SOUVENIR

One-Day
National Seminar
On

Recent Advancement in Pharmaceutical Development and Technology in India

November 26, 2016

Organized by

Bengal College of Pharmaceutical Sciences and Research, Durgapur 713212. West Bengal, India

One-Day National Seminar
On

Recent Advancement in Pharmaceutical Development and Technology in India

From the Chief Patron's Desk

Shri S. K. Sharma

It gives us immense pleasure to extend a warm welcome to all the delegates and participants for the Seminar on "Recent Advancement in Pharmaceutical Development and Technology in India" at our institution, Bengal College of Pharmaceutical Sciences and Research, Durgapur on November 26, 2016.

Bengal College of Pharmaceutical Sciences and Research being one of the pioneer in the arena of pharmacy education in the eastern region, is always engaged in academic and research activities to propagate and uplift the profession of pharmacy in the eastern region of India. The main objective of the seminar is to focus on the present research trends and the developments in the field of Pharmaceutical Sciences and their applicability in pharmaceutical technology and drug therapy, which helps to inculcate not only sharing technical knowledge but also to express their innovative ideas. Fruitful exchange of knowledge and ideas is the need of the hour to ensure progress in the field of pharmaceutical sciences.

Shri Mayank Gautam

We are sure that the seminar would provide an ideal environment for promulgation of ideas between eminent scientists, academicians and the participants.

We wish this National Seminar a grand success.

Chief Patrons

Shri S. K. Sharma,Chairman SKSgi
Shri Mayank Gautam ,Vice-Chairman SKSgi

From the Convener's Desk

*It gives immense pleasure to welcome you all to the one day National Seminar on "**Recent Advancement in Pharmaceutical Development and Technology in India** at our Bengal College of Pharmaceutical Sciences and Research, Durgapur on November 26, 2016.*

It is heartening to know that the one day National Seminar is being organized with the objective to strengthen the current national scenario of drug research and development by offering a common platform to pharmaceutical scientists and researchers. I hope that this seminar would facilitate the national exploration on the recent advances in emerging healthcare vertical of pharmaceutical, field.

I convey my best wishes for grand success of this national event.

Convenor

Dr A. C. Ganguly
Director, Administration SKSgi

One-Day National Seminar
On

Recent Advancement in Pharmaceutical Development and Technology in India

Chief Patron:
Shri. S. K. Sharma
Shri. Mayank Gautam,

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Dr. A. C. Ganguli,

Chairperson
Dr. Arkendu Chatterjee,

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Mr. Partho Das

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Dr. Shyamshree S S Manna
Mr. Sujit Debnath; Mr. Pritam Roy;
Mr. Somenath Bhattacharya
Mr. Arin; Mr. Sandip

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Dr. Arghya K. Dhar; Mr. Raj Biswas;

Hospitality:
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Mr. Sabyasachi

Stage Decoration:
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Mrs. Chandrima Chatterjee

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Mr. Subhas

Media & Photography
Dr. Shyamshree S S Manna
Mr. Pratichha Prasad

From the Chairperson's Desk

It is indeed, a great honor and immense pleasure to organize the National Seminar on "**Recent Advancement in Pharmaceutical Development and Technology in India**" at Bengal College of Pharmaceutical Sciences and Research, Durgapur on November 26, 2016 and to present this abstract book for the seminar. I extend a warm welcome to all the delegates and participants for the Seminar.

I personally feel that the pharmaceutical science is one of the important branches of medical science and has the capability to fulfill all the demands of the society in health care system. Again, I must admire that number of individuals and organizational institute have contributed a lot to the success of this seminar. The abstract book contains useful information about the seminar, which will benefit to all the participants. The one-day deliberation and propositioning interactions of the expert with the fresh-minded young researchers and students will definitely blossom some fruitful results to the society, in general and to the pharmacy community particular.

I express my heartfelt gratitude to Chairman, Vice Chairman, and Director for giving the platform to achieve the above dream to be true.

On behalf of the organizing committee, I take this opportunity to express my sincere thanks to the invited speaker and delegates for the success of the seminar. At last, but not the least, I must express my sincere heartiest thanks to our faculties, supporting staff, students and all BCPSR family members for their untiring help in every aspects of the seminar, without whom it could not be possible to successfully complete this conference.

Chairperson

Dr. Arkendu Chatterjee

ORGANIZING COMMITTEE

Chief Patron:
Shri. S. K. Sharma
Shri. Mayank Gautam,

Convenor
Dr. A. C. Ganguli,

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Transportation
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Media & Photography
Dr. Shyamshree S S Manna; Mr. Pratichha Prasad

ABOUT THE SEMINAR

The aim of the seminar is to create awareness about latest development in field of Pharmaceutical education and research, and it will offer common platform for interaction with eminent academicians, leading researcher and leaders. Mostly scientists and other academicians in their relevant field in Pharmaceutical Research would deliver the lectures in the seminar. This seminar will encourage the students of Pharmacy to participate and present papers on latest happenings in the field of Pharmacy education and research, which will create and increase their awareness about the new development.

PROGRAMME SCHEDULE

	Time	Activity
26th November 2016	8.30-10.30 A.M.	**Registration**
	10.30-10.35 A.M.	Welcoming the Guest, Lamp lightening and Inaugural song
	10.40-10.45 A.M.	Inaugural speech by Prof. A. C. Ganguli, Director, SKSgi
	10.45-10.50 A.M.	Welcome address by Prof. A. Chatterjee, Principal, BCPSR
	10.50-10.55 A.M.	Felicitation of honorable speakers and Guest by Dr. P. Chakraborty and Mr. A. Gangopadhyay
	11.00-11.05 A.M.	Address by the Guest of Honor Prof. S. Bandopadhyay
	11.05-11.15 A.M.	**Tea Break**
	12.15 -1.15 P.M.	**Session by Prof. Biswajit Mukherjee, Department of Pharmaceutical Technology, Jadavpur University.**
	1.20:2.20 P.M.	**Lunch Break**
	2.30-3.30 P.M.	**Session by Dr. Sunil Kumar Brahmachari , Dean Academic & Students' Affairs, BCET, Durgapur**
	3.30-3.40 P.M.	**Tea Break**
	3.40:4.40 P.M.	Poster Session
	4.40:4.50 P.M.	Valedictory Session
	4.50-5.00 P.M.	Vote of Thanks by Mr. Prabir Kumar Dutta

BENGAL COLLEGE OF PHARMACEUTICAL SCIENCES & RESEARCH, DURGAPUR-713212

Bengal College of Pharmaceutical Science & Research was established in the year 2008 by SKS Educational and Social Trust, having an impressive campus is dedicated to develop and nurture pharmaceutical education and research. The campus gives an aesthetic and pleasant look where it will be our endeavour to produce the best graduates in learner-focused environment.

Durgapur, a brainchild of great visionary, Dr. Bidhan Chandra Roy, is an industrial metropolis of West Bengal, located about 180 K.M. from Kolkata. It is the home to the largest industrial unit in the state, Durgapur Steel Plant, one of the integrated steel plants of Steel Authority of India Limited. The splendid development of 60 years past independence has made Durgapur an extraordinary eco-friendly place where natural forest all around the city blend with sophisticated urban infrastructure. BCPSR has been located in the serene Bidhannagar area of steel city Durgapur. Durgapur is well connected to Kolkata, or for that matter, the Eastern region of the country both by Railway and by Road through the excellent Grand Truck Road (NH#02). Apart from taxies and auto rickshaws, one may board a bus of route 8B to reach BCPSR from the railway station. The institution is only 5 K. M. away from the Durgapur Railway Station. The obvious locational advantage of the institution in Durgapur makes it a think tank to reap the benefits of the institution-

Biography

Prof. (Dr.) Biswajit Mukherjee, M. Pharm., Ph.D., W.B.C.S., F.I.C., F.I.C.S., Professor in Pharmaceutics and Head of the department, the Department of Pharmaceutical Technology, Jadavpur University, Kolkata is a former DAAD (German Academic Exchange Services) Fellow, Germany and Ex-Guest Scientist, German Cancer Research Center (DKFZ), Heidelberg, Germany.

He is also the coordinator, AICTE-sponsored Quality Improvement Programme (QIP) Nodal cell (Pharmacy), Department of Pharmaceutical Technology Jadavpur University, Kolkata and Joint Coordinator, Centre for Advance Research in Pharmaceutical Technology, Jadavpur University. He is also the Convener, Animal Ethics Committee, Jadavpur University, Kolkata.

He is a former visiting fellow of the School of Pharmacy, University of London, London, UK and a former Indo-Hungarian Education Exchange Fellow, National Research Institute for Radiobiology & Radio hygiene, Budapest, Hungary. He is also a recipient of Finland government scholarship to work in University of Helsinki. He has worked as a guest Scientist in German Cancer Research Centre, Heidelberg after receiving the Overseas Research Associateship Award, Department of Bio-Technology (Govt. of India). He is also a former faculty of University Institute of Pharmaceutical Sciences, Punjab University, Chandigarh. He works on Antisense Technology and chemoprevention in cancer model. He has been working on novel drug deliveries particularly transdermal patches and nano-size liposomal and niosomal formulations as well as nanoparticles. He has supervised many projects of different funding agencies such as UGC, CSIR, ICMR, DST, DBT, DRDO etc., and guided numbers of PhD scholars and Master degree students. He has published his work in many international journals of repute. He has also written a few books and book chapters. He has few patents in process. He is in the editorial board of some international journals of repute. He is the recipient of UGC research award 2009.

He has received some other awards too. He became the co-chairman, Scientific Services Committee, LOC, 56th Indian Pharmaceutical Congress in Kolkata, India in the first week of December 2004. He is the secretary of Indian Association of Pharmaceutical Scientists and Technologists, Kolkata, India. He delivered an invited lecture in the **Presidential symposium** of 62nd Indian Pharmaceutical Congress at Manipal, Karnataka. Most recently, in October 2016, the Association of Pharmaceutical Teachers of India (APTI) has honored Prof. (Dr.) Biswajit Mukherjee, Prof. C. J. Shishoo award for Research in Pharmaceutical Sciences-2016 for his outstanding contribution in research in Pharmaceutical Sciences during the 21st Annual Convention "APTICON 2016" in the Golden Jubilee year of APTI.

Biography

Completing the Higher Secondary education securing a first division, Sunil Kumar Brahmachari had graduated and Completed his master's degree both under Burdwan University securing first and third positions in Biological sciences and Botany respectively in 1960s. He did his Ph.D. Under the guidance of late Professor Param Nath Bhaduri, Former Head of the Department, Dean of Science and Vice-Chancellor of Burdwan University in the discipline of Genetics and Plant Breeding under Botany.

His doctoral investigations were covering Radiation Biology under Plant Tissue Culture and induced Mutagenesis Studies for qualitative and quantitave Characters of Paddy. Through post doctoral and University level professional life research areas covered by him were on Plant Tissue Culture, Inheritance studies on crop plant's morpho-physiological characters of root system including applications of radio-tracer technique. His later stage interests had been on useful microbial bio-fertilizers particularly the PSBs (Phosphate Solublizing Bacteria) isolated from saline soils of coastal West Bengal. He had been single and joint author of above 30 research papers and reports and 12 original Bacteria registered by NCBI.

Professionally staring as lecturer level scientist at Bidhan Chandra Krishi Viswavidyalaya (BCKV), Mohanpur Nadia, he had been through professor level Teaching Scientific and adminisitrative Positions of Associate Director of Research, Registrar at BCKV and founder Vice-Chancellor of Uttar Banga Krishi Viswavidyalaya (UBKV). In the closing years he had been the Principal of Bengal College of Engineering at Durgapur and is continuing as Professor of Biotechnology and Dean. He had been member of academic & other authorities like member, University Court, NBU (Chancellor's Nominee) , National Committee on Agriculture, Committee of V. Cs of Hill Agricultural Universities, Association of Indian Agricultural Universities and as moderator

INDEX

PCB-1

EPISOMES AS VECTORS FOR GENE THERAPY

Kumari Nisha, Ritwik Misra

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Episome, a genetic element inside some bacterial cells, especially the DNA of some bacteriophages, that can replicate independently of the host and also in association with a chromosome with which it becomes integrated. The increasing knowledge of the molecular and genetic background of many different human diseases has led to the vision that genetic engineering might be used one day for their phenotypic correction. The main goal of gene therapy is to treat loss-of-function genetic disorders by delivering correcting therapeutic DNA sequences into the nucleus of a cell, allowing its long-term expression at physiologically relevant levels. Episome provides modern medicine with new perspectives that were unthinkable two decades ago. Progress in molecular biology and especially, molecular medicine is now changing the basics of clinical medicine. Manifold different vector systems for the therapeutic gene delivery have been described over the recent years. They all have their individual advantages but also their individual limitations and must be judged on a careful risk/benefit analysis. Integrating vector systems can deliver genetic material to a target cell with high efficiency enabling long-term expression of an encoded transgene. The main disadvantage of integrating vector systems, however, is their potential risk of causing insertional mutagenesis. Episomes as vector systems have the potential to avoid these undesired side effects, since they behave as separate extra chromosomal elements in the nucleus of a target cell. Within this article we present a comprehensive survey of currently available episomal vector systems for the genetic modification of mammalian cells.

Keywords: *DNA, Phenotype correction, Mutagenesis.*

PCB-2

A REVIEW ON PLANT TISSUE CULTURE

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Plant tissue culture is an important alternative means of propagation of plants in relatively shorter period of time. It is carried out in aseptic and favorable conditions on growth media using various plant tissue culture techniques. Tissue culture of a plant is based on the concept of the genetic ability of a plant cell for regeneration of plantlets in next offspring. The growth and biodiversity of the various traditional medicinal plants is under a continuous threat due to the loss of growth habitat and uncontrolled trade of medicinal plants. Many Endangered plants are tissue cultured by callus growth and somatic embryogenesis. So tissue culture is a best way to conserve the medicinal plant and also the mass production of the medicinal plants. Regeneration of plantlets can be done from explants by different techniques like callus culture, cell suspension culture and protoplast technology. The usefulness of these techniques is mainly used in the development of the disease resistant plant production, crop improvement and production of secondary plant metabolites etc.

Keywords: *Callus culture, somatic embryogenesis, cell suspension culture, protoplast technology and secondary plant metabolites.*

PCB-3

KINETIC AND THERMODYNAMIC ASPECTS OF A PROTEASE ISOLATED FROM THE LATEX OF ASCLEPIAS CURASSAVICA LINN

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This study was conducted toevaluate the kinetic (Km & Vmax) and thermodynamic parameters of a proteolytic enzyme. The proteolytic enzyme, named as Asclepain-C, was isolated from the latex of Asclepias curassavica Linn. Casein and hemoglobin were used as substrates for kinetic and thermodynamic study of the enzyme. Km values for casein and hemoglobin were found to be 4.8×10-4 and 3.63 × 10-4 respectively and Vmax values for the same substrates were found to be 0.038 and 0.033 respectively. The entropy change (ΔS) was found to be positive (+ve), which is the main factor in the unfolding of the enzyme. The enzyme yields a negative (-ve) ΔG in spite of the positive ΔH values in the cases of both the substrates. It was also found that isoelectric point of the enzyme to be pH 9.0.

