SCIENTIFIC ABSTRACTS

ONE DAY SEMINAR ON

" COMMUNICATION SKILLS AND RESEARCH METHODOLOGIES IN PHARMACEUTICAL SCIENCES "

NOVEMBER 06, 2011

G. Pulla Reddy College of Pharmacy

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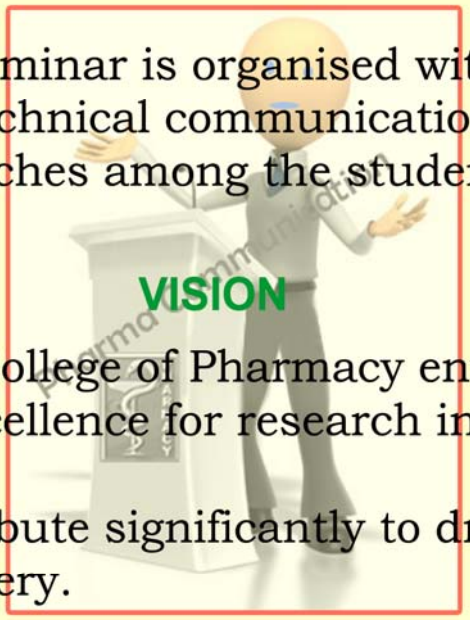
"COMMUNICATION SKILLS AND RESEARCH METHODOLOGY IN PHARMACEUTICAL SCIENCES" AND ORAL PRESENTATIONS - NOVEMBER 06 , 2011

OBJECTIVE OF THE SEMINAR

Many students have sound technical knowledge but lack oral expression and communication capabilities.

This two days seminar is organised with the aim of improving the technical communication skills and research approaches among the students.



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:

D. Pharm

B. Pharm

M. Pharm - Ph.Chemistry
Pharmacognosy
Pharmaceutics
Pharmacology

Ph. D

ABSTRACT BOOK INDEX

ONE DAY SEMINAR ON

" COMMUNICATION SKILLS AND RESEARCH METHODOLOGIES IN PHARMACEUTICAL SCIENCES "

NOVEMBER 06, 2011

PHARMACEUTICAL CHEMISTRY & PHARMACEUTICAL ANALYSIS

OP-CH 1.

SYNTHESIS, DOCKING STUDIES OF MANNICH BASES OF BENZIMIDAZOLE DERIVATIVES AS ANTI-FUNGAL AGENTS

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Molecular docking is routinely used for understanding drug-receptor interaction in modern drug design. Recent reports showed that 2-glutamine, D-fructose-6-phosphate aminotransferase known as a new target for antifungals, it catalyzes a complex reaction involving ammonia transfer from L-glutamine to fructose-6-phosphate, followed by isomerisation of the formed fructosamine-6-phosphateto glucosamine-6-phosphate. A series of mannich base of benzimidazoles were prepared by the reaction of 2- substituted

benzimidazoles with some secondary amines in the presence of formaldehyde. The newly synthesized compounds were characterized on the basis of IR, 1H NMR and mass spectra. All the synthesized compounds were tested for their antifungal activities, among the synthesized compound 3c showed highest antifungal activity against all the four microorganisms. Docking studies showed that compound 3c is having good binging affinity towards 2-glutamine, D-fructose-6-phosphate aminotransferase (PDB code 1JXA).

OP-CH 2.

SYNTHESIS,ANTIMICROBIAL AND ANTI-INFLAMMATORY ACTIVITIES OF SUBSTITUTED QUINAZOLIN-4(*3H*)-ONE ANALOGUES

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The title compounds of derivatives of quinazoline have synthesized from anthranilic acid. The substituted anthranalic acid had treated with acetylating mixture to get 2-methyl methaqunalone and it was treated with ethylene diamine to get a substituted quinazoline with primary amine as a functional group. This amine compound was further treated with various substituted aldehydes to get the corresponding tittle compounds. The recrystalized compounds had characterized by TLC as well as spectroscopic methods like UV, IR, ^{1}H-NMR and Mass spectroscopy. We have to perform an antimicrobial as well as anti-inflammatory activities as per standard protocols.

OP-CH 3.

ANTIBIOTIC RESISTANT BACTERIA: NDM-1 IN ENTEROBACTERIACEAE - TREATMENT OPTIONS WITH CARBAPENEMS COMPROMISED

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Carbapenems are among the few useful antibiotics against multidrug resistant gram negative bacteria particularly those with extended spectrum beta lactamase. However resistance to carbapenems occurs and is mediated by mechanisms like loss of outer membrane proteins and production of beta lactamase that is capable of hydrolyzing carbapenems. An alert issued in the UK in 2009 warned of an increasing number of carbapenem resistant Enterobacteriaceae strains identified in UK hospital patients. Many of them were recently hospitalized in India and Pakistan and had new type of metallo beta lactamase designated as New Delhi Metallo-1 (NDM-1).

Objective: To assess the production of NDM-1 type Metallo beta lactamase enzyme in Enterobacteriaceae at a tertiary care centre in Mumbai.

Materials and Methods: Consecutive carbapenem resistant Enterobacteriaceae isolates were collected from August 2009 to November 2009. Susceptibility testing for carbapenems was performed by the disc diffusion method. Carbapenemase production was confirmed by Modified Hodge test. These strains were then subjected to single target PCR. A 475bp product was amplified by the NDM primers and visualized on 3% agarose gel.

Results and Conclusions: Modified Hodge test was positive for all carbapenem resistant isolates. Of 24 carbapenem resistant Enterobacteriaceae 22 was NDM producers while 2 were NDM non producers. Amongst the 22 NDM producing organisms 10 were Klebsiella spp, 9 were Escherichia coli, 2 were Enterobacter spp and 1was Morganella morganii. This high number in a relatively short span is a worrisome trend that compromises the treatment options with the carbapenems.

OP-CH 4.

EMERGING TRENDS IN RESEARCH: AN OVERVIEW OF GREEN CHEMISTRY

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Chemistry is undeniably a very prominent part of our daily lives. Chemical developments also bring new environmental problems and harmful unexpected side effects, which resulted in the need for 'greener' chemical products. Green chemistry looks at pollution prevention on the molecular scale and is an extremely important area of Chemistry due to the importance of Chemistry in our world today and the implications it can show on our environment. The Green Chemistry program supports the invention of more environmentally friendly chemical processes which reduce or even eliminate the generation of hazardous substances. Green chemistry for chemical synthesis addresses our future challenges in working with chemical processes and products by inventing novel reactions that can maximize the desired products and minimize by-products, designing new synthetic schemes and apparati that can simplify operations in chemical productions, and seeking greener solvents that are inherently environmentally and ecologically benign. Green chemistry offers a stable economy that uses energy and resources efficiently.Green chemistry is not a solution to all environmental problems but the most fundamental approach to preventing pollution. In view of this, our presentation is focused on the recent advances in the field of green chemistry and its significance in the chemical research.

OP-CH 5.

SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL SCREENING OF 1-SUBSTITUTED -3-METHYL-4-ARYLHYDRAZINO- 2-PYRAZOLIN-5-ONES AND ISOXAZOLINONES VIA ETHYL CYANO ACETATE

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The objective of the present work was to prepare and evaluate the derivatives for antimicrobial activity confirming with spectral data. The facile synthesis of 1-substituted-3-methyl-4-aryl hydrazine2-pyrazolin-5-ones and isoxazolinones has been achieved by the diazotization of chlorinated aniline with ethyl cyano acetate in the presence of sodium acetate and ethanol yielded (v). Reaction of the intermediates (V) with aryl hydrazines yielded the compounds and (VIa-c) while the reaction of the intermediates with hydroxylamines furnished the compounds (VII). Structure of these compounds confirmed on the basis of spectral data. The antibacterial and antifungal activities have been evaluated for the synthesized derivatives. The antimicrobial studies for the derivatives was studied by disc diffusion and serial dilution techniques and compared with standard microbes active for gram positive and gram negative organisms against a standard therapeutic drug. Some of the compounds were found to exhibit promising good anti- bacterial and anti-fungal activities.

OP- CH 6.

CHEMICAL ENCODING METHODS IN COMBINATORIAL CHEMISTRY

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The value of molecular libraries generated by combinatorial methods is largely dependent on the ease and ability to deconvolute or decode the structure of compounds of interest after screening the library. Following the introduction of promising concepts in the early 1990s, there has been considerable progress in the development and refinement of methodologies to address this issue.

Chemical encoding is one of the encoding methods used in combinatorial chemistry for the identification of compounds in libraries. It basically involves parallel incorporation of molecular tags whose identity codes for subunits. Chemical encoding can be done again in various methods. My poster presentation consists of various chemical encoding methods and their explanation.

OP-CH 7.

SYNTHESIS, ANTIMICROBIAL AND ANTI-INFLAMMATORY EVALUATION OF SUBSTITUTED 1, 2, 4-TRIAZOLE ANALOGS

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The title compound of triazole with different substituents are derived from substituted p-nitro benzoic acid by the various reactions like methylation, hydazination reaction with carbon-di-sulphide(CS_2) in alc.KOH, hydrazination in alcoholic condition, acetylation with acetic anhydride, substitution of $-S-CH_3$ by hydrazine hydrate and substitution with various aldehydes and halides to get the title compounds. All the compounds are characterized by TLC and spectroscopic methods like IR, ^{1}H-NMR, and Mass spectroscopy. The recrystallised compounds were going to perform against antimicrobial as well as anti-inflammatory activities.

OP-CH 8.

Progress in the Development of Structure Modifications of Taxol

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Abstract:

Paclitaxel (Taxol), a novel highly functionalized diterpenoid isolated from bark of Taxus brevifolia has been proved to be an exceptionally promising anti cancer agent in the treatment of ovarian and breast cancer. Approved by US Food and Drug Administration (FDA) for the treatment of ovarian cancer. The molecule has been extensively modified to enhance its water solubility and to improve its therapeutic profile. As the natural abundance of taxol is low, various methods have been employed to prepare semi synthetically from its precursors. These semi synthetic approaches also provide access to analogs with potential advantages over taxol itself. Various protaxols designed to release taxol insitu under physiological conditions. Plant tissue culture, microbial fermentation, total synthesis provides other possibilities for the production of taxol and its derivatives. Its derivative Docetaxel has entered phase –II clinical trials for the treatment of ovarian, breast, colon and lung cancer.

The present review gives an account of recent developments in the structure modifications of taxol, various methods to synthesize taxol, mode of action and its therapeutic profile.

OP-CH 9.

SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL SCREENING OF 1-SUBSTITUTED -3-METHYL-4-ARYLHYDRAZINO- 2-PYRAZOLIN-5-ONES AND ISOXAZOLINONES

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The objective of the present work was to prepare and evaluate the derivatives for antimicrobial activity confirming with spectral data. The facile synthesis of 1-substituted-3-methyl-4-aryl hydrazine2-pyrazolin-5-ones and isoxazolinones has been achieved by the diazotization of chlorinated aniline with ethylacetoacetate in the presence of sodium acetate and ethanol furnished the compound (II), while the diazotization of chlorinated aniline with ethyl cyano acetate in the presence of sodium acetate and ethanol yielded (v). Reaction of the intermediates (II) and (V) with aryl hydrazines yielded the compounds (IIIa-c) and (VIa-c) while the reaction of the intermediates with hydroxylamines furnished the compounds (IV) and (VII). Structure of these compounds confirmed on the basis of spectral data. The antibacterial and antifungal activities have been evaluated for the synthesized derivatives. The antimicrobial studies for the derivatives was studied by disc diffusion and serial dilution techniques and compared with standard microbes active for gram positive and gram negative organisms against a standard therapeutic drug. Some of the compounds were found to exhibit promising good anti- bacterial and anti-fungal activities.

OP-CH 10.

INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY (ICP-MS)

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Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) is well established, multi-element technique for elemental determinations. Inductively Coupled Plasma – Mass Spectrometry is the method of choice for the determination of a very wide range of trace elements with detection limits down to and below 1ppm in solid samples. The ICP-MS instrument involves plasma (ICP) as ionization source and a mass spectrometer (MS) analyzer to detect the ions produced. It can simultaneously measure most elements in the periodic table and determine analyte concentrations down to sub-nanogram per liter (ng/l) or part per trillions (ppt) level Most analyses performed on ICP-MS instrumentation are quantitative; however, it also can serve as an excellent semi-quantitative instrument. Plasma is an ionized gas that is macroscopically neutral i.e. with same number of positive particles (ions) and negative particles (electrons).Argon is used as the inductively coupled plasma (ICP) plasma gas. In ICP-MS, plasma is used to generate the ions. The sample of interest is introduced in the ICP-MS via a spray chamber, which is converted into an aerosol. The plasma ionizes the elements in the sample, and these ions pass through the interface and ion lens. The focused ions are sorted according to their m/z ratio in a quadrupole mass analyzer and are measured by the detector to produce a mass spectrum.ICP is used in determination of trace elements, medical and forensic field, environmental field, industrial and biological monitoring, oil analysis, radiometric dating, flow cytometry, archeological field, earth science.

OP-CH 11.

ULTRAVIOLET RESONANCE RAMAN SPECTROSCOPY USING FIBER OPTICS

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Ultraviolet resonance Raman spectroscopy (UVRRS) is a powerful tool in the molecular analysis of complex biological systems. Raman spectroscopy is a well known and widely utilized molecular spectroscopy technique. In recent years Raman has grown in popularity, this primarily due to the availability of low cost lasers, holographic filters and the emergence of highly versatile Raman-capable fiber optics. The Raman scatter from water is weak, allowing for analysis of very weak aqueous systems.

OP - CH 12

DEVELOPMENT AND VALIDATION OF RP-HPLC METHOD FOR SIMULTANEOUS ESTIMATION OF LEVOFLOXACIN AND ORNIDAZOLE IN PHARMACEUTICAL DOSAGE FORM

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A new simple, accurate, rapid and precise isocratic Reverse Phase HPLC method was developed and validated for simultaneous estimation of levofloxacin hemihydrate and ornidazole in bulk and tablet formulations. The Method employs Waters HPLC system on XTerra RP18 Column (4.6 x 150 mm and 5 µm) and flow rate of 0.5 ml/min with a load of 20µl. Acetonitrile and Phosphate buffer was used as mobile phase in the composition of 60:40. The Detection was carried out at 315 nm. Retention time was3.096 and 4.097 min for levofloxacin hemihydrate and ornidazole respectively. Linearity was established in the range of 10-30µg/ml and 20-60 µg/ml for levofloxacin hemihydrate and ornidazole respectively. Mean recovery obtained for levofloxacinhemihydrate and ornidazole were found to be 99.4% and 99.7% respectively. This newly developed method was successfully utilized for the Quantitative estimation of levofloxacin hemihydrate and ornidazole in pharmaceutical tablet dosage forms.This method was validated for accuracy, precision, linearity and Robustness as per ICH guidelines

OP - CH 13

CHEMINFORMATICS IN DRUG DISCOVERY

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Cheminformatics or Chemoinformatics or Chemical informatics is the application of information technology to help chemists investigate new problems and organize, analyze, and understand scientific data in the development of novel compounds, materials, and processes. According to BROWN, F.K. the mixing of information resources to transform data into information and information into knowledge, for the intended purpose of making decisions faster in the arena of drug lead identification and optimization. The main objective is computer-aided design and evaluation of lead molecules for emerging as well as existing diseases. Ultimately cheminformatics is a tool that aims at facilitating the decision-making process across various preclinical stages of drug discovery. Recent advances in cheminformatics include compound selection, molecular database, virtual screening, HTS data mining, in-silico ADME, calculation of standard properties (QSAR), combinatorial chemistry, genomics, proteomics, bioisosteric design and chemical genomics. The areas of applications are: - *Life sciences:* In identifying the disease and isolating a protein, nevertheless is a preliminary objective. The how of finding a drug effective against a disease protein could be done in silico. *Pharmaceuticals:* Preclinical testing, formulation & scale-up *Pro-drug design:* Human clinical trials and Food and Drug Administration (FDA) approval. *Chemical databases:* Databases of available chemicals. The most important task for cheminformatics is to constantly reevaluate itself and its utility in the area of drug discovery, in order to provide probabilistic, rather than categorical predictions. At the conclusion, future directions of development or the future trends in cheminformatics are suggested.

OP - CH 14.

COUNTERFEIT DRUG DETECTION

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Counterfeiting of drugs has now become a lucrative multi-billion dollar business that threatens the effective delivery of health care services globally. India is one of the heavens for counterfeits. To combat this menace, concerted efforts are needed from various facets of the community. In addition to visual inspections, sophisticated analytical tools are usually required in order to successfully distinguish counterfeits from the real stuffs like NIR spectroscopy, RAMAN spectroscopy, NMR imaging etc. These techniques focus on concentrations of active ingredients and excipients in the dosage forms. Other methods like XPS (*X-ray Photoelectron Spectroscopy*), ToFSIMS (*Time-of-Flight Secondary Ion Mass Spectrometry*) concentrates on process and manufacturing methods of tablets, the end result being that previously undetectable chemical copies of pharmaceuticals can be identified. In another method consumer can find out whether the drug is original or counterfeit by sending a unique serial number present on tablet strip or package of medicine through SMS. To maintain their profit margin, the preparators of counterfeit pharmaceuticals will continue to develop ingenious ways to circumvent regulatory system. Therefore, relentless efforts should continue towards research and development at low cost, fast and efficient ways to fight against the heinous profession of "*selling death to humanity*."

OP – CH 15

LIQUID CHROMOTAGRAPHY COUPLED WITH MASS SPECTROSCOPY

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In the early 1990's, the notion that LC/MS could be developed into an automated, walk-up system for structure characterization of medicinal lead compounds was prevalent. At the time, mass spectrometers were becoming more stable and easier to use. Microprocessor control, robust ion optics, detectors, reliable LC/MS interfaces, and autosamplers created a high degree of sophistication as well. These improvements, combinedwith the realization that molecular mass was sufficient for structure confirmation of synthetic products, led to a qualitative shift in lead compound characterization. The significant events and overcome obstacles that led to the development and application of LC/MS-based techniques (Snyder, 1995; Covey, 1995; Thomson, 1998) and the mechanistic aspects of ionization (Bruins, 1998) have been recently reviewed. Efforts to develop and re fine an interface for introducing a flowing liquid HPLC system into a high vacuum mass spectrometry environment were fueled by a strong notion that the combination would be unique and would provide powerful advantages for analysis (Arpino et al., 1979; Arpino, 1982). The combined efforts and vision from a diverse group of pioneering researchers helped to create a unique combi-nation for pharmaceutical analysis. The LC/MS applications described in this section are organized into the respective drug development stages; drug discovery, preclinical development, clinical development, and manufacturing . A sequential illustration of pharmaceutical analysis activities provides a unique perspective on the contributions of LC/MS techniques in drug development. The specific selected examples help to illustrate the successful incorporation of effective LC/MS-based analysis strategies in the pharmaceutical industry, and to highlight their impact on accelerated drug development.

