INTERNATIONAL SEMINAR ON

INNOVATIONS IN PHARMACEUTICAL RESEARCH - 2016
& ORAL PRESENTATIONS
and
4th INDO - WESTINDIES CONFERENCE

30th JULY 2016

ABSTRACTS




G. PULLA REDDY COLLEGE OF PHARMACY

Mehdipatnam, Hyderabad

and

Association of Pharmacy Professionals

Telangana State Branch

Mehdipatnam, Hyderabad – 500 028. Phone : 040-23517222, 23515513;
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G. PULLA REDDY COLLEGE OF PHARMACY

ESTD: 1994 - 95

Affiliated to Osmania University
Approved by AICTE and PCI

ISO 9001 - 2008 Certified institution for Graduate and Post Graduate Education

Website: www.gprcp.ac.in E-mail: gprcphyd@yahoo.co.in

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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 & postgraduate students shall be groomed as responsible & highly acclaimed professionals in the Pharmaceutical Arena.

COURSES OFFERED

B. Pharm

M. Pharm - Pharmaceutical Chemistry
Pharmaceutics
Pharmacology
Pharmaceutical Analysis & Quality Assurance

Pharm. D

EAMCET CODE: GPRP

PGECET CODE: GPRP1

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ORGANIZING COMMITTEE

Convener - Dr. B. Madhava Reddy, Principal

Committee	Chairman	Members
Scientific Lectures	Dr.V.Harinatha Babu	Dr.K Latha Dr.K.Naresh Mr. V.Sangram
Registration	Dr. Y. Padmavathi	Mrs. R Padmavathi, Mr.N.Raghavendra Babu Mrs.Ch.Rajeswari
Oral Presentations	Dr. Sama Venkatesh	Mrs.B.Jayanthi Reddy Dr.A Ravikiran Mrs.A.Lalithadevi Ms. Niyati Kandikanti
Abstract	Dr. P K Lakshmi.	Dr.Prashanthi Mrs.K. Pallavi Mr.C.S.Mahalaxmi
Hospitality	Dr. B. Veeresh	Mrs.T Radhika Mr. Naseeb Bhasha Mr.,Ravi Kumar Mr.Y.Sreehari Mrs.S.Sravanthi

Programme Schedule

09.00 - 10.00 A.M : **Registration**

10.00 - 10.30 A.M : **Inauguration**

10.30 - 11.15 A.M : **Lecture I**

11.15 - 11.30 A.M : **Tea Break**

11.30 - 12.15 P.M : **Lecture II**

12.15 - 01.00 P.M : **Lecture III**

01.00 - 02.00 P.M : **Lunch Break**

02.00 - 05.00 P.M : **Oral Presentations**

05.00 - 05.30 P.M : **Valedictory function**

Prize & Certificate Distribution

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CH. Hepshibha	M.Ph (Ph.Chem)
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Afreen Begum	M.Ph. (Ph.cology)
S. Madhavi	B.Ph. IV year
V.Priyanka Goud	B.Ph. IV year
B. Alekhya	B.Ph. IV year
P. Usha Sree	B.Ph. IV year
A.Sai Akshith	B.Ph. IV year

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T.Manasa	M.Ph (Ph.Ceutics)
Pooja Sharma	B. Ph IV year
Shravani Sneha	B. Ph IV year

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R.Shiva Kumar	B.Ph. II year

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Dr.Rachamalla Shyam Sunder

Dean, Faculty of Pharmacy &
Professor,Chemical Engineering
University College of Technology, Osmania University

Dr. Syam Sunder completed his B.Tech, M.Tech and PhD in chemical engineering from Osmania University. He has 29 Years (18 Years of Teaching + 11 Years of Industrial) of Experience. He has conducted workshops such as Renewable energy run by non-conventional energy corporation, National Level Students Technical Symposium – Techniques, N.L.S.T.S. – 2000, Workshop on ISO -9000/4000,Workshop on Total quality management ,National Seminar on Wealth from Waste, National Level Students Technical cultural festival – catalysis, N.L.S.T.S. Annual Session of IIChE, Chem-Con, National Seminar – 2004, New Horzins in food – Tech., Seminar on perspective in Chemical Engineering & Bio Technology, Computer Solution of Process Model Equations, Institution – Industries and Interaction, One day workshop, Technosmania - A Technical & Cultural Festival and many more workshops and conferences from Osmania University.

He has attended ,a five Day International training program on Pneumatics & Electro – pneumatics conducted by S.M.C Sydney, Australia, During December 11 to 15 2006, and a three Day International training program on Particulate solids at Particulate solid research, Inc, Chicago, IL, USA during 5th March to 9th March 2009. He is chairman and member of various committees and board of studies. He is a member of IIChE - Indian Institute of Chemical Engineers and ISCA – Indian Science Congress Association – Life member LM. He has 28 national and international publications. He has contributed one chapter course material as Co- Author on principles of Heat Transfer for Drug Technology unit operations. Book published in 2003 by Dr.B.R.Ambedkar Open University Hyderabad.

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Dr. K. Raghupathi
Founder & CEO
Delsync Pharma Consulting, Hyderabad.

Dr Raghupathi Kandarapu is Founder and CEO of DelSync Pharma Consulting, a pharma-ceutical consulting company that provides drug development solutions to global clients based in Hyderabad. Dr Kandarapu is Alumni of National Institute of Pharmaceutical Education and Research (NIPER Mohali (Punjab). After completing his PhD and MPharm programs from NIPER.

Dr Kandarapu spent about 13-years with major Indian pharmaceutical industries at different capacities, including Head – R&D and specialized in "Contract Pharmaceutical Development Services" business model before founding DelSync. He mentored several cross-functional teams that involved the development of generic, 505(b)(2), and NCE products for global markets.

Dr Kandarapu holds certifications and/or trainings including advanced leadership program in business development from IIM-A, Project Management (PM-BOK) from PM-Soft®, Clinical Research (ICRI, New Delhi), Intellectual Property Rights, etc. He published more than dozen papers in international journals and presented research work in several conferences. He has more than 30-patent applications filed to his credit.

Dr. Kandarapu research focus includes identification and development of "proof of concept (POC)" of novel drug-delivery systems based on 'unmet" medical need, life-cycle management (LCM) of formulations, and development of challenging modified release generic products with innovative concepts. The core area of his interest are Multi-Particulate Drug Delivery Systems (MUPS), Solid-State Characterization to identify novel salt and/or polymorphs for 505(b)(2) and/or exclusive marketing opportunities, and development of complex per-oral modified release products.

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Dr. Sameer Dhingra

Assistant Professor in Pharmacy School
The University of the West Indies, St. Augustine.

Dr. Sameer Dhingra is presently serving as an Assistant Professor in Pharmacy School, The University of the West Indies, St. Augustine. He has more than 14 years of academics, research and administrative experience to his credit. He has a good number of research publications in various prestigious National and International Journals and also filed two patents. His primarily interests include promoting medication safety and rational use of medicines. Being born and raised in Pharmacists' family, Dr. Dhingra has learned basic skills of pharmacy profession much before acquiring a professional degree in pharmacy. He has been associated with various medical and pharmacy practice organizations to improve the current clinical pharmacy practices in developing countries like India.

Dr. Dhingra obtained his doctorate degree from Guru Jambheshwar University of Science and Technology, Hisar and Master's degree from Rajiv Gandhi University of Health Sciences, Bangalore. Prior to this position, he has served as Professor and Head, Dept. of Pharmacology, Swift School of Pharmacy, Rajpura, India. He has also served on Baddi University of Emerging Sciences and Technologies, Baddi, India in the capacity of Head of Department and Officiating Director of Pharmacy School. He serves as a referee for reputed National and International Journals. He has visited various countries for professional contributions. He is a life member of several National and International professional bodies related to Health Sciences. He is also a regular blood donor since last many years.

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Dr. Aravind Kumar Rengan

Assistant Professor

IIT Hyderabad

Dr. Aravind Kumar Rengan is currently an Assistant Professor at IIT Hyderabad. He had a successful start in academics, obtaining merit seat for his M.B.B.S at Thanjavur Govt. Medical College (Tamilnadu Dr.M.G.R Medical University). During his medical internship, he was captivated by research in the emerging field of nanoscience and technology. This made him to take up Master in Nano-medical sciences atAmrita Centre for Nanosciences and Molecular medicine-DST Centre of Excellence. Owing to his competitive academic performance he was able to secure University rank and Department of Science and Technology (DST) fellowship. Immediately after his masters in nanomedical sciences he was selected for his PhD at IIT Bombay.

Dr. Aravind is an aggressive learner of nanomedicine and its practical application in biomedical research. His research work was published in prestigious journals like NANOSCALE and ACS NANO LETTERS. Dr. Aravind was instrumental in getting the "The Bill and Melinda Gates" project on "Transdermal TB drug delivery – TB NANODOTS" during his PhD tenure.

Dr. Aravind has won many awards and accolades including the "Innovative Young Biotechnologist Award – DBT. Govt of India", "Gandhian Young Technological Innovator 2015" and "DST Inspire Faculty Award -2015".

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PHARMACEUTICS

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PCU 001

ADDITIVE MANUFACTURING TECHNOLOGY (3Dp) IN PHARMA

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In the present study an attempt is made to create a medication utilizing additive manufacturing technology which is also called as 3D printing. It is an innovative and efficient method of creating a dosage form with online monitoring and control. In this process successive layer of drug is added one upon other under computer control to create the dosage form (tablet). Formulation of high doses of drug, oro-dispersable pills which are easy for administration is possible using 3Dp. USFDA has approved a pill called spritam(levetiracetum) which is an oro-dispersable pill made using 3Dp. It is highly porous pill which is very useful for epileptic patients and patients having problem in swallowing a tablet. Bio printing enables printing of various tissues and organs which can help in clinical trials of drugs and prosthetic implantation High doses nearly (1000mg) can be formulated simply by using drop on demand process and arranging the successive layers. Highly porous nature of the pill disintegrates immediately (4 sec) after coming in contact with aqueous phase. This also helps in developing personalized dosages for patients. If the dosage formulated using 3Dp pass the stability studies then the additive manufacturing can begin a new era in pharmaceutical industry.

Keywords: 3D Printing, Spritam, Levetiracetum.

PCU 002

PREPARATION AND EVALUATION OF SUSTAINED RELEASE MATRIX TABLETS OF REPAGLINIDE (USP) USING NATURAL POLYMERS

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The objective of the present work is to develop and characterizes oral sustain release matrix tablets of Repaglinide. Repaglinide is practically insoluble in water so it is suitable to develop sustained release matrix tablet using hydrophilic polymers. Repaglinide is anti-diabetic drug used extensively in the treatment of diabetes type II. The natural polymers like carrageenan, chitosan, gum karaya, Bhara gum were utilized in the formulation of matrix tablets containing Repaglinide by wet granulation technique and evaluated for its drug release characteristics. Granules were prepared and evaluated for its physical properties and shows satisfactory results. Formulation was optimized on the basis of acceptable tablet properties (hardness, friability, drug content and weight variations), *in vitro* drug release and stability studies. The *in vitro* release study of matrix tablets were carried out in phosphate buffer pH 6.8 for 12 hr. Among all the formulations, F2 shows 100% better controlled release at the end of 12 hrs when compared to other formulations. The release data was fitted to various mathematical models such as, Higuchi, Korsmeyer-Peppas, First-order, and Zero order to evaluate the kinetics and mechanism of the drug release. The drug release of optimized formulations F2 follows zero order

kinetics and the mechanism was found to be diffusion. The stability studies were carried out according to ICH guideline which indicates that the selected formulations were stable.

Keywords: Repaglinide, Chitosan, Carrageenan, Gum Karaya, Bhara Gum, Matrix Tablet, Sustained Release, Wet Granulation.

PCU 003

FORMULATION, INVITRO EVALUATION & STABILITY STUDIES OF THE BILAYERED TABLETS OF COMBINATION-GLIPIZIDE (I.P) & PIOGLITAZONE (I.P)

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The objective of present investigation was to formulate and evaluate bilayered tablets containing Pioglitazone (I.R) & Glipizide (S.R).The Bilayered tablets prepared by direct compression method. The sustained release layer is prepared by wet granulation method using synthetic and natural polymers like HPMC K4M, Ethylcellulose, and Guargum& Xantham gum. The immediate release layer is prepared by direct compression method using superdisintegrants like Crosscamellose sodium; Crosspovidone & Sodium starch glycolate (SSG). The physicochemical evaluation results for the powdered blend of all trials pass the official limits in Bulk density, Tapped density, Compressibility index, Hausner ratio, and Angle of repose. The formulated tablets were evaluated for thickness, weight variation test, hardness test, friability test and drug content. The prepared tablets exhibited satisfactory physico-chemical characteristics. The formulation (F6) having immediate release layer of Pioglitazone showed 100.8%drug release within 60min & the formulation (F4) having sustained release layer of Glipizide showed 100.1% drug release within 12 hours. The drug release from the tablets was sufficiently sustained. The kinetic modeling of in vitro dissolution profiles revealed diffusion release mechanism. The stability studies revealed no significant changes in physical and chemical properties for the optimized formulation.

Keywords: Sustained Release, Immediate Release, Bilayered tablets, Glipizide, Pioglitazone.

PCU 004

FORMULATION AND EVALUATION OF PANTOPRAZOLE SODIUM ENTERIC COATED TABLETS USING DIFFERENT SUPERDISINTEGRANTS

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Pantoprazole is a proton pump inhibitor acts by suppressing an acid secretion by inhibiting the H+ K+ ATPase belongs to group of benzimidazole which is used in the treatment of gastric, duodenal ulcer , GERD, Zollinger Ellison syndrome. In aqueous media of pH below 4 it suffers a practically complete decomposition within a period shorter than 10 minutes. Pantoprazole which have an irritant effect on the stomach can be coated with a substance that will only dissolve in the small intestine, enteric coating added to the formulation tends to avoid the stomach's acidic exposure, delivering them

instead to a basic pH environment (intestines pH 5.5 and above). The prepared tablets using 3 different superdisintegrants in different ratio's were evaluated for hardness, thickness, weight variation, friability, disintegration, dissolution& drug content uniformity and the results were found to comply with official standards. The prepared tablets were coated using enteric coating polymers such as Eudragit L100, PVAP, and Eudragit RS100 by the spray coating method. The in vitro release was studied using pH 1.2 acidic buffer and pH 6.8 phosphate buffer and the study revealed that the prepared tablets were able to release the drug in the intestine, from all the prepared batch's EC8 was found best. The optimized formulation EC8 shows the average thickness of 2.2 mm, average hardness of 3.52 (kg/cm^2), average weight variation of 213 mg, friability of 0.46%, drug content 101.2 %, disintegration time 1min 10sec, cumulative % drug release 100.16% within 2hrs 45mins and acid resistance time of about 2hrs. Stability studies indicated that the developed tablets were stable and retained their pharmaceutical properties at room temperature and 40 °C / 75% RH for a period of 3 month.

Keywords: Pantoprazole, Superdisintegrants, Enteric coating polymers, Development and Evaluation.

PCU 005

DRUG NANOCRYSTALS

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Nanocrystals, a carrier-free colloidal delivery system in nano-sized range, is an interesting approach for poorly soluble drugs. Nanocrystals provide special features including enhancement of saturation solubility, dissolution velocity and adhesiveness to surface/cell membranes. When investigations on semiconductor nanocrystal quantum dots started more than 25 years ago, no one believed that nanoparticle research would develop into a major field in modern science that it is today. The studies were based on photo catalysis and artificial water splitting driven by oil crisis. The poor solubility of drug is a major problem which limits the development of highly potent pharmaceutics. This lead to low oral bio-availability and erratic absorption which is particularly pertinent to drugs within class II of the Bio-pharmaceutical Classification System (BCS). Generally, the rate-limiting step for absorption of the drugs in this class is the dissolution velocity arising from low solubility. Nanotechnology is the best way to overcome this solubility problem. Nano suspensions are defined as the sub-micron biphasic colloidal dispersions of pharmaceutical active ingredient particles in a liquid phase, size below 1µm, without any matrix material which are stabilized by surfactants and polymers. They are nanoparticles being composed of 100% drug without any matrix material. In this presentation the main focus is given on various techniques conventional as well as patented technology used for preparation of nanocrystals. There are certain characterization parameters such as particle size, polydispersibility index, surface morphology, particle surface charge, crystalline state, Surface hydrophilicity, Adhesion properties for the nanocrystals formulation. This is suitable drug delivery system for all commonly used routes of administration such as oral, IV, SC, and IM and topical application. In addition, nanocrystals can be incorporated into the tablets, capsules, fast-melts and lyophilized for sterile product applications. The process of nanonization of these drugs makes them 100% bioavailable and increases their therapeutic window which lowers the risk of toxicity or any

adverse effect and the patient compliance for the drug also increases as they are very small in size and are highly potent.