Keywords: *Asclepias curassavica Linn; proteolytic enzyme; Km & Vmax; Casein; haemoglobin; isoelectric point.*

PCB-4

rDNA TECHNOLOGY AND IT'S ROLE IN HUMAN INSULIN PREPARATION

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Recombinant DNA is artificially created from two or more DNA incorporated into a single molecule. Genetic engineering, recombinant DNA technology, genetic modification/ manipulation and gene splicing are terms that are applied to the direct manipulation of an organism's gene. The development of these new technologies have resulted into production of large amount of biochemically defined proteins of medical significance and created an enormous potential for pharmaceutical industries. The biochemically derived therapeutics is large extracellular proteins for use in either chronic replacement therapies or for the treatment of life threatening indications. Recombinant DNA (rDNA) molecules are DNA molecules formed by laboratory methods of genetic recombination (such as molecular cloning) to bring together genetic material from multiple sources, creating sequences that would not otherwise be found in biological organisms. Recombinant DNA is possible because DNA molecules from all organisms share the same chemical structure. They differ only in the nucleotides sequence within that identical overall structure. The protein which is formed consists partly of β-galactosidase, joined to both the A and B chains of insulin. The A and B chains are then extracted from the β-galactosidase fragment and purified. The two chains are mixed and reconnected in a reaction that forms the disulfides cross bridges, resulting in pure humulin i.e. synthetic human insulin. Millions of people with diabetes now take human insulin produced by bacteria or yeast (biosynthetic insulin) that is genetically compatible with their bodies, just like the perfect insulin produced naturally in your body.

Keywords: *r DNA, Genetic engineering, β-galactosidase, Insulin, Humulin, Restriction endonuclease.*

PCB-5

GENE CLONING

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Gene cloning which is the act of making exact copies of a segment of DNA molecule that encodes a gene, this process is contrast to clone an entire organism, gene cloning uses recombinant DNA technology .Gene cloning helps to gain information about nucleotide sequence of gene and, to alter the gene's DNA sequence or combine different DNA molecules together. The ability to clone a gene is not only valuable for conducting biological research but also many important pharmaceutical drugs and industrial enzymes are produced from cloned genes. The process of gene cloning involves extraction of DNA from organism having gene of interest then this DNA is cleaved into gene size pieces by restriction enzyme. Bacterial plasmids are also cleaved by the same restriction enzyme. Afterwards , gene size DNA and cleaved bacterial plasmids are combined to form recombinant DNA vector .Then by the process of electroporation or heat shock the recombinant DNA is transferred into bacteria. Under suitable conditions bacteria grow into colonies, these colonies are called gene library. Then screening of gene library is done to identify the colony containing the gene of interest. In humans some rare diseases can be cured by gene cloning. Stem cell cloning can help in the treatment of incurable diseases like leukaemia, paralysis and Parkinson's. And many such organizations have come up where individual person can preserve their stem cells. The gene cloning technology which presently exist should be further improved, so that it can be more safe, effective target oriented and also cost effective.

Keywords: *Recombinant DNA technology, restriction enzymes, Bacterial plasmids, Electroporation.*

PCB-6

HYBRIDOMA TECHNOLOGY

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Hybridoma technology is used to produce a hybrid cell. These hybrid cells are produced by fusing B-lymphocyte with tumour cell and they are called as myeloma cells. Thus these hybrid cells have got the ability to produce antibodies due to the B- lymphocyte genetic material and also capacity to divide indefinitely in the culture due to the presence of tumour cell or myeloma cells involved in the production of hybrid cells. Therefore, these hybrid cells produced from hybridoma technology are cultured in laboratory or passaged or sub cultured using mouse peritoneal cavity and these cells produces monoclonal antibodies, and this technology is called as hybridoma technology. Hybridoma technology was first discovered by G. Kohler and C. Milstein during 1975. They were also awarded Nobel Prize along with N. Jeme in Physiology and Medicine field during 1984. B-lymphocytes are pre- programmed to respond to a single type of antigen or antigenic determinant, therefore they produce single type of antibody specific to the specific antigen. When an antigen reacts with B- lymphocyte receptors, lymphocytes divide rapidly and produce a clone of B cells, all these B cells produce antibodies against that specific antigen and this is called as clonal selection. That is B-lymphocytes produce only one type of antibodies which are specific to only one type of antigen or antigenic determinant. But fully differentiated antibody producing B-lymphocyte cells known as plasma cells does not divide. Hybridoma technology is a method for producing large numbers of identical antibodies. This process starts by injecting a mouse with an antigen that provokes in an immune response. A type of white blood cell, the B cell that produces antibodies that bind to the antigen are then harvested from the mouse. These isolated B cells are in turn fused with immortal B cell cancer cells, a myeloma, to produce a hybrid cell line called a hybridoma. The myeloma cell line that is used in this process is selected for its ability to grow in tissue culture and for an absence of antibody synthesis. In contrast to polyclonal antibodies, the monoclonal antibodies produced by hybridomas are all of single antigen specificity.

Keywords: *Clone, B-lymphocytes, monoclonal antibody.*

PCG-1

NOVEL MEDICINAL AGENTS FROM MARINE SOURCES

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In recent years, marine natural products have produced a significant number of drug candidates used for treating various diseases. Marine macro algae or seaweeds have been used as crude drugs in the treatment of iodine deficiency diseases, such as goiter, Basedow's disease and hypothyroidism. Some seaweed has also been utilized as sources of additional vitamins and in the treatment of anaemia during pregnancy. Various classes of drugs may be produced from these resources; they may include antiparasitic compounds, antimicrobial agents, anti-inflammatory compounds, anticancer, cardiovascular active substance, proteins and also various agrochemical compounds. A few isolated marine products and their analogues have already appeared in the market as therapeutic drugs or health food. This includes ω-3 poly unsaturated fatty acids (PUFA, cholesterol-lowering), Ara-C (Cytarabine, anticancer), Ara-A (antiviral), ziconotide (analgesic), Trabectidin (anti-cancer) etc. In spite of various importances it also contains some toxins like red tidetoxin, ciguatoxin, pallytoxin and other toxic compounds may exert some therapeutic effect along with some side effects like dinoflagellate toxins, a potential neurotoxin isolated from dinoflagellate species, responsible for neural paralysis and gastrointestinal problems of human beings.

Keywords: *Basedow's disease, Hypothyroidism, Anaemia, Antiparasitic, Antimicrobial, Anti-inflammatory, Toxins, Dinoflagellate toxins.*

PCG-2

HERBAL TREATMENT FOR BENIGN PROSTATIC HYPERPLASIA (BPH)

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Benign prostate hyperplasia, also called BPH, is a condition in men in which the prostate gland is enlarged and not cancerous. Its etiology and pathogenesis have not yet been clearly defined; however, it occurs mainly in older men. Therefore, the therapy strategy is controversial. BPH can be a progressive disease. Severe BPH can cause serious problems including renal insufficiency. Management of BPH has changed significantly in the last decade. α-blockers and 5α-reductase inhibitors are the most commonly used drugs. But Synthetic Drugs used in BPH have several side effects. However Herbal treatment has no side effects. Herbal remedies, such as Nettle Root, Saw Palmetto, Pygeum, Pumpkin seed oil, Abroma augusta, and other herbal drugs, have a long tradition for successful treatment of BPH. Very few drugs is available in the market and the existing drug which are used in BPH, do not cure the disease but give only symptomatic relief with lots of major side effect but when it is replaced by herbal therapy it shows maximum activity.

Keywords: *Benign prostate hyperplasia, renal insufficiency, α-blockers and 5α-reductase inhibitors.*

PCG-3

REVIEW ON DILLENIA INDICA L., THE PLANT HAVING MEDICINAL VALUE

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Traditionally used medicinal plants have been a source of relief in controlling different types of diseases throughout the globe. People living in rural areas of developing countries including India rely mainly on indigenous medicinal practice to get rid of various diseases. In our present study we have conducted an ethno botanical survey to collect information about the use of the plant Dillenia indica L. belonging to the family Dilleniaceae. Dillenia indica commonly known as Elephant apple (English), Chalta (Hindi), Chalita (Bengali), and Outenga (Assamese) is a native to southeastern Asia from India, Bangladesh, and Sri Lanka to southwestern China and Vietnam and south through Thailand to Malaysia and Indonesia. In India it grows widely in tropical forest in the western peninsula, Bihar, Sub Himalayan tract, Assam, Bengal and central and southern India. Chromatographic and spectrophotometric analysis of extract from different part of Dillenia plant reveals the presence of different alkaloids, glycosides, steroids, saponins, reducting sugar, tannins, triterpenoids and flavanoids. Lupeol group of tryterpene such as betulin, betulinaldehyde and flavanoid such as myricetin. The stem contains myricetin, isorrhmnetin, dillentin, glucosides, beta sitosterol and stigmasterol. Chief contents of the fleshy sepals are tannins, malic acid, arabinogalactone and glucose. Dillenia indica has several uses. Traditionally whole plant is used in case of fever, as an aphrodisiac, and also promotes virility. Decoction of it is used as universal antidote. Its root is used as prophylactic in cholera season, and ingredient of a medicine for burning sensation in the chest. Young bark and leafs are act as astringent. Leafs are also used for diseases like fever, constipation, dysentery, treatment of stomach ache, paste is applied on bone fracture, poultice is used on bleeding piles and decoction is used in skin disease and body pain. Fruit decoction is used for curing dandruff and checking falling of hairs and eaten to combat weakness. Ethanolic extract of whole plant exhibits antimicrobial activity against wide range of Gram positive and Gram negative bacteria and fungi. It is also believed that the plant has cytotoxic activity.

Keywords: *Ethanobotanical survey, extract, leafs, Dillenia indica, decoction, cytotoxic activity, antimicrobial.*

PCG-4

TRADITIONAL HERBAL DRUGS USED AS ANTICANCER AGENT

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This article has been made to review some medicinal plants used for the treating cancer disease. The plant sources of India are likely to provide effective anticancer agents. Herbs have a vital role in the prevention and treatment of cancer. Examples are provided in this review of promising bioactive compounds obtained from various plants with medicinal and other therapeutic uses. The photochemical exploration of these herbs has contributed to some extent in this race for the discovery of new anticancer drugs. In recent years owing to the fear of side effects people prefer to use of natural plant products for cancer treatment. This review also helps to summarize the diverse methodologies and various ways to evaluate the potential natural compounds having anticancer activity. Many natural products and their analogues have been identified as potent anti-cancer agents and day by day the anti-cancer property of various plants is being measured.

Keywords: *Medicinal plants, anticancer agents, bioactive compounds.*

PCG-5

KITCHEN PHARMACY: COMMON CHEMICALS & SUBSTANCES USED IN AND AROUND YOUR HOME

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The Kitchen Pharmacy describes individually the therapeutic value of common vegetables, fruits, flowers, spices and grains. It explains in simple terms how ailments were traditionally classified in order to prescribe the correct treatment. A wide selection of recipes made from natural resources is suggested to eat and enjoy, to drink, to soothe in the bath, with massage, to improve the hair and skin. Some plants, including red pepper, ginger, black pepper, garlic, etc. have developed chemicals substances secondary metabolites that can be considered vegetable toxins with the purpose of dissuading their predators from eating them because of the unpleasant taste. Cinnamon is at the top of my list for warming up and boosting the metabolism. Turmeric is used around the globe as an anti-inflammatory. Ginger is used as an anti-inflammatory, relieves pain, and is warming to the body. Like cinnamon, nutmeg is naturally sweet but nutty, and has antiviral properties as well. Cloves boost immunity, too, and are antiviral and anti-inflammatory. Garlic improves circulation and helps prevent blood clots, making it a natural choice for heart health. Garlic is an immune system powerhouse: it kills parasites, helps you heal, and is antibacterial and antiviral. Cardamom is another spice commonly used in curry dishes. It's actually a member of the ginger family. It's an antioxidant, and contains potassium, magnesium, and other essential minerals.

Keywords: *Cinnamon, Cardamom, Cloves, Garlic, Ginger.*

PCG-6

PHYTOCHEMICAL INVESTIGATION AND EFFECT OF ETHANOLIC EXTRACT OF POTENTILLA FULGENS ON ORAL MICROFLORA

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Almost everyone faces a dental problem at some point in their lives. Dental health encompasses the likelihood of making healthy choices in relation to diet, smoking, tobacco, oral hygiene and utilization of dental health services. Various lifestyle products are available in market to improve oral health in which toothpastes are most common and useful one. But toothpaste contains so many chemicals which on prolonged use may severely affect oral health. Now a day much attention is laid on herbal replacement of toothpaste which is superior in biocompatibility and medicinally more beneficial to the existing one. Neem, miswak, clove, bajradanti etc are among most preferred herbs for this purpose. In present study phytochemical status and antimicrobial action of Potentilla fulgens against oral microflora isolated from teeth of dental patient was studied and it was observed that the ethanolic extract of P fulgens was most effective in inhibiting growth of such bacteria's.

Keywords: *Organic Toothpaste, Antimicrobial Action, Microflora, Potentilla fulgens*

PCG-7

COMPARATIVE STUDY OF PHYTOCHEMICAL COMPOSITION AND ANTIOXIDANT'S POTENTIAL OF VARIOUS LEAVES AND SEED EXTRACT OF MORUS NIGRA

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Morus nigra is called the "King of Medicines" in Tibet and is always listed first in the Ayurvedic material because of its extraordinary power of healing with wide spectrum of biological activity. It has been used for various disorders related to abdominal, central nervous system, skin, heart, lungs, kidney, urinary bladder and many others. It is also given as adjuvant herb in chronic fever. The objective of the study was to determine the level of antioxidant activity in different extract of Morus nigra leaves and fruits. Dried leaves and fruit of Morus nigra were separately and sequentially extracted with four different solvents i.e., petroleum ether, ethyl acetate, methanol and distilled water in increasing polarity order using soxhlet extraction method and all the extract were tested for antioxidant activity by DPPH free radical scavenging assay. It was observed that in case of leaves the methanolic extract showed the best antioxidant activity. A low concentration of 0.5 mg/ml was sufficient to show a good DPPH radical scavenging activity. It showed an activity of 95.76% which is very close to the antioxidant activity of BHA (92.63%) at a concentration of 1.5mg/ml. In case of fruit the ethyl acetate extract showed the best activity i.e., 88.96%. Hence we can conclude that the leaves have a stronger antioxidant power than fruit and both leaves as well as fruits are very useful antioxidants.