OP – CH 16

UPLC: AN ADVANCED CHROMATOGRAPHY TECHNIQUE

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Ultra Performance Liquid Chromatography (UPLC) can be regarded as a new direction for liquid chromatography. This advanced technique has improved chromatographic resolution, speed and sensitivity analysis, and thus upgrading itself from the conventional HPLC technique. It uses fine particles (less than 2µm) and saves time and thus, reduces the solvent consumption. As particle size decreases to less than 2.5µm, there is a significant gain in efficiency and it's efficiency doesn't diminish at increased linear velocities or flow rates according to common Van Deemter equation. By using smaller particles, speed and peak capacity, number of peaks resolved per unit time can be extended to new limits which is known as Ultra Performance. Its added feature of using elevated temperature also allows for high flow rates by lowering the viscosity of mobile phase, which significantly reduced the column backpressure. Monolithic columns contain a polymerized porous support structure that provides lower flow resistances than conventional particle-packed columns in HPLC. The superiority of UPLC over conventional techniques makes it useful in the detection of additional drug metabolites, bioanalysis studies, ADME Screening, dissolution and degradation studies. This new category of analytical separation science retains the practicality and principles of HPLC while creating a step-function improvement in chromatographic performance. Higher sample throughput with more information per sample may decrease the time to market, an important driving force in today's pharmaceutical industry. At a time when many scientists have reached separation barriers with conventional HPLC, UPLC presents the possibility to extend and expand the utility of chromatography.

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PHARMACOGNOSY
&
PHARM. BIOTECHNOLOGY

OP- CG 1.

REVERSE PHARMACOGNOSY: A NEW CONCEPT FOR ACCELERATING NATURAL DRUG DISCOVERY

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Combinatorial chemistry and high throughput screening led to identification of numerous *in vitro* & selective hits. Traditional medicine cures diseases based on natural material have proven useful for many of the populations worldwide. These huge and dispense amount of knowledge is being neglected in western research because of great difference in the concepts of illness. Here a new approach named "Reverse Pharmacognosy" (from diverse molecules to plants) is used to find new biological targets for natural compounds by virtual or real screening and identify natural resources that contain the active molecules. Reverse pharmacognosy and its inverse docking component can not only be integrated into the programme for new lead discovery but is also a useful approach to find new application for natural compounds. Reverse pharmacognosy utilises new techniques such as High throughput screening, Virtual screening, Knowledge database with traditional usage of plants. Reverse pharmacognosy with amalgamations of traditional knowledge can address various bottlenecks in new drug discovery.

OP-CG 2

HERBAL DRUG INTERACTION

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In recent days there is an increased demand for the usage of herbal drugs in the developed and developing countries, perhaps many users are not aware that dietary supplements are marked without documentation of the safety and efficacy contaminants or undisclosed pharmaceuticals may actually be responsible for suspected herbal- drug interaction as the chemical make up of natural products varies depending on the part of the plant used (bark, stem, leaves, roots, rhizomes), climate etc. combination products composed of multiple natural products complicate matters further not only this the manufacturing process also contributes the complexity. Interactions between herb and medications can be caused by either pharmacodynamic or pharmacokinetic mechanisms. The interactions often involve drug metabolizing enzymes and drug transporter systems. Many herbals may increase the risk for bleeding when combined with warfarin metabolism. Patients receiving warfarin therapy showed to be discouraged from using herbal and other dietary supplements. St.John's wort appears to interact with many prescription drugs, including antidepressant, antiretroviral, anticancer drugs etc. So, pharmacists and other health care providers must take an active role in learning about herbals and other dietary supplements to make informed decisions. It is imperative that patients are asked about their use of herbal supplements to assess for potential herbal-drug interactions.

OP-CG 3

NEED FOR THE DETECTION OF HEAVY METALS IN HERBAL DRUGS

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In recent times most of the people are showing interest towards the usage of herbal medicines due to side effects and are considered to be safe. Herbal medicines are prepared by using drug material of plant origin based on literature for their healing properties. The use of metallic preparations as single drug or as ingredient in many Ayurvedic medicines has evoked concern and debate in the scientific and public forums in the recent times. Herbal medicines may be at risk for heavy metal toxicity. The herbal medicine must pass the laboratory tests for these limits and carry the phrase heavy metals within permissible limits on their labels for herbal medicines. Heavy metal poisoning is the toxic accumulation of heavy metals in the soft tissues of the body. A heavy metal is one with a specific gravity of 5gm cm^{-3} or more. They are stable elements and cannot be metabolized by the body. Some heavy metals are required by the body in small quantities, but these same elements can be toxic in larger quantities. In order to overcome the problem the herbal drugs must be properly standardized. Now-a-days many modern techniques are available to determine the quantity of the heavy metal content. One should maintain the limits for the safe usage of the herbal medicines

OP-CG 4

MICROWAVE ASSISTED EXTRACTION OF CRUDE DRUGS

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Extraction involves the separation of active constituents from crude drugs through use of selective solvents. Extraction of crude drugs can be done by various processes depending on the physical nature of the drug and chemical properties of the constituents present in it. Various traditional techniques used for the extraction of drugs include Infusion, Decoction, Digestion, Maceration and Percolation. The se methods are time and solvent consuming and are also unsafe thermally. This lead to demand for new extraction techniques which encouraged the development of alternative extraction techniques such as MAE. This review brings into prominence the importance of novel methods of extraction for delivering high quality product. Microwave-assisted extraction (MAE) is a relatively new extraction technique, which utilizes microwave energy to heat the solvent and increases the mass transfer rate of phyto constituents from the crude drug into the solvent.

This overcomes the limitations of traditional techniques as this is highlighted by 1) Increased extraction yield 2) Decreased time 3) Reduced solvent consumption 4) Protection to thermo liable substances; and has 5) High and fast extraction performance ability with less solvent consumption Moreover the use of microwave for extraction of constituents from plant material has shown tremendous research interest and potential.

OP-CG 5

HERBAL NEUTRACEUTICALS

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In the recent days, most of the prevailing diseases and nutritional disorders are treated with natural medicines, for this purpose we use neutraceuticals. The concept of neutraceutical was started from the survey in U.K, Germany, and France which concluded that diet is rated more highly by consumers than exercise or hereditary factors for achieving good health. Dr.stephen defelice coined the term neutraceutical from nutrition and pharmaceutical in 1989. Neutraceutical is the coined to describe the substance which are not traditionally recognized nutrients but which have present physiological effects on human body. Risk of toxicity or adverse effects of drugs led us to consider safer neutraceutical and functional food based approaches for the health management. Neutraceuticals are received considerable intrest because of their presumed safety and potential nutritional and therapeutic effects. Some popular nutraceuticals include glucosamaine, ginseng, Echinacea, folic acid, cord-liver oil, omega-3-fatty acid, calcium- enriched orange juice, green tea etc and can be developed for various multiple therapeutic uses or dietary supplements. This article apart from providing information regarding the advantages of the neutraceuticals which includes the drug like ginko biloba extracts is used to treat cerebral insufficiency and other brain disorders, neurosensory deficiencies and peripheral circulatory distrubances and ginseng promote recovery from diseases like the hypertension or hypoglycemia. Not only has the drug due to the low intake of vit-k also leaded to the bone health and regulation of tissue calcification. Multiple micro-nutrient deficiency in the diet leads to cause of type-2-diabetis. This may show an increased risk of multi-morbidity.

OP-CG 6

CANCER AND DIETARY HABITS

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Nutrition is a process in which food is taken in and used by the body for growth and to keep the body healthy. Good nutrition is important for good health. Eating the right kinds of foods before, during, and after cancer treatment can help the patient feel better and stay stronger. Diet May Influence Genetic & Epigenetic Events Associated with Several Cancer Processes. Research shows that a large percentage of cancer-related deaths are directly linked to an unhealthy diet. Changing diet and behaviors, we can minimize the risk of disease and possibly even stop cancer in its tracks. A plant-based diet i.e. vegetables, fruits, nuts, grains, and beans have less fat, more fiber, and more cancer-fighting nutrients. Just as important, the amount of processed foods must be reduced. Research shows that vegetarians are about fifty percent less likely to develop cancer than those who eat meat. High-fat diets have been linked to higher rates of cancer. Choosing healthy food is not the only important factor, it also matters how to prepare and store your food. Researchers estimate that eating lots of cruciferous vegetables such as broccoli, cabbage etc. could lower your risk of breast and colon cancer by 40 percent. Antioxidants, such as vitamin C and E and beta carotene, seem to have a synergistic effect when taken together. So, eating lots of fruits and vegetables in a salad together produces a greater anti-cancer effect than eating each one individually. Therefore we can conclude that by following good dietary habits we can prevent some types of cancer.

OP-CG 7

HERBAL MEDICINES VS CONVENTIONAL MEDICINES

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Medicines have been used widely to treat chronic and acute diseases which include allergic disease (asthma and eczema), headache (including migraine), irritable bowel, and arthritis (both rheumatoid and osteo-arthritis) etc. There are various methods for treatment of diseases. They are conventional and alternative methods. The modes of action of alternative medicines almost invariably work through the same biochemical and physiological pathways as conventional medicines. Advantages of herbal medicines over conventional medicines are cost effective, less expensive, availability is more, herbal medicine and remedies are more effective, do not have negative side effects, if any they are softer than allopathic medicines, some digestive disorders such as colitis, indigestion, peptic ulcers and irritable bowel syndrome can be cured using the herbs, improve digestion and food absorption and boost our immune system etc. one of the benefits around the use of herbal remedies is there are almost never any negative side effects, when used correctly compared to conventional medicines. Many conventional drugs used today to treat various illnesses originated from the natural healing properties found in herbs. A good example is aspirin, which was originally derived from willow bark for its salicylic content. Initially the only drawback of alternative medicines was poor standardization, but due to the increasing demand for the usage of herbal drugs, researches also looking forward to develop, herbal drus as, using novel drug delivery systems like nanoparticles, phytosomes etc, by which the drawback can be overcome.

OP-CG 8

GENETIC MARKERS IN HERBAL DRUGS

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There is a great demand for herbal medicines in the developed and developing countries because of their wide biological activity, higher safety margin than synthetic drugs. Each plant is like factory capable of synthesizing unlimited number of highly complex and unusual chemical substances. In natural product drug discovery the conventional and approach of extraction, isolation, separation, identification, characterization and test for the desired biological activity suffers from problems like lower yields, de-replication, difficult separation and inconsistent biological activity. However with the introduction of innovative technologies like high throughput screening, chromatography and electrophoresis have revolutionized the entire scenario of pharmacognosy. Genetic markers identify plant at genomic level and establish new standards in standardization and quality control of botanicals. A genetic marker is a gene or DNA sequence with a known location on a chromosome and associated with a particular gene or trait. A genetic marker may be a short DNA sequence or a long one, mini satellites. DNA-based molecular markers have been used extensively for a wide range of applications such as study of genetic variation, cultivar identification, genotyping, Cross-breeding studies, identification of disease-resistant genes, identification of quantitative-trait loci, etc. DNA markers are reliable for informative polymorphism and it is not affected by age, physiological condition as well as environmental factors. These molecular techniques can be used in pharmacognosy for cultivation of commercialization in herbal formulations. With the evolution of these molecular approach role of pharmacognosy is likely to be more challenging in forth coming years.

OP-CG 9

PRESSURIZED LIQUID EXTRACTION TECHNIQUE FOR MEDICINAL PLANTS

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The first step in the qualitative and quantitative analysis of medicinal plant constituents is the extraction and it is an important step in studies involving the discovery of active compounds of plants materials. Ideally an extraction procedure should be exhaustive with respect to the constituents to be analyzed, rapid, simple, and inexpensive and for routine analysis. The traditional techniques include soxhlet extraction, maceration, percolation etc has been etc has been used for many decades. They are very often time consuming, require relatively large quantity of solvent moreover, many natural products are thermally unstable and could be degraded during the extraction if the temperature be increased. Some of the newer techniques like pressurized liquid extraction (PLE) are emerged to overcome the problems. PLE operates at high pressures and temperature above point of the boiling point of the organic solvent. The use of PLE decreases significantly the total time of treatment and in addition this extraction method can be more effective and selectively by changing some parameters like temperature, temperature cycles and solvent. The of PLE will be more effective than the convention soxhlet extraction method for obtaining compounds from plants. It can be carried out at high temperature and pressure with economy in time.

OP-CG 10

COW URINE AND ITS MEDICINAL PROPERTIES

Prasad*

Cow is a divine living being according to Hindu tradition.It is regarded as abode of all gods she is Kamdhenu(desire fulfiller) personified. Composition of Panchgavya: It is made up of 5 cow products milk, curd, ghee, urine and dung. About Cow Urine: It is not a waste product. It has many medicinal properties and is mentioned in ancient Ayurvedic books. Evidence: Ancient Ayurvedic books like "Sushruta Samhita", "Ashtanga Sangraha". Chemical composition of Cow Urine: It contains AuOH, Hipuric acid, Uric acid, Kallikrein, Urokinase, many minerals and vitamins. Diseases cured by intake of Cow Urine: Melatonin provokes, tranquility and heightened visualization. Kallikrein is a vasodilator. The enzyme urokinase acts as fibrinolytic agent. Aurum Hydroxide AuOH It is germicidal and increases immunity power. AuOH is highly antibiotic and anti-toxic. For Cough, Dismonerrhoea, Migraine or headache, Constipation, Thyroid, Skin diseases like eczema, ringworm, itching, Acne, Lowers the levels of body cholesterol, Relieves tension. It auguments B and T Lymphocyte blastogenisis. It has bioenhancing activity for Rifampicin, Tetracycline, and Ampicillin.

Cow urine drug developed by RSS body gets US patent: An anti-cancer drug extracted from cow urine and developed by an affiliate of the RSS has got a third US patent for its anti-genotoxicity propertiesResearch for the drug, whose brand name is 'Kamdhenu Ark', was carried out jointly by the Gau Vigyan Anusandhan Kendra and National Environmental Engineer Research Institute (NEERI). The research experiments are carried at CSIR laboratory and CIMAP at Lucknow.

OP-BT 1

REGENERATIVE MEDICINE

Which regenerates our lives from chronic disease and also the job opportunities for pharmacists

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Umbilical cord blood is blood that remains in the placenta and in the attached umbilical cord after child birth. Cord blood is collected because it contains stem cells which can be used to treat hematopoietic and genetic disorders. While stem cells have been hailed as providing wondrous treatments for illnesses, it is their ability to form into completely new organs that is truly miraculous. We've seen the creation of organs such as the bladder, and even witnessed the beating of an artificially grown heart, but the work at Columbia University is the first development of bone. Slowly but surely, it seems that we are developing the means by which every portion of the human body could be replicated or grown in a lab. This may one day lead to the creation of entirely new bodies for those damaged irrevocably, or even for the recently deceased. **Stem cells** are biological cells found in all multicellular organisms, that can divide (through mitosis) and differentiate into diverse specialized cell types and can self renew to produce more stem cells.

As we are not much aware of stem cells we didn't preserved our cord blood during our birth. We still have an opportunity to store our stem cells by preserving the **single tooth**. It might be surprising but its true. A Single tooth can save our life from chronic diseases like cancer, diabetis, thalaseemia etc.

Even we the pharmacists have a job opportunities were we play a crucial role in protecting stem cells. Many organizations like stemade are providing wonderful openings for the pharmacy graduates. So the stem cells are considered as regenerative medicine which regenerates our lives from chronic diseases and also provide job opportunities to the pharmacy graduates.

OP-BT 2

DENDRITIC CELL VACCINE

A New and Promising Approach to Treating Cancers

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Dendritic Cell vaccines involve using Dendritic cells from the cancer patient to stimulate immune responses. The Dendritic Cell is a scarce immune cell which recognizes, processes and presents foreign antigens to the T cells of the immune system. They constantly roam around the body and function as antigen presenting cells when they discover antigens, calling on other cells for help. However, Dendritic cells are usually not present in a large enough quantity to produce a strong immune response. They are now generated by the millions in labs. Glioma is type of cancer that starts in the brain or spine. It can spread within the nervous system but usually do not spread to other parts of the body.•Annually about 17,000 Americans are diagnosed with gliomas and the median survival of patients with glioblastoma multiforme, which is the most common form of glioma, is around 15 months. Because despite advances in chemotherapy, radiation and surgery, for many glioma patients all these methods are ineffective.

The location of these tumors make the traditional methods tricky, since using each radiation treatment kills off many healthy and crucial brain cells. Dendritic cell vaccine seems to be the most promising for a targeted location in this type of cancer.

OP-BT 3

DNA-FINGERPRINTING

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DNA finger printing or profiling is a technique employed by forensic scientists to assist in identification of individual by their respective DNA profiles.DNA profile are encrypted sets of numbers that reflect a person's DNA makeup, which can also be used in ,for example, parentral testing of criminal investigation. Although 99.9% of human DNA sequences are the same in every person, enough of the dna is different to distinguish one individual from another. Unless they are mono zygotic twins.DNA profiling uses repetitive sequences that are highly variable called VNTP'S, particularly STR'S. The sequences are detected by the use of DNA probes that detect a large number of these "hyper variable lois". On autoradiographythese give rise to a band pattern that is reminiscent of the bar code on supermarket goods, the main DNA finger printing represents one of the most significant advances in forensic science this century advantage of which is that a single such test provides a lot of information very rapidly. In forensic laboratories DNA can be analysed from a variety of human samples includes blood, semen, saliva, urine, hair follicles.DNA from the mitochondrias is especcially performed in cases where there is an insufficient amount of sample has got.

OP-BT 4

EMERGING TRENDS IN PROBIOTIC RESEARCH FOR HUMAN HEALTH

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Probiotics are live non-pathogenic microorganisms which when administered in adequate amounts confer a health benefit to the host. Probiotics are available to consumers mainly in the dietary supplements and foods, to improve microbial balance, particularly in the gastrointestinal tract and can be used as complementary and alternative medicine (CAM). Lactic acid bacteria and Bifidobacteria are the most commonly used probiotics; certain yeasts and bacilli may also be helpful. Probiotic dosing varies depending on the product and specific indication. For lactobacilli, doses are from 1–20 billion colony-forming units per day and for *S. boulardii*, doses ranges from 250 to 500 mg. Probiotics exert their beneficial effects through various mechanisms, including lowering intestinal pH, decreasing colonization and invasion by pathogenic organisms, and modifying the host immune response. The strongest clinical effectiveness of probiotics are in treatment of acute diarrhoea, lactose intolerance, irritable bowel syndrome, constipation, cancer, AIDS and leukaemia, immunomodulation ,vaginosis.The minor side effects are bloating, bowel wind, indigestion, constipation, etc. Since probiotics contain live microorganisms, interactions with antibiotics could kill a large number of the organisms, reducing the efficacy of the *Lactobacillus* and *Bifidobacterium* species. There are many potential advantages of probiotics therapy over conventional therapy, including relatively low cost and decreased incidence of antibiotic resistance as they have multiple mechanisms of actions. Eventually, the fruits of this fundamental research will form the basis for logical research and development programmes that will produce efficacious probiotic products.

OP-BT 5

STEM CELL THERAPY

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Stem cells are the building blocks of our blood and immune systems. They form the white cells (white blood corpuscles) that fight infection, red cells (red blood corpuscles) that carry oxygen and platelets that promote healing. Stem cells are present in our bone marrow and they generate new cells throughout our live. Stem cells based approaches hold much promise as potential novel treatments to restore function after stroke. Studies in animal models have shown that stem cell transplantation can improve function by replacing neurons or by tropic actions, modulation of inflammation, promoting of angiogenesis, remyelination and axonal plasticity and neuroprotection. Endogenous stem cells are also potential therapeutic targets because they produce new neurons after stroke.