Keywords: Nanocrystals, Poorly Soluble, Nanosuspension, Polydispersibility, Hydrophilicity, 100% Bioavailablility.

PCU 006

BI DIRECTIONAL NASAL DRUG DELIVERY

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In the present study bidirectional nasal drug delivery is a delivery system where aerodynamics and exhalation technology is involved. The drug can be constrained to nasal area by an equipment through which exhaling by mouth against resistance leads to closing of soft palate separating nasal and oral cavities and the air leaves by other nostril taking a turn towards septum creating bi directional flow in nose. Rapid absorption through nasal mucosa increases the drug action avoiding first pass metabolism.This decreases the deposition of drug in lungs(0.82.0%), whereas in nasal spray inhalation and nebulisers, deposition in lungs is found out to be more (22.38.1%). It is Used primarily in the treatment of chronic rhinosinusitis and polyposis by constricted to nasal areas and 20% increase in bioavailability of the drug diseases like diphtheria and influenza showed positive immune responses to the drug. It is commonly marketed in the name of 'optinose' device where drug can be used in powder form or liquid dosage form. Exhalation technology can play a major role in providing drug constrained to nasal cavity for an effective treatment. It is feasible to deliver efficiently drugs such as small polar molecules, peptides, large proteins and polysaccharides used in vaccines or DNA plasmids exploited for DNA vaccines. This can be used in the treatment of many nasal constricted problems much better.

Keywords: Chronic Rhinosinusitis, Exhalation Technology, Optinose.

PCU 007

EMERGENCE OF ELECTRONIC TATTOOS IN HEALTH CARE

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Medical technology and Nano engineering advancements have opened many avenues in the medical diagnosis. The marvels of science and technology are on the progression note and never going down. The mere achievement is not the mark of the successful implementation of technology, the real fruit of the technology, robustness, the customer compliance and being user friendly, reducing inconvenience, being compatible and providing a benefit to the user. The electronic tattoo in the medical diagnosis of the health monitoring is an unimaginable feat achieved in the field of the medical health monitoring. The use of the electronic tattoos made the diagnosis of the health a very easy task emancipating all the difficulties that prevailed in the previous methods and thus were found to be reassuring in the terms of their performance. A medicated tattoo is a transdermal medicament delivery device in the form of a printed temporary tattoo which conceals the fact that the wearer is taking a drug. Merging biology and electronics gives access to a new and upcoming technology. This has led to a

development of a super thin and highly flexible material like a tattoo, embedded with a wireless electronic chip to be stuck on the human skin. Its applications are many, from monitoring health to even sending commands to human-machine interfaces like video games. The newly developed material/device is easily removable, as easily it's stuck on the skin surface. They combine traditional patient follow-up with cutting edge technology to promote more effective and complete patient care.

Keywords: Electronic Tattoo,Transdermal Device,Electronic Chip,Cutting Edge Technology.

PCU 008

VIROSOMES – A CARRIER FOR DRUG AND VACCINE DELIVERY

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Virosomes are reconstituted viral envelopes that can serve as vaccines and as vehicles for cellular delivery of macromolecules. As virosomes are biocompatible, biodegradable, nontoxic, and non-autoimmunogenic, attempts have been made to use them as vaccines or adjuvants as well as delivery systems for drugs, nucleic acids, or genes for therapeutic purposes. Influenza virus is the most common virus of choice. The success of virosomal drug delivery depends on the methods used to prepare the encapsulated bioactive materials and incorporate them into the virosomes, as are characterization and formulation of the finished preparation. Virosome technology could potentially be used to deliver peptides, nucleic acids or genes, and drugs like antibiotics, anticancer agents, and steroids. In this article the advantages and limitations of virosomes , Preparation methods and their applications has been discussed in detail.

Keywords: Virosomes, Drug Delivery, Biocompatible, Encapsulated Bioactive Materials.

PCU 009

PREFILLED SYRINGES

Raniya Shahid*, M.Musharaff Ali Khan

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In recent years, various technical innovations were realized and new methods developed, making the use of prefilled syringe (PFS) and cartridge system much more convenient and attractive. A Prefilled syringe is a single-dose packet of vaccine to which a needle has been fixed by the manufacturer. Parenteral administration of pharmaceutical products is one of the most popular methods used to produce quick onset of action and also 100% bioavailability. Main problem with the parenteral drug delivery is lack of convenience, affordability, accuracy, sterility, safety etc. Such drawbacks with this delivery system make it less preferable. Hence, all the disadvantages of these systems can be easily overcome by use of prefilled syringes. Prefilled syringes have emerged as one of the fastest-growing choices for unit dose medication. Pharmaceutical companies are able to minimize drug waste and increase product lifespan, while patients are able to self administer injectable drugs at their home instead of the hospital. Eliminating dosing errors and ease of use are two of the greatest advantages of prefilled syringes. Prefilled syringe cartridges are designed to fit into specialized syringes, which are used to administer various fluid medications. These are used in the position of standard syringes, which

practitioners must fill manually before each dose is administered. During an emergency such as an allergic reaction, filling of standard syringes can be a time- consuming and complicated process. Prefilled syringe cartridges can save time, and sequentially save lives. Prefilled cartridges allow injections to be administered more quickly. They can diminish overcrowding in emergency rooms and other treatment areas.

PCU 010

DENDRIMERS: APPLICATIONS AS NOVEL DRUG DELIVERY CARRIERS

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Dendrimers are new class of polymers having improved physical and chemical properties due to their unique three dimensional architecture. They have special properties such as nanometer size range, narrow polydispersity, and high degree of branching and presence of internal cavities which allows them to be used in many applications. Dendrimers can be mainly synthesized by either divergent or convergent routes. Recent advances lead to different routes for dendrimer synthesis which gives control over molecular architecture and allows incorporation of different functionalities in dendritic architecture. As a result new types of dendrimers with different functionalities have been synthesized. Unique properties of dendrimers have attracted attention of several researchers from interdisciplinary fields. This led to applications of dendrimers in various applications for e.g. various routes of drug delivery, gene therapy, cancer therapy, catalysis and in membrane technology. Dendrimers are of great interest for delivering drug molecules via different routes as nanocarrier. Toxicity problems associated with cationic dendrimers are overcome by PEGylation which neutralizes the charge on them. Dendrimers possess suitable properties to establish itself as a potential carrier for delivery of therapeutic agents irrespective of certain synthetic and regulatory constraints. The cavities inside the dendritic structure can be modified to incorporate hydrophobic and hydrophilic drugs. The terminal groups are modified to attach antibodies and bioactive substances for targeting purpose along with providing miscibility.

Keywords: Dendrimer, Nanocarrier, Gene Delivery, Drug Targeting.

PCU 011

NANOTOXICOLOGY

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Nanotoxicology is the study of the toxicology of the nanomaterials because of quantum size effects and large surface area to volume ratio, nanomaterials have unique properties compared with their larger counter parts. Nanotoxicology is a branch of bionanoscience which deals with the study and applications of toxicity of nanomaterials. Nanotoxicological studies are intended to determine whether and to what extent these properties may pose a threat to the environment and to human beings. The branch of nanotoxicology deals with the study relating to the toxicity of the nano materials, as it is

imperative to know that how toxic a nano material is before using it for various applications. The effects and impacts on human health also need to be assessed accordingly. The field of nanotoxicology has been growing fast, and literature reviews show that the results are not only numerous but also exciting. The International Council on Nanotechnology (ICON) has formed a database of all the publications of several nanomaterials along with their impact on environmental health and safety. This emphasizes on the interesting trends associated with the field of nanotoxicology.

Keywords: Nanoparticles, Nanotoxicology, Nanotechnology, Quantum Size.

PCU 012

Formulation and Evaluation of Extended Release Matrix Tablet of Skeletal Muscle Relaxant

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The objective of this study was to formulate and evaluate extended release matrix tablet of Baclofen using HPMC K100M, K4M and Eudragit RSPO as a release modifier. Nine batches were prepared by using HPMC K100M, K4M, and Eudragit RSPO in concentration of 20%, 30% and 40% alone. The precompressional parameters showed satisfactory flow properties and compressibility. Matrix tablets were prepared by direct compression method and were evaluated for weight variation, thickness, friability, hardness, assay, in vitro dissolution, stability study and IR spectroscopy. All nine formulations showed acceptable pharmacopoeial standards. Among all the formulation studied, formulation F5 containing HPMC K100M having concentration of 30% showed extended release of drug for 12 hrs with cumulative percent release 99.50%. The kinetic treatment showed optimized formulation follows higuchi release kinetic model, governed by diffusion through swollen matrix showing fickian transport. No chemical interaction between drug and polymer was seen as confirmed by IR studies. It concluded that extended release matrix tablet of Baclofen containing 30% of HPMC K100M provide better option for extended release of drug.

Keywords: Extended release, HPMC K100M, HPMC K4M, Eudragit RSPO, Baclofen.

PCU 013

MOUTH DISSOLVE TABLET OF ATENOLOL BY DIRECT COMPRESSION TECHNIQUE

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Fast disintegrating dosage forms (mouth dissolve tablet) are those that dissolve or disintegrate quickly in the oral cavity, resulting in solution or suspension. The drug selected for present study was atenolol (25mg). The aim of the present study was to develop the mouth dissolving tablets by simple, cost effective method by utilizing existing pharmaceutical machinery. The study was also aimed at assessment of feasibility of direct compression method for mouth dissolving tablets. Different

disintegrants were mixed in different ratios with the drug, compressed, studied for the granules properties and evaluated for different parameters. The developed formulation of atenolol showed good palatability and dispersed within 40 seconds. Direct compression method was successfully developed for mouth dissolve atenolol tablets. These methods avoid the time and efforts involved in other techniques.

Keywords: Mouth Dissolve Tablet, Atenolol, Direct Compression, Super Disintegrants.

PCU 014

FORMULATION AND EVALUATION OF OMEPRAZOLE NANOPARTICLES BY USING NATURAL POLYMERS

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Nanoparticles are solid colloidal particles having size range from 10 to 1000 nm (nanometer). They consist of polymeric materials and acts as a carrier for drugs used for the controlled drug delivery. These nanoparticles were prepared by the desolvation method by using the natural polymers like gelatin and sodium alginate as they are biodegradable and biocompatible. The work also has been done on gum kondagogu and chitosan to prepare the nanoparticles by desolvation method but the nanoparticles were not formed. The nanoparticles of gelatin 5% with different concentration of sodium alginate ranges from (1-6%) were evaluated after formulating into tablet dosage form using aluminum hydroxide act as diluents and also has an antiulcer property. The prepared tablet were evaluated for pre compression and post compression properties .Among all the formulations dissolution studies showed that f4 formulation containing 5% gelatin and 4% sodium alginate has enteric coating as well as controlled release property and releases 2.49% of drug in acidic PH (1.2) and 98% of drug in intestinal PH (6.8). Gelatin forms the nanoparticles and sodium alginate releases the drug in a controlled manner. Stability and accelerated stability studies of the USP omeprazole tablets shown that the f4 formulation has the promising result with 98% drug release within 12 hours in intestinal PH.

Key words: Nanoparticles, Gelatin, Sodium Alginate, Enteric Coating

PCU 015

ADVANCES IN TRANSDERMAL DRUG DELIVERY SYSTEMS

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Transdermal drug technology specialists are continuing to search for new methods that can effectively and painlessly deliver larger molecules in therapeutic quantities to overcome the difficulties associated with the oral route, namely poor bioavailability due to hepatic metabolism (first pass) and the tendency to produce rapid blood level spikes (high and low).Transdermal delivery can improve the therapeutic efficacy and safety of drugs by more precise (i.e., site-specific).Transdermal drug delivery systems allow delivery of a drug into the systemic circulation via permeation through skin layers at a controlled rate. There are various types of transdermal patches which are further modified to increase

the potential of the drug delivery. In addition to the currently marketed formulations, new drugs are being formulated using the transdermal system because of the inherent advantage of administration by this route. It offers a noninvasive route of drug administration, although its applications are limited by low skin permeability. Innovativeresearch exploiting penetration-enhancing strategies, such as iontophoresis, electroporation, microneedles, and sonophoresis, holds promise for the successful use of these drugs as consumer-friendly, transdermal dosage forms in clinical practice.

Keywords:-Bio Availability, Hepatic Metabolism, Penetration Enhancers, Iontophoresis, Electroporation, Microneedles.

PCU 016

APPLICATIONS OF IONTOPHORESIS

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Iontophoresis is the technique used for the delivery of drug. It is a non-invasive technique. Different Models have been studied for transdermal and ophthalmic delivery of drug. The technique is used to enhance the delivery of drug via transdermal and topical route. It uses the low voltage electric current for the delivery of drugs. Iontophoretic devices have gained importance worldwide. These are used to enhance the bioavailability and better absorption and fast delivery of drugs. Various uses and applications of the iontophoresis technique are discussed. The molecules that are delivered by the help of iontophoresis technique should consist of some charge on them either cationic or anionic. Due to the high solubility and high charge density, salt form of the drug is used. The major application of iontophoresis technique is seen through the transdermal route. Other routes used are cardiac, buccal and ocular. The transport is measured in units of chemical flux, commonly $\mu mol/cm^2h$. The transport of a charged species of interest may also be measured in terms of a representative electric current, but that current might not be the whole of the current driven by the applied electric field. Iontophoresis has purely laboratory experimental as well as therapeutic and diagnostic applications.

Keywords: Iontophoresis, Non-Invasive, Opthalmic delivery, Transdermal delivery, Flux, Electric current.

PCU 017

NATURAL OILS AS SKIN PERMEATION ENHANCERS FOR TRANSDERMAL DELIVERY OF OLANZAPINE: IN VITRO AND IN VIVO EVALUATION

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The feasibility of development of transdermal delivery system of olanzapine utilizing natural oils as permeation enhancers was investigated. Penetration enhancing potential of corn (maize) oil, groundnut oil and jojoba oil on in vitro permeation of olanzapine across rat skin was studied. The magnitude of flux enhancement factor with corn oil, groundnut oil and jojoba oil was 7.06, 5.31 and 1.9

respectively at 5mg/ml concentration in solvent system. On the basis of in vitro permeation studies, eudragit based matrix type transdermal patches of olanzapine were fabricated using optimized concentrations of natural oils as permeation enhancers. All transdermal patches were found to be uniform with respect to physical characteristics. The interaction studies carried out by comparing the results of ultraviolet, HPLC and FTIR analyses for the pure drug, polymers and mixture of drug and polymers indicated no chemical interaction between the drug and excipients. Corn oil containing unsaturated fatty acids was found to be promising natural permeation enhancer for transdermal delivery of olanzapine with greatest cumulative amount of drug permeated (1010.68 µg/cm²/h) up to 24 h and caused no skin irritation. The fabricated transdermal patches were found to be stable. The pharmacokinetic characteristics of the final optimized matrix patch (T2) were determined after transdermal application to rabbits. The calculated relative bioavailability of TDDS was 113.6 % as compared to oral administration of olanzapine. The therapeutic effectiveness of optimized transdermal system was confirmed by tranquillizing activity in rotarod and grip mice model.

Keywords: Permeation Enhancers, Natural Oils, Olanzapine

PCU 018

PHARMACOSOMES: A POTENTIAL VESICULAR DRUG DELIVERY SYSTEM

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Lipid based drug delivery systems have been examined in various studies and exhibited their potential in controlled and targeted drug delivery. Pharmacosomes, a novel vesicular drug delivery system, offering a unique advantage over liposomes and noisomes, and serve as potential alternative to these conventional vesicles. They constitute an amphiphilic, phospholipid complex with drug bearing an active hydrogen atom covalently that bind to phospholipids. They provide an efficient delivery of drug required at the site of action, which ultimately reduces the drug toxicity with reduced adverse effects and also reduces the cost of therapy by imparting better biopharmaceutical properties to the drug, resulting in increases bioavailability, especially in case of poorly soluble drugs. As the system is formed by binding the drug (pharmakon) to carrier (soma), they are termed as pharmacosomes. Depending upon the chemical structure of the drug lipid complex they may exist as ultrafine vesicular, micellar and hexagonal aggregate. Drug having active hydrogen group such as carboxyl, hydroxyl group can be esterified to lipids, resulting in amphiphilic compound. Pharmacosomes are widely used as carriers for various non-steroidal anti-inflammatory drugs, proteins, cardiovascular and antineoplastic drugs. The release of drug from pharmacosomes is generally governed by the process of enzymatic reaction and acid hydrolysis. Here, in the present review paper we have discussed the potential of pharmacosomes as a controlled and targeted drug delivery system and highlighted the method of preparation and characterization.