Keywords: *King of Medicines, soxhlet extraction method, ethyl acetate extract, DPPH*

PCH-1

SIMULTANEOUS ESTIMATION OF DRUGS BY UV-SPECTROPHOTOMETRIC METHOD

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UV-Visible spectrophotometry is one of the most frequently employed techniques in pharmaceutical analysis. In qualitative analysis, organic compounds are identified by use of spectrophotometer, if any recorded data is available, whereas quantitatively it is used to ascertain the quantity of molecular species absorbing the radiation. The fundamental law that governs the quantitative spectrophotometric analysis is the Beer-Lambert law. The assay of single component sample, which contains other absorbing substances, is calculated from the measured absorbance by using one of three principal procedures, which includes use of standard absorptivity value, calibration graph and single or double point standardization. Simultaneously, for assay of substance/s in multi component samples by spectrophotometer, methods include Simultaneous equation method, Derivative spectrophotometric method, Absorbance ratio method (Q-Absorbance method), Difference spectrophotometry and Solvent extraction method. The present study is a detailed description on the analytical method which suits for different drugs using UV spectroscopy.

Keywords: *quantitative spectrophotometric analysis, standard absorptivity value, Q-Absorbance method.*

PCH-2

EVALUATION OF ASCORBIC ACID IN BRANDED SOFT DRINKS

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Ascorbic acid (Vitamin C) is a water-soluble, and used as antioxidant. It is important in forming collagen, a protein that gives structure to bones, cartilages, muscles, and blood vessels. It also aids in the absorption of iron, and helps to maintain capillaries, bones, and teeth. Many soft drinks and fruit juice contain this ascorbic acid. But many times label of these soft drinks does not contain Ascorbic acid. In the present study such type of branded soft drinks had been chosen and tested for the presence of Ascorbic acid. Diluted soft drinks titrated with 0.005 M I2 using starch paste as an external indicator to determine the content of ascorbic acid. Result reviled the presence of ascorbic acid in 3 out of 4 branded soft drinks. It contains 106-159 mg/200 ml in the soft drinks. This can fulfill the daily requirement of Vit-C in human body.

Keywords: *Soft drinks, water-soluble, antioxidant, external indicator*

PCH-3

GAS CHROMATOGRAPHY: A MORDEN ANALYTICAL TECHNIQUE

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Chromatography is special type of analytical technique which is use for the separation and identification of various pharmaceutical substances. There are various chromatographic technique are available in which one of the best chromatographic technique is G.C. This chromatography technique was first introduce by martin and Synge in G.C the separation take place due to difference in affinity of the substance towards the mobile phase, which is also known as carrier gas and liquid stationary phase. Here the principle of separation is based on partition coefficient of substances .different types of liquid stationary phases are available like propylene glycol, esters with high molecular weight etc and different types of carrier gases are nitrogen, argon hydrogen, carbon dioxide etc. In gas chromatography carrier gases passes through the column with samples and the separation take place due to different affinity towards stationary and mobile phase. The substance possesses greater affinity towards stationary phase will travels slower and solute less affinity towards stationary phase will travel faster so according to difference in their affinity different substances migrates at different rates through the column which causes the separation of different substances from their mixture. The substances are finally detected by detectors .there are various types of detectors are available like TCD, AID, FID, ECD and mass spectrometer. In modern pharmaceutical field G.C. plays an important roles for qualitative and quantities analysis of pharmaceutical substances.

Keywords: *Components, Parameters, Procedure, Uses.*

PCH-4

CHARACTERIZATION OF MILK IN DIFFERENT REGIONS OF DURGAPUR, BARDDHAMAN, WEST BEGAL

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Milk adulteration is a social problem. Consumption of adulterated milk causes serious health problems. Common adulteration is addition of water in milk. Many cases milk is adulterated with some preservative like formalin, boric acid, sodium bi carbonate. The other common adulterants that are added to milk are chalk powder, soap powder, starch, hydrogen peroxide and urea. In the present work milk samples were collected from different parts of Durgapur under Barddhaman district, West Bengal. They all tested for the type of adulteration. During analysis skim milk powder, a common additive was found in each sample, which generally added to increase the appearance and taste of milk. Other chemical substance like formalin also found, which were used to preserve the milk.

***Keywords**: Milk adulteration, analysis, formalin, sodium bi carbonate.*

PCH-5

SIMULTANEOUS SPECTROPHOTOMETRIC METHOD FOR ESTIMATION OF LEVOFLOXACIN HEMIHYDRATE AND ORNIDAZOLE IN COMBINED DOSAGE FORMS

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The use of first order derivative spectrophotometry allowed simultaneous determination of Levofloxacin hemihydrate and Ornidazole in fixed dose combination products. The absorbance values at 284.3 nm and 325.9 nm of first derivative spectrum were used for the estimation of Levofloxacin hemihydrate and Ornidazole, respectively without mutual interference. This method obeyed Beer's law in the concentration range of 10-28 µg/ml for Levofloxacin hemihydrate and 20-50 µg/ml for Ornidazole respectively. The absorptivity of the two drugs was calculated by measuring their absorbance at different concentration in 0.1N HCl at the above two maxima. The data was then put in the Cramer's equation and two simultaneous equations were setup. The absorbance of the test samples in the 0.1N HCl was measured at the above two maxima and putting the values in the simultaneous equation, concentration of the two drugs was calculated. To confirm our result a mean of three samples of the test sample was taken. Our result showed a good agreement between different data's. This is clear as the standard deviation was found to be very small (<0.01). Recovery studies confirmed the accuracy of the proposed method.

***Keywords:** Absorptivity, Beer's law*

CH-6

CHARACTERIZATION OF SOFT DRINKS IN PRESENCE OF PULSE AND HAJMOLA

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Now a day's soft drinks are common in parties or restaurants. These soft drinks are generally preferred for the people after heavy meal. Thereafter, these people used to take candy/chocolate to enrich the taste of mouth by willingly or by offer of shopkeeper in ex-change of money. Eating of candy with/after consumption of soft drinks leads serious eruption in your stomach which may led to death. This eruption is caused by a physical interaction, rather than any chemical reaction. The addition of these candy leads to the rapid nucleation of carbon dioxide gas bubbles from soft drinks, which commonly known as salting out effect. To demonstrate this four different branded soft drinks chosen, and tested for physical changes like pH and effervescence study in presence of Pulse and Hajmola. Result reviled excessive effervescence upon addition of Pulse and Hajmola and continues effervescence for several minutes. These effervescence increases internal pressure in the gastro intestinal track. Finally, there was a decrement of PH of the soft drinks after interaction, which may cause acidity.

Keywords: *Physical changes, candy, effervescence study.*

PCM-1

A REVIEW ON A DEADLY HAEMORRHAGIC FEVER (EVD) CAUSED BY A RNA VIRUS

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Ebola virus disease (EVD), formerly known as Ebola haemorrhagic fever is a severe, often fatal illness in humans. The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission. The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks. The first EVD outbreaks occurred in remote villages in Central Africa, near tropical rainforests, but the most recent outbreak in West Africa has involved major urban as well as rural areas. The incubation period, that is, the time interval from infection with the virus to onset of symptoms is 2 to 21 days. Humans are not infectious until they develop symptoms. First symptoms are the sudden onset of fever fatigue, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, symptoms of impaired kidney and liver function, and in some cases, both internal and external bleeding (e.g. oozing from the gums, blood in the stools). Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes. There's no cure for Ebola, though researchers are working on it. Treatment includes an experimental serum that destroys infected cells.

Keywords: *EVD, Symptoms, Precautions, Prevention, Treatment.*

PCM-2

HOW VULNERABLE OUR HEALTH SYSTEM IS TO THE ONSLAUGHT OF ANTIMICROBIAL RESISTANCE

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The discovery and development of antibiotics in the first part of the last century was one of the most important events in improving public health. It had great impact on and significantly affected the morbidity and mortality associated with major diseases. The heroic surgery and transplants possible now are, to some extent, due to the umbrella of protection from infection provided by appropriate use of these antibiotics. However, the rapidly growing demon of resistance of the microorganism to the available drugs and the slow pace of drug discovery in this area are rapidly exhausting options. Time is running out. Our window of opportunity to treat infectious diseases is soon closing. We are likely to come to an end of antibiotic era and may throw back to a period before penicillin when sore throats used to be fatal and patients undergoing surgery faced a high risk of mortality. It is necessary to act and act fast. Improving antimicrobial use must be a key action for contaminant. Improving use requires improving access and changing behavior, which is time consuming. National and local guidelines for antimicrobial use along with infection control policy are needed to prevent the emergence and spread of antimicrobial resistance.

Keywords: *Penicillin, Microbial Resistance, Surgery.*

PCO-1

A NATURAL ANTICANCER DRUG: CATHARANTHUS ROSEUS

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Catharanthus roseus, commonly known as Madagascar periwinkle, rosy periwinkle. It is belonging to the family of Apocynaceae. It is native and endemic to Madagascar, but grown elsewhere as an ornamental and medicinal plant. The active pharmaceutical constituents are mainly present in the flowering top of the plant which is mainly used for the extraction of active chemical constituents. The main active constituent's vincristine and vinblastine which are commonly known as Vinca alkaloids. These alkaloids inhibit cancer cell by its anti-mitotic and anti-microtubuler function. Vinca alkaloids are used in chemotherapy for cancer as a class of cell cycle–specific cytotoxic drugs that work by inhibiting the ability of cancer cells to divide by acting upon tubulin to prevent it forming into microtubules, a necessary component for cellular division. Vinblastine inhibits angiogenesis or the process by which new blood vessels grow from pre-existing ones. Vinca alkaloids are now produced synthetically and used as drugs in cancer therapy and as immunosuppressive drugs. These compounds include vinblastine, vincristine, vindesine, and vinorelbine. Additional researched vinca alkaloids include vincaminol, vineridine, and vinburnine. Vinpocetine is a semisynthetic derivative of the vinca alkaloid vincamine which is sometimes described as "a synthetic ethyl ester of apovincamine". Minor vinca alkaloids include minovincine, methoxyminovincine, minovincinine, vincadifformine, desoxyvincaminol, and vincamajine. These alkaloids are most often applied to treat Hodgkin's disease, non-Hodgkin's lymphoma, breast cancer, and germ cell tumors. All vinca alkaloids are administered intravenously (IV). They are eventually metabolized by the liver and excreted.

Keywords: *Vincristine, Vinblastine, Tubulin, Angiogenesis, Immunosuppressive, Vinpocetine.*

PCO-2

APHRODISIACS

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Aphrodisiacs can be categorized according to their mode of action into three groups: substances that increase libido (i.e., sexual desire, arousal), substances that increase sexual potency (i.e., effectiveness of erection) and substances that increase sexual pleasure. Sexual dysfunction is a serious medical and social symptom that is the inability to achieve a normal sexual intercourse, including premature ejaculation, arousal difficulties resulting from reduced libido, compulsive sexual behaviour, orgasmic disorders, and failure of detumescence. Impotence occurs in 50% of men with diabetes mellitus, Atherosclerosis (blocking of blood vessels by plaques) is the cause of 40% of erectile dysfunction in men older than 50 years& other conditions associated with erectile dysfunction include; High blood pressure, thyroid problems, increased cholesterol, Pelvic traumas etc, Aphrodisiacs are agents (food or drug) that arouses sexual desires.. Some well-known aphrodisiacs are ginko, ashwaganda, oysters and chocolate. Ethnobotanical surveys have indicated a large number of plants as aphrodisiac. The introduction of the first pharmacologically approved remedy for impotence, Viagra (sildenafil) in 1990s caused a wave of public attention, propelled in part by heavy advertisement. One major effect of abuse of Sildenafil (Viagra) is painful sustained erection (priapism). The use of aphrodisiacs like every other drug is contraindicated (not used) in the presence of certain disease conditions and thus should only be prescribed by physicians when the need arises. This review summarizes the experimental study, constituents and the potency of aphrodisiacs& the herbs can be an effective treatment of erectile dysfunction (ED); moreover isolation and identification of active ingredients from these plants can bring a dynamic change in the modern world.

Keywords: *Ethnobotanical surveys,, Herbal plants, Erectile dysfunction*

PCO-3

PARACETAMOL: BEYOND ANTIPYRESIS AND ANALGESIA

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Paracetamol is widely used worldwide for the treatment of pain and fever. Although classified as NSAIDs, the spectrum of effects is unlike to that of other NSAIDs. It is devoid of anti-inflammatory activity, gastrointestinal damage or untoward cardio-renal effects. Thus, the mechanism paracetamol has been a matter of debate. However, recent studies have indicated anxiolytic, antidepressant, anticonvulsant or anti-compulsive effects of paracetamol. This review brings out detailed mechanism of actions and its effects beyond analgesic and antipyresis.

Keywords: *Endocannabinoids, serotonergic system, COX-inhibitor, anandamide.*

PCO-4

ABOUT CANCER- A REVIEW

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Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. Not all tumours are cancerous; benign tumours do not spread to other parts of the body. Possible signs and symptoms include a lump, abnormal bleeding, prolonged cough, unexplained weight loss and a change in bowel movements. While these symptoms may indicate cancer, they may have other causes. Over 100 cancers affect humans. Carcinoma: Cancers derived from epithelial cells. This group includes many of the most common cancers, particularly in older adults. Nearly all cancers developing in the breast, prostate, lung, pancreas, and colon are carcinomas. Sarcoma: Cancers arising from connective tissue (i.e. bone, cartilage, fat, nerve), each of which develop from cells originating in mesenchymal cells outside the bone marrow. Lymphoma and leukemia: These two classes of cancer arise from cells that make blood. Leukemia is the most common type of cancer in children accounting for about 30%. However, far more adults develop lymphoma and leukemia. Germ cell tumour: Cancers derived from pluripotent cells, most often presenting in the testicle or the ovary (seminoma and dysgerminoma, respectively). Blastoma: Cancers derived from immature "precursor" cells or embryonic tissue. Blastomas are more common in children than in older adults.The drugs destroy any cancer cells that are still in the body after surgery or radiation therapy and help reduce the risk that the cancer will come back (recur).

Keywords: *Lymphoma Leukemia, Seminoma, Dysgerminoma*

PCO-5

SIGNAL TRANSMISSION AT SYNAPSE

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The nervous system helps to maintain homeostasis and responsible for our perception, behaviors, memories and initiates all voluntary movements. Neurons do not touch each other, the Electron microscopy and Electrophysiology techniques showed neurons were separated from each other by a 'synapse'. Plasma membranes of presynaptic & postsynaptic neurons are separated by synaptic cleft. The signal transmitted through this synaptic cleft. There are several steps by which a nerve impulse is transmitted from one neuron to another one, by the help of Calcium ion and neurotransmitters. Along with the neurotransmitters there is more important thing i.e. action potential. Signal transmitted through the excitatory and inhibitory neurotransmitters.

