenetic experiments to study behavior in normal function or disease models. The review also discusses the limitations of the technique and its applications in various behavioural and neuropsychiatric disorders such as anxiety, fear, depression, addiction, autism & parkinsonism. Light-responsive proteins are allowing scientists to turn neurons on or off selectively with unprecedented precision. Introducing these proteins into cultured cells or the brains of live animals allows investigation of the structure and function of neural networks. These ‘optogenetic’ tools also hold clinical promise, with the

potential for modulating activity of brain circuits involved in neurological disorders or restoring vision loss. What excites neuroscientists about optogenetics is control over defined events within defined cell types at defined times—a level of precision that is most likely crucial to biological understanding even beyond neuroscience. Looking back at the exploding rate of progress over the last few years, it is reasonable to predict and believe that the molecular techniques for optogenetics will continue to evolve rapidly and that the applications of these methods will continue to expand.

Keywords: Optogenetics, Neurological disorders, Neuroscience

PCL-PP-004

EVALUATION OF CATARACT PREVENTIVE ACTION OF HYDRO ALCOHOLIC EXTRACT OF LEAVES OF LTERNANTHERA SESSILIS

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The present study has been carried out to evaluate the anticataract activity of hydro alcoholic extract of leaves of Alternanthera sessilis (HAAS) using in vitro models such as glucose induced and photochemical induced cataract in lens. Fresh goat lens were collected and divided into six experimental groups in models. Lenses were incubated in artificial aqueous humour. In glucose induced model glucose was used as an inducer, vitamin E(75µg/ml) used as standard drug and extract at a dose of 100 mg/ml, 300mg/ml and 500mg/ml were incubated for a period of 72 hours at room temperature. After incubation various biochemical parameters such as total protein content, malondialdehyde (MDA) levels and enzymatic antioxidants like catalase were measured using lens homogenate. models produced mature cataract by increasing MDA levels and decreasing the protein content when compared to normal group. Results of the present study suggest that simultaneous incubation of the plant extract prevent opacification of lens caused by glucose. Thus hydro alcoholic extract of Alternanthera sessilis (HAAS) protected the lens against cataract progression.

Keywords: Artificial humor, glucose induced cataract, Alternanthera sessilis.

PCL-PP-005

METAL BASED NANOPARTICLES: A PROMISING AND EFFECTIVE PPROACH FOR THE MANAGEMENT AND TREATMENT OF CARDIOVASCULAR DISEASES

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Cardiovascular disease (CVD) is the leading cause of death worldwide estimated 17.9 million lives each year.CVDs are a group of disorders of the heart and blood vessels and include coronary heart disease,cerebrovascular disease and rheumatic heart disease and other conditions. More than four out of five CVD deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age. A search for more effective treatments of CVD is increasingly needed. Major advances in nanotechnology opened new avenues in CVD therapeutics. Owing to their special properties, iron oxide, gold and silver nanoparticles (NPs) could exert various effects in the management and treatment of CVD.The role of iron oxide NPs in the detection and identification of atherosclerotic plaques is receiving increased attention. Moreover, these NPs enhance targeted stem cell delivery, thereby potentiating the regenerative capacity at the injured sites. On the other hand, gold nanoparticles help in detection of various genetic and molecular biomarkers and the silver nanoparticles show anti-microbial effect owing to favourable reduction of infections. Coating of cardiac stents and pacemakers with these particles has been applied to reduce the risk of acquired foreign body associated infections. However, the smaller nanoparticle size is linked to higher toxicity. Overall the study results suggest that nanoparticles play an effective role in targeted delivery and aid in better management of CVD.

Keywords: Cardiovascular disease, Nanotechnology, Gold nanoparticles.

PCL-PP-006

INNOVATIONS IN IMMONOTHEAPY OF CANCER

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Immunotherapy is a type of medical treatment that stimulates or enhances the body's own immune system to fight diseases, including cancer. The immune system is a complex network

of cells, tissues, and organs that work together to defend the body against harmful invaders, such as bacteria, viruses, and cancer cells. One key breakthrough is the development of checkpoint inhibitors, such as PD-1 and CTLA4 inhibitors, which enhance the immune system's ability to recognize and eliminate cancer cells. These inhibitors have significantly improved response rates and introduced targeted treatment strategies. CAR-T therapy stands out as a game-changer, involving the genetic modification of a patient's T cells to target specific cancer antigens. This approach has shown unprecedented success in hematological malignancies, offering hope to patients with limited treatment options. Beyond cancer, immunotherapy innovations extend to autoimmune disorders. Advancements in biologics and monoclonal antibodies enable the precise modulation of immune responses, providing relief for conditions like rheumatoid arthritis and multiple sclerosis. Personalized immunotherapy takes a leap with neoantigen vaccines, tailoring treatments to individual tumor genetic profiles. This approach holds promise for preventing cancer recurrence and improving long-term outcomes.

Keywords: Immunotherapy, CAR-T therapy, Autoimmune disorders

PCL-PP-007

REVERSE PHARMACOLOGY: A NOVEL TALE IN DRUG DISCOVERY

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Despite significant advances in high throughout assays, the current state of drug discovery and development is facing an insurmountable challenge. For this reason, new methods for drug research are urgently needed. Ayurveda was used by almost 70% of Indians. The systematic and research-based search and investigation of native plants for beneficial and therapeutic effects should be modified. For this clarification, new scenarios and approaches were developed and developed Ayurvedic epidemiology, observational studies, and reverse pharmacological methods have produced remarkable achievements, indications, and components for a wide variety of diseases and conditions. The potential Phyto base entity will appear in future scaffolds for medicinal chemists to increase potency while reducing toxicity. Many native medicinal herbs have been shown to be effective. Mucuna pruriens eggs are effective in treating Parkinson's disease, the Nycthanthes plant arbor-tritis is effective in treating malaria, and Phyllanthus amarus is used in treating hepatitis. Reverse

pharmacology is used by several groups around the world for drug development of new formulations, chemicals, and baits.