Keywords: Pharmacosomes, Amphiphilic, Targeted Drug Delivery System, Biosomes, Phospholipids, Bioavailability.

PCU 019

POLOXOMER: A NOVEL FUNCTIONAL MOLECULE FOR DRUG THERAPY AND GENE THERAPY

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Poloxamer a block copolymer is well known for its thermo reversible property also has several other properties used in several formulations for its advantage over optimising the drug release from its formulation with a sol-gel transition. Poloxamer exhibits in a sol state at less than room temperature and gets converted to a gel state at body temperature (37.2°C) thus modifying drug release characteristics. Poloxamer formulations were also evaluated for other therapeutic properties for both invitro and in vivo based on its specific property. Poloxomer is frequently used for several routes of administrations such as oral, topical, ocular, nasal, vaginal, parentrals. Even inclusion of active pharmaceutical ingredients in liposomes, micro and nano formulations were performed and showed more satisfying results. The recent inventions gave a good breakthrough in poloxomer market due to its agreeable application in gene therapy and cytotoxicity studies.

Key words-Poloxomer , Cytotoxicity, Liposomes, Nanoformulation, sol-gel transition.

PCU 020

RELEASED ERYTHROCYTES DRUG DELIVERY

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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, nonpathogenicity, 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, carrier, Isolation, Applications.

PCU 021

MAGNETIC MICROSPHERES AS MAGICAL NOVEL DRUG DELIVERY

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Magnetic microspheres hold great promise for reaching the goal of controlled and site specific drug delivery. Magnetic microspheres as an alternative to traditional radiation methods which uses highly penetrating radiations that is absorbed throughout the body. Its use is limited by toxicity and side effects. Now a days, several targeted treatment systems including magnetic field, electric field, ultrasound, temperature, UV light and mechanical force are being used in many disease treatments (e.g. cancer, nerve damage, heart and artery, anti-diabetic, eye and other medical treatments). Among them, the magnetic targeted drug delivery system is one of the most attractive and promising strategy for delivering the drug to the specified site. Magnetically controlled drug targeting is one of the various possible ways of drug targeting. This technology is based on binding anticancer drug with ferrofluid that concentrate the drug in the area of interest (tumor site) by means of magnetic fields. There has been keen interest in the development of a magnetically target drug delivery system. These drug delivery systems aim to deliver the drug at a rate directed by the needs of the body during the period of treatment, and target the activity entity to the site of action. Magnetic microspheres were developed to overcome two major problems encountered in drug targeting namely: RES clearance and target site specificity.

Keywords: Targeting, Magnetic, Micro Carriers, Magnetite.

PCU 022

MAGNETIC MICROSPHERES

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Drug targeting: Delivery of drugs to receptors or organ or any other specific part of the body exclusively. Various nonmagnetic micro carriers are utilized for drug targeting but they show poor site specificity and are rapidly cleared off by RES. Magnetic particles composed of magnetite are well tolerated by body. Magnetic fields are believed to be harmless to biological systems and adaptable to any part of the body. Up to 60% of injected dose deposited and released in a controlled manner. Magnetic micro carriers were developed to overcome two major problems encountered in drug targeting: Magnetic carriers are normally grouped according to size, RES clearance, Target site specificity.

Keywords: Magnetic microspheres, applications of microspheres

PCU 023

SMART MUSCLE

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The fascinating chemistry of the hybrid polymers is that growing the two types of polymers simultaneously generates a structure that is completely different from the two grown alone. The new capabilities are the result of both rigid and soft compartments with extremely different properties that are organized in specific ways. Polymers get their power and features from their structure at the nanoscale. Such electroactive polymers, combined can act as "Smart-Muscle". Artificial muscle has the potential to fundamentally shift the way many types of industrial, medical, consumer, automotive, and aerospace products are powered and operated. It offers significant advantages over typical electromagnetic-based technologies because it is much lighter, smaller, quieter and cheaper. It also offers more controllable and flexible configuration. It has the potential to do lots of other stuff, like deliver of drugs or even repair itself. The technology has also demonstrated promise for a variety of actuator and electric power generation applications.

PCU 024

PHARMACOSOMES- A REVIEW

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Pharmacosomes are amphiphilic lipid vesicular systems that have shown their potential in improving the bio-availability of poorly water soluble as well as poorly lipophilic drugs. They are the colloidal dispersions of drugs covalently bound to lipids, and may exist as ultrafine vesicular, micellar, or hexagonal aggregates, depending on the chemical structure of drug-lipid complex. Because the system is formed by linking a drug (pharmakon) to a carrier (soma), they are called pharmacosomes hence the expression "vesicular constructs" in common for pharmacosomes, liposomes, niosomes, and biosomes. They are amphiphilic phospholipid complexes of drugs bearing active hydrogen that bind to phospholipids. Pharmacosomes impart better biopharmaceutical properties to the drug, resulting in improved bioavailability. Pharmacosomes have been prepared for various non-steroidal anti-inflammatory drugs, proteins, cardiovascular and antineoplastic drugs. Developing the pharmacosomes of the drugs has been found to improve the absorption and minimize the gastrointestinal toxicity. Pharmacosomes are like a panacea for most of the problems associated with liposomes, transferosomes, niosomes, and so forth. They are an efficient tool to achieve desired therapeutic goals such as drug targeting and controlled release.

Keywords: Pharmacosomes, Amphiphilic, Targeted drug delivery system, Biosomes.

PCU 025

NANOSUSPENSION

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Solubility is the crucial factor for drug effectiveness, independence of the route of administration. Large proportions of newly discovered drugs are water insoluble, and therefore poorly bioavailable contributing to deserted development effort. These so-called 'Brickellia' candidates can now be delivered by formulating them into Nanosuspension. Nanosuspension technology solved the problem of drugs which are poorly aqueous soluble and less bioavailability. Stability and bioavailability of the drugs can be improved by the Nanosuspension technology. Preparation of Nanosuspension is simple and applicable to all drugs which are aqueous insoluble.Nanosuspensions are prepared by using wet mill, high pressure homogenizer, emulsion-solvent evaporation, melt emulsification method and super critical fluid techniques. Nanosuspension can be prepared by using stabilizers, organic solvents and other additives such as buffers, salts, polyols, osmogent and cryoprotectant. Nanosuspensions can be delivered by oral, parenteral, pulmonary and ocular routes. Nanosuspensions can also be used for targeted drug delivery when incorporated in the ocular inserts and mucoadhesive hydrogels.

PCU 026

HYDROGEL NANOPARTICLES

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Hydrogel products constitute a group of polymeric materials, the hydrophilic structure of which renders them capable of holding large amounts of water in their three-dimensional networks. Extensive employment of these products in a number of industrial and environmental areas of application is considered to be of prime importance. As expected, natural hydrogels were gradually replaced by synthetic types due to their higher water absorption capacity, long service life, and wide varieties of raw chemical resources. Literature on this subject was found to be expanding, especially in the scientific areas of research. However, a number of publications and technical reports dealing with hydrogel products from the engineering points of view were examined to overview technological aspects covering this growing multidisciplinary field of research.

PCU 027

POLYMER DEGRADATION AND BIODEGRADABLE POLYMERS

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Synthetic polymers are important in many branches of industry, for example in the packaging industry. However, they have an undesirable influence on the environment and cause problems with waste deposition and utilization. Thus, there is a tendency to substitute such polymers with polymers that undergo biodegradable processes. Increasing interest in applying polymers based on natural materials such as starch has been observed.

The presentation describes biodegradation processes of xenobiotics such as aromatic compounds, plastics (PVA, polyesters, polyethylene, and nylon), and polymer blends (Starch/Polyethylene, Starch/Polyester, and Starch/PVA). Moreover, it includes information about biodegradable polymers such as mixtures of synthetic polymers and substances that are easy digestible by microorganisms (chemically modified starch, starch-polymer composites, thermoplastic starch, and biodegradable packing materials), synthetic materials with groups susceptible to hydrolytic microbial attack (polycaprolactone), and biopolyesters (poly-β-hydroxyalkanoates). Production of this kind of material and introducing it to the market is important for the natural environmental. It may result in decreasing the volume of waste dumps.

Keywords: Biodegradation, Biodegradable Polymers, Xenobiotics.

PCU 028

MICROEMULSIONS

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Since the discovery of microemulsions by Jack H. Shulman, there have been huge progresses made in applying microemulsion syst ems in a plethora of research and industrial processes. Microemulsions are clear, stable, isotropic mixtures of oil, water and surfactant, frequently in combination with a cosurfactant. Microemulsions are optically isotropic and thermodynamically stable liquid solutions of oil, water and amphiphile. To date microemulsions have been shown to be able to protect labile drug, control drug release, increase drug solubility, increase bioavailability and reduce patient variability. Furthermore, it has proven possible to formulate preparations suitable for most routes of administration. Since the discovery of microemulsions, they have attained increasing significance both in basic research and in industry. Due to their unique proper ties, namely, ultralow interfacial tension, large interfacial area, thermodynamic stability and the ability to solubilise otherwise immiscible liquids, uses and applications of microemulsions have been numerous. Microemulsions are readily distinguished from normal emulsions by their transparency, low viscosity and more fundamentally their thermodynamic stability. Microemulsions are shown to be effective dermal delivery mechanism for several active ingredients for pharmaceutical and cosmetic applications. Topical microemulsions allow rapid penetration of active molecules due to the large surface area of the internal phase, and their components reduce the barrier property of stratum corneum. Microemulsions thereby enhance dermal absorption compared with conventional formulations and are therefore a promising vehicle due to their potential for transdermal drug delivery.

Keywords: Microemulsions, Surfactant, Thermodynamically stable.

PCU 029

SOLID LIPID NANOPARTICLES

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One of the situations in the treatment of disease is the delivery of efficacious medication of appropriate concentration to the site of action in a controlled and continual manner.Nanoparticle represents an important particulate carrier system, developed accordingly. Nanoparticles are soli colloidal particles ranging in size from 1 to 1000nm and composed of macro molecular material. Industry estimates suggest that approximately 40% of lipophilic drug candidates fail due to solubility and formulation stability issues, prompting significant research activity in advanced lipophile delivery technologies. Solid lipid nanoparticle technology represents a promising new approach to lipophile drug delivery. SLN's are important advancements in this area. The bio acceptable and biodegradable nature of SLNs makes them less toxic as compared to polymeric nanoparticles. supplemented with small size which prolongs the circulation time in blood, feasible scale up for large scale production and absence of burst effect makes them interesting candidates for study.

Keywords: Solid Lipid Nanoparticles, Preparations Advantages, Characterisation, Characteristics, Applications.

PCU 030

PREPARATION AND EVALUATION OF PRESS COATED TABLETS OF ESOMEPRAZOLE

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Esomeprazole is a proton pump inhibitor, degrades in acidic environment, hence protection of drug is done by coating the drug with retardant coating polymers. The aim and objective of the present study is to prepare press coated tablets of esomeprazole by using press coating technique. Core tablets were prepared by direct compression and evaluated for their physico-chemical properties. Press coated tablets were formulated by using different combinations of ethyl cellulose, HPMC E15 and HPMC K4M as a coating layer. Among the various formulations F5 containing ethyl cellulose: HPMC E15 (10:90) and F9 containing ethyl cellulose: HPMC K4M (20:80) were optimized based on their better drug release within 8 hrs. Stability studies showed that the formulations were stable. SEM photographs of tablets showed that the surface of core tablet is uniformly coated with coat by press coating. As a result, press coated tablets developed in this study delivered esomeprazole in the intestine and protected the drug from degradation.

Keywords: Esomeprazole, press coating, direct compression

PCU 031

EFFECT OF CHEMICAL ENHANCERS ON SKIN PERMEATION OF ITRACONAZOLE

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The objective of this study was to prepare and evaluate itraconazole transdermal gel with different permeation enhancers for basal cell carcinoma treatment. Itraconazole transdermal gel was

prepared by dispersion method in this method polymer was soaked in water for two hours after that other chemical ingredients were mixed and stirred well until a homogenous mass was obtained. Natural polymer (tara gum 2% and kondagogu gum 4%) were used as gelling agents. Propylene glycol 1% was used as emollient. Methanol 23% was used to dissolve itraconazole and stearic acid. Different permeation enhancers (oleic acid, stearic acid, citric acid, acetic acid, maleic acid, succinic acid, dimethyl sulfoxide) with two different concentrations 1% and 2.5% were used. The prepared gels were tested for pH, drug content, extrudability, spreadability, viscosity, in-vitro studies, ex-vivo studies, skin irritation studies and stability studies. All the formulations have shown good physicochemical properties. The ex-vivo results revealed that the (ITM1) formulation using tara gum 2% and maleic acid 1% as permeation enhancer has shown maximum drug release of 96.97% for 8 hrs. Permeability parameter like flux was found to be 314.2±0.025 ($\mu g/cm^2/hr$), permeability coefficient was found to be 123.08±0.002 ($cm/ hr \times 10^{-3}$) and Q_8 was found to be 2473.717±0.91 ($\mu g/cm^2$). Skin irritations have shown to be non irritant. The formulation was stable at room for one month. Based on results, it can be concluded that the ITM1can provide good transdermal delivery and improved bioavailability.

Keywords: Itraconazole, Basal cell carcinoma, Natural polymer, Maleic acid.

PCU 032

NANOTECHNOLOGY

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Nanotechnology received a lot of attention with the never-seen-before enthusiasm because of its future potential that can literally revolutionize each field in which it is being exploited. In drug delivery, nanotechnology is just beginning to make an impact, because materials reduced to nanoscale can show different properties compared to what they exhibit on a macroscale. Drug delivery nanosystems constitute a significant portion of nanomedicine. Many of the current "nano" drug delivery systems, however, are remnants of conventional drug delivery systems that happen to be in the nanometer range, such as liposomes, polymeric micelles, nanoparticles, dendrimers, and nanocrystals. Liposomes and polymer micelles were first prepared in 1960's, and nanoparticles and dendrimers in 1970's. The importance of nanotechnology in drug delivery is in the concept and ability to manipulate molecules and supramolecular structures for producing devices with programmed functions. Conventional liposomes, polymeric micelles, and nanoparticles are now called "nanovehicles". Due to nanoparticles, modern chemistry has reached the point where it is possible to prepare small molecules to almost any structure, which are very useful in manufacturing variety of useful pharmaceuticals. So nanotechnology may be able to create many new materials with a vast range of applications, in medicine and energy production.