Keywords: *Excitatory neurotransmitters, Inhibitory neurotransmitters, homeostasis.*

PCO-6

EVALUATION OF ANALGESIC ACTIVITY OF LEAF EXTRACT OF BLUMEA FISTULOSA (ROXB) KURZ

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On the basis of the ethno-medicinal uses, the analgesic activity of the leaves extract of Blumea fistulosa (Roxb) Kurz was investigated. The extract was prepared using powdered leaves in absolute ethanol. It was then subjected to rotary evaporator under reduced pressure to get concentrated extract; different doses (300, 500 and 1000 mg/kg) were assessed for analgesic activity by tail immersion technique and acetic acid induced writhing test. Aspirin was used as standard drug (positive control) for comparison. Results of both tail flick method and acetic acid induced writhing test revealed that Blumea fistulosa leaves extract possessed varying degree of analgesic activity significant at 300 mg/kg and highly significant at 500 and 1000 mg/kg in comparison to control. In acetic acid induced writhing test, maximum inhibition of writhing was observed at 1000 mg/kg. Above findings suggest that Blumea fistulosa leaves extract possesses significant analgesic activity in albino mice with reference to positive and negative control groups; however further studies on a large number of animals with clinical trials are required to confirm safe and effective use of this leaves extract in humans.

Keywords: *Analgesic, Tail immersion, Acetic acid-induced writhing, Aspirin.*

PCO-7

LIVER CIRRHOSIS AND ITS TREATMENT

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Alcohol is most common substance abused. Liver cirrhosis is a major health care problem in India. Alcohol consumption is directly associated with liver disease mortality and accounts for increased social and economic costs. Alcoholic liver disease may take the forms of acute involvement (alcoholic hepatitis) or chronic liver disease (steatosis, steatohepatitis, fibrosis and cirrhosis). The severity and prognosis of alcohol- induced liver disease depends on the amount, pattern and duration of alcohol consumption, as well as on the presence of liver inflammation, diet, nutritional status and genetic predisposition of an individual. Cirrhosis is a liver disease characterized by extensive fibrosis with nodule formation and disruption of the liver architecture in an umbrella tremens compassing alcoholic liver disease, chronic hepatitis, primary biliary cirrhosis and cirrhosis of unspecified etiology. Cirrhosis is accompanied by regeneration of the liver substance with marked increase in fibrotic connective tissue and may be preceded by alcoholic fatty liver and/or alcoholic hepatitis. Alcohol dependence or abuse rates are higher for men than women and for non-blacks than blacks (though blacks have a higher rate of cirrhosis). Alcohol abuse presents serious public health or social problems, all of which are preventable. The present study is about the liver cirrhosis, its clinical presentation, to access the severity of liver cirrhosis, its complications and their treatment and overall demographical analysis along with awareness for cirrhotic patient.

Keywords: *Alcohol; Liver cirrhosis; alcoholic hepatitis*

PCO-8

ALOPECIA –ITS TREATMENT & MAINTENANCE

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Androgenic alopecia and alopecia areata are common disorder of the hair follicle which may heavily influence self-esteem and self-image. Androgenic alopecia is caused by the heightened sensitivity of scalp follicles to dihydro-testosterone whereas alopecia areata induced by an autoimmune reaction .The treatment of hair loss has been advanced mainly by two drugs– finasteride is a highly specific inhibitor of type 2 5 α reductase activity and is approved for the treatment of androgenic alopecia in men. Minoxidil is a nonspecific drug that is useful in men, women and in children with various conditions including androgenetic alopecia and alopecia areata. Future success in treating these and other problems of hair loss will be require continued research on the regulation of the hair- growth cycle and basic hair biology, the development of new therapeutic approaches , and the judicious use of existing drugs.

Keywords: *Alopecia, Minoxidil, Finasteride, Androgenic alopecia, Alopecia areata*

PCO-9

NON- INFECTIOUS DISEASES: A REVIEW

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In the today's scenario of human population all people are suffered from the diseases which are most oftenly caused by bacteria, viruses and fungi which are known as infectious diseases. As they are common so they can be easily treatable, but Non –infectious diseases are not caused by such agent they are mainly caused by environmental, nutritional deficiencies, lifestyle choices or genetic inheritances. They are not communicable or contagious. It has reported that in today out of 10 patients, 6-7 among them are suffered from NCD which are main causes of death. Major of them are diabetes, hypertension, heart attack and cancer. In this review project we have mentioned some important NCD, their sign and symptoms, causes, risk factor, diagnosis and treatment. There are several NCD but in this review project we have mention bone disorder, circulatory disorder, respiratory disorder, eye problem, ear disorder cancer are important. So if a people suffer among these diseases he immediately admitted to hospital, without taking self medication as it is very much harmful. NCD including cardiovascular diseases (CVD), cancer, diabetis, chronic respiratory disorder accounted for more than three-fifths (61%) of the estimated 58 million deaths worldwide in 2008-2009 and about half (46%) of global burden of diseases.

Keywords: *Non-communicable diseases (NCD), Bone disorder, Heart disorder, Diabetes, Hypertension*

PCO-10

CAN ANTIOXIDANT SUPPLEMENTATION COMBAT AGAINST THE PROCESS OF AGEING?

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Throughout history, scientists have sought strategies for warding off the seemingly inevitable processes of aging and death. In recent decades, the free radical theory of aging has shed light on the degenerative changes that occur, as people grow older. This theory holds that the body produces reactive, unstable agents known as free radicals during normal metabolism and following exposure to ultraviolet light or environmental toxins. While natural antidotes to these free radicals—internally produced antioxidants—are abundant in youth, their levels decline with age. The imbalance between free radicals and the antioxidants needed to inactivate, or "quench," those leads to a generalized state of oxidative stress that can damage lipids, proteins, DNA, and mitochondria throughout the body. In this review we are finding how antioxidant supplementations are useful to improve major outcomes of interest in older persons i.e., physical performance, muscle strength, longevity, etc.

Keywords: *Aging, Antioxidant, Oxidative stress, Free Radicals*

PCO-11

CANCER STEMS CELLS: AN ALTERNATIVE TREATMENT FOR CANCER

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Cancer stem cells (CSCs) have been defined as cells within tumor that possess the capacity to self-renew and to cause the heterogeneous lineages of cancer cells that comprise the tumor. They have been identified in blood, breast, brain, colon, melanoma, pancreatic, prostate, ovarian, lung cancers and so on. It is often considered to be associated with chemo-resistance and radio-resistance that lead to the failure of traditional therapies. The current treatment regimens for cancer have shown limited survival benefits when used for most advanced stage cancers, because these treatments primarily target tumor bulk but not cancer stem cells. Indeed, conventional cancer therapies target neoplastic cells that are largely fast-growing, suggesting that cancer stem cells may survive due to their high resistance to drugs and slower proliferation rate. All the traditional cancer therapies show a lack of efficacy in terms of long-term outcome because of their failure to target cancer stem cells and toxicity due to non-specific effects on normal cells. Eradicating CSC, the root of cancer origin and recurrence, has been thought as a promising approach to improve cancer survival or even to cure cancer patients. Understanding the characteristics of cancer stem cells will help to develop novel therapies to eliminate the initiating cancer stem cell, and the relevant patents on the CSC and cancer therapy by cancer stem cells will be discussed.

Keywords: *Cancer stem cell, therapy, neoplastic cells.*

PCO-12

CLINICAL TRIALS- A REAL WORLD APPLICATION OF THE SCIENTIFIC METHOD

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Clinical trials may be defined as the process designed to determine the safety and efficacy of a particular drug or device on humans. They are experiments done in clinical research. They are conducted only after they have received health authority/ethics committee approval in the country where approval of the therapy is sought. In Clinical Trials, researchers take the results from basic scientific research and translate them into ways to prevent, treat, or diagnose disease. Clinical trials aim to ensure the scientific validity and reproducibility of the results. Without them, we could not ensure safe, effective treatments for diseases. Clinical trials involving new drugs are commonly classified into five phases i.e. 0, I, II, III and IV. Each phase of the drug approval process is treated as a separate clinical trial. A clinical trial for any new drug follows under the guidelines of ICH and GCP; clinical trials are conducted in human volunteers for confirmation of useful properties of new drug. After preclinical development, investigational new drug passes through clinical phases I, II, III and IV. These phases provide in detail explanation of pharmacokinetic, pharmacodynamic profile and side effect which may be harmful or beneficial, adverse effect and post marketing surveillance.

Keywords: *ICH, GCP, trials, pharmacokinetic, pharmacodynamic profile.*

PCO-13

COMPARISON OF IN VITRO MODELS OF DIABETIC NEPHROPATHY USING RENAL TUBULAR CELLS

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Diabetic nephropathy is the major cause of end-stage renal failure throughout the world in both developed and developing countries. Diabetes affects all cell types of the kidney, including endothelial cells, tubule-interstitial cells, podocytes and mesangial cells. During the past decade, the importance of podocyte injury in the formation and progression of diabetic nephropathy has been established and emphasized. However, recent finding provide additional perspectives on pathogenesis of diabetic nephropathy. Glomerular endothelial damage is already present in the normo-albuminuric stage of the disease when podocyte injury starts. Genetic targeting of mice that cause endothelial injury leads to accelerated diabetic nephropathy. Tubulo-interstitial damage, previously considering being a secondary effect of glomerular protein leakage, was shown to have a primary significance in the progression of diabetic nephrology. Emerging evidence suggests that the glomerular filtration barrier and tubule-interstitial compartment is a composite, dynamic entity where any injury of one cell type leads to the dysfunction of the whole apparatus. Accumulation of novel knowledge would provide a better understanding of the pathogenesis of diabetic nephropathy, and might lead to a development of a new therapeutic strategy for the disease.

Keywords: *Normo-albuminuric stage, Podocyte, Tubulo-interstitial compartment.*

PCO-14

ROLE OF DIURETICS IN THE MANAGEMENT OF HYPERTENSION: AN UPDATE

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Hypertension is a common condition associated with increased mortality and multiple morbidities. Evidence based management of hypertension is known to improve both the short term and the long term outcomes in patients with this condition. Combination therapy may be theoretically favored by the fact that multiple factors contribute to hypertension, and achieving control of blood pressure with single agent acting through one particular mechanism may not be possible. The majority of currently available fixed-dose combinations are diuretic based. Diuretics, in particular low dose thiazide and thiazide-like diuretics are widely used in the treatment of hypertension. They have excellent outcome data and high safety and low side affects profiles. In this article, the physiology, pharmacological actions, side effects, and outcome data of the use of diuretics in hypertension are reviewed. Combinations may be individualized according to the presence of comorbidities like diabetes mellitus, chronic renal failure, heart failure, thyroid disorders and for special population groups like elderly and pregnant females.

Keywords: *Hypertension, Diuretics, Blood pressure, Diabetics mellitus, Heart failure, Pregnancy.*

PCO-15

PENTACYCLIC TRITERPENOIDS AS A POTENTIAL AND PROMISING ANTI-CANCER AGENT

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Today cancer treatment is not only a question of eliminating cancer cells by induction of cell death. New therapeutic strategies also include targeting the tumour microenvironment, avoiding angiogenesis, modulating the immune response or the chronic inflammation that is often associated with cancer. This review summarizes the potential of triterpenes belonging to the lupane, oleanane or ursane group, to treat cancer by different modes of action. Since Pisha et al. reported in 1995 that Betulinic acid is a highly promising anticancer drug. In particular, lupane-type triterpenes, such as Betulin, Betulinic acid and Lupeol, display anti-inflammatory activities which often accompany immune modulation. Although up to now no clinical trial has been published using these triterpenes in cancer therapy. They provide a multi-target potential for coping with new cancer strategies. As various triterpenes are an increasingly promising group of plant metabolites, the utilisation of different plants as their sources is of interest. The various parts of plants such as mango pulp, carrot, cucumber, water melons are rich in triterpenes and provide different triterpene compositions.

Keywords: *Anti-Cancer, Triterpenes, Betulinic acid, Betuline, Lupeol.*

PCO-16

IN VITRO ANTHELMINTIC ACTIVITY OF ETHANOLIC EXTRACT OF *CYPERUS KYLLINGIA* ROOTS

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This present study deals with the in vitro evaluation of the anthelmintic activities of the ethanolic extract of *Cyperus kyllingia* roots (Cyperaceae). The anthelmintic activity of the *Cyperus kyllingia* were evaluated on adult earthworms *Pheritima posthuma* (Annelida) . Various concentration of plant extract (25, 50, 100, 150 mg/ml) was tested for the anthelmintic activity. Plant extract was prepared with ethanol & distilled water by soxhlet extraction method. Albendazole (Glaxo Smithkline) was used as reference standard drug and water as control. Paralysis time and death time were recorded for the determination of anthelmintic activity. The phytochemical analysis of the plant shows the presence of carbohydrate, reducing sugar, cardiac glycoside, anthraquinone glycoside, saponin glycoside and tannins. Higher concentration of extract of the *Cyperus kyllinga* produced paralytic effect much earlier and the time taken for death was shorter for all types of worms. The extract shows better anthelmintic activity than the standard drug (Albendazole) at the concentration of 100 mg /ml. So, the plant extract exhibited significant anthelmintic activity. Therefore, further study must be carried out so that the people get benefit from this important medicinal plant.

***Keywords**: Pheretima posthumous, Anthelmintic activity.*

PCO-17

REVIEW ON SWINE FLU

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Swine flu has been creating a terror effects all round the globe and has been declared epidemic in most part of the world. Swine flu (swine influenza) is a respiratory disease caused by viruses (influenza viruses belonging to the family *Orthomyxoviridae*) that infect the respiratory tract of pigs and result in nasal secretions, a barking-like cough, decreased appetite, and listless behaviour. In India day by day the graph of infected person has been climbed up so, it is important to take into consideration about this disease as it may prove deadly one. Oseltamivir (Tamiflu) and zanamivir (Relenza) are the recommended drugs both for the treatment of Swine flu. The best treatment for influenza infections in humans is prevention by vaccination.

***Keywords:** Current Scenario, Transmission, Symptoms, Precautions, Diagnosis, Treatment.*

PCO-18

HYPERLIPIDEMIA AND ITS MANAGEMENT

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Hyperlipidemia is caused by high lipids or fatty substances in the blood and is an important risk factor in development of atherosclerosis and heart disease. Hyperlipidemia may be caused by genetic factors or by generalized metabolic disorders like diabetes mellitus, excessive alcohol intake, hypothyroidism, or primary biliary cirrhosis. Alteration in Cholesterol, triglyceride and very low-density lipoproteins (VLDL), low-density lipoproteins (LDL) and intermediate-density lipoproteins (IDL), which are different forms of lipids, responsible for possible complications in human body such as acute pancreatitis, occlusion of blood vessels and reduced elasticity of the lumen of the artery. Moreover, risk increases with diabetes mellitus, hypothyroidism, nephrosis, alcoholism, use of oral contraceptives, family history of hyperlipidemia and improper diet that is high in fat and cholesterol. However, drugs therapies available for the treatment of hyperlipidemia includes use of drugs like Niacin, Fibrates (clofibrate, gemfibrozil), HMG-CoA reductase inhibitors (lovastatin, pravastatin, simvastatin and fluvastatin), bile acid binding resins (cholestyramine and cholestipol) and Probucol but associated with lots of side effects. Therefore, herbal treatment for hyperlipidemia has been appreciated because of no side effects, economic and easy availability. Herbal drugs involved in the treatment of hyperlipidemia are Allium sativum, Allium.