Keywords: Reverse pharmacology, Parkinson's disease, Phyllanthus amarus

PCL-PP-008

BIOSENSORS: AN EMERGING TOOL FOR THE DIAGNOSIS OF CANCER

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Biochemical pathways in a biological system become impaired by the chaos of cancer. Cancer, which is still the most fatal disease in the world, is the primary example of cells throughout the human body misbehaving. In order to move forward with treatment, it is necessary to identify and detect the differences between the expression of certain parameters within a host during its normal physiology and diseased situations. Despite their possible drawbacks, there are still a lot of traditional ways available today. Therefore, a variety of molecular indicators, including as proteins, peptides, over- or under-expression of gene markers, and gene alterations, are typically assessed for the diagnosis of cancer. In this review, the prospects and difficulties of biosensors for the next generation of cancer diagnostics are discussed. in addition to transducers, varieties of transducers, and Nanomaterials Application in Biosensing.

Keywords: Biomarker, Biosensor, Cancer Diagnosis, Transducer

PCL-PP-009

AN UPDATED REVIEW ON RECENTLY BANNED DRUG PRODUCTS

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For a healthy life style, not only the prevention of diseases is important but equally important is the treatment of such diseases with safe drugs. Good quality of life of human beings can only be achieved with quality drugs with maximum therapeutic benefits and maximum side effects, available to all at affordable cost. Drugs which are found unsafe in post marketing

surveillance are banned by regulatory authorities. Unexpected adverse effects ,excess toxicity availability of safer alternatives, harmful interactions, irrational use and failure of risk management options are the prime reasons which direct whether to use or ban a drug. Every drug shows some side effects, however all the adverse effects and toxicities cannot be elicited in the limited number of volunteers used in the phased trails, a lot of dangerous rare toxicities come to light only when the drugs are marketed and prescribed to thousands of people. Numbers of drugs which are banned in other countries are freely available in India due to prescribers and patients unawareness, commercial interests of manufactures and also an important issue about the availability of banned drugs over the counter the India is that sufficient adverse drug reactions data about these drugs have not been reported. pharmacovigilance is useful in assuring the safety of medicines and protecting the consumers from harmful drug effects. A patient relies on his physician and prescriber for his treatment. It is required to grasp an idea about the medicine which were banned from time to time under what circumstance such as meftalspas tablets and codeine syrup.

Keywords: Rare toxicities, Pharmacovigilance, Dangerous rare toxicities

PCL-PP-010

FENTANYL, POTENT SYNTHETIC OPIOD DRUG

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Fentanyl introduced more than 50 years ago has become the most often used opiod for analgesia.It is a narcotic analgesic which is majorly prescribed for treating severe pain, typically advanced cancer pain. It's structure is similar to that of morphine but is 50 to 100 times more potent. Fentanyl produces effects such as relaxation, sedation and pain relief. The onset of action of this drug is about less than 60 seconds. Fentanyl is typically administered intravenously, intramuscularly, transdermally as skin patches and intranasally. All drugs come with side effects but the major problem associated with fentanyl is addiction. Its is addictive because of its high potency. People addicted to fentanyl who stop using have severe withdrawal symptoms. The overall drug overdose deaths rose to 106,000 from the years 2019 to 2020. Deaths involving fentanyl continued to rise with 70,601 overdose deaths in the year 2021. Adequate doses should be taken under the supervision of physicians and pharmacists.

PCG - PP – 001

MEDICINAL PLANTS WITH ANTIDENGUE ACTIVITY

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Dengue is a major public health challenge worldwide, particularly in tropical areas. Nearly 390 million infections and 22,000 deaths occur every year. At present, there are no specific therapeutics available to treat dengue; however, possible treatment procedures are explained in the traditional medical systems (TMSs), such as Sri Lankan TMS, Indian Ayurvedic, Unani, and Siddha TMS. In these TMSs, medicinal plants have been used in several ways against dengue, such as virocides, larvicides, and mosquito repellents. Therefore, medicinal plants inherit biologically active compounds/lead compounds that are yet to be identified chemically and physiologically. Herein, we discuss the possible applications of crude plant extracts and isolated phytochemicals from medicinal plants such as quercetin, sulfated galactomannans, flavonoids, and glabranine in controlling dengue. Moreover, medicinal plant-based therapeutics can be safer, cost-effective, and non-toxic. Therefore, this paper reviews the medicinal plants that are used in TMSs to manage dengue, the phytochemicals they contain, and mode of action of these phytochemicals such as virocides, larvicides, and mosquito repellents.

Keywords: dengue, in silico, larvicides, phytochemicals, virocides

PHP-PP-001

A PROSPECTIVE STUDY TO EVALUATE THE "ROLE OF TIMING OF VASOCONSTRICTOR ADMINISTRATION IN PATIENT WITH ACUTE VARICEAL BLEEDING."