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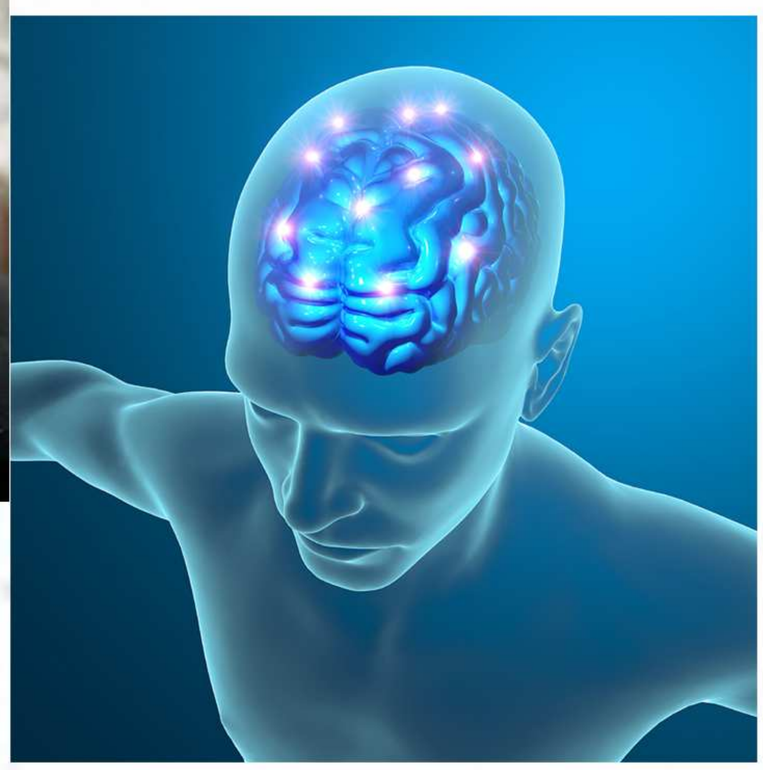
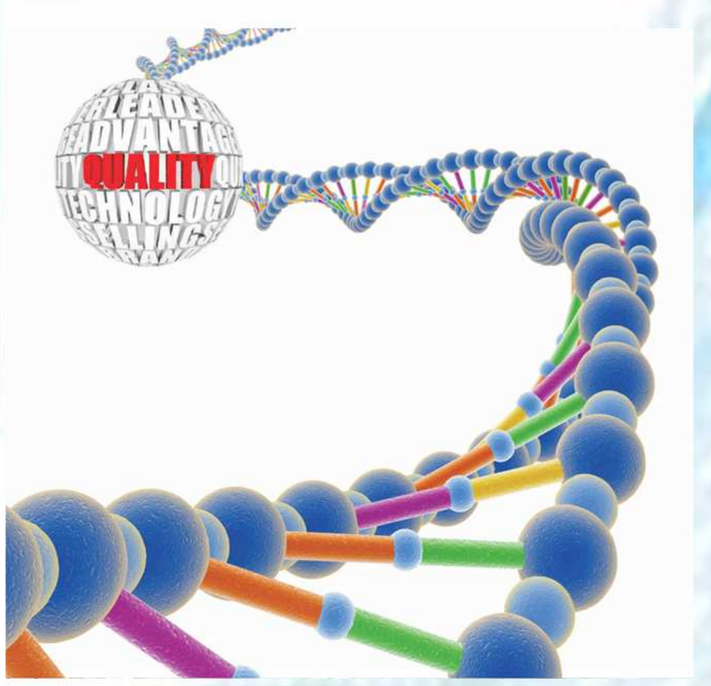
PHARMACOLOGY





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CYTOTOXIC AND TUMOR REDUCING EFFECT OF HDAC INHIBITOR BK-16 LOADED POLYMERIC MICELLES

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Cancer or neoplasm is one of the most unpredictable and deadliest diseases known to man. Previous studies regarding other HDAC inhibitors loaded in carriers have shown significant tumor volume reduction and a reduction in dose. BK-16 is a HDAC inhibitor with poor pharmacokinetic profile. Hence it has been incorporated in polymeric micelles and were evaluated to determine its growth phase arrest and for its anti-proliferative and tumor reducing effect in B16F10 induced melanoma in mice. Calculated amounts of free BK-16 and BK-16 incorporated polymeric micelles were prepared. B16F10 cell lines were seeded in a 6 well plate and were treated with calculated free drug and formulated drug solution were analyzed to observe at which growth phase proliferation had ceased. Drug treatment was performed for 21 days, and tumor volumes were measured daily with the help of vernier calipers. After 21 days, the animals were sacrificed and tumors were harvested to test for apoptotic cells bodies via TUNEL assay. Cytotoxic and tumor reducing activity of BK-16 incorporated polymeric micelles was evaluated. B16F10 cell lines were treated with free BK-16 and BK-16 PM and higher percentage of growth phase arrest were shown in the G_2/M phase by formulated drug when compared to the free drug. Whereas, in-vivo treatments with BK-16 PM to the tumor induced mice significantly reduced the tumor growth when compared to normal control and were harvested to analyze for apoptotic cell bodies using TUNEL assay. The present study suggests that BK-16 PM shows an enhanced anti-proliferative effect against B16F10 cell lines *In vitro* and *In vivo* models when compared to that offree BK-16.

Keyword: polymeric micelles, BK-16, anti-cancer, HDACi

PCL 002

MODELING AND SIMULATION OF TEMOCILLIN IN PATIENTS WITH END STAGE RENAL DISEASE UNDERGOING HAEMODIALYSIS

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Temocillin (TMO) is a narrow-spectrum anti-gram-negative β-lactam marketed since the '80s, it witnesses renewed interest as a carbapenem-sparing drug, because it resists to degradation by most β-lactamases. TMO pharmacokinetics in haemodialysis patients has not been investigated yet. The purpose of this study was to develop a population pharmacokinetic model of TMO patients with end stage renal disease (ESRD) undergoing haemodialysis, and to evaluate by simulation, the clinical performance of current dosing regimens. This method is open, non-randomized, single-center study.12 patients were administered a single dose of 1,2,or 3g of TMO followed by a inter-dialytic period (off-

dialysis) of 20,44, or 68h, respectively and a dialysis period of 4h (total of 39 doses). 351 serum samples were collected according to the sampling scheme and analysed for unbound concentrations using a HPLC-MS/MS. Assay models were selected based upon decrease in objective function value, improvement in goodness-of-fit and diagnostic plots. The final model estimated all parameters with good precision (relative standard error) between 11.4% and 25.7%. Conclusion is that a two compartment pk model for TMO in ESRD patients undergoing haemodialysis was developed to be predictive, including during dialysis period. This model is a useful tool to provide guidance in optimization of TMO dosing regimens in haemodialysis patients.

Key words: Temocillin (TMO), end stage renal disease (ESRD), haemodialysis, carbapenem sparing drug, two - compartment pk model.

PCL 003

BIOLOGICAL PACEMAKER

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A pacemaker is a device that senses when the heart is beating irregularly or too slowly. It sends a signal to heart & makes the heart beat at a correct pace. An artificial pacemaker is an implanted device that mimics the action of nodes & conducting system thus regulating the heart rate. It is a small battery operated computer called pulse generator. Biological pacemaker created by minimally invasive somatic reprogramming or gene therapy technique using appropriate vectors or by stem cell therapy. This method includes insertion of particular gene and transforming the heart cells into a new pacemaker that can restore the missing heart beats. Biological pacemakers replaces the action of heart's natural pacemaker when it's not fast enough or if there is a block in electrical conduction and incase of electronic pacemaker infection. Biological pacemaker has delivery systems such as viral vectors, human embryonic stem cell and human mesenchymal stem cells. A biological pacemaker proves to be very effective cure in pediatric patients & who face a life time of device change. Regeneration or recreation of normal pacemaker function is preferable than fixing something artificially, as electronic devices always cannot really follow human physiology.

Key words: Pacemaker, pulse generator, regeneration.

PCL004

FIBROMYALGIA : AN OVERVIEW

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Fibromyalgia syndrome (FM) is a common chronic pain condition which is not due to tissue damage or inflammation and is thus fundamentally different from rheumatic disorders and many other pain conditions. In addition to chronic widespread pain, patients with FM usually experience other

characteristic symptoms, including fatigue, disturbed sleep, and stiffness, reduced functioning, dyscognition, and depressed mood. Many patients also have comorbid conditions such as depression, irritable bowel syndrome, temporomandibular disorder, or migraine. Although the etiology of FM is not completely understood, the syndrome is thought to arise from influencing factors such as stress, medical illness, and a variety of pain conditions in some, but not all patients, in conjunction with a variety of neurotransmitter and neuro endocrine disturbances. These include reduced levels of biogenic amines, increased concentrations of excitatory neurotransmitters, including substance P, and dysregulation of the hypothalamic-pituitary-adrenal axis. A number of multidisciplinary therapeutic programmes involving education, exercise and cognitive therapy have been shown to be effective in bringing relief. The various medications that are currently being developed for the treatment of fibromyalgia are based on different mechanistic approaches. In particular, serotonin noradrenaline reuptake inhibitors (SNRI) such as duloxetine and milnacipran and alpha2-delta receptor ligands such as pregabalin have been shown, in a variety of placebo-controlled studies, to bring significant relief from pain and other symptoms. The complex symptomatology of fibromyalgia will, however, continue to require a multidisciplinary approach including education and exercise in addition to drug therapy to achieve the most efficient management of fibromyalgia.

PCL 005

ANTI-HYPERLIPIDEMIC ACTIVITY OF AQUEOUS EXTRACT OF AJWA DATES ON HIGH FAT DIET INDUCED HYPERLIPIDEMIA IN WISTAR RATS

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In present research study anti-hyperlipidemic activity of ajwa dates were assessed. Ajwa dates were natural medicinal fruits and these were a rich source of carbohydrates, dietary fibers, certain essential vitamins and minerals. Ajwa dates extract had a tissue protective effect via a free radical scavenging and antioxidant properties. In addition to dietary use the dates were used to treat a variety of ailments in the various traditional systems of medicine. They possess free radical scavenging, antioxidant, antimutagenic, antimicrobial, anti-inflammatory, gastroprotective, hepatoprotective, nephroprotective, anticancer and immunostimulant activities. The most common cause of hyperlipidemia was a combination of genetic and environmental factors. In hyperlipidemic condition total lipid levels were increased than normal in the body. Increased lipids deposited in the arteries and they leads to atherosclerosis and other disorders. For treatment of hyperlipidemia many marketed drugs were available (eg: statins,fibrates), but they had adverse events like hepatotoxicity, myalgia, cutaneous flushing, pruritis and other.Due to this reason natural and plant derived medicinal products were developed. In this study hyperlipidemia was induced in rats by administering high fat diet (10 ml/kg, p.o) for 28 days. Hyperlipidemia was treated by administering aqueous extract of ajwa dates in different doses (60 mg/kg & 120mg/kg, p.o). Aqueous extract of ajwa dates decreases the total cholesterol, triglycerides, low density lipoproteins, very low density lipoproteins and increased the high density lipoproteins. Based on the results it can be concluded that aqueous extract of ajwa dates was best natural medicine for treating hyperlipidemia.

Key words: Ajwa dates, Hyperlipidemia, Cholesterol, High fat diet

PCL006

Antibody-directed enzyme prodrug therapy (ADEPT)

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Antibody-directed enzyme prodrug therapy (ADEPT) was conceived as a means of reducing the toxicity of chemotherapy and improving its efficacy by generating the cytotoxic agent at tumor sites. It was proposed that this could be done by using an antibody directed at a tumor-associated antigen to convey an enzyme to tumor sites and, when the enzyme had cleared from the blood, to give a low toxicity prodrug from which a high toxicity drug would be released by enzymic catalysis within tumors. The active drug would be a small molecule able to diffuse within a tumor and thus overcome the heterogeneity in tumor marker expression that was seen as a potential limitation to conjugates of cytotoxic agents and antibodies.

KEYWORDS:Chemotherapy, cytotoxic, tumour, prodrug, heterogeneity.

PCL007

CELIAC DISEASE: AN AUTOIMMUNE DISORDER

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Celiac disease, also known as gluten-sensitive enteropathy and nontropical sprue, is a prevalent autoimmune disorder that is triggered by the ingestion of wheat gluten and related proteins of rye and barley in genetically susceptible individuals. The immune response in celiac disease involves the adaptive, as well as the innate, and is characterized by the presence of anti-gluten and anti-transglutaminase 2 antibodies, lymphocytic infiltration in the epithelial membrane and the lamina propria, and expression of multiple cytokines and other signaling proteins. The disease leads to inflammation, villous atrophy, and crypt hyperplasia in the small intestine. In addition to the intestinal symptoms, celiac disease is associated with various extra-intestinal complications, including bone and skin disease, anemia, endocrine disorders, and neurologic deficits. Screening studies have revealed that celiac disease is most common in asymptomatic adults in the United States. Although considerable scientific progress has been made in understanding celiac disease and in preventing or curing its manifestations, a strict gluten-free diet is the only treatment for celiac disease to date. Early diagnosis and treatment, together with regular follow-up visits with a dietitian, are necessary to ensure nutritional adequacy and to prevent malnutrition while adhering to the gluten-free diet for life. This review focuses in detail on the gluten-free diet and the importance of intense expert dietary counseling for all patients with celiac disease.

PCL008

HEPATOPROTECTIVE ACTIVITY OF GRAPEFRUIT JUICE AGAINST CARBON TETRACHLORIDE INDUCED ACUTE HEPATOTOXICITY IN WISTAR RATS

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Natural products from plants have received considerable attention in recent years due to their diverse pharmacological properties, including antioxidants and hepatoprotective activities. The protective effects of *Grapefruit* juice against carbon tetrachloride (CCl_4)-induced hepatotoxicity in Wistar rats was investigated. To evaluate the Hepatoprotective activity of Grapefruit juice against carbon-tetrachloride induced acute hepatotoxicity in Wistar rats. Thirty adult Wistar rats were divided into six groups of six animals in each group. Group I (normal control) and group II (disease control) receives normal saline for seven days. Group III (standard control) was treated with standard drug LIV 52 (0.234 ml.) orally[dose of the standard drug was calculated by taking surface area of rat, man and dose of LIV 52 to man into considerations] , Group IV and V were treated with GFJ of 3 and 6 ml/kg b.w. orally respectively for seven days. All the animals except the group I were treated with CCl4 (1.5 mL/kg b.w. 50% v/v with olive oil; I.P.) on 7thday. On seventh day various parameters (ALT, AST, ALP, TP, MDA, SOD) were evaluated and part of the liver tissue was separated for histopathological studies. Treatment with Grapefruit juice showed significant ($p<0.05$) hepatoprotective activity by decreasing the activities of ALT, AST, ALP and increasing the levels of total protein and there was a significant reduction of MDA and also there is improvement in SOD (antioxidant) levels. Histo-architecture of Grapefruit juice treated group rats has restored to normal in a dose dependent manner, when compared to that of disease control group.These data revealed that Grapefruit juice possesses significant hepatoprotective effects against CCl_4-induced toxicity attributable to its constituent phytochemicals. These protective effects may be related to antioxidant properties of the juice.

Keywords: Grapefruit juice, carbon tetrachloride, hepatotoxicity, LIV 52, Wistar rats

PCL 009

ANGIOTENSIN RECEPTORS

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The AT1 receptor is coupled to G-proteins and engages classical intracellular second messenger systems, for example activation of phospholipase-C or inhibition of adenylate cyclase and they are important in the renin angiotensin system. The active peptide hormone angiotensin II is formed from its prohormone angiotensinogen by way of inactive angiotensin I. The development of highly selective angiotensin II receptor ligands allowed the identification of angiotensin II receptor subtypes, designated AT1, AT2, AT3 and AT4. Most of the known effects of angiotensin II can be attributed to the AT1 receptor. In contrast, the function and the signal transduction pathways of the AT2 receptor, which exhibits only a 32-34% homology to the AT1 receptor, are so far not fully understood. Coupling

of the AT2 receptor to phosphatases and inhibitory actions on AT1 receptor- and growth factor-mediated proliferation in endothelial and other cells as well as induction of neuronal outgrowth. AT2 receptor has been associated with cell differentiation and regeneration.

PCL 010

PATCH CLAMP TECHNIQUE: CONVENTIONAL TO AUTOMATED

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Conventional patch clamp technique as revolutionized philosophical approach in drug discovery and development at preclinical stage, as per ICH-S7B guidelines every drug candidate need to be evaluated for their potential to block hERG potassium channels blockade as a measure of proarrhythmic liability can lead to acquired long QT syndromes characterized by action potential prolongation of the QT interval on the surface ECG, and an increased risk for " torsade de pointes" arrhythmias and sudden death example: disopyramide(DISO), mexiletine, ranitidine, clomiphene(antiestrogen). Development of patch clamp technique has been tremendous improvement in understanding of ion channels as potential drug target and versatile method in study in electrophysiological properties of cell membrane. Ion channel are proteins forming pores with in membrane. Some channels are sensitive to membrane potential (voltage gated ion channels) and ligand binding (ligand gated ion channels). Patch clamp technique is unique in enabling real analysis of a single ion channel involving transient changes in electrical current across cell membrane. The technique setup has electrode inside a glass pipette containing salt solution lowered to cell membrane and apply slight suction against pipette tip forming tight seal and measured in giga ohms sealing. Conventional patch clamp screening method need to accelerate the primary screening of ion channel modulator at preliminary stage. In this prospective the automated patch clamp technique are constantly provide high throughput screening method for screening of new chemical entities.