Keywords: *Cholesterol, Triglyceride; Cholestyramine; Clofibrate; HMG-CoA reductase inhibitors.*

PCO-19

A REVIEW ON CURRENT SCENARIO OF DENGUE IN INDIA

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Dengue fever is an arthropod borne virus of the genus *Flavivirus*, and within the family *Flaviviridae*. Other *Flaviviruses* include Japanese encephalitis and yellow fever. There are four distinct serotypes of dengue virus (DV-1, DV-2, DV-3 and DV-4) all of which have the potential to cause either classic dengue fever (DF) or the more serious form of the disease, dengue hemorrhagic fever (DHF). Dengue is transmitted by the bite of an infective female *Aedes* mosquito. These mosquitoes are most active during daylight hours. DHF is seen in children less than 15 years of age but can also occur in adults. It begins with the same symptoms as dengue fever but is followed by rapid deterioration, bleeding and cardiovascular collapse 2-5 days later. There is no specific treatment. Supportive treatment includes plenty of oral fluids and paracetamol for relief of fever and body aches and pains. Aspirin and non-steroidal anti-inflammatory drugs should not be used as they can affect blood clotting. Anyone with DHF should be hospitalized for fluid replacement and observation.

Keywords: *Current Scenario, Serotypes, Symptoms, Diagnosis, Treatment.*

PCO-20

A REVIEW ON *THEVETIA PERUVIANA*

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Thevetia peruviana are belongs to the Apocynaceae family. *T. peruviana* are commonly found in Asian countries, especially in India, Sri Lanka. This plant contains some toxic parts; cardio active glycosides are present such as Thevetin A, Thevetin B, Nerifolin, oleandrin etc. An adverse effect of *T. peruviana* is numbness, vomiting, diarrhoea, nausea but it used as a mild cardio active agent.

Keywords: *Cultivation & Propagation, Toxicity, Uses.*

PCO-21

ROLE OF ZEBRAFISH IN PHARMACEUTICAL FIELD

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In last few years, the use of zebrafish (*Danio rerio*) in scientific research is growing very rapidly. Presently, the research using zebrafish is expanding into other areas such as pharmacology, clinical research as a diseases model and interestingly in drug discovery. The use of zebrafish in pharmaceutical research and drug discovery is mainly screening of lead compounds, target identification, target validation, morpholino oligonucleotide screens, assay development for drug discovery, physiology based drug discovery, quantitative structure-activity relationship (QSAR) and structure–activity relationships (SAR) study and drug toxicity study. Zebrafish have recently entered the fray as a model animal for some human diseases. It has numerous attributes in toxicology studies and high throughput screening. The fish are more affordable, can easier to keep, and faster to rise than mammals, giving a higher-throughput system. Perhaps surprisingly, genes that cause disease in zebrafish are similar to those in humans. Zebrafish being a non-mammalian, drugs can also be tested for toxicity and their potential therapeutic activity against the target more easily than in mammals. The Zebrafish embryo has become an important vertebrate model for assessing drug effects. It exhibits unique characteristics, including ease of maintenance and drug administration, short reproductive cycle and transparency that permits visual assessment of developing cells and organs. Using Zebrafish it is possible to obtain results quickly at lower costs.

Keywords: *Drug discovery; Animal model; Zebrafish; Lead compounds; Target identification; Target validation.*

PCO-22

AN UPDATE ON THE MANAGEMENT OF STRESS

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Stress is anything that puts demands upon our bodies and minds to cope, adjust, change, or accommodate to the demand. Although stress can come from an ongoing, routine, and chosen activity like long work hours or a hurried work place, it is often associated with an intense reaction to an event in our lives, which can be either pleasant or unpleasant. Stress may cause to human life, physiological behavioral, even psychological effect. Some stressors are as academics, dating, environment, extracurricular activities peers, time, money & parents, etc. This article also reveals the relationship between anxiety and stress nutrition and stress, fear and stress, weight gain and stress, age and stress and some newer approaches to manage stress.

Keywords: *Stress managements, stressors, anxiety, nutrition, age, yoga, aroma therapy.*

PCO-23

APOPTOSIS IN CANCER

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The process of programmed cell death, or apoptosis, is generally characterized by distinct morphological characteristics and energy-dependent biochemical mechanisms. Apoptosis is considered a vital component of various processes including normal cell turnover, proper development and functioning of the immune system, hormone-dependent atrophy, embryonic development and chemical-induced cell death. In appropriate apoptosis (either too little or too much) is a factor in many human conditions including neurodegenerative diseases, ischemic damage, autoimmune disorders and many types of cancer. The initiation of apoptosis is tightly regulated by activation mechanisms, because once apoptosis has begun, it inevitably leads to the death of the cell. The two best-understood activation mechanisms are the intrinsic pathway (also called the mitochondrial pathway) and the extrinsic pathway. The intrinsic pathway is activated by intracellular signals generated when cells are stressed and depends on the release of proteins from the inter membrane space of mitochondria. The extrinsic pathway is activated by extracellular ligands binding to cell-surface death receptors, which leads to the formation of the death-inducing signalling complex. Apoptosis has a role in the growth and development of many tissues including neurons, the human retina and maturation of lymphocytes in the thymus. In the haematopoietic system, apoptosis helps to ensure that the massive rate of new cell production in the bone marrow is offset by a commensurate rate of cell death in the periphery. Focal apoptosis plays an important role in many normal embryonic processes such as the development of the Lumina of tubular structures, the fashioning of limbs and the formation of inter digital clefts. Apart from its role in normal oncogenesis, it is also important in teratogeny. A number of teratogenic agents have been found to cause massive apoptosis at their site of action.

Keywords: *Programmed cell death, intrinsic pathway, extrinsic pathway.*

PCO-24

MANAGEMENT OF MOLAR-PREGNANCY

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Molar pregnancy is an abnormal form of pregnancy in which a nonviable fertilized egg implants in the uterus and will fail to come to term. A molar pregnancy is a gestational trophoblastic disease (GTD) which grows into a mass in the uterus that has swollen chorionic villi. These villi grow in clusters that resemble grapes. GTD originates from placental tissue and is among the rare human tumors that can be cured even in the presence of widespread metastases. GTD includes a spectrum of interrelated tumors including complete and partial hydatidiform mole, invasive mole, choriocarcinoma that have different propensities for local invasion and spread. Although most GTD develop after a mole, they can follow any antecedent pregnancy. Molar pregnancy is thought to be caused by a problem with the genetic information of an egg or sperm. A molar pregnancy may seem like a normal pregnancy at first, but most molar pregnancies cause specific signs and symptoms. In case of a suspected mole, investigations include a complete blood count, measurement of creatinine and electrolytes, liver kidney thyroid function tests, and a baseline quantitative beta-hCG measurement is done. Total abdominal hysterectomy, Suction curettage is used for its management & Chemotherapy if required. The general understanding of the natural history and management of molar pregnancy has advanced considerably in recent years. The key role in obtaining a high cure rate becomes an early diagnosis and the subsequent strictly follow up.

Keywords: *Gestational trophoblastic disease, human chorionic gonadotropin, chemotherapy.*

PCO-25

ANTICONVULSANT DRUGS AND ANTICONVULSANT AGENT

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Anticonvulsant drugs are also known as antiepileptic or anti seizure drugs, are a diverse group of pharmacological agents mostly used in the treatment of epileptic seizures. Anticonvulsants are also being used in the treatment of bipolardisorder and borderline personality disorder, since many of them are acts as mood stabilizers, and for the treatment of neuropathic pain. Anticonvulsants suppress the rapid and excessive firing of neurons during seizures. It also prevents the spread of the seizure within the brain. Clinically used antiepileptic drugs (AEDs) decrease the excitability of membrane by interacting with ion channels or neurotransmitter receptors. Currently available AEDs appear to act on sodium channels, $GABA_A$ receptors, or calcium channels. Phenytoin, carbamazepine, and possibly valproate (VPA) decreases the high-frequency repetitive firing of action potentials by enhancing sodium channel inactivation. Benzodiazepines and barbiturates enhance $GABA_A$ receptor mediated inhibition. Ethosuximide and possibly VPA reduce low-threshold calcium current. Lamotrigine may decrease sustained high-frequency repetitive firing. The mechanisms of action of felbamate are unknown. Gabapentin (GBP) appears to bind to a specific binding site in the central nervous system with a restricted regional distribution, but the identity of the binding site and the mechanism of action of GBP remain uncertain. The mechanisms of action of other AEDs currently under development are less clear.

Keywords: *Neuropharmacology, Neurotransmitter, GABA, Phenytoin*.

PCO-26

ANTIDIABETIC POTENTIAL OF COMBINED EXTRACTS OF *PTEROCARPUS MARSUPIUM* AND *TINOSPORA CORDIFOLIA*

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Plants and many plant derived preparations have long been used as traditional remedies and in folklore medicine for the treatment of diabetes in many parts of the world Polyherbal formulation which is relatively a new concept in the field of natural products is gaining much attention worldwide. These formulations were found very effective in chronic illnesses. Heartwood of *Pterocarpus marsupium*, stem of *Tinospora cordifolia* were taken for present study to expolore its antidiabetic potential. Various extracts of the different plant parts were prepared using different solvents in an order of their increasing polarity. The extracts of Pterocarpus marsupium and Tinospora cordifolia were evaluated for their antidiabetic potential. Aqueous extract of Pterocarpus marsupium and Tinospora cordifolia gave significant antidiabetic action. The pharmacological study of current phase showed the excellent anti-hyperglycemic potential of the extracts when combined in ratio of 1:1: (55.73 % reduction in blood glucose level as compared to the standard glibenclamide (61.09 %). A 1:1: combination ratio of the aqueous extracts of two plants gave the best antidiabetic action as compared to the standard drug. The combination was also effective in managing the increased cholesterol, triglycerides, urea, creatinine, SGOT & SGPT levels of diabetic rats. Further the combination of all the aqueous extracts was found to be safe up to adose level of 2000 mg/kg after performing acute toxicity studies.

Keywords: *Pterocarpus marsupium, Tinospora cordifolia, toxicity studies.*

PCO-27

PHYTOCHEMICAL INVESTIGATION AND ANTI-DIABETIC POTENTIAL OF *SYZYGIUM CUMINI* SEED EXTRACTS

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Syzygium cumini has received far more recognition in folk medicine and in pharmaceutical trade than in any other field. The seed powder of this plant when given orally 2-3 times a day, it lowers the blood sugar level. With this aim in mind, present study was carried out to prepare various extract and study of its phytoconstituents and anti-diabetic property of seed extract. In the results obtained from phytochemical test, it was found that the petroleum ether extract is rich in sterols and fixed oils; Chloroform extract is rich in sterols, fixed oils & saponins; Acetone extract is rich in alkaloids, carbohydrates, glycoside and phenolic compound; Methanol extract is rich in alkaloids, carbohydrates, glycosides and phenolic compound; Water extract is rich in alkaloids, carbohydrates, glycosides, gums, mucilage, phenolic compound and tannins. Acetone extract was precipitated in solid (A1) form and remaining was concentrated as sticky (A2) form. The pharmacological data showed that almost all the polar extracts are showing reduction in blood sugar level but the maximum reduction is found in case of acetone A1 as it lowers the glucose level to 63% as compared to standard drug 69%. Therefore, acetone extract itself hold a greater promise of having a lead compound which is responsible for Anti-diabetic property.

Keywords: *Phytochemical test, alkaloids, carbohydrates, glycosides and phenolic compound.*

PCO-28

ANTI-DIABETIC & ANTIOXIDANT STUDIES OF *HELICTERE ISORA ROOTS*

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The present investigations evaluated the antioxidant and antidiabetic activity of *Helicteres isora* (L.) fruits belonging to the family Sterculiaceae. Many indigenous medicinal plants possess promising therapeutic properties, but experimental demonstration of specific active compound is lacking. Recent research findings suggest that bioactive fractions derived from a reverberated medicinal plant, namely, *Helicteres isora* (L.) possesses many therapeutic properties. *Helicteres isora* L., commonly known as Indian Screw Tree is a highly valued medicinal plant in South-East Asia Many indigenous medicinal plants possess promising therapeutic properties, but experimental demonstration of specific active compound is lacking. Recent research findings suggest that bioactive fractions derived from a reverberated medicinal plant, namely, *Helicteres isora* (L.) possesses many therapeutic properties. *Helicteres isora* dried fruit solvent extracts were evaluated for their antioxidant and anticancer activity. Acetone fruit extract *H. isora* showed (96.44%) strong antioxidant activity compared to hexane, and iso-propyl alcohol (IPA). Acetone extract exhibited better cytotoxicity against human lung cancer cells (NCI-H460) whereas; acetone and crude protein extracts showed activity against reactive oxygen species.

Keywords: *Antihyperlipidemic activity, Helicteres isora, Antioxidant activity, antidiabetic activity.*

PCO-29

SWINE INFLUENZA (H1N1) VIRUS: A REVIEW

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Swine Influenza firstly reported in Mexico (April 2009). Swine influenza is a respiratory disease caused by influenza viruses that infect the respiratory tract of pigs and result in nasal secretions, a barking-like cough, and decreased appetite. The infection is communicable to humans and caused a worldwide epidemic in 1918. The Centers for Disease Control and Prevention now call the virus 2009 H1N1, an acute and highly contagious respiratory disease of swine caused by the orthomyxo virus thought to be the same virus that caused the influenza pandemic an acute febrile highly contagious viral disease. Common clinical symptoms are indistinguishable by any viral respiratory illness, and include fever, cough, sore throat and myalgia. A feature seen more frequently with swine origin influenza is GI disturbance. Less than 10% of patients require hospitalization. Patients at risk of developing severe disease are younger than five years, elderly, pregnant women, with chronic systemic illnesses, adolescents on aspirin. Manifestations of swine origin influenza, pneumonia and respiratory failure are the most common. Unusual symptoms reported are conjunctivitis, parotitis, hemophagocytic syndrome. Infants may present with fever and lethargy with no respiratory symptoms. Diagnosis is based on RT PCR, Viral culture or increasing neutralizing antibodies. Principle of treatment consists of isolation, universal precautions, good infection control practices, supportive care and use of antiviral drugs. Antiviral drugs effective against H1N1 virus include oseltamivir and zamanavir. With good supportive care case fatality is less than 1%. Preventive measures include social distancing, practicing respiratory etiquette, hand hygiene and use of chemoprohylaxis with antiviral drugs. Vaccine against H1N1 is not available at present, but will be available in near future.