OP-BT 6

microRNAS IN HUMAN CANCER AND THEREPUTICS

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microRNA (miRNA) is an endogenous non-protein coding small RNA molecule that negatively regulates gene expression by the degradation of messenger RNA (mRNA) or the suppression of mRNA translation. miRNA plays important roles in physiologic processes such as cellular development, differentiation, proliferation, apoptosis, and stem cell self-renewal. Studies show that deregulation of miRNA expression is closely associated with tumorigenicity, invasion, and metastasis. The functionality of aberrant miRNAs in cancer could act either as oncogenes or tumor suppressors during tumor initiation and progression. Similar to protein-coding gene regulation, dysregulation of miRNAs may be related to changes in miRNA gene copy numbers, epigenetic modulation, polymorphisms, or biogenesis modifications. Elucidation of the miRNA expression profiles (miRNomes) of many types of cancers is starting to decode the regulatory network of miRNA-mRNA interactions from a systems biology perspective. Experimental evidence demonstrates that modulation of specific miRNA alterations in cancer cells using miRNA replacement or anti-miRNA technologies can restore miRNA activities and repair gene regulatory networks affecting apoptotic signaling pathways or drug sensitivity, and improve the outcome of treatment. Numerous animal studies for miRNA-based therapy offer the hope of targeting miRNAs as an alternative cancer treatment. Developing the small molecules to interfere with miRNAs could be of great pharmaceutical interest in the future.

OP-BT 7

SWINE INFLUENZA

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Swine flu is caused by orthomyxo virus of influenza A-group of subtype H_1 N_1 recombinants of hemaglutinating antigen(H_1) and neuraminidase antigen(N_1). Swine influenza is an infection by any one of several types of swine influenza virus. Swine influenza virus (SIV) is any strain of the influenza family of viruses that is endemic in pigs. As of 2009, the known SIV strains include influenza C and the subtype of influenza A known as H_1N_1 ,H_1N_2, H_3N_1, H_3N_2 and H_2N_3.Swine influenza virus is common throughout pig populations worldwide. Transmission of the virus from pigs to humans is not common and does not always lead to human influenza, often resulting only in the production of antibodies in the blood. If transmission does cause human influenza, it is called zoonotic swine flu. People with regular exposure to pigs are at increased risk of swine flu infection. The meant of an infected animal poses no risk of infection when properly cooked. Symptoms of zoonotic swine flu in humans are similar to those of influenza and of influenza-like illness in general, namely chills, fever, sore throat, muscle pains, severe headache, coughing, weakness and general discomfort. Transmission in humans by coughing, sneezing, touching infected objects, touching nose, mouth or eyes with infected hands. Diagnosis: different medical kits are available for diagnosis of swine flu. The two major tests that are being used are the nasopharyngeal swab for viral culture, the gold standard, and indirect evidence test by detection of antibodies to novel H_1 N_1 with PCR studies. Prevention of swine influenza has three components: prevention in swine, prevention of transmission to humans, and prevention of its spread among humans.

OP-BT 8

VIROSOMES: A VERSATILE CARRIER SYSTEM

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Virosomes are spherical, unilamellar vesicles with a mean diameter of 150 nm. Essentially, they represent reconstituted viral envelopes, including membrane lipids and viral spike glycoproteins, but devoid of viral genetic material. Virosomes are biocompatible, biodegradable, non-toxic and non-autoimmunogenic and serve as promising carriers for vaccines, adjuvants as well as delivery systems for nucleic acids or genes and drugs like antibiotics, anticancer agents, and steroids.

Virosomes protect pharmaceutically active substances from proteolytic degradation and low pH within endosomes, allowing their contents to remain intact when they reach the cytoplasm. This is a major advantage of virosomal carrier systems over other drug-delivery vehicles, including liposomal and proteoliposomal carrier systems. Virosomes are safely used in a concentration of 20 – 200 mg/ml. They are produced by dissolving the envelope of a virus by a detergent, removal of the viral genetic material and non-membrane proteins and finally reconstitution of the viral membrane. The drugs or bioactive agents can be added to the dissolved viral membrane or included during reconstitution. They are characterized for their size and structure, protein detection and fusion acivity. These can be admininstered in a variety of parenteral, topical, oral and transdermal routes and even as implants and inhalations.Their ability to bind and penetrate into the tumor cells for the delivery of cytotoxic drugs prove them to be a promising targeted delivery system.

Virosomes therefore represent an innovative, broadly applicable adjuvant and carrier system with prospective applications in areas beyond conventional vaccines.

OP-BT 9

STEM CELLS - NEW TREND IN THE THERAPEUTICS

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Stem cells are cells which have the ability to develop into many different cell types in the body during early life and growth. In many tissues they serve as an internal repair system, dividing essentially without limit to replenish other cells as long as the person or animal is still alive. When a stem cell divides, each new cell has the potential either to remain a stem cell or become another type of cell with a more specialized function, such as a muscle cell, a red blood cell, or a brain cell. These new cells could be used for treating numerous genetic and degenerative disorders. Among them, age-related functional defects, hematopoietic and immune system disorders, heart failures, chronic liver injuries, diabetes, Parkinson's and Alzheimer's diseases, arthritis, and muscular, skin, lung, eye, and digestive disorders as well as aggressive and recurrent cancers could be successfully treated by stem cell-based therapies**.** Stem cell research is one of the most fascinating areas of contemporary biology, but, as with many expanding fields of scientific inquiry, research on stem cells raises scientific questions as rapidly as it generates new discoveries in novel clinical therapy. Therefore extensive research work is necessary to understand stem cell behavior upon transplantation as well as the mechanisms of stem cell interaction with the diseased/injured microenvironment.

OP-BT 10

RNA INTERFERENCE TECHNOLOGY IN MEDICINAL PLANTS

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Medicinal plants are one of the most important sources of life saving drugs for majority of the world's population. Plant secondary metabolites are economically important as drugs, fragrances, pigments, food additives, and pesticides. Recent advances in the combined molecular biology and enzymology through post transcriptional gene silencing of medicinal plants suggest that this system is a viable source of important secondary metabolites. RNAi technology is a process of dsRNA mediated gene silencing this triggered sequence specific RNA degradation pathway has been termed post transcriptional gene silencing in plants. RNA interference technology has already had a major impact on the study and manipulation of plant secondary metabolites. To date RNAi has mainly been used as a readily available, rapid, reverse genetic tool to create medicinal plants with novel chemical phenotypes and to determine the phenotypes of genes responsible for the synthesis of many pharmaceutically important secondary metabolites. Interruption or suppression of the expression of a gene at transcriptional or translational levels is called gene silencing. This type of RNA interference (RNAi) is a process of dsRNA mediated gene silencing in which only the mRNa cognate to dsRNA is specifically degraded. This technology helps to make a novel compound in a plant to reduce or eliminate levels of undesirable compounds. RNAi is a potentially powerful tool for a wide variety of gene silencing applications, RNAi might prove to be useful for the studies towards production of important biomedical products by medicinal plants , which in turn can provide novel and rapid applications

OP-BT 11

NEW VACCINE USING WEAKENED MALARIAL PARASITES

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A live attenuated malaria vaccine against the most deadly malaria parasite Plasmodium falciparum (live but weakened malaria parasite) has been developed by purifying the sporozoites from these species found in the liver of the humans and weakening them with radiation. For the treatment of malaria, chloroquine was effectively used. On continuous treatment with it, chloroquine resistant P.falciparum organisms developed. Later, combination of antimalarial drugs is have been used which reduced the drug resistance by individual anti malarial drugs and reducing the transmission of drug –resistant parasites. But some of these combinations proved to show adverse effects and/or pharmacokinetic mismatches or developed drug resistance. Hence, the anti malaria vaccine was developed which directly acted on the immune system and from specific animal studies, delivery of the P.falciparum sporozoites(PfSPZ) vaccine intravenously induced a significant immune response in the liver thereby preventing malaria in humans. It improved protection by inducing specialized immune cells known as CD8+ T cells for the treatment directly on the liver. In my presentation, I will be explaining about malarial parasites, its life cycle, previous medication and details of the newly introduced vaccine. The clinical trial has been successful and it will prove to be the future vaccine for malaria.

OP-BT 12

NANOROBOTICS

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Pharmaceutical Biotechnology, as an allied branch of Pharmacy, is at the threshold of showing such days where instead of giving you a pill or a shot, the doctor refers you to a special medical team which implants a tiny robot into your bloodstream. The robot detects the cause of your fever, travels to the appropriate system and provides a dose of medication directly to the infected area. . They're called nanorobots and engineering teams around the world are working to design robots that will eventually be used to treat everything from hemophilia to cancer. All this is possible with the development opf nano-technology.

While the size of a nanorobot means they can only carry very small payloads of medicine or equipment, many doctors and engineers believe the precise application of these tools will be more effective than more traditional methods. For example, a doctor might deliver a powerful antibiotic to a patient through a syringe to help his immune system. The antibiotic becomes diluted while it travels through the patient's bloodstream, causing only some of it makes it to the point of infection. However, a nanorobot -- or team of nanorobots -- could travel to the point of infection directly and deliver a small dose of medication. The patient would potentially suffer fewer side effects from the medication. Since nanorobots would be microscopic in size, it would probably be necessary for very large numbers of them to work together to perform microscopic and macroscopic tasks. Potential applications for nanorobotics in medicine include early diagnosis and targeted drug-delivery for cancer, biomedical instrumentation surgery, pharmacokinetics, monitoring of diabetes and health care.

In such plans, future medical nanotechnology is expected to employ nanorobots injected into the patient to perform work at a cellular level. Such nanorobots intended for use in medicine should be non-replicating, as replication would needlessly increase device complexity, reduce reliability, and interfere with the medical mission.

This science faces some daunting challenges. A viable nanorobot has to be small and agile enough to navigate through the human circulatory system, an incredibly complex network of veins and arteries. The robot must also have the capacity to carry medication or miniature tools. Assuming the nanorobot isn't meant to stay in the patient forever, it also has to be able to make its way out of the host. This approach proposes the use of biological microorganisms, like the bacterium *Escherichia coli*. Thus the model would use a flagellum for propulsion purposes.

A potential future application of nanorobot technology is to re-engineer our bodies to become resistant to disease, increase our strength or even improve our intelligence. In the future, nanorobots could revolutionize medicine. Doctors could treat everything from heart_disease to cancer using tiny robots the size of bacteria, a scale much smaller than today's robots. Thus with the intervention of nano biotechnology, nanorobots will play an important role in drug delivery in the future.

OP-BT 13

BIOCHIP

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Biochips, the most exciting future technology are an outcome of the fields of computer science, electronics and biology. It's a new type of bio security device to accurately trake information regarding what a person is doing. The chips are of the size of uncooked grains of rise, small enough to be injected under the skin using a hypodermic syringe needle. They respond to a signal from the detector, held just a few feed away, by transmitting out an identification number. The number is than compared to data base listings of registered members. The reader generates a low power, electromagnetic field, in this case via radio signal, which "activates" the implanted biochip. This activation enables the biochip to send ID code back to the reader via radio signals. the reader amplifies the received code, converts it to digital format, decodes or displays the ID number on the reader's LCD display. The reader must be 2 to 12 inches near to biochip to communicate The biochip can store and update financial, medical, demographic data, basically everything about a person. Biochip implaned person does not regnire of rememberings pin numbers, password of social security numbers, everything goes digitalized, no hacker tricks on the internet. Biochip has a variety technique for secured e-money transactions on the net. The power of biochips exists in capability of locating lost children,devoned soldiers and wandering Alzheimer patients. Medical biochips can be implaned to detect glucose, blood pressure, oxygen etc.

OP-BT 14

CYBORG

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A **cyborg** is a being with both biological and artificial (e.g. electronic, mechanical or robotic) parts.
The earlier and more strict definition of Cyborg was almost always considered as increasing or enhancing normal capabilities, whereas now the term can also be applied to those organisms which use technology to repair or overcome their physical and mental constraints: including artificial limbs and hands as well as a device for helping colour-blind people to "hear" in colour. While cyborgs are commonly thought of as mammals, they might also conceivably be any kind of organism and the term "Cybernetic organism" has been applied to networks, such as road systems, corporations and governments, which have been classed as such. The term can also apply to micro-organisms which are modified to perform at higher levels than their unmodified counterpart.

A brain computer interbased, or BCI, provides a direct path of communication from the brain to an external device, effectively creating a cyborg. Research of Invasive BCIs, which utilize electrodes implanted directly into the grey matter of the brain, has focused on restoring damaged eyesight in the blind and providing functionality to paralyzed people, most notably those with severe cases, such as Locked-In syndrome. This technology could enable people who are missing a limb or are in a wheelchair the power to control the devices that aide them through neural signals sent from the brain implants directly to computers or the devices. It is possible that this technology will also eventually be used with healthy people also.

Retinal implants are another form of cyborgization in medicine. The theory behind retinal stimulation to restore vision to people suffering from retinitis pigmentosa and vision loss due to aging (conditions in which people have an abnormally low amount of ganglion cells) is that the retinal implant and electrical stimulation would act as a substitute for the missing ganglion cells (cells which connect the eye to the brain.)

OP-BT 15

PHARMACOGENOMICS - THE GENOME OF DRUG RESPONSE

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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. This is a rapidly expanding field with the hope that, within a few years, prospective genotyping will lead to patients being prescribed drugs which are both safer and more effective. Clinically relevant pharmacogenetic examples, mainly involving drug metabolism, have been known for decades, but recently, the field of pharmacogenetics has evolved into "pharmacogenomics", involving a shift from a focus on individual candidate genes to genome wide association studies. Pharmacogenomics facilitates the identification of biomarkers that can help physicians optimize drug selection, dose, and treatment duration and adverse drug reactions. In addition, pharmacogenomics can provide new insights into mechanisms of drug action and as a result can contribute to the development of new therapeutic agents. Here, I describe evolving policies pertinent to genetic and genomic research, the integration of genetics into clinical care, and the broader issues raised by genetic technologies and information.

OP-BT 16

EFFECTS OF BIOWEAPONS AND COMBATING BIOTERRORISM

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Bioterrorism refers to the intentional release of toxic biological agents to harm and terrorize civilians, in the name of a political or other cause. It was started in 14th century and still seen. Bioterrorism causing agents were classified into class-A, B, C. Class- A are the most dangerous of the 3 classes. Class-B is moderate and class-C was mostly seen. Few major diseases which are dangerous to human race were anthrax, small pox, CCHF, Swine flu etc. Anthrax was caused by Bacillus anthraces which was used as bioweapon by USA. Small pox was caused by virus Variola and it is an airborne virus which made it facile to use as bioweapon. CCHF was caused by Hayalloma tick. As it s an insect, cultivation of ticks was considered as a bioweapon. Swine flu was caused by H1N1 virus. As it is highly contagious it is a major bioweapon after anthrax and plague.Operation Bioshield was started by government of USA in 2004 to terminate bioterrorism.$5.6 billon were granted upto 10 years for medical supply.EUA gave access to best medical treatment. Biosurveillence is the best technology available till today to study and prevent the attack of bioterrorism as early as possible.

OP-BT 17

SIRTUINS

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Sirtuins, also known as Silent Information Regulator proteins, are an exclusive category of proteins possessing one of histone deacetylase and ribosyltransferase activity found in organisms ranging from bacteria to humans. Sir2 (whose homolog in mammals is SIRT1) was the first gene of the sirtuin genes to be found in yeast. The mammals have 7 sirtuins referred to as SIRT1-SIRT7, each having specific function. Sirtuins have been implicated in influencing aging and regulating transcription, apoptosis and stress resistance. The sirtuins have a catalytic domain, unique to this family, characterized by its requirement for nicotinamide adenine dinucleotide (NAD) as a cofactor. Sirtuin activity is inhibited by nicotinamide which binds to a specific receptor site, so the that drugs interfere with this binding should increase sirtuin activity and could provide an avenue for development of newer agents to treat degenerative diseases such as Alzheimer's, diabetes, atherosclerosis and gout. SIRT1 has emerged as a drug development target for treating age-dependent diseases. Sirtuins effect aging mainly by acting as calorie restriction (CR) mimetic and also by preventing death of old cells. Resveratrol is a natural compound found to be a potent sirtuin activator. It is reported to slow aging and age related problems in mice. The main aim of sirtuin biology is to elucidate the functions of all seven sirtuins and to screen different compounds for their ability to act as sirtuin modulators. If research is successful, man's long cherished dream of prolonged aging is fulfilled and cure to many geriatric diseases can be known.

OP-BT 18

IN-PROCESS QUALITY CONTROL TESTS FOR BIOLOGICAL PRODUCTS

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In process quality control is a process of monitoring critical variables of manufacturing process to ensure a quality of the final product. The main objectives of the in-process quality control are to minimize the intra batch and inter batch variability, to ensure the quality of final product and to ensure the implementation of GMP in manufacturing. Biological products like other drug products are used for the treatment, prevention or cure of disease in humans. In contrast to chemically synthesized small molecular weight drugs, biological products, are generally derived from living material such as human, animal, or microorganism and are complex in structure, and thus are usually not fully characterized. Biological products include vaccines, immune sera, toxoids, blood products, allergenic products and in-vivo diagnostics. Tests that are crucial for quality control but that cannot be carried out on finished products shall be performed at an appropriate stage of production. In order to determine the microbial contamination of the biological products sterility test is carried out either by using immersion method or membrane filtration. Apart from microbial contamination biological products should also be tested for absence of pyrogens and assay. In case of vaccines the in-process quality control tests include the inactivation test and freedom from abnormal toxicity. For blood products such as concentrated RBCs and whole human blood hemoglobin content should be determined. Thus in-process quality control not only provides a means of controlling production, it also performs a quality assurance function.

OP-BT 19

STEM CELL IN CANCER TREATMENT

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Cancer is a large, heterogeneous class of diseases characterized by uncontrolled division of cells and the ability of these to spread, either by direct growth into adjacent tissue through invasion, or by implantation into distant sites by metastasis. Statisticians estimate that over 10 million new cases of cancer have appeared worldwide, with over 7 million deaths in the year 2000. Moreover, the global incidence of cancer is expected to increase, with up to 16 million new cases and 12 million deaths expected in the year 2020.Cancer can be treated by surgery, chemotherapy, radiation therapy, immunotherapy, monoclonal antibody therapy and other methods. The choice of the therapy depends upon the location and grade of the tumor, the stage of the disease, as well as the general state of the patient. Complete removal of the cancer without damage to the rest of the body is the goal of treatment and to improve the quality of life of the people. Recent discoveries have witnessed the importance and the role of stem cells in the treatment of cancer. Stem cells are biological cells found in all multicellular organisms, that can divide through mitosis and differentiate into diverse specialized cell types and can self renew to produce more stem cells. They are immature cells found in the bone marrow, blood stream, and in umbilical cords which later develop into blood cells. These cells can be used in bone marrow transplantation and peripheral blood stem cell transplantation. Both of these procedures are used to restore stem cells that have been destroyed by a high dose of chemotherapy. These treatments can also be used for patients who have had a radiation treatment for their cancer. Stem cells are used in a type of cancer treatment called autologous stem cell rescue. A number of other stem cell therapies exist, but most of them are at the experimental stages. A lot of clinical trials are being conducted before the stem cell therapies are applied in the clinical setting. Stem cell research holds a great promise for improving human health by the control of degenerative diseases and restoration of damage to organs by various injuries. But at the same time it also raises several ethical and social issues such as destruction of human embryos to create human embryonic stem (hES) cell lines, potential for introducing commodification in human tissues and organs with inherent barriers of access to socioeconomically deprived and possible use of technology for germ-line engineering and reproductive cloning, which is termed as the stem cell controversy. The research in this field is therefore still on-going and needs to be regulated to strike a balance.

ONE DAY SEMINAR ON

" COMMUNICATION SKILLS AND RESEARCH METHODOLOGIES IN PHARMACEUTICAL SCIENCES "

NOVEMBER 06, 2011

PHARMACEUTICS
&
ADVANCE DRUG DELIVERY SYSTEMS

OP-PC 1.