Keywords: disopyramide (DISO), mexiletine, ranitidine, clomiphene (antiestrogen agent), pro-arrhythmia, high throughput screening.

PCL 011

ALTERNATIVE TECHNIQUES FOR EVALUATION OF ANTIDIABETIC AGENTS

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In-vitro techniques are most widely used techniques for evaluation of antidiabetic agents in order to reduce the use of animals as per CPCSEA guidelines. Various in-vitro methods have been established for primary screening of hypoglycemic agents. Inhibition of carbohydrate digesting enzymes like pancreatic α-amylase, α-Glucosidase, sucrase, dipeptidyl peptidase IV (DPP IV) and Protein tyrosine phosphatase 1B (PTP 1B) are the widely used enzyme screen methods. Apart from

enzyme screens, various cell line models like insulin secretion assay using pancreatic RIN m5F cells, cytotoxicity assay, insulin release assay using RIN m5F cells, insulin secretion assay using pancreatic ß-cell line, ß-cell proliferation assay, glucose uptake assay using 3T3 L1 cells, immunoblotting using CHO-IR cells, peroxisome proliferator-activated receptor-γ luciferase assay. In conclusion, these assays provide information of various in-vitro studies used in antidiabetic assessment reduces the number of usage of animals.

PCL 012

NOVEL SCREENING TECHINQUES FOR RECEPTOR-LIGAND INTERACTIONS

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Receptor–ligand interactions play a crucial role in biological systems and their measurement forms an important part of modern pharmaceutical development. Receptors are classified as : G Protein Coupled Receptor, Ion-Channel Receptors, Enzyme Linked Receptors, Nuclear Receptors.Various Screening Techniques have been established for evaluation of Ligand-Receptor Interactions viz Scintillation Proximity Assay, Fluorescence Screens (Fluorescence Resonance Energy Transfer, fluorescence polarization, Flurogenic Assay). Patch Clamp Techniques includes four basic recording configurations (whole cell, cell-attached, inside-out, outside-out), Dynamic Combinatorial approach, piezoelectric Biosensor, Atomic Force Microscopy Technique, NMR Spectroscopic technique and Cell Based Assays.

PCL 013

OVERVIEW OF HIV INFECTION

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An overview of HIV pandemic provides the basic biology, immunology of the virus(e.g genetic diversity of HIV and the viral life cycle), the phases of disease progression, modes of HIV transmission, HIV testing, immune response to the infection and current therapeutic strategies. HIV is occurring in epidemic proportions, especially in sub-Saharan Africa. In the US, men who sex with men account for over half of AIDS diagnose, racial and ethnic minorities are disproportionately affected. Factors influencing the progression and severity of HIV infection include type of immune response, coinfection. Antiretroviral therapies can achieve reduction in blood level of the HIV virus below the limits of detection by current technology. However, effective treatment requires adherence to therapy. Patient failure to adhere to treatment regimens results in detectable circulating virus and in HIV disease progression, and is the primary cause of drug resistance.

PCL 014

RECENT ADVANCES IN BIOSENSORS TECHNOLOGY: A REVIEW

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Biosensors are the devices that combine biological materials and transducers for detection of sample. For example, drug, metabolites, microbial etc., by converting biochemical signals into measurable physicochemical signals which in turn quantify the amount of sample. First glucose biosensor developed by Clark in 1962 and later many have been commercially exploited for various applications as they are more specific, rapid, reproducible. Recently nanobiosensors, implanted biosensors and integrated biosensors are current in research. The main challenges in field of implantable biosensors are its stability, selectivity and biocompatibility.

Keywords: Biosensors, nanobiosensors, implantable biosensors.

PCL 015

TENELIGLIPTIN: SWEET NEWS FOR DIABETICS

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Diabetes is a debilitating disease that afflicts over 67 million individuals in India with an additional 35 million persons who remain undiagnosed. Oral DPP-4 inhibitors (Gliptin) are new incretin-based therapies for treatment of type 2 diabetes mellitus (T2DM) which costs about Rs 45 per day. Teneligliptin is a newer third-generation oral anti-diabetic drug which costs only Rs 9 per day. The launch of the Teneligliptin molecule has revolutionized the concept of diabetes management by lowering the cost of therapy by 80% from Rs 45 per day for the gliptin category to only Rs 9 per day for Teneligliptin. Teneligliptin in currently manufactured by over 15 companies in India. It is required to be administered only once in a day to control blood sugar. Since the half-life (t ½) of Teneligliptin is 24.2 hours, studies are on to test the effectiveness of Teneligliptin when it is taken only once in every two days which would further halve the cost of the medication and make it more affordable to poor patients. Teneligliptin was developed by a Japanese drug maker Mitsubishi Tanabe and has been approved for use in Japan, Korea and India. Gliptins have been used as the preferred line of treatment for T2DM and are globally accepted since they have reduced side effects. Gliptins are generally prescribed in combination with other medications when it is found that the other medications alone are not adequate in controlling blood glucose.

PCL 016

NANOTECHNOLOGY BUILDING BLOCKS FOR INTERVENTIONWITH ALZHEIMER'SDISEASE PATHOLOGY

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Alzheimer's disease is among the most common brain disorders affecting the elderly population the world over, and is projected to become a major health problem with grave socio-economic implications in the coming decades. The total number of people afflicted by Alzheimer's disease (AD) worldwide today is about 15 million people, a number expected to grow by four times by 2050. This review looks at some of the nanotechnology-enabled approaches that are being developed for early detection and accurate diagnosis of Alzheimer's, its therapeutic treatment, and prevention. These potential solutions offered by nanotechnology exemplify the growing significance that it holds for dealing with brain ailments in general.At the forefront of these new strategies is nanotechnology. In particular, nanoparticles (NPs), engineered tunable devices with the size in the order of a billionth of a meter, are being considered as a useful alternative to treat and diagnose neurodegenerative diseases. By way of treatment, NPs are intriguing candidates for this purpose because of their potential for multi-functionalization, enabling them to mimic the physiological mechanisms of transport across the blood-brain barrier (BBB). This barrier is an important physical fence made of cells protecting brain from potential hazardous substances in the blood flow; however, it also prevents the passage of 98 per cent of available neuro-pharmaceuticals and diagnostics. Synthesized NPs are able to convey conventional pharmaceutics and biologicals, such as genes, siRNa, antibodies or contrast agents, to the brain in vitro and in vivo.

PCL 017

CROHN'S DISEASE : A REVIEW

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Crohn's disease is a chronic relapsing inflammatory bowel disease that may affect any part of the gastrointestinal tract. The ileum, colon, and perineum are most commonly affected. It is characterised by transmural inflammation, and granulomata may be present. Whilst the aetiology of Crohn's disease is not completely understood, it is thought to be caused by the complex interplay between genetic, immunological, microbiological, and environmental factors. Current opinion is that, in genetically susceptible individuals, there is an immune dysregulation to an environmental factor, and the intestinal microbiota plays a central role. Genetic studies of patients with Crohn's disease have found several gene mutations which affect the innate immune system. Two important mutations contributing towards the pathogenesis of Crohn's disease are Nucleotide-binding oligomerisation domain-containing protein 2 (NOD2) and autophagyrelated 16-like 1 (ATG16L1). The most common symptoms of Crohn's disease are diarrhoea, abdominal pain, weight loss, and fatigue. Symptoms reflect the site and behaviour of disease, and the presence or absence of strictures and fistulae. Extraintestinal

manifestations may be present and typically affect the eyes, skin, joints, or biliary tree. Investigations are performed to map the disease location, assess disease severity, and survey for complications of the disease or treatment. Management is with smoking cessation, steroids, immunomodulators, anti-tumour necrosis factor (TNF) therapy, or surgery.

PCL018

HUMAN PSYCHOPHARMACOLOGY OF ECSTASY (MDMA): A REVIEW OF 15 YEARS OF EMPERICAL RESEARCH

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MDMA (3, 4-methylenedioxymethamphetamine) or 'Ecstasy' was termed as an illegal drug back in 1986, but since then the recreational use of the drug has increased dramatically. MDMA is an indirect monoaminergic agonist, stimulating the release and inhibiting the reuptake of serotonin (5-HT) and, to a lesser extent, other neurotransmitters. Single doses of MDMA or ecstasy have been administered to human volunteers in double-blind placebo-controlled trials, although most findings are based upon recreational MDMA users. These reports have been generated based on the 15 years of research into patterns of use, its acute psychological and physiological effects, and long term consequences of repeated use. The 'massive' boost in neurotransmitter activity can generate intense feelings of elation and pleasure and can also cause hyperactivity and hyperthermia i.e the condition of having a body temperature greatly above normal. The illicit manufacture of MDMA is not a difficult chemical procedure, and most Ecstasy tablets do contain MDMA, although other drugs or drug mixtures are also found. Often they comprise ring-substituted amphetamine derivates such as MDA (3, 4-methylenedioxyamphetamine) or MDE (3,4-methylenedioxyethylamphetamine). Neurochemically these are very similar to MDMA. Abstinent regular Ecstasy users often display reduced levels of 5-HT, 5-HIAA, tryptophan hydroxylase and serotonin transporter density; functional deficits in learning/memory, higher cognitive processing, sleep, appetite and psychiatric well being, and most paradoxically, 'loss of sexual interest/pleasure'.

Keywords: Ecstasy, MDMA, serotonin, neurotoxicity

PCL019

ADVANCES IN DEVELOPMENT OF NEW TREATMENT FOR LEISHMANIASIS

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Leishmaniasis is a neglected infectious disease caused by several different species of protozoan parasites of the genus Leishmania. Current strategies to control this disease are mainly based on chemotherapy. Despite beingavailable for the last 70 years, leishmanial chemotherapy has lack of efficiency, since its route of administration is difficult and it can cause serious side effects, which

results in the emergence of resistant cases. The medical-scientific community is facing difficulties to overcome these problems with new suitable and efficient drugs, as well as the identification of new drug targets. The availability of the complete genome sequence of Leishmania has given the scientific community the possibility of large-scale analysis, which may lead to better better understanding of parasite biology and consequent identification of novel drug targets. In this review we focus on how high-throughput analysis is helping us and other groups to identify novel targets for chemotherapeutic interventions. We further discuss recent data produced by our group regarding the use of the high-throughput techniques and how this helped us to identify and assess the potential of new identified targets.

Key words: Leishmaniasis, efficient drugs, novel drug targets, high- throughput analysis and chemotherapeutic interventions.

PCL020

PHARMACOLOGICAL EVALUATION OF RHODIOLA ROSEA ON SODIUM VALPROATE INDUCED AUTISM IN WISTAR RATS

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Autism is a neurobehavioral disorder characterized by impairment in social interaction, verbal and nonverbal communication, restricted interests, and repetitive/stereotyped patterns of behavior. Early prenatal or post natal exposure to environmental insults such as valproic acid (VPA), induced autism. On 12.5 day of gestation the female pregnant rats were divided into control and VPA treated group. They were administered saline/VPA (600mg/kg, i.p.) respectively and allowed to raise their own litters. From both groups pups were separated.On postnatal day (PND 21) VPA induced autistic pups were divided into four groups (n=6); Group I- received saline and Group II- received *CMC;* Group III received *R.ROSEA* lowdose (100mg/kg/p.o.) Group-IV received *R.ROSEA* high dose (200 mg/kg/p.o) from PND 21-35. Behavioral tests (nociception, locomotor activity, exploratory activity, anxiety and social behavior) were performed in adolescence (PND 30-50) period. At the end of behavioral testing animals were sacrificed, brain was isolated for histopathological examination. Induction of autism significantly affected normal behavior, increased oxidative stress,when compared with normal control group. Treatment with *R.ROSEA* significantly ($p<0.05$) improved behavioral alterations, decreased oxidative stress markers. In conclusion, the beneficial effect in ameliorating the autistic symptoms possibly due to its anti-anxiety, antioxidant and neuro-protective activity.

PCL021

PHARMACOLOGICAL EVALUATION OF CURCUMIN ON SODIUM VALPROATE INDUCED AUTISM IN WISTAR RATS

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Autism is a neurobehavioral disorder characterized by impairment in social interaction, verbal and nonverbal communication, restricted interests, and repetitive/stereotyped patterns of behavior. Early prenatal or post natal exposure to environmental insults such as valproic acid (VPA), induced autism. On 12.5 day of gestation the female pregnant rats were divided into control and VPA treated group. They were administered saline/VPA (600mg/kg, i.p.) respectively and allowed to raise their own litters. From both groups pups were separated.On postnatal day (PND 21) VPA induced autistic pups were divided into four groups (n=6); Group I- received saline and Group II- received *CMC;*Group III received curcumin lowdose (40mg/kg/p.o.) Group-IV received curcumin high dose (80 mg/kg/p.o)from PND 21-35. Behavioral tests (nociception, locomotor activity, exploratory activity, anxiety and social behavior) were performed in adolescence (PND 30-50) period. At the end of behavioral testing animals were sacrificed, brain was isolated for histopathological examination. Induction of autism significantly affected normal behavior, increased oxidative stress,when compared with normal control group. Treatment with *CURCUMIN* significantly ($p<0.05$) improved behavioral alterations, decreased oxidative stress markers. In conclusion, the beneficial effect in ameliorating the autistic symptoms possibly due to its anti-anxiety, antioxidant and neuro-protective activity.

PCL 022

CANCER

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Cells divide and multiply as the body needs them, when these cells divide when body does not need them it results is mass or growth which is called as tumor. Benign and malignant are types of tumor.The process of development of cancer are termed as carcinogenesis which tends be gradual and may take years. Characteristics of Cancer: lack of cell differentiation; abnormal nuclei; loss of contact inhibition; causes of cancer: carcinogenic agents, stress etc. One of four death occuring in the world is due to cancer. Men are more prone to lung cancer whereas women are more prone to breast cancer. There are over more than 100 different cancer forms which are very dangerous to human life.For years scientists have questioned why immune system is not aggressively fighting against cancer cells. New evidence shows that T cells which are important for body's immune response, have a protein (CLTA-4) that have an suppressing action and decrease their ability to fight against cancer cells. Researchers are focusing on this protein in hopes to produce a more aggressive immune system that can fight against cancer cells. Cancer treatment-Radiation therapy; surgery. Radiation therapy is a local treatment; it affects the cancer cells only at the treated area. Cancer Prevention- Healthy lifestyle; Exercise; Healthy and balanced diet; Complete rest and sleep.

Keywords: Tumor; Carcinogenisis; Radiation therapy; Immune system;

PCL 023

VIRUS BEHIND INFERTILITY IN WOMEN

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Human herpes virus (HHV) is notable potent influencing the reproductive system of females. Women infertility is throwing major challenges to researchers across the world. Through investigation, it has been found that, this HHV virus has become one of the major peril and thus top the charts for causing infertility in women. Researchers have found human herpes viruses (HHV) that potentially infects the lining of uterus and is behind the unexplained infertility in women. Approximately 25% of female infertility cases are unexplained, leaving women with few options other than expensive infertility treatments, according to the earlier study**.** Findings showed that the HHV-6A virus infects the lining of uterus in 43-45% of women with unexplained infertility. The virus can productively infect CD8+T cells, natural killer cells, according to paper. The virus seems to activate immune cells called Natural Killer (NK) cells in the uterus and lead those cells to produce chemicals called cytokines- tools the immune system, uses to orchestrate an attack on a foreign invader, like a virus. Roberto Marci from University of Ferrara, stated his view accordingly, "Our study indicates, for first time, that HHV-6A infection might be an important factor in female unexplained infertility development, with a possible role in modifying endometrial NK cells immune profile and ability to sustain a successful pregnancy." It can be diagnosed through a biopsy of the uterine lining. Meanwhile, Professor Anthony at Harvard Medical School stated these finding may lead to improved treatments for a large subset of infertility women if they are substantiated.

Keywords: Human Herpes virus, Infertility, Natural Killer cells, Cytokine tools, Successful pregnancy.