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The study endeavours to evaluate the optimal timing for EVL (Endoscopic Variceal Ligation) banding and seeks to analyse the initiation, process, duration and potential complications of employing vasoactive agents in treatment of variceal bleeding. Variceal haemorrhage is nothing but the rupture of variceal wall due to excessive wall tension and is one of the most immediate life-threatening complications in patients with cirrhosis.70% of GI bleeding events in patients with portal hypertension are due to variceal bleeds. Vasoactive agents have been shown to improve mortality in variceal bleeding and is effective as endoscopic therapy at reducing mortality, haemostasis and to prevent re-bleeding. But there is no definitive consensus about timing of vasoactive agents Initiation, duration and its long-term effect on outcome of variceal bleed, requirement of blood products, recurrence and control of GI bleed. About 30-50% of patients admitted for the first episode of variceal bleeding die within 6 weeks.In this study, we like to optimise the timeline for development of EVL from onset of variceal bleed and intend to evaluate the APASL severity score in relation to five-day treatment failure, in-hospital mortality, need for ICU, length of hospital stays, recurrence of bleed, and also study the prevalence of renal dysfunction, infections and any other complications if present.

Keywords: Vasoactive agents, variceal haemorrhage, Endoscopic variceal ligation.

PHP-PP-002

REVIEW ON AUTISM SPECTRUM DISORDER

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Autism, also called autism spectrum disorder (ASD), is a developmental disability caused by difference in the brain. Some people with ASD have a known difference, such as genetic condition. Other causes are not yet known. It is a complicated, lifelong condition that includes problems with communication and behaviour. It's spectrum disorder, which means it

affects people in different ways and in varying degrees. It usually appears by age 2 or 3. People with ASD often have problems with social communication and interaction, and restricted or repetitive behaviours or interests. People with ASD may also have different ways of learning, moving, or paying attention. The current science suggests that several genetic factors may increase the risk of autism in a complex manner. Having certain specific genetic conditions such as Fragile X Syndrome and Tuberous Sclerosis has been identified as conferring a particularly increased risk for being diagnosed with autism. Certain medications, such as valproic acid and thalidomide, when taken during pregnancy, have been linked with a higher risk of autism as well. While there is no "cure" for autism, there are several effective interventions that can improve a child's functioning. Having a child with autism affects the whole family. It can be stressful, time-consuming and expensive. Paying attention to the physical and emotional health of the whole family is important.

Keywords: Autism, Spectrum disorder, Repetitive behaviour, Genetics

PHP-PP-003

REVIEW ON ALZHEIMER'S DISEASE

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Alzheimer's disease (AD) is a progressive neurodegenerative disease that impairs memory and cognitive judgment. It is the leading cause of dementia in late adult life and is associated with a significant social burden and increased morbidity and mortality in the elderly. It represents a significant challenge for the aging health of our country. Because of medical advances, the life expectancy of our residents is increasing. Aging also is the greatest risk factor for development of AD and the Alzheimer's Association estimates that 81% of people who have AD are 75 years or older. The most significant risk factors for AD are family histories and the presence of related genes in a person's genome. An AD diagnosis is based on a clinical examination as well as a comprehensive interview of the patient and their relatives. Herbal remedies, vitamins and other supplements are widely promoted for cognitive health or to prevent or delay Alzheimer's. But clinical trials have produced mixed results. There's little evidence to support them as effective treatments.

Keywords: Dementia, Neurodegenerative, Memory

PHP-PP-004

REVIEW ON SPINAL MUSCULAR ATROPHY

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Spinal muscular atrophy (SMA) is a genetic disease affecting the central nervous system, peripheral nervous system, and voluntary muscle movement (skeletal muscle). Most of the nerve cells that control muscles are located in the spinal cord, which accounts for the word spinal in the name of the disease. SMA is muscular because its primary effect is on muscles, which don't receive signals from these nerve cells. Atrophy is the medical term for getting smaller, which is what generally happens to muscles when they're not stimulated by nerve cells. The most common form of SMA (types 1-4) is caused by a defect (mutation) in the SMN1 gene on chromosome 5. The first steps in diagnosis of a neuromuscular disease are usually an in-office physical examination and family history, with some simple tests to distinguish spinal muscular atrophy (SMA) from similar conditions (such as muscular dystrophy). Muscle weakness and hypotonia should be the first signs that raise suspicion for SMA in babies. In recent years, the availability of portable, effective ventilation devices has created more options for newborns with SMA, and in some cases has greatly extended life. Assisted ventilation also can help children and adults with different forms of SMA.

Keywords: Genetics, CNS, Mutation

PHP-PP-005

A CASE STUDY ON FIBRODYSPLASIA OSSIFICANS PROGRESSIVA (STONEMAN SYNDROME)

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Stoneman syndrome, also known as Proteus syndrome and Fibrodysplasia Ossificans Progressiva is a rare genetic disorder that affects the growth of various tissues in the body. In Stoneman syndrome, there are specific changes in a gene called AKT1, which plays a role in cell growth and development. These changes result in the overactivation of the AKT1 pathway, leading to uncontrolled cell proliferation and abnormal tissue growth. One of the most striking symptoms of Stoneman syndrome is the overgrowth of skin, bones, and other

tissues. This can result in asymmetrical limb overgrowth, causing one side of the body to be larger or longer than the other. Facial features can also be affected, with overgrowth of the lips, nose and cheek. Doctors typically rely on a combination of physical examination, medical history, and imaging studies to identify

characteristic features associated with the syndrome. Genetic testing may also be performed to detect mutations in the AKT1 gene, although not all cases may have identifiable mutations. As of now, there is no cure for Stoneman syndrome. Treatment mainly focuses on managing the symptoms and complications that arise. This can involve a multidisciplinary approach, including surgical interventions to correct skeletal abnormalities, physical therapy to improve mobility and function, and supportive care to address specific needs.

Keywords: AKT1, surgical interventions, genetic disorder, therapy, mutations.