MULTIPLE MARIX CONTROLLED RELEASE DOSAGE FORM OF VENLAFAXINE HCL PRODUCED BY NOVEL MASS EXTRUSION TECHNOLOGY

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The purpose of this study was to formulate and evaluate controlled release Venlafaxine Hcl minimatrices. HPMC K15M and Ethyl Cellulose were used as rate controlling polymers to prepare minimatrices. Minimatrices were evaluated for different parameters such as diameter, swelling property, water uptake, drug content, flow properties, percentage yield, moisture content, taste evaluation using taste panel. All the parameters were found to be in acceptable limits. The physicochemical compatibility of the drug with other excipients used in the formulations were studied by FTIR analysis. The results obtained showed no physicochemical incompatibility between the drug and other excipients used in the formulations. Minimatrices were also evaluated for *in vitro* drug release in pH 7.4 phosphate buffer for 24 hrs in USP Type II dissolution apparatus. In order to determine the mode of release, the data was fitted into various kinetic models. Optimization of HPMC and Ethyl Cellulose formulations was done based on the drug content and drug release of minimatrices.

OP-PC 2.

POLYMORPHISM IN PHARMACEUTICAL SOLID

Sai Krishma

Pharmaceutical companies, has recently faced many complex issues arising from polymorphism. Most of these issues are concerned with patent cases. For these reason it is essential that during drug product development close attention has to be paid to pharmaceutical polymorphism. Polymorphism is the ability of solid material to exit in more than one form or crystal structure. As a result of polymorphism molecules has different arrangement in unit cell of its crystal and thus display different physical property. Polymorphism has contributed too much variability in product performance in pharmaceutical, chemical and food industry and continues to pose a challenge to pharmaceutical scientist. Unexpected appearance or disappearance of polymorphic form may lead to serious pharmaceutical consequence. The thermodynamically stable polymorph is the only one that is guaranteed not to convert into another polymorphic form, but the disadvantage of this form is that it is least soluble polymorph and therefore has the lowest bioavailability, If thermodynamically stable polymorph is protected by patent the respective drug substance can be marketed as metastable form without obtaining a licence from the patent owner. The primary goal of any pharmaceutical company is selection of an active pharmaceutical solid form that will remain unaltered.

OP-PC 3.

ORODISPERSIBLE TABLETS

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The purpose of this research is to provide the patient with the most convenient mode of administration.There is a need to develop a fast disintegrating dosage form particularly one that disintegrates and dissolves in saliva and can be administered without water anywhere,anytime.such

formulations are known as MELT IN MOUTH TABLETS(MIMT). These tablets constitute an inventive dosage form that overcomes the problems of swallowing and provides quick onset of action.Extremely helpful in pediatrics and geriatrics. Nifedipine is a calcium channel blocker used as anti-anginal,anti arrhythmic and anti hypertensive agent but with extensive first pass metabolism and poor water solubility.Development of MIMT using super disintegrants like kyron and crosspovidone facilitates fast disintegration and good drug dissolution in oral cavity,thus bypassing first pass metabolism.

OP-PC 4.

PRODUCTION OF INCULIN-LOADED POLY(ETHYLENE GLYCOL) / POLY (LACTIDE) (PEG/PAL) NANOPARTICLES BY GAS ANTISOLVENT TECHNIQUES

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Insulin and insulin poly (ethylene glycol) (PEG) loaded poly (l-lactide) (PLA) nanoparticles were produced by gas antisolvent (GAS) CO2 precipitation starting from homogeneous polymer/protein organic solvent solution. Different amounts of PEG 6000.(0, 10, 30, 50, 100, and 200c/(PEG/PLA w/w) or concentration of 30% PEG/PLA with PEGs with different molecular weight (MW; 350, 750, 1900, 6000, 10,000 and 20,000) were used in the preparations, The process resulted in high product yield, extensive organic solvent elimination and amaintenance of > 80% of the insulin hypoglycernic activity. Nanospheres with smooth surface and compact internal structure were observed by scanning electron microscopy, the nanospheres presented a mean particle diameter in the range 400-600 nm and narrow distribution profiles. More than 90% of drug and PEG were trapped in the PLA nanoparticles, when low MW PEGs were used in the formulation, Where as the addition of high MW PEGs significantly reduced the loading yield. In all cases, in vitro release studies showed that only a little amount of drug was released from the preparations. However, formulations containing low MW PEGs allowed for a slow but constant drug release throughout 1500h, where as a burst was obtained by increasing the PEG MW. In conclusion, the GAS process offers a mean to produce protein-loaded nanoparticles processing the prerequisites, for pharmaceutical applications. The PEG added to the formulation was found to play a key role in the simultaneous solute precipitation phenomena and in determining the release behavior and the chemical-physical properties of the formulation.

OP-PC 5.

PULSATILE DRUG DELIVERY SYSTEM

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Pulsatile drug delivery system (PDDS) is the most interesting time and site-specific system. This system is designed for chronopharmacotherapy which is based on circadian rhythm. The principle rational for the use of pulsatile release is for the drugs where a constant drug release profile is required. Pulsatile drug delivery system is defined as the rapid and transient release of certain amount of molecules within a short time period immediately after a predetermined off-release periods. i.e. lag time. Some of the disease conditions wherein PDDS are promising include duodenal ulcer, cardiovascular diseases, arthritis, asthma, diabetes, neurological disorder, cancer, hypertension and hypercholesterolemia. Various systems like capsular systems, osmotic systems, pulsatile system based on the use of soluble or erodible polymer coating, use of rupturable membranes and pulsatile system based on membrane permeability are considered. These systems are beneficial for the drugs having chronopharmacological behavior where night time dosing is required and for the drugs having high first-pass effect and having specific site of absorption in gastrointestinal tract. Various techniques are available for the pulsatile delivery like pH dependent systems, time dependent systems, micro-flora activated systems, etc. Development of more "User-Friendly" dosage form ultimately increases dosing convenience for the patient.

OP-PC 6.

ROLE OF DEEP EUTECTIC SOLVENTS IN IMPROVING THE SOLUBILITY OF POORLY SOLUBLE COMPOUNDS

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Deep eutectic solvent (DES) is a new class of solvents typically formed by mixing choline chloride with hydrogen bond donors such as amines, acids, and alcohols. Most DES's are non-reactive with water, biodegradable, and have acceptable toxicity profiles. Eutectic mixtures are the cornerstone for solid dispersions to improving bioavailability of poorly soluble compounds. A simple eutectic mixture consists of two compounds which are completely miscible in the liquid state but only to a very limited extent in the solid state. When a mixture of A and B with composition E is cooled, A and B crystallize out simultaneously, whereas when other compositions are cooled, one of the components starts to crystallize out before the other. Solid eutectic mixtures are usually prepared by rapid cooling of the two compounds in order to obtain a physical mixture of very fine crystals of the two components. When a mixture with composition E, consisting of a slightly soluble drug and an inert, highly water soluble carrier, is dissolved in an aqueous medium, the carrier will dissolve rapidly, releasing very fine crystals of the drug. The large surface area of the resulting suspension should result in an enhanced dissolution rate and thereby improve bioavailability.

Deep eutectic solvents, mixtures of ammonium or metal salts such as choline chloride and hydrogen bond donors such as urea or glycerol, were exceptional low-cost, biodegradable alternatives to organic solvents for hydrolase-catalyzed reactions. These physical mixtures may be thought of as ionic liquids, because they share similar physical properties to those solvents. Though they are composed of potential denaturants such as urea or halide anions, deep eutectic solvents stabilize enzymes. This stabilization is likely due to a preference for intra-solvent hydrogen bonding compared to enzyme-solvent hydrogen bonding. Deep eutectic solvents enhanced enzyme activity for a number of lipases either as pure solvents for reactions such as transesterification or polyesterification; or as additives in aqueous reactions such as epoxide ring opening or ester hydrolysis. There is preliminary evidence that deep eutectic solvents may induce a conformational change in enzymes that can alter reaction rates. These changes appear to be distinct from those caused by denaturing.

DES's consisting of a choline salt (chloride or acetate form) and glycerol are biodegradable and inexpensive solvents for biocatalysis. They display excellent fluidity and high thermal stability. High transesterification activity and selectivity of immobilized subtilisin were observed in choline chloride/glycerol (1:2) containing 3% (v/v) water.

OP-PC 7.

DRUG DELIVERY TO BRAIN

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Delivery of therapeutic agents to the brain is limited by the presence of the Blood-Brain Barrier (BBB). Despite great strides in the basic science of brain physiology and disease in the past decade, delivery issues have received minimal attention. Current estimates are that 98% of all small molecule drugs minimally cross the BBB, and very low amounts of large molecule drugs cross the BBB, except leakage in areas of BBB dysfunction. This obstacle has slowed the application of pharmacotherapy and immunotherapy in brain diseases. In this presentation I review the major advances in brain drug targeting research in the last 5 years, including approaches to circumvent the BBB for brain delivery by making use of endogenous transport mechanisms or bypassing the BBB altogether. I also discuss the major unresolved problems in brain drug targeting, barriers to progress and important future areas of research.

OP-PC 8.

INHALED INSULIN

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Inhaled insulin is a new route of insulin delivery that can be used in d treatment of type-1 and type-2 diabetes. It offers an alternative and additional means of insulin administration, and has been received with particular satisfaction by patients who dislike injection. Trials include that inhaled insulin can be used effectively for pre-meal bolus intensification of treatment. Pre-meal inhaled insulin with Exubera has shown faster absorption and similar duration of action to regular subcutaneous insulin with an overall similar glucodynamic effects. The common side effect reported inhaled insulin, as with subcutaneous insulin, was hypoglyceameia. Increased antibody titres and change in lung function return to normal on discontinuation of inhaled insulin. Quality of life sources indicate patient preference for inhaled versus injected insulin, thus increased chaice may improve adherence to treatment regimens. However true cost: benefit analysis have to be undertaken as do studies in children, smokers and people with respiratory conditions, e.g asthma.

OP-PC 9.

ETHOSOMES

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In a transdermal drug delivery system skin acts as major target as well as barrier for drug penetration. Though this system has many advantages, the major obstacle is low drug diffusion rate across stratum corneam. Formulation of drug as elastic vesicles is one among several methods to enhance drug penetration rate. These elastic vesicles are termed as ethosomes. Ethosomes are soft, malleable vesicles tailored for enhanced delivery of active agents. Ethosomes are associated with benefits like enhancing drug efficacy, improving patient compliance, comfort and reducing the cost of treatment for the disease. Although ethosomal systems are conceptually sophisticated, they are characterized by simplicity in their preparation, safety and efficacy a combination that can highly expand their application. The increased permeation of ethosomes is probably due to its ethanolic content. Ethanol increases the cell membrane lipid fluidity which results in increased skin penetrability of the ethosomes. These ethosomes permeates inside the skin and fuse with cell membrane lipids and release the drug. Because of their unique structure, ethosomes are able to encapsulate and deliver through the skin highly lipophilic molecules such as cannabinoids, testosterone, andminoxidil, as well as cationic drugs such as propranolol, trihexyphenidil, Cyclosporine A, insulin, salbutamol etc. Ethosomes plays vital role in numerous fields like pharmaceutical, biotechnology, cosmetic, veterinary and neutraceutical markets.

OP-PC 10.

GASTRO RETENTIVE DRUG DELIVERY SYSTEMS

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In recent years scientific and technological advancements have been made in the research and development of controlled release oral drug delivery systems by overcoming physiological adversities like short gastric residence times and unpredictable gastric emptying times. Furthermore, absorption windows in the proximal gut can limit the bioavailability of orally administered compounds and can be a major obstacle to the development of controlled release formulations for important drugs. Methods to increase the residence time of drugs at or above the absorption window are discussed. Gastro retentive dosage forms are retained in the stomach for a longer period of time and thereby improve the bioavailability of drugs. Several approaches are currently utilized in the prolongation of the GRT, including floating drug delivery system (FDDS), also known as hydro dynamically balanced systems (HBS), swelling and expanding systems, bioadhesive systems, modified shape systems and high density systems.

OP-PC 11.

A REVIEW ON CURRENT NATURAL AND SYNTHETIC SUPERDISINTEGRANTS

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Immediate release oral solid dosage forms such as orally disintegrating tablets are usually formulated in order to provide safer, immediate and effective drug delivery to the patient. There is a need for proper selection of disintegrants or superdisintegrants and to know their performance when added in the formulation of orally disintegrating tablets. Superdisintegrants are usually added to the formulation of fast dissolving tablets in order to improve the efficacy of the dosage form and to obtain optimum bioavailability by reducing the disintegration time. Superdisintegrants are usually used in low concentration (1-10%w/w) in the solid dosage form. The objective of this review is to compare the functionality and the performance of different types of natural and synthetic commercially available superdisintegrants. This review may provide insight in to the selection of superdisintegrants according to the class of drug selected for the formulation of orally disintegrating tablets and also the mechanisms involved in the disintegration of the tablets by the addition of superdisintegrants. Apart form the natural and synthetic superdisintegrants novel co-processed superdisintegrants are also discussed.

OP-PC 12.

MOUTH DISSOLVING TABLETS

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Among the different routes of administration, the oral route of administration continues to be the most preferred route due to various advantages including ease of ingestion, avoidance of pain, versatility and most importantly patient compliance. Many patients find it difficult to swallow tablets and hard gelatin capsules and thus do not comply with prescription, which results in high incidence of non-compliance and ineffective therapy. Recent advances in Novel Drug Delivery System (NDDS) aim to enhance safety and efficacy of drug molecule by formulating a convenient dosage form for administration and to achieve better patient compliance. The swallowing problems are also common in some cases such as patients with motion sickness, sudden episodes of allergic attack or coughing and due to lack of water. To overcome these problems, formulators have considerably dedicated their effort to develop a novel type of tablet dosage form for oral administration i.e., one, which disintegrates and dissolves rapidly in saliva without the need for drinking water. This tablet disintegrates instantaneously or disperses in the saliva. Some drugs are absorbed from the mouth, pharynx and oesophagus as the saliva passes down into the stomach and produce rapid onset of action. In such cases, bioavailability of drug is significantly greater than those observed from conventional tablet dosage form. The concept of formulating mouth dissolving tablets offers a suitable and practical approach in serving desired objective of faster disintegration and dissolution characteristics with increased bioavailability while also showing easy and wide acceptance by patients.

OP-PC 13

EMULGELS- A SURROGATE APPROACH FOR TOPICALLY USED HYDROPHOBIC DRUGS

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A unique aspect of dermatological pharmacology is the direct accessibility of the skin as a target organ for diagnosis and treatment. The combination of hydrophilic cornified cells in hydrophobic intercellular material provides a barrier to both hydrophilic and hydrophobic substances. Within the major group of semisolid preparations, the use of transparent gels has expanded both in cosmetics and in pharmaceutical preparations. In spite of many advantages of gels a major limitation is in the delivery of hydrophobic drugs. So to overcome this limitation an emulsion based approach is being used so that even a hydrophobic therapeutic moiety can enjoy the unique properties of gels. When gels and emulsions are used in combined form the dosage forms are referred as emulgels. In recent years, there has been great interest in the use of novel polymers which can function as emulsifiers and thickeners because the gelling capacity of these compounds allows the formulation of stable emulsions and creams by decreasing surface and interfacial tension and at the same time increasing the viscosity of the aqueous phase. In fact, the presence of a gelling agent in the water phase converts a classical emulsion into an emulgel. Emulgels for dermatological use have several favorable properties such as being thixotropic, greaseless, easily spreadable, easily removable, emollient, no staining, water-soluble, longer shelf life, bio-friendly, transparent & pleasing appearance. These emulgel are having major advantages on novel vesicular systems as well as on conventional systems in various aspects. Various permeation enhancers can potentiate the effect. So emulgels can be used as better topical drug delivery systems over present systems. The use of emulgels can be extended in analgesics and antifungal drugs.

OP-PC 14.

PULSATILE DRUG DELIVERY SYSTEM

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Traditionally, drugs are released in an immediate or extended fashion. However, in recent years, pulsatile drug release systems are gaining growing interest. A pulsatile drug release, where the drug is released rapidly after a well defined lag-time, could be advantageous for many drugs or therapies. Pulsatile release systems can be classified in Multiple - pulse and single - pulse systems. A popular class of single-pulse systems is that of rupturable dosage forms .Other systems consist of a drug-containing core, covered by a swelling layer and an outer insoluble, but semipermeable polymer coating or membrane. The lag time prior to the rupture is mainly controlled by: (i) the permeation and mechanical properties of the polymer coating and (ii) the swelling behavior of the swelling layer. As is frequently found in the living body, many vital functions are regulated by pulsed or transient release of bioactive substances at a specific site and time. Thus it is important to develop new drug delivery systems to achieve pulsed delivery of a certain amount of drugs in order to mimic the function of the living systems, while minimizing undesired side effects. Special attention has been given to the thermally responsive poly (*N*-isopropylacrylamide) and its derivative hydrogels. Thermal stimuli-regulated pulsed drug release is established through the design of drug delivery devices, hydrogels, and micelles. Therefore Pulsatile drug delivery is one such systems that, by delivering drug at the right time, right place and in right amounts, holds good promises of benefit to the patients suffering from chronic problems like arthritis, asthma, hypertension.

OP-PC 15.

DRY POWDER INHALERS- A NEW APPROACH FOR NASAL DRUG DELIVERY

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Generally the drug product should contain the pharmacological activity with the pharmaceutical properties. The ideal characteristics for dosage forms are physical and chemical stability, ease of processing, accurate and reproducible delivery to the target organs and availability at the site of action. A Dry Powder Inhaler (DPI) is a device for respiratory tract infections that delivers medication to the lungs in the form of a dry powder. For the DPI, these goals can be met with a suitable powder formulation, an efficient metering system and a perfectly selected device of aerosols. The concept of using a device to disperse small powder particles for inhalation into the lung to give therapeutic effect is easy to grasp in a general sense. However, of the three most commonly used methods for delivering therapeutic agents to the lung in broad clinical use today (i.e.,nebulizers, powder inhalers and pressurized meter dose inhalers), powder aerosols are the latest of the three to be developed, partly due to the difficulty in manufacturing and reproducibly dispersing small, controlled amounts of fine particles. Most of the dry powder inhaler formulation encompasses micronized drug particles blended with larger carrier particles that promote the flow properties, reduce aggregation and help in dispersion. A combination of the physicochemical properties, particle size, shape, surface area and morphology affects the forces of interaction and aerodynamic properties, which in turn determine the fluidization, dispersion, delivery to the lungs and deposition in the peripheral airways. However the properties of free micronized powders often interfere with the drug handling and with drug delivery, reducing the dose consistency. DPI's are evaluated by the drug product characterization studies such as the in vitro dose proportionality, effect of patient dose, priming etc. The development of the new designs of the DPI is governed by the driving forces such as the regulatory and pharmacopoeial requirements, delivery systems for the new chemical entity, clinical factors and commercial factors.

OP-PC 16.