PCL 024

WATER MEMORY: AN INCREDIBLE DISCOVERY IN BIOLOGICAL SCIENCE

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Homeopathic dilutions' and 'Memory of Water' are two expressions capable of turning a peaceful and intelligent person into violently irrational one, as Michel Schiff points out in introduction of his book "The Memory of Water". Even after 20 years the debate is still ongoing even though an increasing number of scientists report they have confirmed the basic results. In the paper, the hypothesis is substantiated by few simple biological experiments. The Rice beaker experiment stated that the beaker which received good words gave nice aroma, whereas the rice beaker which received bad words assisted the fungal growth. In homeopathy, a concentrated solution of the compound produces untoward effects whereas highly diluted solution of the same compound shows quite opposite or therapeutic effects implicating that water can retain the nature of the compounds or products. Virus which lacks cytoplasm cannot grow or multiply outside the host but bacteria with inherent cytoplasm

can multiply and grow even in the absence of host. Bacteria can develop resistance to indiscriminate use of antibiotics whereas virus cannot show the same effect toward anti-viral drugs unless it undergone a drastic mutation, due to lack of cytoplasm, in which water is the major constituent. Recent studies stated the presence of lymphatic vessels in the meninges of brain relating memory and immune system which further corroborated our findings. From a physical and chemical perspective, these experiments pose a riddle since it is not clear what mechanism can sustain such "Water Memory" of the exposure to molecular signals. From a biological perspective, the puzzle is what nature of imprinted effect (Water Structure) can impact biological functions.

Keywords: Water Memory, Rice beakers, Homeopathy, Anti-biotic Resistance, Mutations, Lymphatic system and Immunity

PCL 025

ZEBRAFISH–AN INSIGHT INTO A RARE HUMAN DISEASE

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With recent advancements in Human Molecular Genetics, an attempt was made to bring hope to children born with a rare disorder-charge syndrome if at all the results seen in Zebra fish are reproducible in humans. Charge stands for Coloboma, Heart defects, Atresia Choanae, Retarded growth and development, Genital abnormality and Ear abnormality. A mutation in the CHD7 gene is responsible for 60-70% of all the CHARGE effects. The expression of the gene peaks in the early stages of embryo development. To observe keenly about the initial stages of development and the growth of organs a fertilised egg of a Zebra fish was studied. An RNA injected into one-cell embryo interferes with the making of the CHD7 protein, thus producing a Zebra fish embryo with very similar problems as the human babies with charge syndrome. The findings stated deep lying defects are not apparent on gross examination of charge patient by the doctors. Further researchers have found that the CHD7 protein causes charge syndrome by modifying a second gene –sox10. More amounts of sox10 protein, were found in the Zebra fish and attempts were made to reduce the levels of this protein to reduce the defects using RNA interference. Positive results were obtained as there was a dramatic reduction in the intensity of the defects. Though charge syndrome is extremely complex with multiple defects, reducing the sox10 protein in charge patients may go a long way in reducing their suffering and improve chances of survival. This discovery might pave the way to find better remedies in countering the dreadful outcomes of this syndrome.

Keywords: CHARGE syndrome, Multiple defects, Zebra fish, Transparent embryo, CHD7, sox10 protein and RNA interference

PCL 026

RECENT ADVANCES IN CANCER VACCINES

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Cancer related deaths have shown a progressive increase over the past decade and the newer cases of cancers are estimated to rise in 2030. The current treatment modalities available for cancer are highly toxic, impair quality of life and develop resistance with course of time. Thus, there is a growing necessity for the prevention and cure of cancer related morbidity and mortality. One of the promising approaches for cancer prevention could be immunization with specific vaccines.The latest advances in immunology have led to the development of effective cancer vaccines to enhance immunity against tumour cells. Moreover, the occurrence of cancer with infectious agents like Hepatitis B virus (HBV) and Human Papilloma virus (HPV) as well as their prevention with specific cancer vaccines has further confirmed the role of immunotherapy in cancer.Though prophylactic vaccines are found to be more successful in cancer prevention, in the present scenario most of the vaccines under development are therapeutic cancer vaccines. Cancer vaccines stimulate the immune system and attack specific cancer cells without harming the normal cells. Hence this review gives an overview of various strategies involved in the development of cancer vaccines and the currently approved vaccines available for the prevention of cancer.

PCL 027

PHARMACOGENOMICS

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Pharmacogenomics is a branch of pharmacology which deals with the influence of genetic variation on drug response in patients by correlating gene expression or single nucleotide polymorphisms with a drug's efficacy or toxicity. Pharmacogenomics is a science that examines the inherited variation in gene that dictates drug response and explores the ways these variations can be used to predict whether a patient will have good respond to our drug, a bad response to our drug, or no response at all. Pharmacogenomics aims to develop rational means to optimise drug therapy, with respect to patients' genotype, to ensure maximum efficacy with minimal adverse effect. Pharmacogenomics is being used all critical illness like cancer, cardiovascular disorders, AIDS, TB, asthma, diabetes.The way a person responds to a drug (this includes both positive and negative reactions) is complex trait that is influenced by many different genes. Without knowing all of the genes involved in drug response, scientists have found a difficult to develop genetic tests that could predict a person's response to particular drug. One's scientists discovered that people's genes show small variation(or changes) in their nucleotide(DNA base) content, all of that changed genetic testing for predicting drug response is now possible. Pharmacogenomics is the study of how and individual's genetic inheritance affects the body response to drug's. Pharmacogenomics leads to better understanding of interaction of drugs and organisms. It is generally anticipated that pharmacogenomics information will have a large impact on drug development and will facilitate individualized drug treatment.

PCL 028

DUCTAL CARCINOMA *IN-SITU*

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Ductal carcinoma in situ (DCIS) is the most prevalencing type of non-invasive breast cancer. Ductal means that the cancer starts inside the milk ducts, carcinoma refers to any cancer that begins in the skin or other tissues (including breast tissue) that cover or line the internal organs, and in situ means "in its original place." DCIS is called "non-invasive" because it hasn't spread beyond the milk duct into any normal surrounding breast tissue. DCIS isn't life-threatening, but having DCIS can increase the risk of developing an invasive breast cancer later on. Women who have breast-conserving surgery (lumpectomy) for DCIS without radiation therapy have about a 25% to 30% chance of having a recurrence at some point in the future. DCIS is usually found during a mammogram done as part of breast cancer screening or when there is another concern with a woman's breast. Because of increased screening with mammograms, the rate at which DCIS is diagnosed has increased dramatically in recent years. DCIS isn't life-threatening, it does require treatment to prevent the condition from becoming invasive. Most women with DCIS are effectively treated with breast-conserving surgery and radiation.

PCL 029

BRAIN GATE

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Brain Gate was developed by the bio-tech company Cyber kinetics in 2003 in conjunction with the Department of Neuroscience at Brown University. The device was designed to help those who have lost control of their limbs, or other bodily functions. The computer chip, which is implanted into the brain, monitors brain activity in the patient and converts the intention of the user into computer commands. Currently the chip uses 100 hair-thin electrodes that 'hear' neurons firing in specific areas of the brain, for example, the area that controls arm movement. The activities are translated into electrically charged signals and are then sent and decoded using a program, thus moving the arm. According to the Cyber kinetics' website, two patients have been implanted with the Brain Gate system. The device was designed to help those who have lost control of their limbs, or other bodily functions, such as patients with amyotrophic lateral sclerosis (ALS) or spinal cord injury. The computer chip, which is implanted into the brain, monitors brain activity in the patient and converts the intention of the user into computer commands.

PCL 030

UTERUS TRANSPLANTATION

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The clinically detailed report of a successful uterus transplantation and live birth in Sweden, in which a family friend donated her uterus, provides a basis for expanded practice. Family members and friends can serve as living donors without offending legal or ethical prohibitions of paid organ donation, even though family members and friends often engage in reciprocal gift exchanges. Donations from living unrelated sources are more problematic, and there is a need to monitor donors' genuine altruism and motivation. Donation by deceased women - i.e. cadaveric donation - raises issues of uterus suitability for transplantation, and how death is diagnosed. Organs' suitability for donation is often achieved by ventilation to maintain cardiac function for blood circulation, but laws and cultures could deem that a heartbeat indicates donors' live status. Issues could arise concerning ownership and control of organs between recovery from donors and implantation into recipients, and on removal following childbirth, that legal resolution.

PCL 031

MICROFLUIDIC ORGANS ON CHIP FOR PHARMACEUTICAL RESEARCH, DRUG SCREENING AND REGENRATIVE MEDICINE

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A new research has come out with an innovative miniature models of human organs on plastic chips. These chips are more realistic models of human body that are flat layers of cells grown in petridishes. It is a multichannel 3-D micro fluidic cell culture chip that stimulates the mechanics and physiological response of entire organs and organ systems, a type of artificial organ. Organs-on-chips will vary in design and approach between different researchers. Organs that have been simulated by micro fluidic devices include the heart, the lung, kidney, artery, bone, The application of micro fluidics in organs-on-chips enables the efficient transport and distribution of nutrients and other soluble materials throughout the viable 3D tissue constructs. Animal studies are long, expensive and cannot predict accurately the behaviour of a drug in humans, as animals and humans react differently to the same stimulus, in addition, cell cultures cannot fully replicate an organism's response, in such cases organs on chips can be used. Organs-on-chips are referred to as the next wave of 3D cell-culture models that mimic whole living organs, biological activities, dynamic mechanical properties and biochemical functionalities. The chips also help companies to pinpoint the dose of a drug that is both effective and safe. Their creation opens up great opportunities for research and, above all, for pharmacology, they are an improvement on the usual measurement procedures and can speed up drug development as well as reducing its costs. Organs-on-chips has revolutionise the pharmaceutical industry by making drug development faster and cheaper, and by producing more successful therapies by new drug discoveries. Different disease states can be modelled on the chips and, crucially, drugs can be added to the channels and their effects on the tissue examined.

PCL 032

REVIEW ON DESIGNING OF ANTICANCER PRODRUGS

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The conventional old treatment method for cancer therapy is associated with severe side effects along with several limitations. Therefore, searching and developing new methods for cancer became crucial. The approach of prodrug for designing of anticancer drug is applied to avoid or reduce the side effects produced during cancer treatment. Targeted prodrugs approach is useful as it depends on the presence of unique cellular conditions at the desired target, especially the availability of certain enzymes and transporters at these target sites, antibody directed enzyme prodrug therapy (ADEPT), gene-directed enzyme prodrug therapy (GDEPT) are utilized for design of prodrugs that is accomplished using computational calculations based on molecular orbital and molecular mechanics methods. Correlations between experimental and calculated rate values for some intramolecular processes provided a tool to predict thermodynamic and kinetic parameters for intramolecular processes that can be utilized as prodrugs linkers. This approach does not require any enzyme to catalyze the prodrug interconversion. The interconversion rate is solely dependent on the factors govern the limiting step of the intramolecular process.

PCL 033

BIO ARTIFICIAL SKIN

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Artificial skin refers to a collagen that induces regeneration of skin in mammals. It was late discovered that this artificial skin is useful in the treatment of deep skin wounds in animals and humans. Artificial skin induces regeneration of dermis. It is developed commercially under the name Integra TM. Artificial skin is used majorly to treat burned patients, during plastic surgery of the skin. Alternatively, the term “artificial skin” sometimes is used to refer to skin like tissue grown in laboratory although this technology is still not practically used in medical field. Artificial skin is a semiconductor material that can sink touch for those with prosthetic limbs. Artificial skin is composed of gelatin and beta-glucan. It is prepared using the freeze drying method. The bio artificial skin has an inter connected pore structure with average pore size of 90-150mm. High gelatin content is suitable for cellular attachment and distribution. To prepare a stratified wound dressing to mimic the normal human skin, fibroblasts and keratinocyte cells were isolated from a child’s foreskin and were co-cultured in gelatin.

PCL 034

CANCER PHARMACOLOGY

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Cancer or neoplasm is an abnormal mass of tissue as a result of abnormal proliferation of cells. Neoplasm: novel swelling mass in the body. Some blood cancers such as leukemia don't form a tumor; it widely spread in the bloodstream and bone marrow (acute myelogenousleukemia). Normal cells: committed cells divide only a defined number of times and are limited in capacity for self renewal.Specialized cells carry out organ function and are incapable of cell division. Restricted to its functional area. Distinguish features of cancer cells: The origin of a tumor is from the existing cells or tissues of the body. The tumor grows following its own laws and is not regulated by the exisiting laws of biology. The rate of growth and multiplication is greater than the ordinary healthy cells (rapid growth). Resistance to anticancer drugs: resistance to cancer chemotherapeutic drugs is a major limitation to treatment. Primary resistance occurs when some inherent characteristic of the cancer cells prevents the drugs from working. Acquired resistance occurs when cancer cells become resistant during treatment. Cancer chemotherapeutics are typically given in cycles to allow normal cells time to recover from the treatment. Unfortunately; stopping the drug therapy also allows any remaining cancer cells to recover and develop resistance. In order to reduce the impact of the recovery/resistance problem; the key principles to antineoplastic drug therapy. Cancer pharmacology deals with the study of cells and tissues of the human body where the cancer destroys the cells and further treatment is then in following order that is surgery-radiation-chemotherapy and giving ceratin antibotics for further growing of cancer cells in the body. This may vary from one individual to another individual.

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PAQ 001

ANALYTICS IN PHARMA AND LIFE SCIENCES

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The pharma and life sciences industry is faced with increasing regulatory oversight, decreasing Research & Development (R& D) productivity, challenges to growth and profitability, and the impact of digitization in the value chain. Application of pharma and life sciences analytics ranges from basic reporting and internal dashboard creation to high-end predictive and prescriptive analytics. The key applications of analytics in pharma and life sciences include regulatory compliance reporting, marketing/sales support, and product/service enablement. The third-party analytics services market for healthcare is expected to increase by over five times its current size by 2020.Today, however, the market is still in a fairly nascent stage and there are significant challenges, such as poor data integration, lack of investment in talent and technology, and limited stakeholder alignment, impacting this industry. However, the best practices are emerging to help overcome these challenges and push pharma and life sciences analytics further on the path of rapid growth. The pharma and life sciences industry is still considering the increased regulatory oversight as a burden and not realizing the opportunity that it presents. Organizations need to utilize the additional information made available as a result of the regulatory requirements and move away from a siloed approach across functions. They should also utilize the full impact of cloud, mobility, and social media to embrace analytics-driven decision making to create differentiation in an extremely competitive, dynamic, and challenging market.

PAQ 002

FLAME PHOTOMETRY AND FLUORIMETRY

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Flame photometry is a measure of intensity of emission radiation when the sample molecule is subjected to flame. It is mainly used for the atoms of 1^{st} and 2^{nd} group elements of periodic table i.e. Na, K, Ca, Li etc. It is not applicable to the metals of periodic table other than the 1^{st} and 2^{nd} group elements. The elements like gold, silver and inert atoms and other atoms are not analyzed by flame photometry because they need higher energy to bring about excitation state then the 1^{st} and 2^{nd} group elements. Flame photometry is a type of emission spectroscopy and the main principle involved is the measurement of emission radiation. The sample molecules (atoms) are bought to excitation state by using thermal energy rather than the EMR. When a sample solution is exposed to a flame the following events take place such as the 1^{st} solvent evaporate and leaves the residue of solute. The residue is converted into gases state. The gaseous state is converted into atomic state (individual atoms)/ionic state. The atoms which are released from a gaseous state undergo excitation by using thermal energy and come back to the ground state by the emission of radiant energy (hv). In the excitation process the electron present in the molecular orbitals moves to higher molecular orbital. When the electrons moves from one orbital to another takes away the energy and comes back to the original by the liberation of particular radiation for each atom. Flame or atomizer converts the analyte into free atoms.

PAQ 003

ANTIOXIDANTS IN TEA

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In this study, a glassy carbon electrode (GCE) modified with laccase was used as the working electrode for analysis of phenolic compounds. The electrochemical behaviour of rutinand ascorbic acid were used to assess the antioxidant capacities (trolox reagents) for the estimation of total phenolic (TP) content in two herbal tea samples common in South Africa. The result showed a positive linear correlation between the trolox equivalent antioxidant capacities (TEAC) and TP content (R2 = 0.9812 ± 0.012), which indicated that phenolic compounds could be one of the main components responsible for the antioxidant activities in the tea samples investigated. The experimental results obtained using a Differential Pulse Voltammetry (DPV) suggested that indeed laccase is a suitable biosensor showing good reducing properties. The scavenging ability of 2,2'-Azino-bis(3-ethylbenzothiazolin- 6-sulfonic acid) (ABTS), a diammonium salt assessed using UV-Visible spectro photometry in the sample extract yielded half maximal effective concentration (EC50) values of 10.80 µg/ml and 11.62 µg/ml for ascorbic acid.