PHP-PP-006

APPROACH TO MANAGING IgA NEPHROPATHY

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IgA nephropathy, a prevalent form of glomerulonephritis, arises from the accumulation of immunoglobulin A (IgA) in the kidneys, instigating inflammation and potentially leading to kidney damage. Despite its generally benign nature, approximately 20-40% of patients confront chronic kidney disease or progress to end-stage kidney disease (ESKD) within two decades of onset. The Kidney Disease: Improving Global Outcomes (KDIGO) guidelines offer a comprehensive approach for managing IgA nephropathy. Blood pressure control stands as a pivotal strategy, with angiotensin-converting enzyme inhibitors (ACE inhibitors) or angiotensin II receptor blockers (ARBs) such as Ramipril recommended to mitigate hypertension and diminish proteinuria. In cases of persistent proteinuria and evident kidney impairment, the guidelines advocate for judicious consideration of immunosuppressive therapy. Corticosteroids, potent anti-inflammatory agents, may be employed to swiftly quell kidney inflammation and manage associated symptoms. However, their usage is typically reserved for more severe presentations, emphasizing an individualized approach. Supportive care plays a crucial role, with dietary modifications such as a low-protein diet suggested to alleviate proteinuria and reduce strain on the kidneys. This multifaceted treatment approach reflects the complexity of IgA nephropathy management, highlighting the need for tailored

interventions based on the distinct characteristics of each patient. As research evolves, continued refinement of therapeutic strategies aims to optimize outcomes and mitigate the progression of this intricate renal disorder.

Keywords: ACE Inhibitors, immunosuppressive agents, corticosteroids, supportive care

PHP-PP-007

IMPACT OF CLINICOPATHOLOGICAL FEATURES of IgA NEPHROPATHY IN INDIAN POPULATION

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IgA nephropathy (IgAN) is a progressive autoimmune kidney ailment and stands as the most prevalent primary glomerular disease on a global scale, being a prominent cause of kidney failure. IgA nephropathy is related to auto antibodies against immunoglobulin A1 (IgA1) with poor O-glycosylation. The disease manifests diverse glomerular changes, ranging from no observable alterations under light microscopy to more severe conditions like crescentic glomerulonephritis. Histologically, the extent of interstitial fibrosis and tubular atrophy in kidney biopsies is the strongest predictor of disease. Its incidence varies considerably across geographic regions, with a higher occurrence in Asian countries, particularly India. The prevalence of IgAN in India exhibits geographical variation. IgAN often progresses slowly without symptoms and is typically diagnosed when symptoms like hematuria and proteinuria, either gross or microscopic, or abnormal renal function become evident. Unfortunately, delayed diagnosis can lead to prolonged periods of elevated proteinuria, a strong predictor of kidney failure. Understanding how clinicopathological features, such as kidney damage severity, proteinuria levels, and histological findings, interact with treatment is crucial for tailoring effective patient care. This study emphasizes the need for comprehensive exploration of these factors to enhance the management of IgA Nephropathy in India.

A retrospective observational study is being conducted at AIG hospital. Thus ,we aim to identify the clinicopathological features and the prevalence of disease in Indian population.

Keywords: Ig A nephropathy, clinicopathological, Hematuria, glomerulonephritis.

PHP-PP-008

RARE DISEASES IN INDIA

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A rare disease is a health condition of low prevalence that affects a small number of people compared with other prevalent diseases in the general population. Most common rare disease includes: Duchenne muscular dystrophy, Pompe disease, Marfan syndrome, Gaucher syndrome. Policy for facilitating access to treatment for RD's has been prepared. National Health Mission (NHM) is one of the crucial programs initiated by the government of India to address the health needs of the under-served. Diagnosis of RD's may take up to several years, owing to difficulty in diagnostic modalities and lack of awareness among doctors. Many doctors lack appropriate training and awareness to be able to correctly and timely diagnose and treat these conditions. A fundamental challenge in research and development for the majority of RD's is that there is relatively little known about the pathophysiology or the natural history of these diseases. RD's are difficult to research upon as the patient pool is very small and it often results in adequate clinical experience. However, diagnosis and treatment of RDs is a complicated process that requires multisystem involvement and complex care by several healthcare providers. Thus, post-screening and identifying the potential cases, a more focused pathway is necessary for an exact diagnosis and treatment of RDs.

PHP-PP-009

MICROSCOPIC HEMATURIA AS A RISK FACTOR FOR IGAN PROGRESSION: CONSIDERING THIS BIOMARKER IN SELECTING AND MONITORING PATIENTS.

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Hematuria is the presence of blood in the urine. Hematuria can be gross or microscopic; gross hematuria is visible in blood in urine whereas microscopic hematuria refers to the detection of blood on urinalysis or urine microscopy. Hematuria—either macroscopic hematuria or asymptomatic microscopic hematuria—is a clinical feature typical but not specific for immunoglobulin A nephropathy (IgAN). The only biomarker supported by the kidney

disease: Improving Global Outcomes group as a predictor of progression, identifying patients needing treatment, is proteinuria >1 g/day persistent despite maximized supportive care. Proteinuria can occur in the setting of active glomerulonephritis or secondary to sclerotic renal lesions. Microscopic hematuria is observed in experimental models of IgAN after IgA–IgG immunocomplex deposition, activation of inflammation and complement pathways. Oxidative damage, triggered by hemoglobin release, is thought to contribute to the development of proteinuria and progression. Despite being the clinical hallmark of IgAN and having a rational relationship with its pathophysiology, the value of microscopic hematuria in assessing activity and predicting outcomes in patients with IgAN is still debated. This was partly due to a lack of standardization and day-to-day variability of microhematuria, which discouraged the inclusion of microhematuria in large multicenter studies. More recently, several studies from Asia, Europe and the USA have highlighted the importance of microhematuria assessment over longitudinal follow-up, using a systematic approach with either experienced personnel or automated techniques. Thus, we aim to consider microscopic haematuria as a risk factor for IgAN progression in selecting and monitoring patients.