MEDICATED CHEWING GUM

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Chewing gums are mobile drug delivery systems. It is a potentially useful means of administering drugs either locally or systemically via, the oral cavity. In medicated chewing gum several ingredients are incorporated, e.g. Fluoride for prophylaxis of dental caries, chlorhexidine as local disinfectant, nicotine for smoking cessation, aspirin as an analgesic, and caffeine as a stay alert preparation. In addition, a large number of chewing gum intended for prevention of caries, xerostomia alleviation, and vitamin/ mineral supplementation are currently available. Medicated chewing gums are solid, single dose preparations with a base consisting mainly of gums that are intended to be chewed but not swallowed. Chewing gum can be used without water, at any time. The release of a drug from chewing gum is dependent upon its water solubility. Water soluble substances are released rapidly and completely from chewing gum and methods are available which retard their release from chewing gum to provide an extended release profile. Today improved technology and extended know how have made it possible to develop and manufacture medicated chewing gum with predefined properties. Consequently today chewing gum is a convenient drug delivery system, which is appropriate for a wide range of active substances.

OP-PC 17.

OCULAR DRUG DELIVERY SYSTEM

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Ocular drug delivery is primarily related with the treatment of ophthalamic diseases and it is one of the most intresting and challenging endeavours faced by the pharmacist. The Anatomy, physiology and biochemistry of the eye render this organ highly impervious to foreign substances. Static barriers (different layers of cornea, sclera, and retina including blood aqueous and blood–retinal barriers), dynamic barriers (choroidal and conjunctival blood flow, lymphatic clearance, and tear dilution), and efflux pumps in conjunction pose a significant challenge for delivery of a drug alone or in a dosage form, especially to the posterior segment. Major classes of the drugs that are administered through ocular route Miotics, Mydriatics/Cycloplegics, Anti-inflammatories, Anti-infectives, Surgical adjuvants, Diagnostics etc. There are different types of ocular dosage forms developed for ocular delivery which include mostly control release systems like non erodible (ocuserts, contactlenses, inserts),erodible(lacrisert,SODI,minidisc)liposomes and nanoparticles. Development of all these dosage forms is a big challenge faced by the pharmacists now days.

OP-PC 18.

SELF MICRO-EMULSIFYING DRUG DELIVERY SYSTEMS

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More than 60% of drugs being discovered are lipophillic in nature and have poor aqueous solubility, thereby posing problems in the formulation of delivery systems and suffer from poor bioavailability, low aqueous solubility and permeability, dissolution and/or release rate forms the rate limiting step in their absorption and systemic availability. Bioavailability problem of lipophillic drugs can be solved by formation of Self-Micro Emulsifying Drug Delivery System (SMEDDS). SMEDDS appears to be a unique and industrially feasible approach to overcome the problem of low oral bioavailability associated with the lipophillic drugs. Self-micro emulsifying formulations are mixtures of oils and surfactants, ideally isotropic, and sometimes containing co-solvents, which emulsify spontaneously to produce fine oil-in-water emulsion when introduced into aqueous phase under conditions of gentle agitation. The digestive motility of the stomach and intestine provide the agitation necessary for self-emulsification *in vivo*. SMEDDS are characterized for electro kinetic, physicochemical and *in vitro* release properties. SMEDDS is the promising strategy to improve the rate and extent of oral absorption of lipophillic drugs.

OP-PC 19.

AN OVERVIEW ON HANDLING OF COMPLAINTS AND RECALLS OF MARKETED PHARMACEUTICAL PRODUCTS

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Complaint and recall handling is an important tool for the maintenance of good manufacturing practices. "Complaint is defined as statement that is something wrong or not good enough, which shows customer dissatisfaction about the company and the product". A systematic procedure must be developed and implemented in order to register and investigate complaints and recalled products. The proposed handling system is in compliance with the GMP Guidelines of EU, USA and Brazil and is presented in four steps: Receiving complaints, Technical investigation, Corrective actions/feedback to customers, Monthly reports/trend analysis. The received complaints should be investigated based on the documentation available and laboratory analysis. They are classified as confirmed, non-confirmed and counterfeit/ tamper suspicion based on the degree of specifications followed. ''Recall'' means a firm's removal or correction of a marketed product that the Food and Drug Administration considers to be in violation of the laws it administers and against which the agency would initiate legal action, e.g., seizure. The recall process helps in the efficient removal of the affected product and helps in the safe guarding the public health. It involves the establishment of recall strategy, classification of drugs (class I, II and III) as per health hazard evaluation and by following a process approved by FDA. These systems help in analysis of root cause of problems leading to the generation of complaints and recalls of violating marketed pharmaceutical products.

OP-PC 20

A REVIEW ON QUALITY AUDITS IN PHARMACEUTICAL INDUSTRY

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Quality audit is the process of systematic examination of a quality system carried out by an internal or external quality auditor or an audit team. It is an important part of organizations quality management system and is a key element in the ISO quality system standard, ISO 9001.

Audits are essential management tool to be used for verifying objective evidence of processes, to assess how successfully processes have been implemented, for judging the effectiveness of achieving any defined target levels, to provide evidence concerning reduction and elimination of problem areas. For the benefit of organization, quality auditing should not only report non-conformances and corrective actions, but also highlight areas of good practice. In this way other departments may share information and amend their working practices as a result, also contributing to continual improvement. Audits may be Internal (first party audit) or External (second party audit and third party audit). First party audit is usually performed by the company (or a department within the company) upon itself. Second party audit is an audit of an organization's quality program not under the direct control structure of the auditing organization; it is conducted by customers on their suppliers. Third party audit is an assessment of an organization's quality system conducted by an independent, outside auditor or team of auditors. Thus, inspection and audits are important to control the principles of GMP in manufacturing plants during the entire supply chain of drugs.

OP-PC 21

HERBAL TRANSDERMAL PATCHES

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Many people in the world today take herbal medicines or herbal products for their health care in different national health-care settings. Safety is a fundamental principle in the provision of herbal medicines for health care, and a critical component of quality control.

The objectives of these guidelines are to:

- support Member States, in the context of the WHO International Drug Monitoring Programme, to strengthen national pharmacovigilance capacity in order to carry out effective safety monitoring of herbal medicines
- provide technical guidance on the principles of good pharmacovigilance and the inclusion of herbal medicines in existing national drug safety monitoring systems; and where these systems are not in place, to facilitate the establishment of an inclusive national drug safety monitoring system
- provide standard definitions of terms relating to pharmacovigilance, and safety monitoring of herbal medicines
- promote and strengthen internationally coordinated information exchange on pharmacovigilance, and safety monitoring of herbal medicines among Member States
- promote the safe and proper use of herbal medicines.

The guidelines were developed with the view that, within current pharmacovigilance systems, monitoring of the safety of medicines should be enhanced and broadened in ways that will allow the successful monitoring of herbal medicines. It is not the intention to suggest that different systems should be instituted for this purpose.However, in view of the unique characteristics of the provision and use of herbal medicines, there are several technical issues that need to be addressed if adequate and effective monitoring is to be introduced. The guidelines therefore identify the particular challenges posed in monitoring the safety of herbal medicines effectively and propose approaches for overcoming them. Special attention is also given to the reporting system for adverse reactions to herbal medicines, and to the analysis of the causes of the reported adverse reactions.

Currently, the majority of adverse events related to the use of herbal products and herbal medicines that are reported are attributable either to poor product quality or to improper use. Member States are, therefore, encouraged to strengthen national regulation, registration and quality assurance and control of herbal medicines, as well as to give greater attention to consumer education and to qualified practice in the provision of herbal medicines.

OP-PC 22

OCULAR DRUG DELIVERY SYSTEMS: CONVENTIONAL AND CONTROLLED DRUG DELIVERY SYSTEMS: AN OVERVIEW

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The pharmaceutical scientists on day to day basis are striving harder to provide a sophisticated formulation for better patient compliance on the basis of physicochemical and biochemical parameters. Ocular Drug Delivery Systems (OCDDS) are specialized dosage forms designed to be instilled onto the external surface of the eye (topical) , administered inside (intraocular) or adjacent (periocular) to the eye or used in the conjunction with an ophthalmic device. Drug delivery to posterior segment of eye is necessary in different ocular disorders and is challenging now a days. This study is carried out to summarize the details of different barriers in posterior segment of eye and advances of the OCDDS. This review includes characteristics of ophthalmic preparations, routes of administration, conventional and controlled drug delivery systems with newer approaches like particulate and vesicular systems, ocular drug delivery devices and various marketed products.

OP-PC23

NANOSUSPENSION TECHNOLOGY FOR POORLY WATER SOLUBLE DRUGS

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Poorly water-soluble drugs often exhibit variable bioavailability and bio-inequivalence due to its poor water-solubility leading to hurdles in formulation development efforts. There are number of formulation approaches like micronisation, solubilization using cosolvents, precipitation techniques etc., to resolve the problems of low solubility and low bioavailability. Each of them have their own limitations. Other techniques like micro emulsions, solid dispersions and inclusion complexes using cyclodextrins, even though showed increased solubility, are not applicable for drugs which are insoluble in both aqueous and organic media. The next development step is transformation of the micronized drug to drug nanoparticles and nanosuspensions. Nanoparticulate drug delivery system may offer plenty of advantages over conventional dosage forms which include improved efficacy, reduced toxicity, and enhanced bio distribution and improved patient compliance.

Nanosuspensions are sub-micron colloidal dispersion of pure particles of drug which are stabilized by surfactants. They can also be defined as a biphasic system consisting of pure drug particles dispersed in an aqueous vehicle in which the diameter of the suspended particle is less than 1µm in size.

Nanosuspension technology offers novel solution for such poorly soluble drugs. Nanosuspension consists of pure poorly water soluble drugs with or without any matrix material suspended in dispersion and can be surfactant free or comprise of surfactants or stabilizers or both. Nanosuspensions differ from nanoparticles, which are polymeric colloidal carriers of drugs (Nanospheres and nanocapsules), and from solid-lipid nanoparticles (SLN), which are lipidic carriers of drug. This review focuses on characterization, properties, method of preparations, formulation considerations and various applications in drug delivery systems of nanosuspensions.

OP-PC 24.

SOLID-SELF EMULSIFYING DRUG DELIVERY SYSTEMS (S-SEDDS)

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SEDDS are defined as isotropic mixtures of lipid/oil, surfactant, co-surfactant and drug substance that rapidly form a fine oil-in-water (O/W) emulsion/lipid droplets, ranging in size from approximately 100 nm, when exposed to aqueous media under conditions of gentle agitation or digestive motility that would be encountered in the GIT. In such system, the lipophilic drug is presented in solution, in small droplets of oil, leading to the elimination of the dissolution steep which can be the rate limiting step in absorption of poorly water soluble drugs.

A potential advantages of these systems include enhance oral bioavailability enabling dose reduction, more consistent temporal profiles of drug absorption, selective drug targeting toward a specific absorption window in the GIT, and drug protection from the hostile environment in the gut, control delivery pro-files, reduced variability including food effects, protective of sensitive drug substances, high drug pay loads.

SEDDS are generally encapsulated in either in hard or soft gelatin capsules. Lipid formulations however may interact with the capsule resulting in either brittleness or softness of the shell, to avoid this limitation, liquid lipid formulations could be transformed into free flow-ing powder by loading the formulation on a suitable solid carrier combines the features of a lipid based drug delivery systems and solid dosage forms. Thus, S-SEDDS combine the advantage of SEDDS, i.e., enhanced solubility and bioavailability, with those of solid dosage forms, for example, low production cost, convenience of process control, high stability and reproducibility, better patient compliance. SEDDS loaded powder however should have acceptable flow properties to facilitate capsule or tablet manufacturing in order to pass compendial limit for content uniformity and weight variation.

OP-PC IA

NANOTECHNOLOGY AND CANCER

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Nanotechnology refers to the interaction of cellular and molecular components and engineered materials, typically clusters of atom molecular fragment at the most elemental level. It plays a pivotal role in providing the technological power and tools that will enable the developing new diagnostics. It allowed for the control, manipulation, study and manufacture of structures and devices in the "nanometer" size range. The novel property of nanoparticles offers the ability to interact with complex cellular functions in new ways. Nanoparticle formulation have efficacy in treating solid tumors, and oral delivery of therapeutic proteins. Recent advance in drug delivery system hold great are used to deliver cancer drugs and other therapeutic agents like oncolytic virus, suicidal promise for improving cancer therapy. Nanoparticles, liposomes and carbon nanotubes gene, siRNA.This review summarizes the current progress on targeted drug delivery in cancer treatment. Anticancer drug resistances almost invariably emerge and pose major obstacles towards curative therapy of various human malignancies. It is anticipated that innovative nano vehicles will b develop which will harbor 4.major components: 1.A selective targeting moiety. 2. A diagnostic imaging aid for the localization of malignant tumors.3. A cytotoxic small molecule drugs on novel therapeutic biological, 4. A chemo sensitizing agent aimed at neutralizing a resistance mechanism, molecular "Achilles hill" of drug resistant. This targeted strategy holds promise in the introduction of highly effective nanoscopic vehicles for cancer therapeutics.

OP-PC 2A.

IONTOPHORETIC DRUG DELIVERY SYSTEMS

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The goal of delivery system is to get optimal therapeutic management.Several transdermal approaches have been used and recently there has been a great attention in using iontophoretic technique for the transdermal delivery of the medications,both ionic and non ionic.This technique of facilitated movement of ions across a membrane under the influence of an externally applied potential difference is one of the most promising physical skin penetrations enhancing method.The payback of using iontophoretic technique includes improved systemic bioavailability ensuing from bypassing the first metabolism.Variables due to oral adminstration such as pH,the presence of food or enzymes and transit times can all be eliminated.This article is an overview of the history of iontophoresis,mechanism,principles and factors influencing iontophoresis and its applications for various dermatological conditions.

OP-PC 3A.

NANOMEDICINE

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Nanomedicine is the medical application of nanotechnology. Nanomedicine ranges from the medical applications of nanomaterials, to nanoelectronic biosensors, and even possible future applications of molecular nanotechnology.

Nanomedicine seeks to deliver a valuable set of research tools and clinically useful devices in the near future . The National Nanotechnology Initiative expects new commercial applications in the pharmaceutical industry that may include advanced drug delivery systems, new therapies, and in vivo imaging. Neuro-electronic interfaces and other nanoelectronics-based sensors are another active goal of research. Further down the line, the speculative field of molecular nanotechnology believes that cell repair machines could revolutionize medicine and the medical field. Current problems for nanomedicine involve understanding the issues related to toxicity and environmental impact of nanoscale materials.

Nanomedicine is a large industry, with nanomedicine sales reaching 6.8 billion dollars in 2004, and with over 200 companies and 38 products worldwide, a minimum of 3.8 billion dollars in nanotechnology R&D is being invested every year. As the nanomedicine industry continues to grow, it is expected to have a significant impact on the economy.

OP-PC 4A

SELF MICRO-EMULSIFYING DRUG DELIVERY SYSTEMS

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More than 60% of drugs being discovered are lipophillic in nature and have poor aqueous solubility, thereby posing problems in the formulation of delivery systems and suffer from poor bioavailability, low aqueous solubility and permeability, dissolution and/or release rate forms the rate limiting step in their absorption and systemic availability. Bioavailability problem of lipophillic drugs can be solved by formation of Self-Micro Emulsifying Drug Delivery System (SMEDDS). SMEDDS appears to be a unique and industrially feasible approach to overcome the problem of low oral bioavailability associated with the lipophillic drugs. Self-micro emulsifying formulations are mixtures of oils and surfactants, ideally isotropic, and sometimes containing co-solvents, which emulsify spontaneously to produce fine oil-in-water emulsion when introduced into aqueous phase under conditions of gentle agitation. The digestive motility of the stomach and intestine provide the agitation necessary for self-emulsification *in vivo*. SMEDDS are characterized for electro kinetic, physicochemical and *in vitro* release properties. SMEDDS is the promising strategy to improve the rate and extent of oral absorption of lipophillic drugs.

OP-PC 5A

MICROSPONGE AS THE VERSATILE TOOL FOR DRUG DELIVERY SYSTEM

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Microsponge technology has been introduced in topical drug products to facilitate the controlled release of active drug into the skin in order to reduce systemic exposure and minimize local cutaneous reactions to active drugs. Microsponge consists of macroporous beads, typically 10-25 microns in diameter, loaded with active agent. When applied to the skin, the microsponge releases its active ingredient on a time mode and also in response to other stimuli (rubbing, temperature, pH, etc) that are used mostly for topical and recently for oral administration. Microsponge technology has many favorable characteristics which make it a versatile drug delivery vehicle. Microsponge Systems can suspend or entrap a wide variety of substances, and then be incorporated into a formulated product such as a gel, cream, liquid or powder. The outer surface is typically porous, allowing the sustained flow of substances out of the sphere. Microsponge delivery system (MDS) can provide increased efficacy for topically active agents with enhanced safety, extended product stability, enhanced formulation flexibility, reduced side effects and improved aesthetic properties in an efficient and novel manner. In addition these are non-irritating, non-mutagenic, non-allergenic, and non toxic. The present review introduces Microsponge technology along with its synthesis, characterization, programmable parameters and release mechanism of MDS.

OP-PC 6A

MICROSPHERES

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The term microspheres / microcapsules are defined as spherical particle ranging in size form 1 to 1,000µm containing a core substances these microcapsules was developed to reduce the frequency of drug administration case of dose adjustment and improve patient compliance present study discuss about role of polymers and development of microspheres, types applications of microspheres various methods of preparations like double emulsion, polymerization phase separation, spray drying, solvent technique etc, microspheres are also considered as the targeting drug delivery systems drug targeting is the delivery of drugs to receptors or organs of to any other specific part of the body this study also highlights characterizations techniques like particle size release characteristics and above evaluation method like drugs. Particle size, and size distribution, surface characterization, surface charge analysis, density, flow properties drug release profiles, surface area, porosity, hardness and friability, drug content, drug release profiles advanced techniques like interaction study by FTIR, surface topography by scanning electron microscopy, drug entrapment capacity, solid state by DSC/XRD. Microspheres received much attention not only for prolonged release, but also for targeting of anticancer drugs to the tumor. In future by combing various other strategies, microspheres will find the central place in novel drug delivery, particularly in diseased cell sorting, diagnostics, gene & genetic materials, safe, targeted and effective in vivo delivery and supplement as miniature versions of diseased organ tissues in the body.

OP-PC 7A

MICRO BALLOONS- AN OVERVIEW

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Micro balloons also known as hollow microsphears are one of the novel drug delivery systems. A micro balloon based drug delivery system can improve the bioavailability of the therapeutic agents by prolongation of gastric residence time in the stomach. The micro spheres tended to float on the stimulated gastric medium for over 12 hours. Most of the floating systems have an inherent drawback of high variability in the GI transit time, invariably affecting the bioavailability of the drug. To overcome it, a multiple unit floating system with extended GI transit time, capable of disturbing widely throughout the GIT for effective enteric release of the drug has been sought. Micro balloons loaded with the drug in the outer polymer shells were prepared by novel emulsion solvent method.

Micro balloons have a wide spectrum of applications. Apart from enhanced bioavailability PVA based micro balloons show a remarkable shelf life of several months. Their external surface can be incorporated with a number of biologically relevant molecules. These features together with the tested biocompatibility make them attractive candidates for use as multifunctional device for diagnostic and therapeutic purposes.

OP-PC 8A.

NANOBURRS: A NANO TARGETED DRUGDELIVERY AGAINST HEART DISEASES

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Nanoburrs are targeted nanoparticles that can cling to artery wall and slowly release medicine, an advance that provides an alternative to drug releasing stents in patients with cardiovascular disease. The particles are a sphere of 60nm diameter having a inner core containing a complex of the drug and polymer chain .The nanoburrs are coated with a short peptide sequence and are targeted to a specific structure of basement membrane of arterial wall which only exposed when the wall are damaged as in artherosclerosis and other inflammatory cardiovascular disease. The drug release is by ester hydrolysis of polymer and the rate of drug release is controlled by altering the chain length of polymer.It is found advantageous because it can release drug over a long period of time and injected intravenously. Patient would not have to go for repeated surgical invasive injection to the affected site.