Keywords: Laccase, Antioxidants, Biosensor, Voltammetry, UV-Visible spectro photometry

PAQ 004

ESTIMATION OF NATEGLINIDE AND PIPERINE BY U.V SPECTROPHOTOMETRY USING Q ABSORBANCE RATIO METHOD

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Piperine, an alkaloid obtained from Piper nigrum inhibits the bio-transformation and metabolism of nateglinide leading to higher levels of drug in systemic circulation, thus increases the bioavailabilty of nateglinde. In the present study a simple, accurate, precise, economical procedures have been developed for the simultaneous estimation of Piperine and Nateglinide using Q-Absorbance ratio method, for this purpose a combined tablet of Nateglinide and Piperine was formulated. Nateglinide and piperine have shown absorbance maxima at 210 nm and 340 nm respectively & they showed iso-absorptive point at 228 nm, in methanol. This method involved analysis at two wavelengths, 210 nm (absorbance maxima of Nateglinide) & 228 nm (Iso absorptive point). Beer's law was obeyed over the concentration range of 10-50 µg/ml for both Nateglinide and Piperine. The validation parameters like precision, accuracy, limit of quantitation (LOQ), limit of detection (LOD), were determined according to ICH guidelines. All the results were found to be within the limits.

Keywords: nateglinide, piperine, Q –absorbance ratio method, methanol, ICH guidelines

PAQ 005

ESTIMATION OF NATEGLINIDE BY USING CHROMOGENIC AGENTS

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Two visible spectrophotometric methods have been developed for the determination of Nateglinide in pure and dosage forms using chromogenic agents. Method I is based on oxidation followed by coupling by 3-methyl-2-benzothiazolinone hydrazone with drug in the presence of ferric chloride to form apple green colored chromogen exhibiting absorption maximum at 634 nm and beer's law is obeyed in the range of 50-300µg/mL with coefficient of determination (r^2) as 0.998. The Limit of Detection and Limit of Quantitation were found to be 11.25µg/mL,35µg/mL respectively. Method-II is based on reaction of drug with 1,2-naphthaquinone-4-sulphonate sodium in alkaline media to yield reddish brown colored chromogen exhibiting absorption maximum at 454nm. Beer's law is obeyed in the concentration range of 20-120µg/mL with coefficient of determination (r^2) as 0.999 The Limit of detection and Limit of Quantitation were found to be 2.2µg/mL,6.6µg/mL respectively. The developed methods have been validated as per the ICH Q2 (R1) guidelines. The results demonstrate that the method is linear, precise and accurate.. The proposed methods were successfully applied for determination of Nateglinide in pharmaceutical dosage forms (tablets) with good recovery and reproducibility.

Keywords: 3-methyl-2-benzothiazoline hydrazone, 1,2-naphthaquinone-4-sulfonate sodium, nateglinide, spectrophotometric determination, ICH guidelines.

PAQ 006

ANALYTICAL METHOD DEVELOPMENT AND VALIDATION FOR THE ESTIMATION OF RESIDUAL ELEMENT MOLYBDENUM IN OMEPRAZOLE BY ICP-OES TECHNIQUE

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Inductively Coupled Plasma Optically Emission Spectroscopy (ICP-OES) is a powerful tool for determining the trace elements in a variety of solutions or elemental composition of material dissolved in solution. ICP-OES uses emission spectroscopy / spectrometry to quantify levels of elements in sample. In ICP-OES sample solutions are introduced, the high temperature source (plasma) excites the atoms and ions to emit light at particular wavelength which corresponds to different elements in sample solution. The intensity of the emission corresponds to the concentration of the element detected. The ICP-OES is sensitive and is able to detect over 70 elements. In the present study, a new method was developed and validated to quantify the residual element molybdenum in the drug omeprazole, both in API and formulation. The instrument was operated at a temperature between 15 and 35 °C (59-95 °F) with a maximum rate of change of 2.8 °C (5 °F) per hour. Argon is used as the ICP torch gas with the Optima 8000. Nitrogen is recommended for the optical purge gas. Samples are prepared using a 2.5%

Nitric acid. The method developed was appropriately validated for accuracy, precision, repeatability, linearity, limits of detection and quantification (LOD, LOQ) as per the ICH Q2 (R1) guide lines.

Keywords: ICP-OES, Molybdenum, Omeprazole.

PAQ 007

STABILITY INDICATING LIQUID CHROMATOGRAPHIC ASSESSMENT OF DOLUTEGRAVIR BY QBD APPROACH – RESPONSE SURFACE METHODOLOGY

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Based on the current regulatory requirements for an analytical method development, a reversed phase High Performance Liquid Chromatographic method for quality control of dolutegravir in dosage form has been optimized using analytical quality by design approach. A sigma tech software was employed utilizing response surface method, experimental conditions using two factors such as flowrate and % organic phase composition of mobile phase while theoretical plates was used as response. The analytical method conditions were optimized as mobile phase consisted of acetonitrile and ammonium formate buffer pH-3.0 in the ratio 40:60 % v/v with flow rate 0.6 mL/min using SPOLAR C_{18} Column (250 x 4.6mm, 5µm) with run time of 15 min . The linearity plot between peak area Vs concentration were rectilinear in the range of 5-30 µg/mL with detection and quantification limits were 0.01 and 0.3 µg/mL respectively at retention time 13 min. The application of proposed method was utilized to assay the dosage form and further extended to quantification of drug in the presence of degradation studies. The % assay in marketed tablets was found to be 99.08 and degradation products were well resolved from the analyte peak with significant difference at their retention time values. The method was validated as per ICH guidelines. To postulate the degradation pathways and acid, base hydrolysis products were characterized by IR and mass spectral data. The proposed method can be applied for routine analysis of dolutegravir.

Key words: QBD, Dolutegravir, Spolar, Validation.

PAQ 008

SIMULTANEOUS ESTIMATION OF TAMSULOSIN HYDROCHLORIDE AND SOLIFENACIN SUCCINATE BY 1^0 DERIVATIVE SYNCHRONOUS SPECTROFLUORIMETRY

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A 1^0 Derivative Synchronous Spectrofluorimetry method has been developed and validated for simultaneous determination of tamsulosin hydrochloride, solifenacin succinate in combined tablet dosage forms without any prior separation of components from the sample. Tamsulosin hydrochloride was determined at a wavelength of 322 nm (zero-crossing wavelength point of solifenacin succinate). Similarly, solifenacin succinate was measured at 570 nm (zero-crossing wavelength point of tamsulosin

hydrochloride). Calibration graphs were constructed over the concentration range of 2-10 µg/mL for tamsulosin hydrochloride and 30-150 µg/mL for solifenacin succinate. Detection and quantitation limits were 0.210 and 0.639 µg/mL for tamsulosin hydrochloride and 2.64 and 8.0 µg/mL for solifenacin succinate respectively. The method was validated for precision and accuracy as per ICH guidelines. The % recovery was found to be in the range 95.0 –113.75 for tamsulosin hydrochloride and 97.22 – 101.3 for solifenacin succinate by the proposed method.

Key-words: Tamsulosin hydrochloride, solifenacin succinate, Synchronous, 1^0, simultaneous, method development, validation.

PAQ 009

QUANTIFICATION OF CEFPIROME SULPHATE BY VISIBLE SPECTROPHOTOMETRIC METHOD BY APPLIANCES OF CHROMOGENIC REAGENTS

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Two simple, specific, accurate, precise, sensitive and cost effective visible spectrophotometric methods have been developed and validated for quantification of cefpirome sulphate in pure form and pharmaceutical formulations. Method A is based on the measurement of absorbance of bluish green coloured chromogen complex at 628.5 nm which is formed by the oxidative coupling reaction of the amine group of cefpirome sulphate with MBTH HCl. Method B is based on measurement of absorbance of orange coloured chromogen at 500.4 nm which is formed by reaction of the amino group of cefpirome sulphate with NQS reagent. Both methods obeyed linearity in the concentration range of 2.5-40 µg/ml and 5-30 µg/ml for Method A and B respectively. The correlation coefficient value was 0.9991 for Method A and 0.9990 for Method B. The developed method was validated statistically as per ICH guidelines. There was no significant interference with the assay procedure due to the presence of excipients in the dosage form. The reliability of both the methods is further ascertained by performing recovery tests by standard addition method. The developed method is simple, sensitive, specific and can be successfully employed in routine analysis of cefpirome sulphate in pharmaceutical dosage forms.

Keywords: Cefpirome sulphate, MBTH, NQS reagent, Validation.

PAQ 010

Metabolomics in Food and Nutrition Laboratories

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Metabolomics, the screening of small-molecule metabolites, enables the molecular fingerprinting of food components. Metabolomics also confers the ability to evaluate the effect of ingested food, by providing an analytic "snapshot" of metabolism. Some applications of metabolomics in nutrition science involve determining the concentration and bioavailability of dietary compounds or developing quantitative diagnostic tests to monitor nutritional imbalances or deficiency in dietary metabolites. The approach, called *MS imaging*, uses a focused excitatory beam (such as a laser, ions, or

charged droplets of solvent) to scan, with a spatial resolution of 1–200 μm (32–34), through tissues along the axes. The impact of the excitatory beam desorbs from the sample surface a vapour of ions, which is then directed into the mass spectrometer. The molecular information can be processed and overlaid on microscopic images, generating topographic maps of metabolite composition. Various desorption ionization techniques are currently used for MS imaging, including matrix-assisted laser desorption-ionization (MALDI), laser ablation electrospray ionization (LAESI). To authenticate food safety, quality, and traceability metabolomics is providing a better understanding of the interplay between food components and human physiology.

Key words: *Metabolomics, MS Imaging,* Mass Spectrometer, Topographic Maps.

PAQ 011

DEVELOPMENT AND VALIDATION OF FTIR SPECTROSCOPIC METHOD FOR SIMULTANEOUS ESTIMATION OF TELMISARTAN AND HYDROCHLOROTHIAZIDE IN PURE AND PHARMACEUTICAL DOSAGE FORMS

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A simple, economic and reliable method has been developed for the simultaneous estimation of telmisartan and hydrochlorothiazide in pure and pharmaceutical dosage forms by using Fourier Transform Infrared (FTIR) Spectroscopy. Infrared spectroscopy is most often used for qualitative identification, but quantitative determination by using FTIR is an economic, rapid technique which is cost effective as there is less consumption of solvents. The method involves extraction of telmisartan and hydrochlorothiazide from tablets using chloroform and direct measurement in liquid phase mode using reduced path length cell. The spectra were measured in absorbance mode and the equipment was configured to collect spectra at 8cm^{-1} resolution. The spectra were collected between 4000cm^{-1} and 450cm^{-1}. The infrared spectra showed different peaks with base line correction, among which intense, clear and proportionate peaks were selected at 3411cm^{-1}, and 1309cm^{-1} corresponding to N-H group and asymmetric SO_2 group for telmisartan and hydrochlorothiazide respectively for quantitative estimation. Beer-Lambert's law was obeyed over the concentration range of 50-250 μg/ml for telmisartan and 25-125 μg/ml for hydrochlorothiaizde. The developed method was validated according to ICH guidelines. The validation parameters like precision, accuracy, limit of quantitation (LOQ), limit of detection (LOD) were determined. All the results were found to be within the limits. All the results obtained were compared statistically with pharmacopoeial method (HPLC) by t-test, which indicated there was no significant difference between the methods at the probability value 0.05. The results obtained with FTIR showed very good correlation with the pharmacopoeial method and therefore could be considered as an alternative in the place of official method.

PAQ 012

Biopharmaceutical Candidate Screening with Automated Dynamic Light Scattering

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High-throughput candidate screening is an important pre-formulation step during biopharmaceutical development. Pre-screening processes ensure the identification of the therapeutic candidates in order to meet performance and safety targets and reduce the risk of costly failure. However, the presence of aggregates and impurities within any of the hundreds of protein samples can misrepresent experimental results and damage the micro fluidic channels used during screening. Automated high-throughput dynamic light scattering (HT–DLS) is a non invasive technique and used to assess the presence of aggregates, preventing much of productivity loss , DLS can be performed using high-throughput unattended automation, with sample analysis requiring only 10–30 s per well, including transition times. Maximizing the reliability and productivity of the candidate selection process. A case Study was performed to illustrate the application of automated HT–DLS for rapid sample purity studies using Dynamics data handling software (Wyatt Technology).

Keywords: Biopharmaceutical development, Automated high-throughput dynamic light scattering, Wyatt Technology

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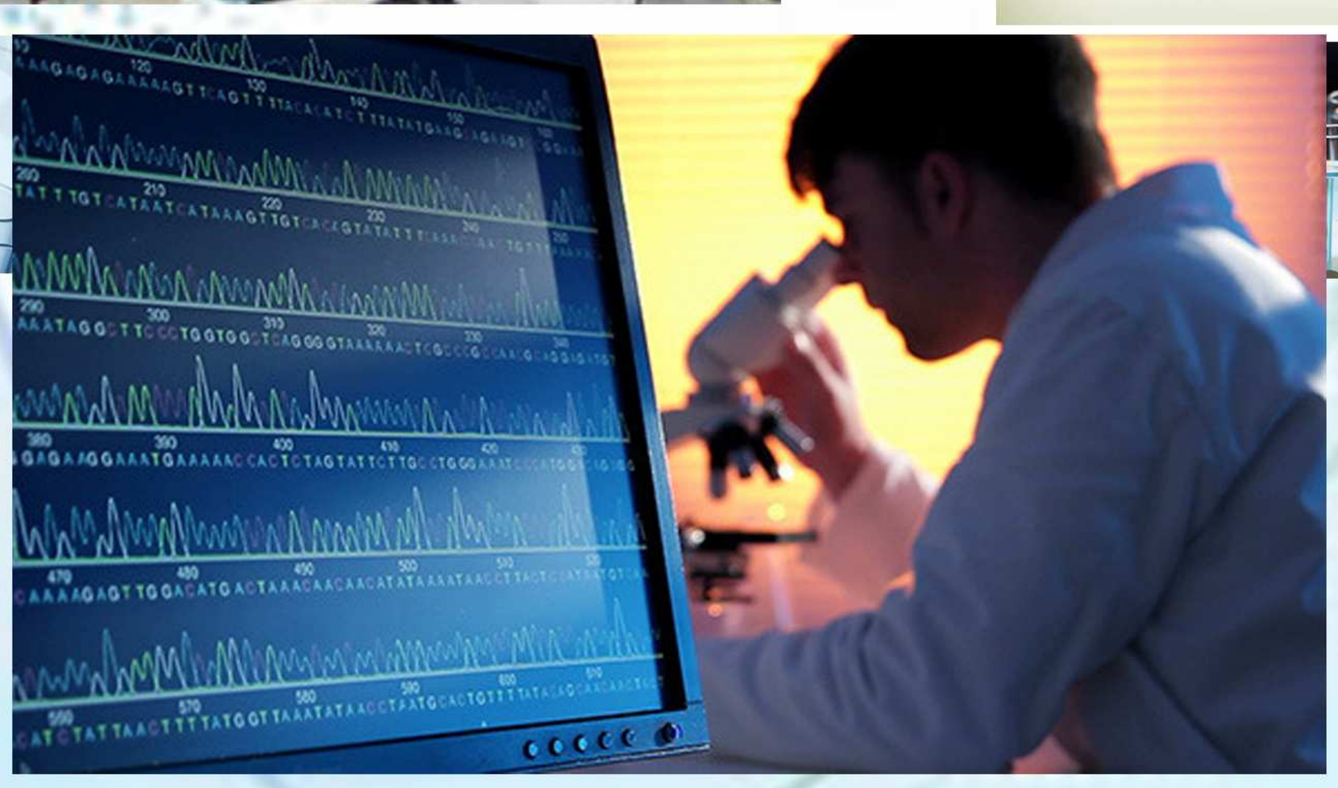

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PCH 001

DESIGN AND SYNTHESIS OF AHL ANALOGUES AS POSSIBLE LUXR (CviR) QUORUM SENSING INHIBITORS

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Gram-negative bacteria such as Pseudomonas aeruginosa and violaceum use N-acylated L-homoserine lactones (AHLs) as auto inducers (AIs) for quorum sensing (QS), a chief regulatory and cell-to-cell communication system. QS is responsible for social adaptation, virulence factor production, biofilm production and antibiotic resistance in bacteria. Inhibition of the molecular signaling system used by biofilm forming bacteria could lead to an effective treatment of chronic bacterial infections by interrupting the communication that promotes biofilm formation. In view of this, the present investigation is directed to the design of AHL analogues employing a multidimensional drug design approach. In this approach molecular docking studies of some LuxR inhibitors were carried out. New AHL analogues were designed (4A-4K) by considering existing inhibitor of CviR(PDB ID 3QP5). The designed molecules were docked into the active site of CviR protein. Among the designed molecules 4E (-8.73) was found to be potent than the existing inhibitor.