Keywords: *H1N1 virus, influenza virus, Oseltamivir, zanamivir.*

PCO-30

EBOLA VIRUS: A REVIEW

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Ebola hemorrhagic fever (EHF) is an acute viral syndrome that presents with fever and an ensuing bleeding diathesis that is marked by high mortality in human and nonhuman primates. Fatality rates are between 50% and 100%. Due to its lethal nature, this filo virus is classified as biological class 4 pathogen. Since there is no specific treatment outside of supportive management and palliative care, containment of this potentially lethal virus is paramount. In almost all outbreaks of EHF, the fatality rate among health care workers with documented infections was higher than that of non–health care workers. To gain further insight into the interdependent pathogenic processes in Ebola hemorrhagic fever (EHF), we have examined the dynamics of host responses in individual rhesus macaques infected with *Zaire ebola virus* over the entire disease course. This has been proposed as one of the significant mechanisms underlying disseminated intravascular coagulation in EHF patients. Furthermore, monitoring of expression levels for cytokines/chemo-kines suggested a mixed anti-inflammatory response syndrome (MARS), which indicates that a catastrophic uncontrolled immunological status contributes to the development of fatal hemorrhagic fever. These results highlight the pathological analogies between EHF and severe sepsis and not only contribute to our understanding of the pathogenic process, but will also help to establish novel post exposure treatment modalities.

Keywords: *Filoviridae, Ebola, Outbreak, Reservoir, Transmission.*

PCO-31

INSULIN-A BLOOD GLUCOSE REGULATOR

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Blood glucose or blood sugar is a tightly regulated biochemical parameter in normal humans and animals. Insulin and glucagon are potent regulators of glucose metabolism. For decades, we have viewed diabetes from a bi-hormonal perspective of glucose regulation. Intensively managing diabetes with insulin is risky. Despite our best efforts, glucose fluctuations are unpredictable, and hypoglycemia and weight gain are common. These challenges may be a result of deficiencies or abnormalities in other glucoregulatory hormones. Rapid globalisation, urbanisation and industrialization have spawned epidemics of obesity, diabetes and their attendant co-morbidities, as physical inactivity and dietary imbalance unmask latent predisposing genetic traits. This section provides an overview of insulin, followed by a discussion of insulin resistance and its associated clinical manifestations along with its role as a blood glucose regulator.

Keywords: *Diabetes, glucose fluctuations, rapid globalization, industrialization*

PCO-32

A REVIEW ON INFLAMMATION IN HUMAN BODY

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Inflammation is the body's attempt at self-protection; the aim being to remove harmful stimuli. It is a part of complex biological response of body tissues to harmful stimuli such as pathogens, damaged cells or irritants, is a protective response involving immune cells, blood vessels and molecular mediators. Inflammation can be classified as either acute or chronic. Acute inflammation is the initial response of the body to harmful stimuli and is achieved by the increased movement of plasma and leukocytes (especially granulocytes) from the blood into the injured tissues. A series of biochemical events propagates and matures the inflammatory response, involving the local vascular system, the immune system, and various cells within the injured tissue. Prolonged inflammation, known as chronic inflammation, leads to a progressive shift in the type of cells present at the site of inflammation, such as mononuclear cells, and is characterized by simultaneous destruction and healing of the tissue from the inflammatory process. Acute inflammation is a short-term process, usually appearing within a few minutes or hours and begins to cease upon the removal of the injurious stimulus.

Keywords: *Self-protection, granulocytes, injurious stimulus, mediators.*

PCS-1

WATER FOR PHARMACEUTICAL USE

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This article deals with the water for pharmaceutical use, guidance about which quality of water to use for specific applications. High quality water is essential for the manufacturing of pharmaceuticals. Water is widely used as a raw material, ingredient, and solvent in the processing, formulation, and manufacturing of pharmaceutical products, active pharmaceutical ingredients (APIs) and intermediates. Pharmaceutical water production, storage and distribution systems should be designed, installed, appropriate quality. Eight types of water used in the pharmaceutical industry which are drinking water, purified water, water for injection, sterile water for injection, water for analytical purpose. This article also deals with about the guidelines for microbial control in water for pharmaceutical use. The main objective of this article is to provide guidance to the industry on the pharmaceutical use of different grades of water in manufacture of active pharmaceutical ingredients (APIs) and medicinal products for human and veterinary use.

Keywords: *Water, active pharmaceutical ingredients (APIs), microbial control.*

PCS-2

PHARMACOSOMES: AN EMERGING VESICULAR DRUG DELIVERY SYSTEM

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Pharmacosomes are the colloidal dispersion of drugs covalently bound to lipids and may exist as ultrafine vesicular, micellar or hexagonal aggregates, depending on the chemical structure of drug-lipid complex. They act as befitting carrier of delivery of drugs precisely owing to their unique properties like small size, amphiphilicity, active drug loading, high entrapment efficiency, and stability. Entrapment efficiency is not only high but predetermined, because drug itself in conjugation with lipids forms vesicles. They help in controlled drug release at the site of action as well as reduction in cost of therapy, drug leakage and toxicity, increased bioavailability of poorly soluble drugs, and restorative effect. There has been advancement of drug in the scope of this drug delivery system for a number of drugs used for inflammation, heart disease, cancer and protein delivery along with a large number of herbal drugs. Developing the pharmacosomes of the drugs has been found to improve the absorption and minimize the gastrointestinal toxicity.

Keywords: *Cancer and protein delivery, hexagonal aggregates, ultrafine vesicular, micellar form.*

PCS-3

MOUTH DISSOLVING TABLETS

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The advances in Novel Drug Delivery Systems (NDDS) is aimed for designing dosage forms, convenient to be manufactured and administered, free of side effects, offering immediate release and enhanced bioavailability to achieve better patient compliance. Despite of tremendous advancements in drug delivery, the oral route remains the perfect route for the administration of therapeutic agents because of low cost of therapy, ease of administration, accurate dosage, self-medication, pain avoidance, versatility, leading to high levels of patient compliance. Tablets and capsules are the most popular dosage forms. But, one important drawback of such dosage forms is 'Dysphagia' which is seen to afflict nearly 35% of the general population. This disorder is also associated with a number of conditions like Parkinsonism, motion sickness, unconsciousness etc. To overcome such problems, 'Mouth Dissolving Tablets' have been developed, which are novel dosage forms and dissolve in saliva within a few seconds, when put on tongue. Such tablets can be administered anywhere and anytime, without the need of water and are thus quite suitable for children, elderly and mentally disabled patients. The present study is a detailed description on mouth dissolving tablets.

Keywords: *Mouth dissolving tablet, advantage, disadvantage.*

PCS-4

CHARACTERIZATION OF SOFT DRINKS IN PRESENSE OF DIFFERENT FLAVOURS OF VICKS COUGH DROPS

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Vicks Cough Drops work as a cough suppressant and/or oral anaesthetic. Some of time it also offered as an exchange of money from the shop keeper or the restaurant. Side by side soft drinks are used to consume by everyone more frequently. In Literature, salting out effect reported as an interaction between common electrolytes and carbonated water. Death/ illness of many children also occurred due to this reason when they take candy with soft drinks. In our present work, physical interaction study was carried out between branded soft drinks and Vicks (Ginger & Menthol). The result reviled the high pressure effervescence upon addition of Vicks in branded soft drinks. These effervescences continue for the several minutes and finally the pH of soft drinks decrease, which increase the chances of acidity.

Keywords: *Vicks cough drop, salting out effect, effervescence, acidity.*

PCS-5

A REVIEW ON EXTRACTION OF PHARMACEUTICAL BIOPOLYMERS BY FOAM FRACTIONATION METHOD

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Foam Fractionation is an economical foaming method of Adsorptive Bubble Separation Technology. The generic name of the technology was first proposed by Robert Lemlich (1966) and sent to IUPAC committee in the year 1967 by Lemlich R.et.al. It has the basis on surface chemistry known as adsorption. Chemical or physical adsorption of surface active molecules on the bubble's surface of sparged air or nitrogen gas rising through the liquid pool is the principle of separation. A soluble as well as dispersed molecule below critical micelle concentration in aqueous solution is separated at the top of the foam fractionation column carried by air or nitrogen bubbles as foam by adsorption. Adsorbed amount of surface active species at gas-liquid interface can be mathematically expressed by Gibb's Equation of Adsorption Isotherm .This unit operation compared with distillation can be used as a low cost industrial method for enrichment as well as extraction of pharmaceutical biomolecules like phytonutriants, metabolites ,proteins, antibiotics, antioxidants and antibacterial bio surfactant heptapeptide surfactin, a metabolite of bacillus subtillis BBK006 from downstream processing and industrial waste at the end. Ongoing research in the fields of surface chemistry, protein chemistry and process engineering along with development of physico-chemical and design parameters of this unit operation can help to close this gap. This review discusses primarily on separation of pharmaceutical biomolecules like proteins.

Keywords: *Proteins, foam fractionation, bio-molecules, enrichment, downstream.*

PCS-6

NANOTECHNOLOGY IN BRAIN TARGETED DRUG DELIVERY SYSTEM

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Drug delivery to the brain is a challenging task for formulations due to presence of blood brain barrier (BBB) and blood cerebrospinal fluid barrier which causes obstruction in free flow of blood between brain and rest of body. It also prevents penetration of hydrophilic compounds such as neurotransmitters, amino acids etc unless these are transported in brain by active transport system. Different approaches like BBB disruption , prodrugs, liposomes, nanoparticles, intranasal delivery are implemented for drug delivery to brain. Among drug carrier system, nanoparticles exhibit an impressive attention because of possessing solid colloidal particle. The mechanism for transport of polymer based nanoparticles across BBB has been characterized as receptor-mediated endocytosis by the brain capillary endothelial cells. Transcytosis then occur to transport the nanoparticles across the tight junction. Gradual drug release reduces peripheral toxicity and potential to target specific brain sites by crossing the BBB are the major benefits contributed by nanoparticles. Drug delivery technology based on nanoparticles which presently exist should be improved further, so that it can be safe, effective, target oriented and also cost effective. The synthesis of nanoparticles mimicking immune cells might be effective in brain associated disorders and it is therefore predictable. The BBB is most important limiting factor for development of new drugs for CNS. It may be possible that most of future therapeutics against brain diseases can be delivered through nanovehicles, as use of nanotechnology is an innovative and promising approach in drug delivery to CNS.

Keywords: *Neurotransmitters, receptor-mediated endocytosis, prodrugs, nanovehicles.*

PCS-7

NANOPARTICLES: CANCER TARGETED DRUG DELIVERY SYSTEM

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Cancer is a disease caused by uncontrolled cell growth of abnormal cell. The current treatment strategies for cancer are radiation, surgery, chemotherapy or combination of the mentioned therapy. The long-term use of conventional drug delivery systems for cancer chemotherapy leads to fatal damage of normal proliferate cells and this is particularly used for the management of solid tumors, where utmost tumor cells are not invaded quickly. Targeted drug delivery system facilitates release of drug at a preselected biosite in a controlled manner. Nanotechnology based drug delivery system provides a significant impact on cancer treatment and the polymer play an important key role for the development of nanoparticles for carriers of cancer therapy. These particles allow exquisite modification for binding to cancer cell membranes, the microenvironment, or to cytoplasmic or nuclear receptor sites. This results in delivery of high drug concentrations to the targeted cancer cell, with reduced toxicity of normal tissue. Several such nanoparticles are in clinical practice, including liposomal doxorubicin and albumin conjugate paclitaxel. The carrier mediated paclitaxel already shown efficacy in taxanes resistant cancer cell. Nanoparticles that can easily cross the blood brain barrier can be used for targeted drug delivery systems for brain tumor. Other modifications including transferrin receptor and folate receptor targeted drug delivery molecules are in study. This new technology provides efficacious approaches for the treatment of cancer with reduced toxicity to normal cell.

Keywords: *Chemotherapy, biosite, liposome, paclitaxel.*

PCS-8

SOFTWARES USED IN PHARMACEUTICAL SCIENCE-A REVIEW

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Software is a computer program and related data that provide the instructions to the computer to perform particular task. These programs are designed to address special purpose applications. Software reduces constant human attention and reduces errors. Software used in pharmaceutical sciences cover wide subject areas such as Pharmacology, Pharmaceutical Chemistry, Pharmaceutics, Pharmacognosy, Pharmaceutical Biotechnology etc. Software used in pharmacology give efforts that are needed in determining pharmacokinetic principles of particular drug in individuals and consequently, its adverse reactions. Applications of softwares in pharmaceutical chemistry are to elucidate various drug activity values for newly synthesized compounds to generate the large databases from massive efforts in drug research. However, softwares used in pharmaceutics provide biopharmaceutical characterization, accurate and precise stability profile of formulated dosage form. Softwares used in pharmacognosy give information on herb activity, interactions, mechanisms of action and supporting data underlying the use of herb for health. Wide applications of software in pharmaceutical biotechnology help to increase the predictability of results, identify genes, elucidate protein structure, and identify genome responsible for expression of particular characteristics. Pharmaceutical software also plays an important role in pharmacovigilance studies. Hence, it is obvious that the proper understanding and use of these softwares will help serve in evolving the idea for the new drug development.

Keywords: *Pharmaceutical software, formulated dosages, genome.*

PCS-9

DISPOSAL OF MEDICAL WASTE

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Biohazard regulated medical waste or (RMW) also known as bio hazardous, biomedical, infectious, sharps waste or even sometimes clinical medical waste, is the portion of a health-care facility's hazardous waste stream that may be contaminated by blood, body fluids or other potentially infectious materials thus posing a significant risk of transmitting infection to humans or harming the environment. The basic concept of disposal of medical waste in India means "In every hospitals and pharmaceutical industries should take the necessary regulatory process to dispose the harmful waste by using different disposable methods at minimum cost." The reports and related information regarding the disposal of medical waste in India should provide the necessary requirements like proper machineries, experienced personals and areas. The disposal methods vary with the classes of waste products. According to World Health Organization (WHO) estimates 85% of hospitals waste is actually non-hazardous and around 10% is infectious while the remaining 5% is non-infectious but consist of hazardous chemicals like methyl chloride and formaldehyde. The main concern of infectious hospital waste is the transmission of HIV and hepatitis B or C virus. The syringes and needles have the highest disease. Government of India, Ministry of Health and Family Welfare amended various provisions to dispose-off the hospital waste in India.

Keywords: *Medical waste; biohazard; disposal; RMW.*

PCS-10

EMULSION AND ITS APPLICATIONS

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An emulsion is a biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as minute globules into the other. The liquid which is converted into minute globules is called the dispersed phase and the liquid in which the globules are dispersed is called the continuous phase. Normally, two immiscible liquids cannot be dispersed for a long period. So an emulsifying agent is added to the system. It forms a film around the globules in order to scatter them indefinitely in the continuous phase; so that a stable emulsion is formed. The globule size in emulsion varies from 0.25 to 25 micron diameter. Emulsion having large globules is called coarse emulsions while those having globules of mean diameter below about 5µm are considered to be fine emulsions. The emulsions having globules of smaller diameter as small as 10nm are known as micro emulsions. These emulsions are milky and transparent. The whiteness of fine emulsion is due to the reflections and refractions at many interfaces. If the two phases have the same refractive index, a transparent emulsion is produced.