Further test is going on to determine most effective dose for treating damaged vascular tissue .They may also be useful to deliver drug to tumors and is useful in disease like cancer and inflammatory disease where permeablity and vascular damage is common. It proved its usefulness for patients for whom a stent is not suitable.

OP-PC 9A.

TARGETED DRUG DELIVERY SYSTEM-MAGNETIC TARGETED CARRIERS

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Targeted drug delivery is a method of delivering medication to a patient in a manner that increases the concentration of the medication in some parts of the body relative to others. It concentrates the medication in the tissue of interest ,reducing the relative concentration of the medication in the remaining tissues. Thus improves therapeutic efficacy by reducing side effects. Targeted drug delivery can be used to treat most dreadful diseases like CARDIAC,DIABETES MELLITUS and CANCERS.MTCs (Magnetic Targeted Carriers) are Micro particles, composed of metallic iron and activated carbon, which serve as delivery vehicles for the site specific targeting,retention and release of drugs in a controlled and targeted manner. There are different types of MTC and they work with different mechanism and have wide range of application. Upto 60% of an injected dose can be deposited and released in a controlled manner in selected non reticulo endothelial organs. So magnetic targeted carriers were developed to overcome two major problems encountered in drug targeting namely RES clearance and target site specificity.

OP-PC 10A.

SUPRAMOLECULAR DRUG DELIVERY: AN OVERVIEW

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The main purpose of this presentation is to highlight the various applications of Supramolecular chemistry in pharmaceutical Industries. Supramolecular chemistry involves understanding of structural and chemical interactions between host guest systems, self assembling systems. Biomolecular systems have such fantastic properties in and of themselves. The main principle of supramolecular drug delivery is based on the concept of biomimetism of endogeneous transport systems such as lipoproteins to achieve efficient targeting. The self assembling principles of supramolecular drug delivery has found immediate applications in the development of bio and immuno sensors, non linear optics, photoresists, triple helical DNA, DNA tubes, Cage compounds that are expected to yield novel neutral networks and bio optic electronic devices. The role of supramolecular science in the life processes cannot be overlooked and the prospects for this type of drug delivery system seem to be limitless.

OP-PC 11A

DENDRIMERS

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Dendrimers are hyper branched, tree like structures and have compartmentalized chemical polymer. Dendrimer contain three different regions core branches and surface. The macromolecule constituents radiate in branching from the central core, creating an internal cavity as well a sphere of end group that can be tailored according to requirements. They can be tailored as modified into biocompatible compounds with low cytotoxicity and high biopermiability. They bear promising properties for delivery of bio active ranging from drugs, vaccines, metal and gens to desired site. Their hollow interior provides space to incorporate drugs and other bioactive agents physically or by various interactions to act as drug delivery vehicles. Most important application of dendrimers is solubilisation, gene therapy, dendrimers based drug delivery, immune assay and MRI contrast agent. Dendrimers is ideal carriers for drug delivery due to advantages like very low size (1-5nm) feasibility to develop with defined molecular weight, very low polydispersity index to number average molecular weight, good entrapment efficient drug delivery but their toxicity profile renders them not very popular system for use as delivery.

OP-PC 12A.

NANO EMULSIONS

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The use of nano technology in pharmaceuticals has grown over the last few years. Various nanopharmaceuticals currently being used are nanoemulsions (NE), nanosuspensions, nanospheres, nanotubes, nanoshells, nanocapsules, lipid nanoparticles and dendrimers. NEs are colloidal dispersions that are under extensive investigation as drug carriers for improving the delivery of therapeutic agents. NEs are thermodynamically stable, transparent dispersions of oil and water stabilized by an interfacial film of surfactant and cosurfactant molecules. NEs have a higher solubilization capacity than simple micellar solutions and their thermodynamic stability offers advantages over unstable dispersions, such as emulsions and suspensions. The novel formulations have potential applications in the treatment of diseases which are not cured by conventional mode of drug therapy. NEs are used in cancer treatment, drug targeting to organs such as brain, as a mucosal vaccine, as a vehicle for transdermal drug delivery and lipophilic drug, as a self-nanoemulsifying and solid self-nanoemulsifying drug delivery system. Extreme emulsification methods can be used to produce nanoemulsions and characterized for size, charge, rheological parameters, in vitro release and targeting potential. NEs show great promise for the future of cosmetics, diagnostics, drug therapies and biotechnologies.

OP-PC 13A

MICROCHIP FOR DRUG DELIVERY SYSTEM.

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Microchip are provided, which control both the rate and the time release of molecule. This allows release of wide variety of molecule in either continuous or pulsatile manner. The device consist of substrate containing multiple reservoir is capped with conductive membrane(gold) and wired with final circuitry controlled by microprocessor. Reservoir are etched into substrate using either chemical etching or ion beam etching techniques. Maximum reservoirs can be fabricated on a single microchip using microfabrication.The molecule to be delivered are inserted into reservoir by injection. The filled reservoirs can be capped with material that degrade or allow the molecule to diffuse out of reservoir over time or materials that oxidize and dissolve upon application of electric current. Release from an active device can be controlled by a preprogrammed microprocessor. This device is more dependable than the aforementioned devices that attempt to control drug release rate (i.e. electro-mechanical or polymer systems)

The microchip can be created by general microfabrication techniques and can also be self-contained, which eliminates the need for patient or doctor intervention. The proposed device described (assuming one dose per day) can last over a year; however, the delivery abilities do depend on patient need. Moreover, the flexible chip may offers advantages over conventional drug delivery devices by improvement of dosing precision, ease of operation, wider versatility of elution pattern, and better compliance. It is used in diabetes, Parkinson's disease, congestive heart failure, anti coagulation, tumor cancer and epileptic seizure, where drug is delivered can have a significant effect on its therapeutic efficacy.

OP-PC 14A

MAGNETIC MICROSPHERES

Mahathi

Magnetic drug delivery is a novel approach to delivery drug using engineered 'smart' micro carriers which appears to overcome a number of limitations facing current methods of delivering medicines. The drug and a suitable ferrofluid are formulated into a pharmaceutically stable formulation which is usually injected through the artery that supplies the target organ or tumor in the presence of an external magnetic field. The uses of particulate drug delivery systems cover all areas of Medicine such as cardiology, endocrinology, oncology, gynecology, immunology, pain management, molecular biology. Microsphere is already having an impact on products as diverse as novel foods, medical devices, personal health testing kits, chemical coatings, sensors for security systems, water purification units for manned space crafts, and high throughput screening techniques. This technology is based on binding establish between drug with ferrofluids that concentrate the drug in the area of interest by means of magnetic fields. There has been keen interest in the development of a magnetically target drug delivery system. These drug delivery systems aims 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.

OP-PC 15A

ELECTRONIC-TONGUE: AN ANALYTICAL GUSTATORY TOOL

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Taste is an important organoleptic property governing acceptance of products for administration through mouth. But majority of drugs available are bitter in taste. For patient acceptability and compliance bitter taste drugs are masked by adding several flavouring agents. Thus, taste assessment is one important quality control parameter for evaluating taste masked formulations. The primary method for the taste measurement of drug substances and formulations is by human panelists. The use of sensory panelists is very difficult and problematic in industry this is due to the potential toxicity of drugs and subjectivity of taste panelists, problems in recruiting taste panelists, motivation and panel maintenance are significantly difficult when working with unpleasant products. Further, non FDA approved molecules can't be tested. Therefore, analytical taste sensing multichannel sensory system called as electronic tongue (e-tongue or artificial tongue) which can assess taste, have been replacing the sensory panelists. Thus, e-tongue includes benefits like reducing reliance on human panel.

OP-PC 16A.

ROLE OF NANOTECHNOLOGY IN NOVEL DRUG DELIVERY SYSTEM

Pradeep

Nanotechnology is the engineering of functional systems at molecular scale. This covers both current work and concepts that more advanced. nanotechnology enhanced materials will enable a weight reduction accompanied by an increase in stability and an improved functionality. Biomedical nanotechnology, bionanotechnology and nanomedicine are used to describe this hybrid field. nanotechnology is on its way to make a big impact in biotech, pharmaceutical and medical diagnostic sciences. it is expected that the fourth coming generation of nano products will have target specificity, may carry multiple drugs, and could potentially release the payloads at varying time intervals the prefix nano refers to the one-billionth. The integration of nano material with biology has led to the development of diagnostic devices, contrast agents, analytical tools physical therapy applications and drug delivery vehicles. Nanotechnology can help to reproduce or repair damaged tissue .This is so called "***TISSUE ENGINEERING***" makes use of artificially stimulate cell proliferation by suitable nanomaterial based scaffolds and growth factors. tissue engineering might replace today's conventional treatments like organ transplants or artificial implants much of nanoscience and many nano technologies are concerned with producing new or enhanced material.

OP-PC 17A

HERBAL TRANSDRMAL PATCHES

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Transdermal drug delivery system is an integral part of novel drug delivery systems. Transdermal patches are polymeric formulation which when applied to skin delivery the drug at a predetermined rate across dermis to achieve systemic effects transdermal dosage forms, through a costly alternative to conventional formulations, are becoming popular because of their uniqe advantages .Controlled absorption ,more uniform plasma levels, improved bioavailability, reduced side effects, painless and simple application and flexibility of terminating drug administration by simple removing the patch from the skin are some of thepotential advantages of transdermal drug delivery.

Adhesive of the transdermal drug delivery system is critical to the safety efficacy and qality of the product, topical administration of therapeutic agents offers many advantages over conventional oral and invasive methods of drug delivery .Several important advantages of transdermal drug delivery are limitation of hepatic first pass metabolism, enhancement of therapetic efficiency and maintains of steady plasma level of the drug .

Though herbal drugs are highly effective with less side effects .The main drawback of herbal medicines is its stability, acceptability, quality and poor bioavailability to some extent which can be overcome by using this type of drug delivery system as the world is looking towards the herbal medicines.

Transdermal patches of gtn, fentanyl, nicotine ,and estrodiolare available in India .While those of isosobarbide dinitrate ,hyoscine and clonidine are available in other countries..these have been desinedto last for 1-7days in case of .they are become popular as they provide smooth plasma concentration of the drug without fluctuation.

OP-PC 18A

HERBAL NANO EMULSIONS

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Nanotechnology comprises technological developments on nanometer scale usually 0.1-100nm.Theuse of nanotechnology in pharmaceuticals and medicines has grown over the last few years.Herbal nanoemulsions are one of the improved version of nanopharmaceutical dosage forms for the delivery of biologically active agents for controlling drug delivery and targeting.Herbal nanoemulsions are submicron sized emulsions that under extensive investigation as drug carriers for improving the delivery of therapeutic agentes.Generally herbal nanoemulsion is composed of oil phase,water phase,surfactant and subsurfactant and these are thermodynamically stable isotropic systems in which two immiscible liquids(oil and water)are mixed to form a single phase by means an appropriate surfactant with droplets having the diameter nearly about 0.5-10μm.Some times the droplet sizes fall typically in the range of 20-200nm and show narrow distributions.The size of the emulsion particle has an impact on it target distribution.These are translucent to transparent liquids distributes in vivo in the targeted manner due to its affinity to lymph,in addition the drug can be sustained release in a long time and producing the herbal emulsions drug.Herbal emulsion will also strengthen the stability of drugs to the hydrolyzed meterials ,improve the penetrability of drugs to the skin and mucous and reduce the drug stimulates to tissues. These herbal nanoemulsions playing a wide role in the cancer treatmen t(eg.emuntum emulsion), as mucousal vaccine, anti-inflammatory (eg.triptolide emulsion), hepatoprotactive (eg.silybin nanoemulsion), antioxidant (eg.quercetin nanoemulsion) and hepatoprotactive (eg.zeodary nanoemulsion). Among this,these herbal nanoemulsions are going to a great future in cosmetic, diagnostic, drug therapies and biotechnology.

OP-PC 19A.

MICROENCAPSULATION OF HERBALDRUGS

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Herbal drug technology is used for converting botanical materials into medicines, where standardization and quality control with proper integration of modern scientific techniques and traditional knowledge is important. Microencapsulation means packaging an herbal extract inside a capsule ranging in size from one micron to several millimeters .the capsule protects the herbal drug from its surrounding environment until an appropriate time. The core must be isolated from its surroundings as in isolating vitamins. Herbal extracts usually has some problems like evaporation of a volatile core, improving the handling properties of a sticky material, or isolating a reactive core from chemical attack. The problems may be as simple as masking the taste or odor of the core, or as complex as increasing the selectivity of an adsorption or extraction process. Microencapsulation has many applications such as sustained (or) prolonged drug release, masking taste (or) odor of many drugs to improve patient compliance. This technique can be used for converting liquid drugs in a free flowing powder. Finally the micro encapsulation of herbal drugs can really help to overcome the problems related to herbal drugs and also help to give a modern look to give a modern look to the traditional drugs.

OP-PC 20A

HERBAL LIPOSOMES

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Liposomes are spherical, self-closed vesicles of colloidal dimensions (20nm-100nm in particle size) with a membrane composed of phospholipids bilayer. Herbal extracts can be either entrapped in the aqueous space or intercalated into the lipid bilayer of liposomes, depending on the physicochemical characteristics of drug. Liposomes can be made entirely from naturally occurring substances and are therefore non-toxic, biodegradable and immunogenic. Liposomes having amphiphillic character, so which are acts as a powerful solubilising system for a wide range of compounds. Which are also exhibits many special biological characters, including interactions with biological membrane and various cells. Liposomes can be filled with drugs and used to deliver drugs for cancer and other diseases. The use of liposomes for transformation or transfection of DNA into a host cell is known as lipofection currently, they are used as carrier of various substances between the outside and inside the cell. Some of these substances are drugs or cosmetics and even used for treatment of heavy metals poisoning, enzyme replacement, membrane studies and skin care.

Now a days herbal liposomes are also being formulated, the development of herbal liposomes helps us to reduce the dose, enhance the penetration of drug into cytoplasmic barrier not only this we have many advantages. So, for some herbal liposomes like quercetin liposomes, colchicin liposomes etc. are developed. This dosage form will deffinetly helps to raise the standards of herbal drugs.

OP-PC 21A

NANOROBOTICS

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Nanorobots are theoretical microscopic devices measured on the scale of nanometers (1nm=10^{-9}m) When fully realized from the hypothetical stage they would work at the atomic, molecular and cellular level to perform task in both the medical and industrial streams. These are planned to use inside the human body in the medical fields. These can be used to cure many diseases with negligible harm to the body. These are the sensitive to acoustic signals, therefore these can be programmed using the sound waves to perform the specified task.

To do all these things inside the body, the nanorobots can get the energy from the body itself. (in the form of heat produced inside the body or glucose or sugars which are present in the body itself).These nanorobots identify the particular harmful cells and try to quarantine. If not possible to quarantine it may destroy the harmful cell itself.

A major advantage of nanorobots is thought to be their durability. In theory, they can remain operational for years, decades, or centuries. Nano scale systems can also operate much faster than their larger counterparts because displacements are smaller; this allows mechanical and electrical events to occur in less time at a given speed.

OP-PC 22A

CHRONOPHARMACOKINETICS

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Absorption, distribution, metabolism and elimination are influenced by many different physiological functions of the body which may vary with time of day. Thus, the pharmacokinetic parameters characterising these different steps, conventionally considered to be constant in time, depend on the moment of drug administration. Time of day has to be regarded as an additional variable influencing the kinetics of a drug. Chronokinetic studies have been reported for many drugs in an attempt to explain chronopharmacodynamic phenomena and demonstrate that the time of administration is a possible factor of variation in the kinetics of a drug.

OP-PC 23A

FLOATING DRUG DELIVERY SYSTEM

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Oral administration is the most convenient and preferred route of administration. A problem frequently encountered with conventional CR dosage forms is the inability to increase their residence time in the stomach, and proximal portion of the small intestine. Therefore prolonged gastric retention is important in achieving control over the GRT because this helps retain the CR system in the stomach for a longer time in a predictable manner. Dosage forms that can be retained in the stomach for prolonged and predictable period of time are called gastro retentive drug delivery systems (GRDDS) .Therefore the real issue in the development of oral GRDDS is not just to prolong the delivery of drugs for 12 hours or more, but to prolong the presence of DDS in the stomach or upper GI tract until the entire drug is released. Thus GRDDS can improve the controlled delivery of drugs that have an absorption window by continuously releasing the drug for a prolonged period of time before it reaches its absorption site, thus ensuring its optimal Bioavailability.

OP-PC 24A.

SWIMMING ROBOTS IN MEDICINE

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Swimming robots are micro or nano robots that can swim when injected in to the body via vascular and digestive systems by using blood sugar as fuel. Its aim is to avoid invasive major surgery and enhanced diagnosis of disease. FDA granted an approval for the use of capsule endoscopy, which holds a capsular size camera. Then there, a work began to make a small micro robotic system, A micro robot was developed by a team of scientists at the Technion University which is led by Prof .Sylvain Martel demonstrated an automatically navigated untethered object in the blood vessels of living organisms. These perform their functions by using magnetotacter bacteria, in which magnetic fields are used. Because of small size they have no capacity to swim against the blood flow in larger vessels for this purpose the magnetic fields are used to transport them to the tumour and release the therapeutic medicament for treatment. When injected in to the body they will swim in the body. Their speed was controlled by using external magnetic field. They hold a pill cam which gives the complete picture of organ and there by providing information. By using external devices its directions were controlled and there by reaches the user desired site.Micro Robots Have promising applications in Eye, Brain- and Fetal surgery Treat arteriosclerosis.Examination of the g.i.t In the treatment of cancers and Gout. To break the kidney stones, Thoracoscopy. In Future there will be micro-robots that will be permanently implanted in our bodies and will be able to navigate to problematic points.

OP-PC 25A.

CUBOSOMES: BICONTINUOUS CUBIC CRYSTALLINE NANOSTRUCTURED PARTICLES

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Cubosomes are bicontinuous cubic liquid crystalline dispersed nanostructured particles that have stimulated significant research interest because of their potential for application in controlled-release and drug delivery. Cubosomes are nanoparticles but instead of the solid particles, cubosomes are self-assembled liquid crystalline particles of certain surfactant with proper ratio of water with a microstructure that provides unique properties of practical interest. The discovery of cubosomes is a unique story and spans the field of food science, differential geometry, biological membranes and digestive processes. One of the most common surfactants used to make cubosomes is the monoglyceride glycerol monoolein. Bicontinuous cubic liquid crystalline phase is an optically clear, very viscous material that has a unique structure at the nanometer scale. The word bicontinuous refers to the division of the two continuous but non-intersecting aqueous regions by a lipid bilayer that is contorted into a space-filling structure. Hydrating a surfactant or polar lipid that forms cubic phase and then dispersing the solid-like phase into smaller particles usually form Cubosomes. There is a lot of excitement about the cubic phases because its unique microstructure is biologically compatible and capable of controlled release of solubilized active ingredients like drugs and proteins.

ONE DAY SEMINAR ON

" COMMUNICATION SKILLS AND RESEARCH METHODOLOGIES IN PHARMACEUTICAL SCIENCES "

NOVEMBER 06, 2011

PHARMACOLOGY
&
CLINICAL PHARMACY

OP- CL 1.