Keywords: Hematuria, biomarker, IgA nephropathy microhematuria.

PHP-PP-010

AZATHIOPRINE DOSE ADJUSTMENT BASED ON PHARMACOGENETICS

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Azathioprine is the most common immunosuppressive antimetabolite used in the treatment of acute lymphoblastic leukemia, autoimmune disorders (such as Crohn’s disease and rheumatoid arthritis), and in patients receiving organ transplants. Thiopurine-S-methyltransferase (TPMT) is a cytoplasmic trans-methylase catalyzing the S-methylation of thiopurines. The active metabolites obtained from thiopurines are hydrolyzed into inactive forms by the Nudix hydrolase 15 (NUDT15). According to a recent study, the TPMT*2 (defined by rs1800462), *3A (defined by rs1800460 and rs1142345), *3B (defined by rs1800460), *3C (defined by rs1142345), *6 (defined by rs75543815), and NUDT15 rs116855232 genetic variant have been associated with the response to azathioprine, and, the approved drug label for azathioprine and main pharmacogenetic dosing guidelines recommend starting with reduced initial doses in TPMT intermediate metabolizer (IM)

patients and considering an alternative treatment in TPMT poor metabolizer (PM) patients. The study aiming to assess the clinical impact of azathioprine dose tailoring based on TPMT genotyping was reviewed, studying the azathioprine toxicity and efficacy, treatment starts, and dose adjustments during follow-up, comparing TPMT IM/PM and normal metabolizer (NM) patients. The association of NUDT15 rs116855232 with response to azathioprine was also reviewed in patients

receiving a tailored treatment based on TPMT and characterized the TMPT and NUDT15 studied variants in the population. The results of the study showed that azathioprine dose reduction in TPMT IM patients (TPMT*1/*2, *1/*3A, or *1/*3C genotypes) was related to lower toxicity events compared to TPMT NM (TPMT *1/*1 genotype), and lower azathioprine dose adjustments during follow-up without showing differences in the efficacy.

Key words: Azathioprine, TPMT, NUDT15 and Pharmacogenetics.

PHP-PP-011

MOBILE HEALTHCARE APPS

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Health apps are software programs and mobile devices that process health related data on or for their users. In the past few years, several companies have marketed wearable devices and mobile apps that can track our personal health data. These M-health devices and apps lead to the birth of what is known as quantified self – a phenomenon where the individuals start tracking their physiological, biological, and other kinds of health markers. The first of its kind study uses data from major stakeholders like digital app platforms, hospitals, clinic, doctors, nutritionists, pharmacists, and so on to examine whether emerging M-health technologies effectively persuade people to modify their lifestyle and thereby reduces hospital visits and medical expenses overtime. The relatively new area of M-health care services includes mobile computing, medical sensor and communication technologies used for health care services (e.g. managing chronic diseases). The adoption of the M-health app led to an improvement in both short time metrices such as reduction in patients' blood glucose and glycated hemoglobin levels and long-term metrics such as reduction in hospital visits and medical expenses. M-health apps makes it easier than ever to connect to one's medical records, staff, and physicians and with applications solutions designed to improve

clinical efficiency, physician and patient experiences and health outcomes. Medical apps are intended for clinical and medical purposes and can be legally regulated as mobile medical devices.

Key words: Mobile Health Apps, Digital Health, Mobile Medical Device, Digital Care Applications.

PHP-PP-012

PREGNANCY-ASSOCIATED BREAST CANCER: A MULTIDISCIPLINARY APPROACH

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Pregnancy-associated breast cancer represents a challenge in terms of clinical management to guarantee both maternal and fetal security in choosing the right Treatment. This situation is complex and requires a multidisciplinary approach, including the surgeon, anesthesiologist, oncologist, radiotherapist, psychologist, and

maternal–fetal medicine specialist, clinical pharmacist. In the present review, we examined the management of pregnancy-associated BC, focusing on pathophysiologic background, complications, risk factors, diagnosis, staging procedures, anesthesia, surgical management, and systemic treatment.

Keywords: cancer, pregnancy, management.

PHP-PP-013

SALIVA – THE NEXT FRONTIER FOR CANCER DETECTION

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The aim of saliva diagnostics is to develop a rapid and non-invasive detection of oral and systemic diseases, which now also includes detection of cancer. In 2021, the U.S. FDA gave an innovative device designation to a saliva-based oral and throat cancer pre-diagnostic tool which is developed by U.S company. Although cancer can be diagnosed through tissue biopsy, that requires trained physicians wielding long needles, scalpels, endoscopes or other tools to pry into the body to take samples. Liquid biopsy, which looks for traces of tumor components in fluids such as blood, urine, cerebrospinal fluid, semen or saliva, is a less

invasive alternative. Of these, the simplest sample to collect is undoubtedly saliva. View of saliva as an afterthought could begin to change in the coming years as techniques to analyze it advance and a better understanding develops of what information it can hold. Scientists have found that saliva may contain biochemical signals(biomarkers) that provide an alert that a person has non-small cell lungcancer, the most common type of lung cancer. These signals are circulating tumor DNA (ctDNA) and tumor-derived exosomes that enter the circulation and reach the salivary glands. Both are taken up by secretory (acinar) cells of the salivary glands and are included in the saliva the glands produce. The presence of certain ctDNA mutations,

combined with information provided by the exosomes, allow early detection and offer insight into the treatment of this type of cancer.