Keywords: *Immiscible liquid, micro emulsion.*

PCS-11

MODERN PACKAGING OF AEROSOLS

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Aerosol or Pressurised package is defined as a system that depends on the power of a compressed gas or liquefied gas to expel the contents from the container. Pharmaceutical aerosol is defined as an aerosol product containing active ingredients dissolved, suspended, or emulsified in a propellant or mixture of solvent and propellant and intended for oral and topical administration or for administration into the eye, nose, ear, rectum and vagina. The main components of aerosol comprise of propellants, container, valve, actuator and product concentrate. This presentation is about to feature some modern packaging trends in packaging of aerosol system such as the “bag on valve aerosol system”, “airless technology”, “ recycled content aluminum aerosol can”, “a solvent free internal coating from TUBEX”, “de-bossed cans from ARDAGH”, and about their benefits over the earlier aerosol packaging systems.

Keywords: *Pressurised package, propellant.*

PCS-12

GRANULATION TECHNIQUES FOR SOLID DOSAGE FORM (TABLET) -A REVIEW

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The present study is focused on different techniques adopted while formulating solid dosage forms like tablets, capsules & granules etc. The ideal characteristics of granules is used mainly to improve flow, compressibility of powders and to prevent segregation of the blend components, improve content uniformity and eliminate excessive amounts of fine particles. Tablets are one of the oral solid dosage forms most widely used by the pharmaceutical manufacturers, physicians & patients due to the convenience in manufacturing, administration & stability for delivery of most of the active ingredients. Tablets are manufactured by different methods such as wet granulation, dry granulation, and direct compression. Granulation is defined as the size enlargement process in which fine & smaller particles are aggregated to form strong & stable particles called granules. Granulation is one of the most important unit operation in the production of pharmaceutical oral dosage forms. The present article is mainly focused on advance granulation techniques such as moisture activated dry granulation, thermal adhesion granulation, foam binding granulation etc. The result will show improved yields, reduced tablet defects increased productivity & reduced down time. The objective of the present work is to focus on the novel granulation technologies.

Keywords: *Unit operation, size enlargement process, advances granulation techniques.*

PCS-13

SUPERDISINTEGRANT: AN OVERVIEW

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Disintegrants are substances or mixture of substances added to the drug formulation that facilitates the breakup or disintegration of tablet or capsule content into smaller particles that dissolve more rapidly than in the absence of disintegrants. In dosage forms, solid orals gain maximum popularities, about 85%, because of many advantages over others. The therapeutic activity of these formulations is obtained through a typical manner like disintegration followed by dissolution. Hence disintegration has major role for facilitating drug activity and thus gain popularity among other dosage forms. Superdisintegrants are generally used at a low level in the solid dosage form, typically 1- 10 % by weight relative to the total weight of the dosage unit. The present work gives an overview on the various kinds of superdisintegrants which are being used in the pharmaceutical formulation to provide the safer, effective drug delivery with patient's compliance and more emphasis is given on application and usage of various superdisintegrants comparing with other disintegrants in reference to available scientific studies. The various sources of superdisintegrants and their modification to improve disintegration property are also high-lighted.

Keywords: *Disintegration, dissolution, tablet, capsule.*

PCS-14

PHARMA MARKET SURVEY

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A market survey is done to gather information from consumers about their preferences of product and problem they are facing. It gathers information about the moving of goods from producer to consumers. Marketing survey help businesses to make better decision about its product and services they offer, how to deal with the competitor, when to enter and exit market. A market survey of pharmaceutical products in four districts of West Bengal i.e. Kolkata, Howrah, Hooghly and North 24 Parganas is done along with survey of franchise of medical stores and a small review of the new entrants of pharmaceutical industry have been done. 12 separate categories of pharma product have been made for survey. They are anti-hypertensive drugs, anti-asthmatic drugs, drugs against gastro-enteric disorder, hepatic disorder, and neurological disorder, anti diabetic drugs, antibiotics, ophthalmic drugs, OTC drugs, antacids, anti-tubercular drugs and baby food. From this survey some probable questions of layman and a professional have been tried to be answered. From the study, it has been found that which are the preferred brands of doctors, Indian MNCs versus Foreign MNCs, company with the maximum outreach, new entrants in the pharma market, Generic versus Brand drugs, the difference between the price of the drugs in various stores, advent of medical store franchise, online & telephonic medical stores in modern India and stocks of Indian pharma industry.

***Keywords**: Generic & Brand names, market capitalization, compound annual growth rate.*

PCS-15

POTENTIAL APPROACHES OF FLOATING DRUG DELIVERY SYSTEM TO DELAY IN GASTRIC EMPTYING AND BUOYANCY

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Floating drug delivery system (FDDS) basically follows the principal mechanism of floatation to achieve gastric retention. The recent developments of FDDS, including the physiological and formulation variables affecting on gastric retention, approaches to design floating systems and their classification and formulation aspect were covered. After studying various articles and thesis on FDDS, it can be concluded that FDDS promises to be potential candidates to achieve gastric retention. Dosage form with prolonged GIT will bring about new and important therapeutic actions. The currently available polymer-mediated non effervescent and effervescent FDDS designed on the basis of delays in gastric emptying and buoyancy principles appear to be very much effective approach to the modulation of controlled oral drug delivery. Due to complexity of pharmacokinetic and pharmacodynamic parameters, *in vivo* studies are required to establish the optimal dosage form for a specific drug through FDDS. Now a day, a large number of companies are focusing towards commercializing this technique.

***Keywords:** Gastric retention; GIT-Gastro Intestinal Tract; Polymer-mediated; Oral drug delivery.*

PCS-16

PRESERVATIVES IN LIQUID PHARMACEUTICALS: AN INSIGHT

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Preservatives are excipients added to multi-dose containers of both sterile and non-sterile drug products, used primarily to inhibit growth of microbial contamination occurring during the period of use. Preservatives must be able to limit the proliferation of microbes that may be introduced unavoidably during manufacture and the use of non-sterile and sterile products (oral drops, eye drops and sterile products). Preservatives must be able to minimize the risk of the consumer acquiring an infection when the preparation is administered. The objective of the review is to show the classification, mechanism of action, effectiveness test and factors causing loss of such preservative action in liquids and sterile pharmaceutical products. It also emphasizes on the problems caused by chemical preservatives and the use of natural preservatives to replace them. Preservatives, either singly or in synergistic combinations remain necessary to prevent microbial contamination of multi-use liquid or semi-solid medicinal products, particularly from opportunistic pathogens. Non-inclusion can result in serious health consequences. We can use natural preservatives as alternatives to chemical preservatives in order to lessen many of the complications.

Keywords: *Preservative, liquid, natural preservatives*

PCS-17

RECENT ADVANCES IN TARGETED DRUG DELIVERY SYSTEM

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Targeted drug delivery is an advanced method of delivering drugs to the patients in such a targeted sequence that increases the concentration of delivery drug to the targeted body part of interest only, which in turn improves efficacy of treatment by reducing side effects of drug administration. Some drugs have an optimum concentration range with in which maximum benefit is derived and concentrations above or below the range can be toxic or produce no therapeutic effect. Various drug delivery and drug targeting systems are currently under development. The main goal for developing such delivery systems is to minimize drug degradation and loss, to prevent harmful side effects and to increase bioavailability. Targeting is the ability to direct the drug loaded system to the site of interest. Among drug carrier one can name soluble polymers, microparticles made of insoluble (or) biodegradable natural and synthetic polymers, microcapsules, cells, cell ghosts, lipoproteins, liposomes and micelles. Two major mechanisms can be distinguished for addressing the desired sites for drug release, (a) Passive and (b) Active targeting. Nanoparticles can be classified as nano tubes, nano wires, nanoshells, quantum dots, nano pores. Researchers at north western university using gold particles to develop ultra sensitive detection systems for DNA and protein markers associated with many forms of cancer, including breast and prostate cancer. Drug loaded erythrocytes is one of the growing and potential systems for delivery of drugs and enzymes. Drug delivery vehicles are liposomes, micelles and dendrimers, biodegradable particles, artificial DNA nanostructures.

Keywords: *Drug delivery system, carriers, nanoparticles, colloidal drug carriers.*

PCS-18

DEVELOPMENT OF IN SITU GEL FOR VISUAL SYSTEM

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Ophthalmic drug delivery is one of the most interesting and challenging endeavors facing the pharmaceutical scientists. The major problem encountered to pharmaceutical scientist is rapid precorneal elimination of the drug, resulting in poor bioavailability and therapeutic response, because of high tear fluid turnover and dynamics. In situ-forming gels are liquids those, upon instillation undergo phase transition in the ocular cul de-sac to form visco-elastic gel and these gels provides a response to environmental changes. In the past few years, an impressive number of novel temperature, pH, and ion induced in situ-forming systems have been reported for sustained ophthalmic drug delivery. Each system has its own advantages and drawbacks. The choice of a particular gel depends on its intrinsic properties and envisaged therapeutic use. This review highlights use of various temperature, pH, and ion induced in situ-forming polymeric systems used to achieve prolonged contact time of drugs with the cornea and increase their bioavailability. Now a day, in situ gel has been used as vehicles for the delivery of drugs for both local treatment and systemic effects. Different administration routes other than ocular have been explored, and these cutaneous and subcutaneous delivery, dental, buccal delivery and delivery to the esophagus, stomach, colon, rectum and vagina.

Keywords: *Ophthalmic drug delivery, in-situ gels, route*

PCS-19

LIPOSOMES AS CARRIERS OF ANTICANCER DRUGS

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The term nanotechnology is derived from the Greek word "nano" which means one billionth or 10^{-9} and dwarf. Nanotechnology produces ‘nanoparticles’ that have the ability to deliver drugs to specific sites in the body. Liposome is one of the various other nanoparticles which have been extensively used for targeted drug delivery. Cancer is a major fatal disease worldwide with more than 10 million new cases coming up every year. In many countries, cancer is the cause of more than 25% of deaths. According to a report from the World Health Organization, the International Agency for Research on Cancer (IARC), death rates due to cancer are supposed to rise 50% by the year 2020. It has also been predicted that, approximately 12 million people will die of cancer by the year 2030. Liposomes are artificially-synthesized globular, closed-colloidal vesicles composed of a lipid bilayer that often contains phosphatidylcholine-enriched phospholipids and may also contain mixed lipid chains possessing surfactant properties such as egg phosphatidylethanolamine and other lipid parts like cholesterol that enclose an interior aqueous space. Typical size range of liposome is 25-150 nm.

Keywords: *Nanotechnology, International Agency for Research on Cancer (IARC), phosphatidylcholine-enriched phospholipids.*

PCS-20

VESICULAR CARRIERS FOR OCULAR DRUG DELIVERY

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The most precious and easily accessible organ of the body is the eye. Ocular drug delivery has been considered to be an ideal route of administration for treatment of ocular diseases related to the eye. The eye possesses an easy route to local drug delivery. Ocular drug delivery has been a major challenge to pharmacologists and drug delivery scientists due to its unique anatomy and physiology. Ocular delivery in spite of possessing various advantages has the limitation of poor bioavailability and low permeability across the cornea thus, limiting the efficacy of drugs. Therefore, various carrier systems have been developed to overcome these limitations. Vesicles are bilayered structures formed by the hydration of lipid molecules that can be used for incorporating both hydrophilic and lipophilic drugs. Vesicular drug delivery systems have been used for improving the therapeutic index, solubility, stability and rapid degradation of drug molecule. These systems exhibit enhanced permeability required for the treatment of ocular diseases that provides a new era in vesicular research for ocular drug delivery. Most recently, colloidal dosage forms like dendrimers, nanoparticles, niosomes, liposomes and microemulsions have been developed as efficient vesicular carriers for ophthalmic drug delivery. It prolongs the existence of the drug in systemic circulation and finally reduces the toxicity.

Keywords: *Eye, poor bioavailability, ocular diseases, vesicular drug delivery systems, enhanced permeability, colloidal dosage forms.*

PCS-21

A REVIEW ON OVERVIEW OF BIO-POLYMERS

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Worldwide every year approximately 140 million tonnes of synthetic polymers are produced. These polymers are stable and their degradation cycle in the biosphere is limited. This necessitates the need for natural biodegradable polymers which fit into the ecological cycle. This review covers the recent developments in the field of pharmacy. Special emphasis is placed on the barrier properties, which are crucial in terms of food packaging. The state-of-the-art of several biopolymers including pectin, starch, chitosan, xylan, galacto glucomannan, lignin and cellulose nano fibrils are discussed. As in most cases, the packaging related properties of single layer biopolymer films are inadequate, the thin film coatings, such as sol-gel and ALD (atomic layer deposition), as well as the multilayer coatings are also briefly touched. Among these biopolymers, chitosan, a partially deacetylated form of biopolymer chitin has been receiving more attention due to its versatile nature. Commercial chitosan is obtained from crustacean shells such as crabs, lobsters and shrimps are loaded with many demerits and limited the potential industrial acceptance of chitosan. Mycelial wastes from fermentation processes act as a source of fungal chitin and chitosan would offer a stable non-seasonable source of raw material and would be more consistent in character and of high quality. In this context, the present review discusses biopolymers, the merits and demerits of various sources of chitosan and its various biological activities.

Keywords: *Chitosan, crustacean shells, fungal chitin.*

PCS-22

SELF EMULSIFYING DRUG DELIVERY SYSTEM: A REVIEW

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Drugs are most often administered by the oral route. However, more than 40% of new chemical entities exhibit poor aqueous solubility, resulting in unsatisfactory oral drug delivery. Recently, much attention has been focused on self-emulsifying drug delivery systems (SEDDS) to improve the oral bioavailability of poorly aqueous soluble drugs. SEDDS are isotropic mixtures of oil, surfactants, solvents and co-solvents/surfactants. The principal characteristic of these systems is their ability to form fine oil-in-water (o/w) emulsions or micro emulsions upon mild agitation following dilution by an aqueous phase through the gastrointestinal tract for lipophilic drugs, which display dissolution rate-limited absorption. SEDDS may be a promising strategy to improve the rate and extent of oral absorption. This article gives an overview of various developments of SEDDS and biopharmaceutical aspects of SEDDS. The characterization of SEDDS and application of SEDDS is also introduced, with particular emphasis being placed on the developments of Solid self-emulsifying delivery system and dosage form of SEDDS.