SCREENING OF FREE RADICALS

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Exposure to various environmental, physical and chemical stress cells may lead to an over production of ROS (Reactive Oxygen Species) or a deficiency of antioxidant enzymes. ROS are responsible for various cellular anomalies like protein damage, deactivation of enzymes, alteration of DNA and lipid peroxidation which in turn leads to pathological conditions like carcinogenesis, reperfusion injury, rheumatoid arthritis, diabetes etc. The regular intake of antioxidants seems to limit or prevent the dangerous effects caused by ROS. Antioxidants are first line of defense against free radical damage and are critical for maintaining health and wellbeing. Antioxidants are capable of stabilize, deactivate or scavenge free radicals before they attack cells. Thus, to maintain cellular health, it is important to have a specific and effective antioxidant that scavenges multiple types of free radicals so that it can be used in multiple diseases. Different in vitro and in vivo test systems are available to assess the free radical scavenging activity of various compounds. So, the need for antioxidants becomes even more critical with increased exposure to free radicals. Screening the scavenging of free radicals in invivo conditions by antioxidants like reduced glutathione (GSH), superoxidedismutase (SOD), catalase (CAT), glutathioneperoxidase (GPx). Various methods available, which can be used to determine the different types of free radicals.

OP- CL 2.

NICOTINIC RECEPTORS

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Acetylcholine receptors (AChRs) like many other ligand-activated neurotransmitter receptors, consist of two major subtypes: the metabotropic muscarinic receptors and the ionotropic nicotinic receptors. They are activated by the endogenous neurotransmitter acetylcholine and are expressed by both neuronal and non-neuronal (muscular) cells throughout the body which are considered as sub types. Present review focuses on origin of nicotinic receptors through two natural oddities, The first was the finding that the electric organ of a fish that produces an electric pulse to stun its prey, such as *Torpedo*, expresses nAChRs and The second was the discovery of α-bungarotoxin (α-BGT), a component of krait snake venom that binds muscle-type nAChRs with near covalent affinity to inhibit their function and promote debilitating paralysis at the neuromuscular junction . It includes studies that combine genetic, protein, immunological, microscopic and functional assays which provide a view of structure of muscle nicotinic acetylcholine receptors. Neuronal nicotinic receptors form a heterogenous family of subtypes which are formed by five subunits arranged around a central pore that is permeable to cations. nAChRs are important in two crucial periods of brain life: early, pre and perinatal circuit formation and age related cell degeneration. Perturbation of nicotinic acetylcholine neurotransmission can lead to various diseases during development, adulthood and aging. The abnormalities of nicotinic receptors have major effect on CNS. There are many drugs which are used to get over these abnormalities. Recently, EnVivo pharmaceuticals has one drug candidate in clinical trials, EVP-6124, a selective α7 nicotine receptor agonist for Alzheimer's disease and schizophrenia and one follow-up compound, EVP-4473, that has successfully completed pre-clinical development.

OP- CL 3.

CHRONOPHARMACOLOGY

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Chronopharmacology is the investigative science concerned with biological rhythm dependencies of medications. Chronopharmacology is the branch of chronobiology. Chronopharmacology is useful to solve problems of drug optimization i.e. to enhance the desired efficiency or to reduce its undesired effects. In human organisms (among other animal species) the metabolic fate of a pharmacologic agent is not constant as a function of time, thus the chronobiological approach of pharmacologic phenomenon involves a lesser risk of errors and/or false information then the conventional homeostatic approach . Biologic rhythms not only impact the pathophysiology of the diseases, but also the pharmacokinetics and pharmacodynamics of medications.

Large scale clinical trials have shown that the efficiency and safety of certain conventional medications can be improved by dosing them with reference to the circadian time structure. Chronopharmacology has shown its efficiency in treating patients suffering from diseases that show their effect in accordance with a biologic rhythm such as asthma, cardiovascular diseases – hypertension, myocardial infarctions, angina and others like peptic ulcer and allergic rhinitis. The same medication doses when administered in the evening rather than morning need not have the same pharmacokinetic or efficiency of effect, thus chronopharmacology helps us to understand the effects of the body's rhythms or bodies biological rhythms on the behavior of medications. It is also observed that the principles of chronopharmacology are more applicable in ayurvedic treatment than in allopathic treatment.

OP-CL 4.

NOVEL SCREENING MODEL FOR ANTI-EPILEPTIC

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Epilepsy is a common chronic neurological disorder characterized by seizures. Seizures are episodes of abnormal electrical activity in the brain that cause involuntary movements,sensations or thoughts.seizures happen when clusters of nerve cells, or neurons, in the brain send out the wrong signals. People may have strange sensations and emotions or behave strangely. They may have violent muscle spasms or lose consciousness.Epilepsy has many possible causes,trauma,stroke,hypoxia. including illness, brain injury and abnormal brain development. In many cases, the cause is unknown. Seizure is caused by synchronous discharge of a group of neurons(focus) in the cortex.Activation of NMDA(N-methyl-D-aspartate) receptors increases calcium influx n NO2 synthesis.NO2then diffuses to presynaptic neuron and increases the release of glutamate via formation of cyclic guanosin monophosohate.Increased excitatory glutamate neurotransmission leads to long term potentiation.Long term potentiation is believed to facilitate a depolarising shift,characterisied by prolonged depolarisation with spikelets.The depolarisation shift can cause adjacent neurons to discharge synchronously and thereby precipitate seizure. These are the 4 models used for screening of Anti-Epilepsy 1.Maximal Electroshock seizure(MES) Test. 2.Kindled Rat Seizure Model. 3.Pentylenetetrazol(PTZ) Test. 4.Systemic Penicillin Test. Novel screening is the process where it is used to reduce the number of animals(preclinical trails)and it also provides a new experimental method for screening by using new species like flies,earthworms,mice etc. It is used for developing targets for therapeutic modalities. These are basically models of seizures rather than of epilepsy.These models are more closely approx human epilepsy and give oppurtunity to study genetic and biochemical basis of epilepsy. 1.Photo sensitive baboons 2.audiogenic seizure susceptible mice(seizure prone mice strains) In this model loud sound is used as stimulus to produce convulsions.DBA/2J mice an inbred strain of the house mouse (Mus musculus) is the most studied strain of audiogenic seizure mice.Generally mice b/w 2-4weeks exhibit sound induced seizures after which susceptibility gradually declines, such that by 8weeks of age they are totally free of audiogenic seizures. Mice between ages 2-4weeks were used and exposed to sudden,loud sound which contains frequency components 12-16KHz.The seizure pattern involves a wild running phase, followed by clonic convulsions and a tonic extension ultimately leading to respiratory arrest(in about 60%) or full recovery.Anti convulsant effect of drugs is evaluated by efficacy against clonic seizures. These seizures can be prevented by phenytoin,Phenobarbital or valproic acidAudiogenic seizure susceptible mice are useful as sensitive gross screening model for potential anti convulsant drugs.

OP- CL 5.

RECENT ADVANCES IN ALZHEIMER'S DISEASE (AD)

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Abstract:

Alzheimer's disease (AD) is a slowly progressive disease of the brain that is characterized by impairment of memory and eventually by disturbances in reasoning, planning, language, and perception. Many scientists believe that AD results from an increase in the production or accumulation of a specific protein (beta-amyloid protein) in the brain that leads to nerve cell death. The three major hallmarks in the brain that are associated with the disease processes of AD are Amyloid plaques, Neurofibrillary tangles (NFTs), Loss of connections between neurons responsible for memory and learning. AD is a complex disease, and no single "magic bullet" is likely to prevent or cure it. That's why current treatments focus on several different issues, including helping people maintain mental function, managing behavioral symptoms, and slowing AD. Commonly prescribed treatments include Cholinesterase Inhibitors, Memantine, anti anxiety, anti depression and anti psychotic drugs. More than 800 clinical trails were held for AD during August 2010, out of which 149 clinical trails were in phase III. Use of stem cells and effect of statins in the treatment of AD are being studied. Balanced diet, managing stress, body exercise, mind exercise, taking drugs and practicing a disciplined life style are the best methods to prevent AD.

OP- CL 6.

PAINLESS AND SCARLESS TREATMENT FOR BURNS - HEPARIN THERAPY

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Burns can be produced by fires, steam, water, subzero freezing, electricity, caustics and explosions. Depending on the temperature, duration and area exposed burns destroy increasing larger groups of cells because of blood clotting and inflammatory changes .inhalation of hot smoky air damages the lungs. This injury can be completely resolved by using heparin. Smoke inhalation is the leading cause of death from fires and this can be treated by using the aerozolised heparin. The body is able to heal small burns by itself. This theorized that perhaps these same methods might permit healing of larger burns if the detrimental punishment of surgery was avoided. The primary focus was directed toward finding therapies that would increase the blood flow to the burn site. Persons burning a finger are often observed to shake the finger vigorously. This increases the blood flow to the finger so healing gets started and the pain diminishes. The primary use of heparin relates to its ability to prevent clotting of blood. This results in stopping burn damage, easing pain and initiating the growth of normal healthy unscarred skin. This process proceeds in a painless manner until the old burnt skin is sloughed off like a snake sheds a skin. The use of heparin therapy has dramatically changed the course of severe burn therapy. Patients are now going home in a month instead of three months. There are no ugly permanent burn scars. Heparin is not expensive. The average cost per patient stay has fallen from hundreds of thousands of dollars for surgically treated burn to about one tenth this amount. Additionally, some severe burn patients are surviving what would have been fatal burns.

OP- CL 7.

GENETHERAPY IN HUNTINGTON'S DISEASE

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HD is a progressive neuro degenarative diseases that affects approximately 30,000 Americans this condition is caused by a genetic mutation on chromosomes which is inherited by approximately 50% of offspring. The Huntington gene normally provides the genetic information for a protein that is also called as "Huntingtin". The mutation of Huntington gene codes for a different form of the protein whose presence results in gradual damage to specific areas of the brain. In general there is no way other than genetic counseling if you have family history of HD. To some extent HD can be prevented by genetherapy .It is a technique in which simple virus are genetically modified to enable the insertion of gene into specific cells in the body, there by altering their biochemistry in a cutting edge technology. XIAP gene therapy can be effectively used to prevent HD. In this therapy presence of the mutant XIAP gene codes for a protein that inhibits caspase activity, thereby protecting brain nerve cells from premature cell death. In XIAP genetherapy HD is a lethal and untreatable inherited neurological disorders caused by a mutation in the huntington gene(htt).HD is caused by a pathological expansion of polyglutamine repeats in the Huntington gene(mhtt), resulting the eventual loss of predominately of striatal medium spinal nuerons although dysfunction and degeneration of other brain region can occur as well. A powerful cell protective gene is called XIAP is introduced into the brain. XIAP is the most potent number of a family of apoptosis inhibitor proteins, which is known to bind to and block the function of effector of apoptosis including caspases and mitochondrial cell death proteins.

OP-CL 8.

FREE RADICALS AND ANTIOXIDANTS IN HEALTH AND DISEASE

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Free radicals and related species have attracted a great deal of attention in recent years. They are mainly derived from reactive oxygen and nitrogen species. They are generated in our body by various endogenous systems, exposure to different physicochemical conditions or pathophysiological states. Free radicals can adversely alter lipids, proteins and DNA and have been implicated in aging and a number of human diseases. Lipids are highly prone to free radical damage resulting in lipid peroxidation that can lead to adverse alterations. Free radical damage to protein can result in loss of enzyme activity. Damage caused to DNA, can result in mutagenesis and carcinogenesis. Anti oxidants present in fresh and minimally processed foods are helpful to our health because they are able to provide the electrons that free radicals want. Once free radicals are neutralized by antioxidants, they become harmless and eliminated from our body. This talk explains the role of free radicals and oxidative stress in pathogenesis of various diseases and advancements made in developing antioxidant based therapeutics and also discuss the opportunities to develop therapeutics from traditional medicinal practice.

OP-CL 9.

APOPTOSIS

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Apoptosis is a form of programmed cell death involving a biochemical cascade mechanism comprising of proteins as Bcl-2, Bax, Apaf-1 or apoptotic protease activating factor-1, caspases (caspase-9, caspase-3, and caspase-7), as well as proteins involved in digestion, degradation of DNA, and phagocytosis. Apoptosis is a normal cellular process and is essential for the proper development and maintenance of the organism. Apoptosis is also necessary for the destruction of cells considered a threat such as cells infected with viruses, cells with DNA damage, cancerous cells, and cells of the immune system. The decision of a cell to undergo apoptosis are growth factors and interleukins such as IL-2 and negative signals that call for cellular suicide (eg, oxidative stress, DNA damage, improper protein folding, and specific molecules such as tumor necrosis factor (TNF-α and TNF-β), and the FAS ligand (FasL) that binds to the Fas receptor, or CD95. Apoptotic processes have widespread biological significance, being involved in development, differentiation, proliferation/homoeostasis, regulation and function of the immune system and in the removal of defective or harmful cells. Thus, dysfunction or dysregulation of the apoptotic program is implicated in a variety of pathological conditions. Defects in apoptosis can result in cancer, autoimmune diseases and spreading of viral infections; while neurodegenerative disorders, AIDS and ischaemic diseases are caused or enhanced by excessive apoptosis.

OP-CL 10.

INFLUENCE OF AN AYURVEDIC DRUG MADHUMEHARI ON THE PHARMACODYNAMICS OF GLIMEPIRIDE

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OP-CL 11

VITAMIN D AND DIABETES

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Vitamin D deficiency is newly recognized as a common condition of increasing prevalence worldwide. Clinically, Vitamin D has an established role in calcium and bone metabolism and has recently been shown to be associated with increased risk of developing type I and II DM and CVDs, as well as with cardiovascular risk factors such as hypertension and obesity. Vitamin D deficiency has been shown to impair insulin synthesis and secretion in humans and in animal models of diabetes, suggesting a role in the development of type II diabetes. Furthermore, epidemiological studies suggest a link between vitamin D deficiency in early life and the later onset of type I diabetes. In some populations, type I diabetes is associated with certain polymorphisms within the vitamin D receptor gene. In studies in non-obese diabetic mice, pharmacological doses of 1alpha, 25-dihydroxyvitamin D3, or its structural analogues, have been shown to delay the onset of diabetes, mainly through immune modulation. Vitamin D deficiency may, therefore, be involved in the pathogenesis of both forms of diabetes, and a better understanding of the mechanisms involved could lead to the development of preventive strategies.

OP-CL 12.

NEW APPROACHES IN CANCER TREATMENT.

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Major advances in cellular biology, genetics, pharmacology and immunology in the past decade are beginning to be translated into progress in cancer treatment. This progress is manifested by new cytotoxic drugs which have recently entered clinical practice (taxanes, topoisomerase I inhibitors, gemcitabine, vinorelbine, new purines), as well as the efficacy of monoclonal antibody therapies against the CD-20 antigen of B-cell lymphomas and the Her2/neu oncogene in breast cancer. Several new drugs in development are targeted at reversal or prevention of the multidrug resistance mechanism caused by expression of the MDR1 gene (P-glycoprotein). Tumour angiogenesis as a target is being studied in several early clinical trials. As with many other biological therapies, the evaluation of these compounds and their integration with standard therapies presents a major challenge to clinical investigators. The emerging field of genomics and gene expression micro-arrays will provide enormous information about the biology of cancers. This technology offers great opportunities for the discovery of new therapeutic targets, which should provide a basis for the design and evaluation of many new agents in the coming decade.

OP-CL 13.

IN VIVO EVALUATION OF ANTI- INFLAMMATORY ACTIVITY OF TERAMNUS LABIALIS

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Inflammation is the complex biological protective response of vascular tissue to harmful stimuli such as pathogens, damaged cells or irritants. The release of chemicals from WBC, increase the blood flow to the injured area and may result, in redness, warmth, swelling and pain. Teramnus labialis is a plant commonly known as mashaparni (Sanskrit), and mashavan (Hindi). It belongs to the family Fabaceae. The plant was evaluated for anti carcinogenic, antilipidperoxidative, anti ulcer, hepatoprotective, anti hyperglycaemic and immunomodulatory actions. The ethanolic extract of the whole plant is subjected for phytochemical analysis. The Flavanoids and Glycosides were separated and evaluated for Anti inflammatory activity. The isolated fractions were evaluated for anti inflammatory activity by carrageenan induced rat paw edema in wistar albino rats. The animals were divided into four groups containing 5 animals each, Group I (control), Group II and III (test 50mg/kg and 100mg/kg) and Group IV (standard diclofenac 25mg/kg p.o). The anti inflammatory activity was assessed by measuring the paw volumes of inflammatory paws at 0,1,2,3,4and 24hrs after administration of carrageenan. With a student physiograph (model no. PG-02,CNCO,Ambale India). The difference between initial and subsequent reading gave the actual edema volume. The test extracts (50mg/kg and 100mg/kg) had shown promising effect in reducing the carrageenan induced paw edema volume in rats when compared with vehicle treated group.

OP-CL 14

PHARAMACOLOGICAL TREATMENT OF OBESITY

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Obesity now presents one of the biggest health problems of our times. Diet and exercise are best for both prevention and treatment; unfortunately, both require much discipline and are difficult to maintain. Medications offer a possible adjunct, but their effect is modest, they are limited by side effects, and the weight loss lasts only as long as the drug is being taken, since as soon as treatment is stopped, the weight is regained. Considering that our knowledge on the physiological systems regulating food intake and body weight is considerably increased, many studies have underlined the scientific and clinical relevance of potential treatments based on management of peripheral or central neuropeptides signals by drugs.

Sibutramine, a sympathomimetic medication which was available for long-term treatment, is the most recent of the drugs to be withdrawn from the market due to side effects; in this case it was an increased risk of cardiovascular events. We review those medications which are available for treatment of obesity, including many of those recently taken off the market. And also discuss some of the newer treatments that are currently being investigated.

OP-CL 15.

ROLE OF GSK-3 INHIBITORS IN DIABETES MELLITUS

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Diabetes has emerged as most common metabolic disease characterized by increased blood glucose level. There are three main type of diabetes; type 1, type 2 and Gestational diabetes. Approaches to treat diabetes include drugs like sulphonylurease (Tolbutamide,chlorpropamide, Glibencamide), Biguanides (Metformin, Fenformin), Thiozolidinediols(Ciglitazones/ Troglitazones) and Glucosidase inhibitors (Acarbose). Glycogen Synthase Kinase (GSK-3) has been recently identified as potential target to treat type 2 diabetes. The activity is due to selective inhibition of conversion of glycogen into glucose. GSK-3 is one of the originally five kinases which was first identified by its activity to phosphorylate glycogensynthase and regulates glycogen metabolism. It is serine/threonine protein kinase that mediates the addition of phosphate molecule on certain serine/threonine amino acids. GSK-3 is a key regulator of glycogen synthase which converts glycogen to glucose. It also plays important role in the expression of gluconeogenic enzymes such as gluco-6-phosphatase and phosphoenolpyruvate carboxy kinase. Under healthy conditions insulin is able to inhibit GSK-3 and so during insulin resistant states GSK-3 activity is increased. Therefore several GSK-3 inhibitors have shown therapeutic activity in treating diabetes. Apart from the anti-diabetic activity, it has also been identified as potential target in Alzheimer's disease, stroke, bipolar disorders, chronic inflammatory process and cancer. The development of GSK-3 inhibitors thus holds considerable promise for numerous serious and unmet pathologies including diabetes, Alzheimer's disease, stroke and manic depression and are currently under pre-clinical trials.

OP-CL 16.