Key words: Saliva, Cancer, Biomarkers, ctDNA

PHP-PP-014

PSYCHIATRIC CLINICAL PHARMACY PHARMACEUTICAL SERVICES, PSYCHIATRIC CARE.

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The significant role of pharmacists in mental health care is starting to be recognized around the world. Psychiatric pharmacists have become more active in therapeutic counselling for patients, which is also known as psycho-education, and reconciling medications in the field of mental health in order to improve medication management and medication adherence, respectively. However, few research has examined the evidence for pharmacist involvement in inpatient mental hospital settings. Examine the

various types of results achieved and the quality of the evidence for clinical pharmacy services provided in inpatient mental health settings. The patients enrolled in the second stage of the study who were provided with comprehensive psychiatric pharmacy care. During the second stage, pharmaceutical services included participation in treatment team sessions, performing baseline assessments, weekly reviews, pharmacotherapy recommendations, medication histories, daily reviews of drug administration records, monitoring for adverse drug reactions, medication awareness classes, and counselling prior to patient discharge. Data were analyzed based on the size of the sample population, regarding age, sex, length of

sickness, number of hospitalizations, and months from previous hospitalization, the study design and outline, the pharmacist involvement in the investigation, and the main results of the study. In comparison, patients exhibited notable improvements in their clinical response and in the drug-induced extra pyramidal symptoms. Improvements in rating-scale scores for clinical response and drug-induced extra pyramidal symptoms were linked to the provision of clinical pharmacy services to inpatients in an acute care mental health hospital.

Keywords: Clinical pharmacy, Psychiatric education, Psychiatric Pharmacist, Pharmaceutical services, Clinical outcomes, medications, evaluations, management.

OAP- PP – 001

INNOVATIONS IN ORGAN-ON CHIP: SHAPING THE FUTURE OF MEDICAL RESEARCH

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Organ-on-a-chip (OOC) technology is a single or multi-channel device containing living tissues that are cultured under controlled conditions in a smart. It is like a mini lab that mimics human organs bringing big changes to how we develop medicines. It involves biomedical technology, cell biology and engineering combined together. They recapitulate the architecture and function of the tissues in an intact human body thus enabling studies of organ function facilitating physiology and pathophysiology with high fidelity, discovery of new therapeutics and monitoring the toxic effects of drugs in real time. Organ on chip technology is widely regarded as a potential game-changer for many applications and might offer a potential alternative for traditional cell and animal models. It recreates the complexity of our organs, imitates how our bodies react to drugs and how safe they are. It helps us to model complex diseases and rare genetic disorders, to study host microbiome interactions, reproduce the human clinical responses to drugs, radiation, toxins and infectious pathogens and figure out personalized treatments by creating environments that match specific patient conditions. The advantage of human organ on chips is that they may have a better or at least equivalent predictive value for humans and contribute to reduction in use of laboratory animals. OOC is a key player in research promising a future with better and more affordable treatments. This will be an advantageous research tool for drug discovery.

Keywords-Organ on chip technology, Biomedical technology, cell biology, toxic effects, genetic disorders, microbiome interactions.

OAP- PP – 002

ARTIFICIAL INTELLIGENCE: MILESTONES AND ROLE IN PHARMA AND HEALTHCARE SECTOR

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Artificial Intelligence (AI) is the branch of engineering science which deals with making of intelligent machines, especially intelligent computer programs. It is the ability of a computer or a robotic computer enabled system to process the given information and produce outcomes in a manner similar to the attention process of humans in learning, decision making and solving problems. AI is a branch of computer science that aims to create intelligent machines, which becomes an essential part of the technology industry. Research associated with AI is highly technical and specialized. The design of intelligent machines based upon the neural networks and perceptron. The artificial neurons think like human beings in learning, solving problems and decision making. Machine learning technology is assisting the research and development scientists to analyse the mass of scientific data to get essential new knowledge. e.g. To carry out research on Amyotrophic Lateral Sclerosis (ALS), they developed "Judgement Correlation System" (JACS), which is able to check billions and trillions of sentences and paragraphs of various abstracts and research and review articles. This review mainly focuses on the milestones of AI, advantages and disadvantages of AI system. The applications of AI system in drug discovery process and in all areas of health care system was explained in detail.

Key words: Artificial Intelligence, milestones, neural networks, health care.

OAP-PP-003

"SMART BRA TO DETECT EARLY-STAGE BREAST CANCER"

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Breast cancer is the leading cancer in women worldwide with about 2 million new cases and 685,000 deaths each year. It is very common to find out late-stage cancers, can be done very easily. But ever wondered where our world would be right now, had we been able to detect deathly/fatal cancers at the initial stage itself? Larger women with larger breasts may be less

able to feel breast lumps, the most common symptoms of breast cancer. Unlike existing cancer-detection technology that uses radiation, this smart bra technology emits ultrasound waves, which when detects a suspicious mass of cells, will alert the wearer. It uses a non-invasive, painless method based on frequent ultrasound monitoring. These bras are comfortable to wear and nearly imperceptible. Their advantages are an absence of irradiation, an absence of breast compression and a flexibility of use. Mammary gland analysis times vary between 30min and 24h. They are all connected to data transmission systems and models that analyse the results. Results are sent to a phone and can be transmitted to a doctor at the comfort of your home This revolutionary technology could also be an alternative to conventional treatments, which are expensive and have major side effects that significantly impact patients' quality of life

Keywords: Breast cancer ultrasound monitoring cancer-detection technology, and mammary gland analysis