Keywords: *isotropic mixtures, oil-in-water (o/w) emulsion*

PCS-23

AN OVERVIEW OF NIOSOMAL DRUG DELIVERY SYSTEM AND ITS APPLICATIONS

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Niosome is a non-ionic surfactant-based vesicle (biology and chemistry). Niosomes have more penetrating capability than the previous preparations of emulsions. Niosomes have shown promise as cheap and chemically stable drug delivery systems. Niosomes have been prepared with different molar ratios of surfactant and cholesterol and their morphological properties are determined by scanning electron microscopy. Niosomes are a novel drug delivery system, in which the medication is encapsulated in a vesicle. Different novel approaches used for delivering these drugs include liposomes, microspheres, nanotechnology, micro emulsions, antibody loaded drug delivery, magnetic microcapsules, implantable pumps and niosomes. Niosomes and liposomes are equiactive in drug delivery potential and both increase drug efficacy as compared with that of free drug. Niosomes are now widely studied as an alternative to liposomes. Proniosomes are non-ionic surfactant coated dry forms, converted to niosomes by hydration to yield a niosome dispersion having the capability of delivering drugs in a sustained manner for enhanced bioavailability and therapeutic effect. Proniosomes are superior to niosomes by displaying high physical and chemical stability, improved drug targeting with less production cost. This review gives relevant information regarding proniosomes and their preparation, characterization and their applications in transdermal route of drug delivery. They improve the therapeutic performance of the drug molecules by delayed clearance from the circulation, protecting the drug from biological environment and restricting effects to target cells. The application of niosomal technology is widely used to treat a number of diseases.

Keywords: *Proniosomes, vesicles, target cells, biological environment, transdermal route of drug delivery.*

PCS-24

APPLICATION OF INTERNET IN MEDICAL SHOPPING

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We live in the 21st century and it is the age of growing technology. So technology is being used in every field and also in medicinal system. "Application of Internet in Medical Shopping" is nothing but an online medicine shop. An online pharmacy, internet pharmacy, or mail-order pharmacy is a pharmacy that operates over the Internet and sends the orders to customers through the mail or shipping companies. Conventional stationary pharmacies usually have controlled distribution systems from the manufacturer. Validation and good distribution practices are followed. Home delivery of pharmaceuticals can be a desirable convenience but sometimes there can be problems with uncontrolled distribution. The shipment of drugs through the mail and parcel post is sometimes a concern for temperature-sensitive pharmaceuticals. Uncontrolled shipping conditions can include high and low temperatures outside the listed storage conditions for a drug. For example, the US FDA found the temperature in a mail box in the sun could reach 136 °F (58 °C) while the ambient air temperature was 101 °F (38 °C). Shipment by express mail and couriers reduces transit time and often involves delivery to the door, rather than a mail box. The use of insulated shipping containers also helps control drug temperatures, reducing risks to drug safety and efficacy.

Keywords: *Validation, temperature-sensitive pharmaceuticals, online pharmacy.*

PCS-25

AWARENESS ABOUT BANNED DRUGS

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India has become a dumping ground for banned drugs, also the business for production of banned drugs is booming. All the formulations are meant for prevention or treatment of ailments and diseases, out of which only a few drugs are lifesaving and essential, rest of the drugs are substitutes of each other. Banned drugs are still available in developing countries like India due to lack of law enforcement physician awareness and the drug control authorities' fail to inform all the hospital of the status of medicine. Some of the dangerous drugs have been globally discarded but are available in India. The most common are like nimesulide, furazolidone, phenyl propanolamine and other over the counter preparations are banned by US FDA due to their side effect on kidney, liver and nerve. Unfortunately, analgesic, anti- diarrheal and cough preparations which are banned in other countries and are blindly used in India as over the counter drugs because of unawareness, lack of law enforcement and corruption. The Government of India is in the process of developing a regulatory regime designed to ensure the quality, safety and performance of medical devices. The pharmacist should take interest in public information campaigns and educate consumers and thus can play an important role of eliminating the banned drugs from market.

Keywords: *Banned Drug, Indian Drug, Nimesulide, FDA.*

PCS-26

CARBON NANOTUBE: APPLICATIONS IN NANOTECHNOLOGY

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Carbon nanotubes (CNTs) are allotropes of carbon with a nanostructure that can have a length-to-diameter ratio greater than 1,000,000. These cylindrical carbon molecules have novel properties that make them potentially useful in many applications in nanotechnology. Their unique surface area, stiffness, strength and resilience have led to much excitement in the field of pharmacy. Nanotubes are categorized as single-walled nanotubes and multiple walled nanotubes. Techniques have been developed to produce nanotubes in sizeable quantities, including arc discharge, laser ablation, chemical vapor deposition, and silane solution and flame synthesis methods. The properties and characteristics of CNTs are still being researched heavily and scientists have barely begun to tap the potential of these structures. They can pass through membranes, carrying therapeutic drugs, vaccines and nucleic acids deep into the cell to targets previously unreachable. Overall, recent studies regarding CNTs have shown a very promising glimpse of what lies ahead in the future of medicines.

Keywords: *laser ablation, Single and multiple walled nanotubes, Nanomedicines.*

PCS-27

A REVIEW ON BI-LAYER TABLET

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Combination therapy has various advantages over mono-therapy. In the last decade, interest in developing a combination of two or more Active Pharmaceutical Ingredients (API) in a single dosage form (monolithic or bilayer tablet) has increased in the pharmaceutical industry, promoting patient convenience and compliance. Bilayer tablets can be a primary option to avoid chemical incompatibilities between API by physical separation, and to enable the development of different drug release profiles (immediate release with extended release). Several pharmaceutical companies are currently developing bi-layer tablets, for a variety of reasons: patent extension, therapeutic, marketing to name a few. To reduce capital investment, quite often existing but modified tablet presses are used to develop and produce such tablets. This article on purpose-built tablet presses to overcome common bi-layer problems, such as layer-separation, in sufficient hardness, inaccurate individual layer weight control, cross-contamination between the layers, reduced yield etc. Using a modified tablet press may therefore not be best approach in producing a quality bi-layer under GMP conditions, especially when high production output is required. There are various applications of the bi-layer tablet consist of monolithic partially coated or multilayered matrices.

Keywords: *Bi-layer tablet; combination therapy; multilayered matrices*

PCS-28

NATURAL BINDERS

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Natural binders are the binders obtained from renewable resources such as plants and animals that can be used in their natural form or after processing (bio-based binders, bio-binders, bio-based adhesives, bio-adhesives). The aim of this review is to focus on its source and advantages over the polymer binders, as a way of substituting the polymer binders in excipients of tablet and capsule preparations in the pharmaceutical industry. With steadily increasing crude oil prices and increasing environmental awareness, "natural binders" have regained attraction as alternative bonding agents. Natural polysaccharides are widely used in the pharmaceutical and food industry as excipients and additives due to their low toxicity, biodegradability, availability and low cost. They can also be used to modify the release of drug, thereby, influencing the absorption and subsequent bioavailability of the incorporated drug. Natural binders like different starch, gums, mucilages, dried fruits, plant juices, animal excretes possesses binding capacity as well as some other properties like filler, disintergrants & natural polymers are safe and economical than polymers like PVP. Natural binders are non-polluting renewable resources for sustainable supply of cheaper pharmaceutical excipients or product.

Keywords: *renewable resources, Natural polysaccharides, non-polluting renewable resources.*

PCS-29

BIO-EQUIVALENCE STUDY

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This article aimed at the bioequivalence studies which are required by regulations to ensure therapeutic equivalence between a pharmaceutical equivalent test drug and a reference drug. It is a relative term which denotes that the drug substance in two or more identical dosage forms, reaches the systemic circulation at the same relative rate and to the same relative extent i.e., their plasma concentration-time profiles will be identical without significant statistical differences. If a new product is intended to be a substitute for an approved medicinal product as a pharmaceutical equivalent or alternative, the equivalence with this product should be shown or justified. In order to ensure clinical performance of such drug products, bioequivalence studies should be performed. It should be performed if there is a risk of bio-in equivalence or a risk of pharmacotherapeutic failure or diminished clinical safety. Bioequivalence can be demonstrated either *In vivo* or *In vitro.* A study design meant for estimating essential pharmacokinetic parameters differs significantly from a bioequivalence study meant for comparing the test formulation with reference to a standard.

Keywords: *Clinical safety, pharmaceutical, In vivo, In vitro.*

PCS-30

SOFT GELATIN CAPSULE

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This Article aims at Soft Gelatin Capsules. It is estimated that more than 40% of new chemical entities (NCEs) coming out of the current drug discovery process have poor biopharmaceutical properties, such as low aqueous solubility and/or permeability. These suboptimal properties pose significant challenges for the oral absorption of the compounds and for the development of orally bioavailable dosage forms. Development of soft gelatin capsule (softgel) dosage form is of growing interest for the oral delivery of poorly water soluble compounds. The softgel dosage form offers several advantages over other oral dosage forms, such as delivering a liquid matrix designed to solubilize and improve the oral bioavailability of a poorly soluble compound as a unit dose solid dosage form, delivering low and ultra-low doses of a compound, delivering a low melting compound, and minimizing potential generation of dust during manufacturing and thereby improving the safety of production personnel. However, due to the very dynamic nature of the softgel dosage form, its development and stability during its shelf-life are fraught with several challenges. The goal of the current review is to provide an in-depth discussion on the softgel dosage form to formulation scientists who are considering developing softgels for therapeutic compounds.

Keywords: *Softgel, Soft gelatin capsule, Encapsulation, Cross-linking, Dissolution.*

PCS-31

PREPARATION OF METHYL CELLULOSE FROM ALPHA CELLULOSE ISOLATED FROM *LANTANA CAMARA* BY USING DMS

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Lantana camara belongs to the family Verbenaceae, is a noxious weed which has imposed a great threat to land productivity, grazing livestock, biodiversity and consequently to the overall ecology. From the day it was perceived as a menace, efforts are being made to control the weed by different methods. Since it is rich in lignocellulosic material, so an attempt has been made to isolate alpha cellulose from *Lantana camara* and to prepare cellulose derivative of commercial utility. So a process has been optimized for preparing alpha cellulose by chemical means from this weed and then derivatizing it to prepare methyl cellulose. Cellulose can be chemically modified to give products of specialized properties of industrial importance. Cellulose molecule contains three reactive hydroxyl groups in each anhydro D-glucopyranose unit. It is, therefore, theoretically possible to substitute three hydroxyl groups at position 2, 3 and 6 with other substituent which play an influential role in the preparation of cellulose derivatives. Methylation of alpha cellulose isolated from *Lantana camara* was carried out with di methyl sulfide in gaseous phase in presence of sodium hydroxide under different reaction conditions. Variables studied were concentrations of sodium hydroxide and di methyl sulfide, methylation temperature and time. The degree of substitution (DS) was determined. The results show that alpha cellulose isolated from stems of *L. camara* can subsequently be modified to methyl cellulose by methylation reaction. Using optimized set of conditions viz: 1M/AGU sodium hydroxide and di methyl sulfide 10 ml at 60^{o}C for 06 hours, having a DS of 0.668 could be prepared. The optimized methyl cellulose exhibit solubility in 8% aq. NaOH and are used as permanent sizing for cloth or may be formed into sheeting similar to cellophane. *L. camara,* therefore, seems to be a potential feedstock for production of alpha cellulose which can subsequently be converted methyl cellulose for a variety of applications and further the optimized product was also evaluated with IR, SEM, TGA/DTA and WAXDs.

Keywords: Land productivity, degree of substitution, industrial importance.

PCS-32

RECENT ADVANCES IN DRUG DELIVERY SYSTEMS

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Drug targeting to specific organs and tissues has become one of the critical endeavors of the century since the use of free drugs in conventional dosage forms generally in volves difficulties in achieving the target site at the appropriate dose after or during a proper time period. Two major mechanisms for drug release passive and active targeting. Controlled drug release and subsequent biodegradation are important for developing successful formulations Colloidal drug carrier systems such as micellar solutions, vesicle and liquid crystal dispersions, as well as nanoparticle dispersions consisting of small particles of 10–400 nm diameter show great promise as drug delivery system. New drug delivery systems include lipidic, proteic and polymeric technologies to provide new sustained drug delivery with better body distribution, drug protection from the harsh external environment and avoidance of drug clearance. Many of these technologies have reached the market therefore proving the benefits of these new carriers. This review covers the generalities of those new carriers and their new advances in drug delivery.

Keywords: *Nanoparticles, Drug delivery system, Colloidal drug delivery, Carriers.*

PCS-33

NOVEL CHEMICAL PERMEATION ENHANCERS FOR TRANSDERMAL DRUG DELIVERY

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As skin is a readily accessible organ of the body, it acts as the portal of entry for extraneous substances for their effective transdermal delivery. Possessing various advantages, it has the limitation of low permeability of drugs across it, limiting the efficacy of drugs. Therefore, various carrier systems have been developed to enhance the permeation deep into the systemic circulation. Transdermal drug delivery has been accepted as a potential non-invasive route of drug administration, with advantages of prolonged therapeutic action, decreased side effect, easy use and better patient compliance. However, development of transdermal products is primarily hindered by the low permeability of the skin. To overcome this barrier effect, numerous new chemicals have been synthesized as potential permeation enhancers for transdermal drug delivery. Transdermal drug delivery offers controlled as well as predetermined rate of release of the drug into the patient, it able to maintain steady state blood concentration. It's a desirable form of drug delivery because of the obvious advantages e.g. convenient and pain free, self administration for patients, avoidance of hepatic first pass metabolism and the GI tract for poorly bioavailable drugs over other routes of delivery. Transdermal patches are polymeric formulations which when applied to skin deliver the drug at a predetermined rate across dermis to achieve systemic effects. The number of drugs formulated in the patches has gained tremendous potential to deliver the drug via transdermal route. Controlled absorption, more uniform plasma levels, improved bioavailability, reduced side effects, painless and simple application and flexibility of terminating drug administration by simply removing the patch from the skin are some of the potential advantages of transdermal system.

Keywords*: Permeation enhancer, first pass metabolism, Transdermal patches.*

PCS-34

EVALUATION OF SOME MARKETED ISOSORBID-DINATRATE FAST DISSOLVING TABLETS

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Drug delivery systems are becoming more complex and acquire better understanding of the physicochemical and biochemical parameters pertinent to their performance. Since the demand of fast disintegrating tablet over the last decades has grown mainly for geriatric and pediatric patients because of swallowing difficulties, studying the characteristics of fast dissolving tablet has been important for potential emergency treatment. The aim of the present study was to evaluate some of marketed mouth dissolving tablets of isosorbide dinitrate. The tablets were evaluated for weight variation, hardness, wetting time, and water absorption ratio and disintegration time study.

Keywords: *Antianginal, mouth dissolving, tablets.*

PCS-35

HYDROGEL: AN OVERVIEW

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Hydrogels are a class of macromolecular networks which can hold a large fraction of aqueous solvent within their structure. Natural and synthetic hydrophilic polymers can be physically or chemically cross linked in order to produce hydrogel. Their resemblances to living tissues make them suitable for bio medical application. This review provides an analysis of their structure, classification, swelling behavior; mathematical description and mechanism of solvent diffusion. The important applications of hydrogels and release kinetics of hydro gels are also briefly reviewed.

Keywords: *Macromolecular networks, hydrophilic polymers, bio medical application, solvent diffusion.*

********** The End **********