GLEEVEC-PROTEIN KINASE INHIBITOR THERAPY FOR CML

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Chronic myelogenous (or myeloid) leukemia (CML), also known as chronic granulocytic leukemia , is a cancer of the white blood cells. It is a form of leukemia characterized by the increased and unregulated growth of predominantly myeloid cells in the bone marrow and the accumulation of these cells in the blood. It is a type of myeloproliferative disease associated with a characteristic chromosomal translocation called the Philadelphia chromosome. In this translocation, parts of two chromosomes (the 9th and 22nd) switch places. As a result, part of the BCR ("breakpoint cluster region") gene from chromosome 22 is fused with the ABL gene on chromosome 9. abl carries a domain that can add phosphate groups to tyrosine residues (a tyrosine kinase), the *bcr-abl* fusion gene product is tyrosine kinase. Production of tyrosine kinase causes increase in rate of apoptosis, protects the cell from apoptosis. Gleevec {imatinib mesylate} act specifically inhibiting tyrosine kinase enzyme. BCR-ABL gene contains ATP site and the site for substrate to bind. When imatinib is used it binds in place of ATP and it prevents phosphorylation of tyrosine residues. The main advantage of using gleevec is it specifically targets an enzyme in cancer cells, not in normal healthy cells, well-tolerated, given orally instead of injections, minimal side effects compared to other treatments. It was found that gleevec is effective in treating ten different types of cancer.

OP-CL 17.

BRAIN PACEMAKERS

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Deep brain stimulation is a surgical treatment involving the implantation of a medical device called a brain pacemaker, which sends electrical impulses to specific regions of brain for treatment of movement disorders. Because of the small size of surgical target and possible shift of deep brain structures due to air invasion when dura is opened, intra operative adjustment of the surgical approach is often necessary. Knowledge about the position of the optic tracts gained from the intra operative measurements is useful for placement guidance. Then pre operative knowledge of the location of the optic tracts may not only help the placements and programming of the deep brain stimulation implant but also prove useful in estimating the intra operative brain shift.

OP-CL 18.

SEQUENCING "ORPHAN RECEPTORS" IN HUMAN NERVE CELLS.

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Orphan receptors are receptors bind to unknown chemicals. Almost every neuron consists of orphan receptors. A gene is "on" in a cell if its messenger RNA is present. To study gene activity in warm sensitive cells, scientists isolated single cells and extracted their RNA. They then made cDNA copies of the messenger RNAs and determined the sequence of the nucleotide bases in each cDNA molecule. By matching the DNA sequences obtained to published sequences, the scientists were able to identify the corresponding genes, and thus which genes are turned "on" in the nerve cells. The technique differs from commonly used methods for studying gene activity. Current techniques generally rely on searching for active genes using microarray which is a technique that relies on the preferential binding of sequences in the messenger RNAs /cDNAs to matching DNA sequences spotted on the microarray. Using single cells, rather than pooling, and sequencing, rather than microarrays, uncovers many more receptors active in neurons. By applying the new method scientists found more than 400 receptors responding to neurotransmitters, hormones, and other chemical signals.In addition to providing important insights into the complexity of nerve cells, the study has implications for identifying potential drug targets for diseases that currently have no treatments. This new way may be applied to finding hidden receptors in other types of nerve cells, expanding the repertoire of potential drug targets for diseases ranging from schizophrenia to Parkinson's disease.

OP-CL 19.

OBESITY

Mahesh

Obesity is a global epidemic disorder resulting from sedentary life styles, which affects all age and socioeconomic groups.Body Mass Index (BMI) is a simple index of weight for height that is commonly used in classifying over weight and obesity.WHO projects that by 2015,approximately 2.3 billlion adults will be over weight and more than 700 million be obese.Over weight and obesity lead to serious health consequences such as Cardiovascular diseases,Diabetes,Cancer of colon, gall bladder, prostrate,breast,uterus,cervix and kidney. The fundamental cause of obesity and overweight is an energy imbalance between calories intake and calories utilization. Phytotherapy complements the dietetic treatment of obesity by means of plants, which reduce appetite, activate the metabolism, then increase the assimilation of ingested calories.Some of the herbal plants, which are proven to possess anti-obesity property are *Garcinia cambogia,Glycyrrhiza uralensis,Gymnema sylvestre,Panax ginseng* etc.Guggul is a popular herb used in ayurveda for weight control.Green tea enhances the ability of the body to burn fat.Aloe vera juice improves digestion and cleanses the digestive tract. Bee pollen stimulates the metabolism and helps to suppress appetite. Neem, ginger, nutmeg, liquorice are used in preparation of kashayams,lehyams,for the use of obesity patients.

OP-CL 20.

CURRENT TRENDS IN CANCER DIAGNOSIS: TUMOUR BIOMARKERS

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Tumor markers are endogenous proteins or metabolites whose amounts or modifications are indicative of tumor state, progression characteristics, and response to therapies. They are present in tumor tissues or body fluids and encompass a wide variety of molecules, including transcription factors, cell surface receptors, and secreted proteins. Effective tumor markers are in great demand since they have the potential to reduce cancer mortality rates by facilitating diagnosis of cancers at early stages and by helping to individualize treatments. During the last decade, improved understanding of carcinogenesis and tumor progression has revealed a large number of potential tumor markers. It is predicted that even more will be discovered in the near future with the application of current technologies such as tissue microarrays, antibody arrays, and mass spectrometry. Understanding how and when biomarkers can be integrated into clinical care is crucial if we want to translate the promise into reality. In view of this, our presentation is focused in narrating the tumor markers selection, their role in diagnosis and the applications of presently available tumor biomarkers using tumor signaling pathways.

OP-CL 21.

ATTENTION DEFICIT HYPERACTIVITY DISORDER

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Have you ever had trouble concentrating, found it hard to sit still, interrupted others during a conversation or acted impulsively without thinking things through? Can you recall times when you daydreamed or had difficulty focusing on the task at hand?

Most of us can picture acting this way from time to time. But for some people, these and other exasperating behaviors are uncontrollable, persistently plaguing their day-to-day existence and interfering with their ability to form lasting friendships or succeed in school, at home and with a career.

Unlike a broken bone or cancer, attention deficit hyperactivity disorder(ADHD, also sometimes referred to as just plain attention deficit disorder or ADD) does not show physical signs that can be detected by a blood or other lab test*. The typical ADHD symptoms often overlap with those of other physical and psychological disorders. The causes remain unknown, but ADHD can be diagnosed and effectively treated. Many resources are available to support families in managing ADHD behaviors when they occur.

ADHD, also known as attention deficit disorder (ADD) or hyperkinetic disorder, has been around a lot longer than most people realize. In fact, a condition that appears to be similar to ADHD was described by Hippocrates, who lived from 460 to 370 BC. The name Attention Deficit Disorder was first introduced in 1980 in DSM-III, the third edition of the 'Diagnostic and Statistical Manual of Mental Disorders', used in psychiatry. In 1994 the definition was altered to include three groups within ADHD: the predominantly hyperactive-impulsive type; the predominantly inattentive type; and the combined type. ADHD usually appears in childhood but can be diagnosed in adults.

OP-CL 22.

HOMOCYSTEINE – A RISK FACTOR FOR CARDIOVASCULAR DISEASES

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Hcy is a sulphur-containing amino acid. Hcy is not contained in the protein or DNA, but is a metabolic intermediary derived from the essential sulphur containing amino acid, methionine. Hcy is in fact a health measure. There is an extraordinary connection between the quantity of Hcy and the patient's general state of health. The Hcy value is an indicator for both health and non-health factors such as exercise, smoking, coffee drinking, cholesterol, vitamins, etc. There are several factors that cause elevation of Hcy levels in blood. They are Vitamin B deficiency, enzyme (MTHFR) deficiency, renal dysfunction, some drug interactions, etc. The exact mechanism by which elevated Hcy causes atherosclerosis is still unclear. But it has some direct toxic effects that damage the cell lining inside arteries and promotes vascular inflammation and also have a synergistic effect with other risk factors. The individuals who are at risk of developing cardiac diseases or the patients with stated risk factors are advised to check Hcy levels and to adhere to physician's advise for Hcy lowering treatment if Hcy level is >15µmol/L. Life style changes and proper diet can also help to lower levels of Hcy.

OP-CL 23.

EFFECT OF FERULIC ACID ON LITHIUM/PILOCARPINE INDUCED STATUS EPILEPTICUS (SE) IN WISTAR RATS

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ABSTRACT

Objective:

It is well known that involvement of oxidative stress is one of the main causative factors for development of SE in Lithium Sulphate – Pilocarpine SE animal model. Recent studies demonstrated the protective effect of vitamin A, C and E on pilocarpine induced SE due to their antioxidant property. However, no study has been reported the protective effect of ferulic acid, a potent anti oxidant and neuroprotective agent on Lithium Sulphate – Pilocarpine induced SE.

Method:

Status Epilepticus was induced in Wistar rats of either sex by administration of Pilocarpine (3mg/kg, i.p.) 24hr after injection of Lithium Sulphate (3mEq/kg, i.p.). Ferulic acid (250mg/kg, i.p.) was administered 1hr before the injection of pilocarpine. The severity of status epilepticus was observed and recorded every 15min for 90min using Racine scoring system. Oxidative stress markers MDA, catalase and GSH were measured.

Results:

Administration of Lithium sulphate-pilocarpine significantly induced SE. Acute treatment with ferulic acid significantly ($p<0.05$) decreased the MDA, latency for SE but significant difference was not observed in the GSH and catalase levels.

In conclusion, present study suggests that acute treatment with ferulic acid moderately protected lithium sulphate-pilocarpine induced SE and there is need to study protective effect in chronic treated state.

OP-CL 1C.

CLINCAL TRIALS – INDIAN SCENARIO

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Clinical trials are the studies performed with human subjects to test new drugs, new approaches to surgery or radiotherapy or procedures to improve the diagnosis of disease and the quality of life of the patient. There were recent reports, in India, about 49 babies dead from clinical trials carried out by a foreign pharmaceutical company. Does this imply that we are being seen as Guinea pigs by the West? In our country there are allegations that the poor, illiterate and sometimes even the mentally challenged are being used for the clinical trials. It is more than likely that these individuals do not fully understand the implications of the procedures involved. But, in the year 2005, contract research in India was estimated at $100-120M, growing all the while at a rate of 20-25% each year. Outsourcing of clinical trials makes transfer of technology possible. This would help in advancing medical research and knowledge to find better cure for diseases. And enhance the financial conditions and clinical infrastructure of the country and new job opportunities to Pharmacy and medical professionals.

OP-CL 2C.

NECESSITY AND IMPACT OF MICRO DOSING IN CLINICAL STUDIES

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The micro dose (MD) clinical study enables to select a "better" compound for new drug candidate that shows desirable PK profiles in human. Along with a rapid progress in life sciences factors that cause various diseases have been understood and identified, which has accelerated the discovery and the development of new medicines that may enable the ultimate therapy of disease. This new methodology is highly expected to increase the success rate in the clinical trial. Since only a small amount of the test compound (less than 100 μg) is administered, the risk due to harmful effects is minimized in the MD clinical study. However, the low dose also incurs the arguments about the usefulness of this method, since it may result in different PK profiles of drugs. In addition, information on the efficacy/safety of the test compound cannot be obtained from study. On the other hand, Physiologically Based PK model analysis based on the data of both the MD clinical study and in vitro study on metabolism, transport and binding enables the accurate prediction of PK profiles in humans at the therapeutic dose. Positron Emission Tomography molecular imaging technology further enhances the usability and applicability of the MD clinical study by offering the information on efficacy/safety. These methodologies, if coordinated effectively, are expected to innovate the new drug discovery and development that enable the rapid creation of better drugs with in short span of time.

OP-CL 3C.

PRESCRIPTION PATTERN OF STATINS IN CARDIOVASCULAR DISEASE

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Statins are effective in both primary and secondary prevention of coronary heart disease (CHD), and other conditions. The present study is mainly focused on prescription pattern of statins in cardiovascular disease. However, prescriptions were collected from out-patient departments visiting different hospitals of Hyderabad, Andhra Pradesh, India. A total of 1000 prescriptions were collected out, of which 306 were included with the statins and were used for further analysis. The results show that males were prescribed more on statins therapy compared to that of females. Whereas, predominant age groups in these patients were found to be 60-70 yrs in males and 50-60 yrs in females. In addition to that, co-morbidities conditions for which statins were prescribed are CVD (279), diabetes (199), thyroid disorders (25), Osteoporosis (5) and renal insufficiency (6). The different statins prescribed are Atorvastatin (261), Rosuvastatin (26), Simvastatin (12) and Lovastatin (7). Our article suggests that, statins are first-line agents in most situations. These drugs are cost-effective in secondary prevention and high-risk primary prevention risk groups.

OP-CL 4C.

PHARMACOVIGILANCE

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Pharmacovigilance is the pharmacological science relating to the detection, assessment, understanding and prevention of adverse effects, particularly long term and short term side effects of medicines. Generally speaking, pharmacovigilance is the science of collecting, monitoring, researching, assessing and evaluating information from healthcare providers and patients on the adverse effects of medications, biological products, herbalism and traditional medicines with view to identifying new information about hazards associated with medicines preventing harm to patients.

The process of collection of such information about a drug begins in phase I of the clinical trial, before approval of the drug, and continues even after approval; several post-market safety studies are conducted, with many made mandatory by drug regulatory agencies around the world. Pharmacovigilance is gaining importance for doctors and scientists as the number of stories in the mass media of drug recalls increases.

Because clinical trials involve several thousand patients at most; less common side effects and ADRs are often unknown at the time a drug enters the market. Even very severe ADRs such as liver damage are often undetected because study populations are small. Postmarketing surveillance uses tools such as data mining of spontaneous reporting systems and patient registries, and investigation of case reports to identify the relationships between drugs and ADRs.

The purpose of clinical trials is to discover: if a drug works and how well, if it has any harmful effects, and its benefit-harm-risk profile - does it do more good than harm, and how much more. If it has a potential for harm, how probable and how serious is the harm.

Clinical trials do, in general, tell us a good deal about how well a drug works and what potential harm it may cause. They provide information which should be reliable for larger populations with the same characteristics as the trial group - age, gender, state of health, ethnic origin, and so on.

The variables in a clinical trial are specified and controlled and the results relate only to the population of which the trial group is a representative sample. A clinical trial can never tell you the whole story of the effects of a drug in all situations. In fact, there is nothing that could tell you the whole story, but a clinical trial must tell you enough; "enough" being determined by legislation and by contemporary judgements about the acceptable balance of benefit and harm.

OP- CL 5C.

PERSONALIZED MEDICINE

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Personalized medicine is a form of medicine that uses the patient's genomic information to improve diagnosis, prevention and therapy. Over the past century, medical care concentrated on standards of care based on epidemiological studies of large groups. However, large group studies do not take into account the genetic variability of individuals within a population. Personalized medicine is a rapidly advancing field of healthcare that is informed by each person's unique clinical, genetic, genomic, and environmental information. Because these factors are different for every person, the nature of diseases - including their onset, their course, and how they respond to treatment. Personalized medicine is not to be confused with "genetic medicine." Genetics is the study of heredity. It examines individual genes and their effects as they relate to biology and medicine. Genomic and personalized medicine aims to tackle more complex diseases, such as cancer, heart disease, and diabetes etc. for years believed to be influenced primarily by environmental factors and their interaction with the human genome.

Personalized medicine is not yet established, but a number of medical institutions now have personalized medicine programs, and many are actively conducting both basic research and clinical studies in genomic medicine. Today, scientists and doctors are learning how to tailor health care to a person's unique genetic makeup. That's the idea behind personalized medicine.

OP-CL 6C.

PHARMACOVIGILANCE

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Pharmacovigilance is the science that deals with the detection, assessment and prevention of adverse effects, which occur at normal doses of drugs prescribed in regular clinical practice. Although drugs are approved for clinical practice after controlled clinical trials, which are carried out by clinical professionals to demonstrate the efficacy and safety of a new drug on a selected number of patients, these patients normally do not represent the large population of patients who will receive the drug after its approval. Pharmacovigilance is the detection of effects which are unlikely to be detected during the controlled clinical trials because the number of patients involved in these trials are inadequate. Pharmacovigilance is also meant to detect interactions that might occur with concurrent drug therapy and other clinical conditions of the patient.

A pharmacist can play an important role in pharmacovigilance by monitoring, documenting and reporting the undesirable effects of the drug, adverse events, drug-drug interactions, food-drug interactions, and contra-indications that are likely to be produced by the drug in its course of being prescribed to larger patient populations.

OP-CL 7C.

A STUDY ON RATIONAL DRUG PRESCRIBING PATTERN IN GERIATRIC PATIENTS IN HYDERABAD METROPOLITAN

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OBJECTIVE : To describe rational drug prescribing in general practice for elderly patients, using patients age, sex, encounters of the occurrence of some inappropriate drug prescribing according to Beer's criteria, drug-drug interaction of common OTC drugs and WHO essential drug list.

METHODS : A retrospective study on rational drug prescribing patterns in geriatric patient was carried out using prescriptions issued to the geriatric patients, 65yrs and above, attending the outpatient and inpatient department of various hospitals, clinics of Hyderabad. The prescriptions were collected from December 2010 to February 2011 (i.e.) for a period of 3 months. A total of 150 prescriptions were analysed.

RESULTS: Out of the 150 prescriptions studied, 83(55.34%) belonged to males and the rest 67(44.37%) to females, giving a male to female ratio of 1:0.80. Antidiabetics were the most prescribed medicine (N=142, 15.58%), analgesics ranked second (N=129, 14.16%), cardiovascular drugs ranked third (N=120, 13.17%), vitamins/minerals occurred in 118(12.95%). Psychotherapeutic drugs occurred in 78(8.56%) of the prescriptions. Injectables gastrointestinal drugs, respiratory tract infection drugs & antibiotics were prescriptioned in 64(7.02%), 63(6.91%), 50(5.48%) & 33(3.62%) respectively. Average number of drugs per prescription was 6.07. Percentage of drugs prescribed as generics was found to be 10.09. 17(11.3%) prescriptions had one or more potentially inappropriate medicines from Beer's criteria. In 16(10.6%) prescriptions drug-drug interactions were ascertained according to drug-drug interaction of common OTC drugs.

CONCLUSION: Prescribing for the elderly was found to be suboptimal and there was occurrence of inappropriate prescribing. This calls for caution on the part of prescriber and pharmacists alike and also the need for awareness of tools that can be used by practitioners for detecting drug therapy problems.

OP-CL 8C.

BREAK THROUGH SOLUTION FOR NON- COMPLIANCE

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Non-compliance is the term applied to patients who do not follow their doctor's or pharmacist's instructions regarding their medications dosage, timing and continuation. It is a serious problem, because it can increase the possibility of therapy failure, adverse reactions and even patient fatalities. Pharmaceutical packaging has gone high tech, using technologies like printed electronics, RFID, and conductive inks to communicate not only with the patient, but also with his or her physician or other authorized healthcare organizations. They become intelligent by enabling pharmacists to communicate in different ways with a medicine's user, as well as for clinical trials where it is communicating numerous bits of information back to a research team. The OtCM™ technology: (electronic monitoring of patient compliance with oral medication) helps to improve compliance, which ensures benefits for everyone in the healthcare chain. The system includes self-adhesive OtCM™-activated Radio Frequency Identification (RFID) labels that are applied to any existing standard medication blister package. These labels record when a pill has been removed from its blister packaging. The compliance information can be read out with a mobile phone and transferred to a central database. The information can be sent wirelessly from the central database to caregivers and other involved organizations. Caregivers analyze the compliance data and offer feedback to the patient, in this way influencing the patient's behavior. The OtCM™ technology can also be used for transmitting outcomes data from a connected diagnostic device to the database, so that these outcomes can be correlated with the compliance data.

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