OAP-PP-004

TRANSFORMATIONS IN PHARMACEUTICAL INDUSTRY BY AI

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Artificial Intelligence (AI) has a wide range of applications in the life sciences, showcasing its transformative impact on drug development, clinical trials, and disease diagnosis. AI systems exhibit superior capabilities in compressing vast datasets, aiding the pharmaceutical sector in identifying, repurposing, and validating drug candidates with best speed and accuracy. Moreover, AI's integration into manufacturing processes holds the potential to enhance efficiency, reducing expenses and accelerating time to market.AI addresses the challenges of time and cost inefficiencies inherent in the drug development regulatory and patient enrolment processes. By optimizing trial recruitment and introducing innovative approaches like 'digital twins' to replace placebo control groups, AI streamlines processes and ensures patient safety.AI helps in diagnosis and disease identification, increasing its capacity to discern patterns and correlations within extensive datasets. This leads to reduction in human error, leading to faster and more accurate diagnoses compared to human healthcare professionals. Emphasizing the need for technology to access and analyse unstructured text in medical documents for a holistic understanding of patients' lives can be easily done by

electronic medical records. Target proteins can be conveniently identified using AI. It can be used in in-silico evaluation in the Absorption, distribution, metabolism and excretion. It is transforming Research and Development by applying data science and machine learning to massive data sets enabling rapid discovery of new molecules.

Key word: Artificial Intelligence, life sciences, drug development, placebo, target proteins.

OAP-PP-005

COMORBIDITIES WITH COVID-19: HARMFUL EFFECTS ON INFECTED PATIENTS WITH CLINICAL COMPLICATIONS ASSOCIATED WITH SARS-COV-2 INFECTION:

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Human life has been endangered due to the pandemic crisis caused by the emergence of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from China. The novel coronavirus known as SARS-CoV-2, or severe acute respiratory disease, poses serious problems for the healthcare system and has caused millions of deaths, which has a significant impact on the mortality rate. The symptoms of COVID-19, referred to as coronavirus disease (2016), is presented with asymptomatic, mild or severe pneumonia- like symptoms. Patients with COVID-19 who have diabetes, HIV, hypertension, cancer, cardiovascular disease, chronic obstructive pulmonary disease (COPD), and other comorbidities increase the risk of developing life-threatening. Most patients with compromised medical histories get a serious COVID-19 complications. It appears that SARS-CoV-2 targets the respiratory system, resulting in pneumonia and acute respiratory distress syndrome. These conditions cause severe systemic inflammation, multi-organ failure, and mortality, particularly in patients with pre-existing comorbidities. SARS-CoV-2 affects host cells by means of ACE-2 receptors that are present on their surface. Strong ACE-2 receptor expression and enhanced pro-protein convertase release, which facilitates viral entrance into host cells, have been associated to specific comorbidities. Comorbid people need careful management and must take preventative measures with awareness. The literature on the correlation between comorbidities and COVID-19 is limited; however, this study demonstrates the wider range of comorbidities associated with COVID-19 patients. For a better understanding of the

etiopathogenesis of COVID-19, we included the major comorbidities and a range of clinical complications associated with the virus.

Keywords: SARS-CoV-2; Comorbidities; COVID -19 Diabetes; Chronic Obstructive pulmonary disease; Cancer; Cardiovascular Diseases

OAP-PP-006

EPIDEMIOLOGICAL STUDY OF MDR ON TB

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Multi Drug Resistance Tuberculosis (MDR) Likewise, forms of tuberculosis (TB) resistant to first- and second-line TB medicines present a major challenge for patients, healthcare workers and healthcare services. The World Health Organization (WHO) convened an independent international expert panel to review new evidence on the treatment of multidrug-(MDR) and rifampicin-resistant (RR) TB. Tuberculosis is an infectious disease which is caused by bacteria. The disease is mostly transmitted from person to person, usually by inhaling bacteria-carrying air droplets. Tuberculosis most commonly affects the lungs, but it can also affect any other organ. TB is one of the most ancient diseases of mankind, with molecular evidence going back to over 17,000 years. In spite of newer modalities for diagnosis and treatment of TB, unfortunately, people are still suffering, and worldwide it is among the top 10 killer infectious diseases, second only to HIV. According to World Health Organization (WHO), TB is a worldwide pandemic. It is leading cause of death among HIV-infected people. TB can be broadly classified into three periods: early period, before the discoveries of x-ray and chemotherapy, post-independence period. Tuberculosis is caused by a group of closely related bacterial species termed Mycobacterium tuberculosis complex. Other members of the M. tuberculosis complex that can cause tuberculosis include M. bovis, M. microti and M. africanum. M. microti is not known to cause TB in humans; infection with M. africanum is very rare, while M. bovis has a wider host range and is the main cause of tuberculosis in other animal species. Humans become infected by M. bovis, usually via milk, milk products or meat from an infected animal. Since the immune system in healthy people walls off the causative bacteria, TB infection in healthy people is often asymptomatic. This bacterium lives and multiplies in the macrophages, thus avoiding the natural defense system in the patient's serum. Infection with TB can result in two stages:

asymptomatic latent tuberculosis infection (LTBI) or tuberculosis disease. If left untreated, the mortality rate with this disease is over 50%.

Keywords: Isoniazid, Rifamipicin, Interferon gamma release assay.