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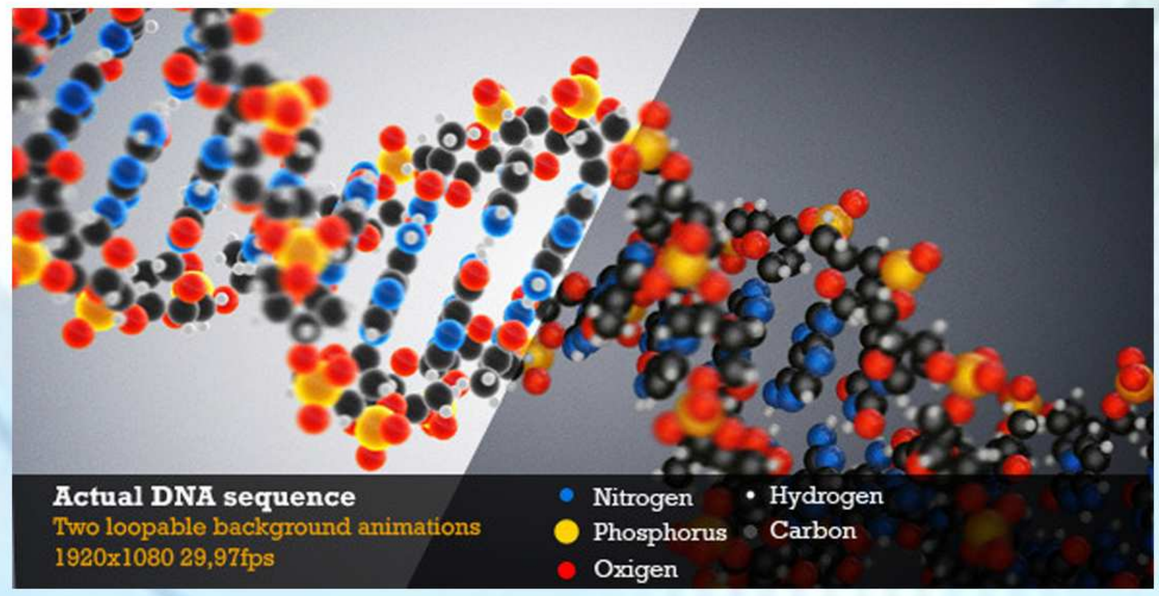

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PCG 001

SPIRULINA- SMALL BUT SPECTACULAR SPECIES

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Spirulina is marine blue green alga which is being extensively studied as the biomass of these microalgae and the compounds they produce have been shown to possess several biological applications with numerous health benefits. Apart from being used as nutra ceutical food supplement worldwide, it shows therapeutic benefits on an array of diseased conditions including hypercholesterolemia, hyperglycerolemia, cardiovascular diseases, inflammatory diseases, cancer and viral infections. Spirulina is also incorporated as a functional ingredient in food products and beverages. The people in Africa have been known for consuming as Arthrospira (formerly, Spirulina) as principle food for past 100 years. But it became famous after it was successfully used by NASA as a dietary supplement for astronauts on space missions. There have been numerous studies investigating the efficiency and current clinical applications of Spirulina in treating several diseases in the recent years.

Keywords: Etymology and ecology, nutraceutical food supplement, therapeutic benefits of spirulina.

PCG 002

APPLICATIONS OF NOVEL DRUG DELIVERY SYSTEM IN ENHANCING THE THERAPEUTIC POTENTIAL OF PHYTOCONSTITUENTS

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Various phytoconstituents obtained from nature have wide biological activities in chronic diseases and have wide therapeutic efficacy. The main advantage of using phytoconstituents is it provides free from adverse effects treatment where none of the medication can do. However, the physiochemical properties such as poor solubility, poor permeation, and non-targeting at the active site will create a barrier which hinders its therapeutic efficacy. So, various nano formulation strategies are employed to overcome these barriers and provide uniform drug targeting at the active site in desired concentration and improved therapeutic efficacy. These strategies will constitute novel drug delivery systems (NDDS), such as nanoparticles, emulsion-based formulations, liposomes, phytosomes, microspheres, and topical based formulations, are available in commercial level to enhance the bioavailability of the poorly soluble herbal drug.

PCG 003

METHOD TO USE PLANT'S IMMUNE RESPONSE TO PRODUCE HIGHER YIELDS OF CRUDE DRUGS

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In an article, it was stated that acacia plant produced higher amount of tannins as defensive mechanism against herbivorous predators. Tannins are phenol containing plant compounds having an ability to precipitate proteins. In another study it was noted that a high level of tannin production was seen in acacia plant when the conditions were unfavorable. This method was adapted by these plants as the high concentration of tannin can lead to precipitation of major digestive proteins. It was also recorded that xerophytes like acacia produces high levels of tannins as an immune response to protect itself from overgrazing by many herbivores during drought when there is no other source of food available. It is also proved that endangered plants produces ethylene gas which signals the surrounding plants to produce more tannins as a mode of defensive mechanism. However, current studies are planned on this ability of the plants to amplify their immune system by synthesizing such chemicals (crude drugs) which can be used by the pharmacist or herbalists to extract higher amounts of crude drug and develop better remedies.

Keywords: Tannins, Acacia plant, Herbivorous Predators, Xerophytes, Immune response and Crude drugs

PCG 004

BIOPHARMING

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Biopharming is the genetic engineering of plants to produce novel pharmaceuticals and useful industrial compounds. Plants are potential biopharming factories because they are capable of producing unlimited numbers and amounts of recombinant proteins safely and inexpensively. In plant production systems have been developed for monoclonal antibody production, which has been useful in passive immunization of viral or bacterial diseases. Biopharming will be an ideal factory for the production of antibodies, diagnostic immuno-reagents, vaccines and other pharmaceutical proteins. It has the potential to provide revolutionary benefits, but it also raises a host of daunting challenges. The drug is obtained from genetically engineered tobacco plants that have been infected with genetically engineered plant viruses. During infection of the tobacco plants over the course of a week, the viruses, which are completely harmless to animals and humans, produce huge amounts of antibodies.The plants are then harvested and homogenized and the antibodies are purified and formulated for administration. These are proved to be effective in Ebola patients. As they bind to the proteins of Ebola virus and elicit a humoral (antibody) and cellular (lymphocyte) response to the virus.

PCG005

P^{53} PROTEIN

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Located on the short arm of chromosome 17 with apparent molecular mass of 53 is the P^{53} protein generally, called Guardian of Genome. This guardian spans 20kb with a non coding exon1 and a very long first intron of 10kb. This was identified in 1979 and for the first time in 1982, Chumakov cloned the guardian angel. The P^{53} Protein has its functions in several cellular processes-senescence, metabolism and autophagy. But the important of all is its ability to cause apoptosis and cell cycle arrest. P^{53} is extremely well connected with cell, knocking it out cripples the normal functioning of the cell. This made a lot of euphoria which made scientists all over the world to look into it. The major break in the study of P^{53} protein came in 1989 when it was identified that the wild type of P^{53} acts as a tumor suppressor protein. P^{53} has a pivotal role in tumorigenesis. In 1992 it was known that Mdm2, which is product of P^{53} itself, binds to it and prevents its action by degradation of protein via ubiquity system. Therapeutic application for restoration of P^{53} activity in-vivo has gained importance for oncology. Tailoring P^{53} based cancer immunotherapy requires overcoming of both hurdles, interference with P^{53} self tolerance and induction of appropriate repertoire of P^{53}. Tenvoin is the one that was found to activate P^{53} in-vivo. A promising target for anti cancer drug is HASPERON HSP-90 that interacts with P^{53} in-vivo. Even after such astonishing researches it remains a mystery. Progress on drugs like RITA (Reactivation of P^{53} and induction of tumor cell apoptosis) makes it justifiable to move these drugs into phase-1 and phase-2 clinical trials. As mechanism of Mdm2-P^{53} interaction is known some lipophilic substances that bind with Mdm2 and inhibit protein degradation can be found out. More novel technologies and investment on this Guardian of Genome-P^{53} can bring out wonders in the field of oncology.

PCG006

ANTIFUNGAL ACTIVITY OF CERTAIN ESSENTIAL OILS ON FUNGAL GROWTH AND AFLATOXIN PRODUCTION

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Contamination of food commodities like wheat and broad bean is very prominent by the aflatoxins synthesized by the fungi species Aspergillus flavus and Aspergillus parasiticus. The inhibition of the fungal growth and aflatoxin production by Essential oils like clove oil, cumin oil, almond oil and caster bean oil was observed. Fungal growth was determined by reverse Petri-dish method where as aflatoxin production was monitored by TLC(thin layer chromatography method).Tests revealed that only clove oil and cumin oil were able to reduce the fungal growth as well as inhibit the aflatoxin production. Such essential oils could be very prominent antimicrobial compounds as well as anti-aflatoxin agents.

Key Words: Essential oils, Aflatoxin, Fungal growth

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PP 001

PERSONALIZED MEDICINE CONCEPT IN NON SMALL CELL LUNG CANCER THERAPY

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Non Small Cell Lung Cancer (NSCLC) is a heterogeneous, complex and most common cause of cancer-related mortality accounting for about 85-87% of lung cancer cases worldwide. Personalized medicine is a tailored therapy that provides a significant precision and positive result for individual patients. It facilitates the choice of most favorable treatment and diminishes "One size fits all" prescribing. The biomarkers help to gain the efficacy of personalized therapy in alleviating the outcomes of a disease. There has been a remarkable development in the field of oncology, after the study of personalized medicine has been evolved as new hope in the treatment of tumors. Since many years, systemic chemotherapy (especially platinum-based doublet chemotherapy) has been the paramount in treating metastatic NSCLC by enhancing the overall survival rate and limiting the toxicities. Recent advancements in treating NSCLC have included histological as well as molecular diagnosis in order to decide the treatment strategy for an individual. During the initial stages of Non Small Cell Lung Cancer (NSCLC), the personalized treatment of an individual involves the proper use of biomarkers such as ERCC1, RRM1, beta tubulin, thymidine synthase etc. Recent studies have proved that Permetrexed (multi-targeted antimetabolite) is more effective in patients with non squamous cell NSCLC rather than in squamous cell NSCLC. In the advanced stage of NSCLC, personalized systemic chemotherapy and molecular targeted therapies (Antiangiogenesis, EGFR TKIs, and EML4-ALK etc) are known to exhibit better outcomes in an individual.

Keywords: non small cell lung cancer, personalized medicine, biomarkers, systemic chemotherapy, permetrexed, EGFR TKIs.

PP 002

MONITORING MEDICATION ADHERENCE AND KNOWLEDGE ASSESSMENT IN HYPERTENSIVE PATIENTS

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Patient's beliefs about treatment initiation, implementation and adherence to therapy. Adherence is a complex and multifactorial, issues concerned with non-adherence in hypertensive patients. Knowledge assessment and medication adherence in hypertensive patients. To monitor medication adherence and knowledge assessment in hypertensive patients. Patient data collection forms, case sheets, treatment charts, medication histories, interviews. A cross-sectional study was carried out with 200 patients who got admitted in general medicine department in Owaisi Hospital and Research Centre, Hyderabad, India. Two validated questionnaires, Hypertension Fact Questionnaire and Morisky 8-item Scale were used for data collection along with the demographic details form. Patients knowledge regarding hypertension, medication adherence and lifestyle modifications followed

were monitored. Out of 200 patients, 114 (57%) showed average knowledge regarding the disease. 76 (38%) of the patients showed medium adherence to their medications. High adherence was showed by 39 patients (19.5%). Out of 200, 113 patients (56.5%) were effected with diabetes mellitus that was a major comorbidity. Spearman rank correlation showed positive association between knowledge scores and adherence levels. (0.99). Even though people showed average level of knowledge, patients did not comply or adhere to their regimens due to their insecurities regarding continuous medication therapies and fear of developing addiction. Proper counseling, medication aids and proper supervision of health care professionals would be helpful in improving medication adherence in the patients.

PP 003

INFLAMMATORY BOWEL DISEASE

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IBD cause due to dysregulation of immune response, it is categories mainly into 2 types, ulcerative colitis which effects only colon, chrons disease which effects any part of GIT from mouth to anus that is skip lesions. To determine the effect of Lactobacillus in the treatment of Inflammatory bowel disease. To evaluate the effectiveness of probiotics in treatment of active IBD and to know the beneficial effects of probiotics. To alleviate signs and symptoms of IBD, patients condition & to minimize the occurrence of side effects. Patients are diagnosed with IBD from the presenting complaints, investigated and examined through Flexible Sigmoidoscopy Colonoscopy/ Biopsy(SOS).The data is collected from the patients case sheet and laboratory findings. Patients reported a beneficial effect when the probiotic-prebiotic mix was administered as an adjuvant to antibiotic therapy. As per the statistical analysis of the data, it may be inferred that in the test group of patients, the use of Lactobacillus (probiotic) was found to be beneficial along with the standard therapy for IBD. The significance of the study was proved by P value < 0.05. Probiotics are living microorganisms, able to survive stomach acid and bile, maintain viability throughout extended periods of storage, and safe for human consumption, inducing beneficial results in the host. Ingestion of probiotic bacteria has the potential to stabilise the immunological barrier in the gut mucosa by reducing the generation of local proinflammatory cytokines. A P value <0.05 confirms that this study was highly significant as it helped in alleviating the signs and symptoms of the patients. Thus, it may be concluded that the use of Lactobacillus was found to be beneficial in the treatment of Inflammatory Bowel Disease along with the standard therapy. Although the trials summarized above are promising, the current consensus is that a number of larger controlled trials are necessary before the use of probiotics as a routine medical treatment is warranted.

PP 004

A PHARMACOECONOMIC AND DRUG UTILIZATION ARRAY ON USE OF ANTIBIOTICS IN INFECTIOUS DISEASES: AN ANALOGOUS OBSERVATIONAL AND PROSPECTIVE APPROACH

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Antibiotics use is a global concern and the economic burden of these antibiotics is mounting in a developing country like India. The prime objective of the current study is to draw a cost analysis and understand the treatment pattern of antibiotics used in infectious diseases. An observational prospective pilot study was executed in the indoor and outdoor setting of a general medicine ward. The data was collected in predesigned forms which contained demographics, complaints, medication profile of the cohort. The collected data was analysed on individual merit in order to comment on the appropriate usage of antibiotics. In this study, we observed 150 patients who were administered with antibiotics like, azithromycin (28.6%), ceftriaxone (18%), cefotaxime (24.6%), metronidazole (9.3%), ofloxacin (7.3%) and fixed dose of cefoperazone salbactum (6%) and amoxicillin and clavanulic acid (6%). The study indicates that 42% cases requires cross intervention in their utilization array because of inappropriate indication (31.7%), incorrect dose (30.1%), extended duration (17.5%) and decreased duration (20.6%). The cost analysis revealed an increased economic burden of 24.06% with extended duration when compared with other parameters. The study outcome clearly shows evidences of inappropriate usage of antibiotics causing a foremost impact in achieving desired therapeutic effect and imposing an excess economic burden on the cohort. The increased cost of antibiotics when used for extended duration justifies the economic burden.

Keywords: Antibiotics, infectious diseases.

PP 005

SPONTANEOUS HUMAN COMBUSTION

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The term "spontaneous human combustion" refers to a situation when a human body is found with significant portions of the middle parts of the body reduced to ashes, much less damage to the head and extremities, and minimal damage to the direct surroundings of the body. Typically, no observable source of ignition is found in the vicinity of the victim and a bad smelling oily substance is noted. In the past, such a situation was erroneously attributed to supernatural powers; as such phenomenon occurs in the absence of any witness. A unique sequence of events takes place for the human body to incinerate to ashes. The flame burn victim has to die for the body fat to start melting. A tear in the skin has to occur for the melted fat to impregnate the charred clothes, igniting a wick effect that produces localized heat for extended period. A phenomenon called spontaneous human combustion is reality. The purpose of this presentation is to analyze the information about the spontaneous human combustion

Keywords: Human combustion.

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