OAP-PP-007

ANTIMICROBIAL RESISTANCE ON SIX PATHOGENS ALARMING GLOBALLY

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Antimicrobial resistance (AMR) is one of the most serious global public health threats in this century. Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites no longer respond to antimicrobial medicines. As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become difficult or impossible to treat, increasing the risk of disease spread, severe illness, disability and death. The Indian Council of Medical Research (ICMR) has been supporting research on antimicrobial resistance through the Antimicrobial Resistance Research & Surveillance Network (AMRSN) since 2013. The data collected from the network has enabled compilation of drug resistance data on various pathogenic groups on antimicrobial resistance from the country. Among them Escherichia coli was the most commonly isolated pathogen followed by the Klebsiella pneumoniae, Pseudomonas aeruginosa, Acinetobacter baumannii, and Staphylococcus aureus. In Staphylococcus aureus, susceptibility to erythromycin, clindamycin, ciprofloxacin and co-trimoxazole was more evident in MSSA when compared to MRSA. MRSA rates are increasing each year from 2016 to 2021. The anti MRSA antibiotics such as vancomycin and teicoplanin showed excellent in vitro activity (nearly 100% against MRSA isolates). In India in 2019, there were 297,000 deaths attributable to AMR and 1,042,500 deaths associated with AMR. India has the 145th highest age-standardized mortality rate per 100,000 population associated with AMR across 204 countries.

Key words: Antimicrobial resistance, Escherichia coli, MSSA, MRSA, co-trimoxazole, vancomycin.

OAP-PP-008

FROM ALGORITHM TO CURVES: POWER OF ARTIFICIAL INTELLIGENCE/MACHINE LEARNING IN DRUG DEVELOPMENT

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The integration of Artificial Intelligence (AI) in pharmaceutical research and development has emerged as a transformative force, revolutionizing the entire drug development life cycle. AI harnesses anthropomorphic knowledge, particularly in genomics and proteomics, to expedite drug discovery, formulation, and testing processes. This comprehensive review explores the multifaceted applications of AI in the pharmaceutical industry, emphasizing its pivotal role in target identification, drug design, preclinical research, automated synthesis, and market influences. Machine learning algorithms analyze vast biological datasets, enabling researchers to pinpoint disease-associated targets and predict interactions with potential drug candidates. This targeted approach not only enhances the efficiency of drug discovery but also increases the likelihood of successful approvals. Moreover, AI's contribution extends to cost reduction by optimizing research and development processes. By predicting pharmacokinetics, toxicity, and facilitating experimental design, AI aids in lead compound prioritization, minimizing reliance on extensive and costly animal testing. Beyond drug development, AI facilitates personalized medicine through real-world patient data analysis, leading to more effective treatment outcomes and improved patient adherence. The abstract also highlights the increasing integration of AI in areas actively engaged by regulatory bodies like the FDA, including Digital Health Technologies (DHTs) and Real-World Data (RWD) analytics. While acknowledging the benefits, the review discusses the limitations of AI in drug R&D and proposes potential solutions. Overall, continued investment and exploration of AI in the pharmaceutical industry holds promising prospects for advancing drug development processes and ultimately enhancing patient care.

Key words: Artificial Intelligence (AI), Machine Learning (ML), Target Identification, Drug Design, PBPK (Physiologically-Based Pharmacokinetics), QSAR (Quantitative Structure-Activity Relationship).

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- First Private Pharmacy College in the state of combined Andhra Pradesh to start M. Pharm Course in 2003 .
- Parliamentary committee visit in the year 2000.
- College is a recognized Research centre for Ph.D. by Osmania University, from the year 2006-2007 onwards. Several Scholars are pursuing their Ph.D program under senior Professors.
- First Prize in IPA National Elocution Competition in 2007.
- Active role in Organization of Association of Pharmaceutical Teacher's of India (APTI) - 15th Annual National Convention (APTICON-2010) in association with APTI state branch.
- G. Pulla Reddy Memorial Gold Medal was instituted in Osmania University for University topper in B.Pharm from the academic year 2011-12.
- "Best Principal of the year -2011 Award" at 16th APTICON-2011.
- FIP (International Pharmaceutical Federation) "Best Poster presentation award" in 2011.
- "Prof. M. L. Khorana medal (IPA)" for securing highest marks at B. Pharm level among all Indian Universities at 63rd IPC, Bengaluru , 2011.
- "Best Outstanding student of the year 2011" by 54th IPC Trust.
- "Best Research Guide and M. Pharm Thesis Award" by Rajanibhai. V. Patel Trust, Ahmedabad.
- "Second prize in the National level Sipra Innovative Pharma Research Award-2014 ".
- Second prize in National level Quiz Competition conducted by AIDCOC during 66th IPC Hyderabad in 2015.
- First prize in National Pharma Quiz Competition conducted by SKBCOP, Nagpur in Feb 2016.
- Third Position in 68th IPC National level Quiz Competition in 2016 at Vishakhapatnam , A.P.
- Best Oral Presentation in 68th IPC held from 16th - 18th Dec 2016 at Vishakhapatnam , A.P.
- First prize in 69th IPC National level Quiz Competition in 2017 and Second prize in National Elocution Competition 2017 at Chitkara University, Chandigarh .
- "Best Pharmacy Teacher of the year-2017 " by Pharmacy teachers trust.
- The College conducts National Symposia and Workshops for students & faculty regularly.
- G. Pulla Reddy college of Pharmacy - USP Collaborative Training Course- 2018 to 2020.
- Active role in organization of PERCEPT-2020 held at UCT Osmania University.
- NAAC Accreditation from March 2021.
- PCI-CBIT Grant for faculty 2021.

* Student selected at state level National Youth Parliament Festival (NYPF)- 2022 and participated in mock parliament session at New Delhi.
* Student selected for parliament visit by Nehru Yuva Kendra Sanghatan- 2022 , New Delhi.
* Research Innovation presentation in PCI- Pharmaanveshan-2023 at Vigyan Bhavan, NewDelhi.

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