



Atomic Energy Regulatory Board

Sponsored

National Seminar

On

Implications and pitfalls in nuclear pharmacy through
nanosized cargoes for treatment of diseases

December 19 – 20, 2019

ABSTRACT BOOK



Organized by

Columbia Institute of Pharmacy,

Near Vidhan Sabha Road, Tekari, Raipur (C.G.),

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Jan Pragati Education Society (JPES)

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Chief Patron's message

I am very happy that Columbia Institute of Pharmacy, Raipur (C.G.) is organizing two days Atomic Energy Regulatory Board (AERB) Sponsored National Seminar on the theme “**Implications and pitfalls in nuclear pharmacy through nanosized cargoes for treatment of diseases**” from 19th to 20th December, 2019.

This national seminar will be beneficial for the scientific fraternity and researchers in the field of diagnosis and treatment of disease through nanosized cargoes using nuclear pharmacy.

My greetings for the success of this event.



Shri Kishore Jadwani
Chief Patron, National Seminar

Patron's Message

I feel delighted to share that Columbia Institute of Pharmacy, Raipur is organizing Atomic Energy Regulatory Board (AERB) Sponsored two day national seminar on the theme “**Implications and pitfalls in nuclear pharmacy through Nanosized cargoes for treatment of diseases**” from 19th to 20th December, 2019.

I as the patron of this National Seminar welcome all the guests, eminent speakers, resource persons, faculty of different colleges and students. This seminar is a platform where participants would explore the development of nuclear pharmacy and their applications in research and development.

Warm wishes for the grand success of this national seminar.



Shri Harjeet Singh Hura
Patron, National Seminar

Principal's Message

It is a matter of immense pleasure that Columbia Institute of Pharmacy, Raipur is organizing Atomic Energy Regulatory Board (AERB) Sponsored two days National Seminar on 19th and 20th December, 2019. This is new field to be explored as platform for seminar highlighting key areas and applications of nuclear pharmacy. The theme will be beneficial to the society and community dealing with health care system in India.

I extend my heartfelt greetings for this Seminar to achieve success.



Prof. Amit Roy
Principal, National Seminar

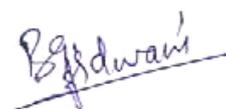
Convener's message

As the Convener of National Seminar, it is my great pleasure to welcome you all to our institute, Columbia Institute of Pharmacy, Raipur. On behalf of organizing committee we welcome all the keynote speakers, resource persons & delegates from all over the India. It will provide the platform to the academic researchers, scholars and students for getting the insight of nano sized cargoes using nuclear pharmacy.

The seminar offers the space for exchange of ideas to change our perception towards research. I extend thanks to AERB for providing financial assistance because of which we are able to organize this exciting two days national seminar where ideas and skills will be expressed, shared, demonstrated and implemented.

I sincerely hope that this seminar will be benefitted by your gracious participation.

We wish that the seminar will be a grand success.



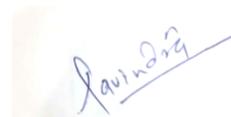
Dr. Bina Gidwani
Convener, National Seminar

Organizing Secretary's Message

It is a matter of pleasure and honor for us to host this two days AERB sponsored National Seminar at Columbia Institute of Pharmacy, Raipur. The theme for the Atomic Research Regulatory Board (AERB) sponsored national seminar is selected to explore the finding and recent advancements in nuclear pharmacy focusing researchers. The theme of the seminar aims to synchronize the different fields of healthcare like Pharmacy, Nursing and Medicals to understand the benefits, utilization and problem faced during the use of radioactive substances in disease management.

The assimilation of the experts from different field may help to do a better interpretation of hypothesis developing by young researchers in this area. The specialists have invited to deal with the different aspects of specified topic along with the ongoing progress and advanced techniques that have been developed till date.

With best wishes and regards.



Prof. Ravindra Kumar Pandey
Organizing Secretary, National Seminar

Atomic Energy Regulatory Board

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December 19-20, 2019

Program Schedule

Day	Timing	Session
Day – 1 [19th December, 2019]		
19th December 2019	9:30 am to 10:30 am	Registration and Breakfast
	10:30 am to 11:30 am	Plenary Lecture – I Prof. Preeti K Suresh UIOP, Pt RSU, Raipur
	11:30 am to 1:30	Workshop & Plenary Lecture – II Dr. Karan Peepre & team AIIMS Raipur
	1:30 – 2:30	LUNCH
	2:30 – 3:30	Poster Presentation
	3:30 – 4:00	Interaction and High Tea
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NS2019C01

Medical exploits of Radiopharmaceuticals

Authors

Ankush Ranglani*¹, Shubham Yadu¹ Ankur Dhurandhar¹, Akash Verma¹, Devendra Sahu¹,
Gunjan Kalyani¹

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111,
Chhattisgarh, India

***Presenting Author Email Id:** ankush.ranglani16@gmail.com Phone No: +91–9755556832

Abstract

A radiopharmaceutical is a preparation anticipated for *in vivo* use that encloses a radionuclide in the form of a simple salt or a complex. It may be in the form of solid, liquid, gas or a pseudo gas. The chemical and physical individuality and a form of a radiopharmaceutical are incredibly significant because upon administration the radiopharmaceutical is intended to target certain tissues, binding sites, biochemical pathways. A radiopharmaceutical can be used for either diagnostic or therapeutic purposes depending on its specific physicochemical and radiation properties. The characteristic of radioactive decay is what makes radioisotopes useful in their medical applications; however, different applications will take advantage of radioactive emissions in different ways. Radioactive materials are regularly used to treat medical conditions, diagnosis pathology, visualize and measure physiological functions, and localize structures and pathways. This paper focuses both on the therapeutic as well as diagnostic uses of radiopharmaceuticals.

Keywords: Radiopharmaceuticals, Therapeutic purpose, Diagnostic uses

NS2019C02

**Nanoparticle Based Approach for Nanogel Drug Delivery System:
Application and Future Prospects**

Chandrika Chouhan*, Dr. Rudra Pratap Singh Rajput

Department of Pharmaceutics,
Columbia Institute of Pharmacy, Raipur - 493111, Chhattisgarh, India
chandrikachouhan85@gmail.com

Abstract

Nanocomposite hydrogels or nanogels (a nanoparticles composed of a hydrogel) are nanomaterial filled, swollen nanosized networks of deliquescent or amphiphilic compound chains. It may be developed by drug - polymer interactions and to create 3D advanced networks. Nanogel may be ready by many strategies just like the particle gelation, Inverse mini emulsion, Dispersion, Chemical cross linking, fabrication of biopolymers and so on. It can be characterized by SEM, DSC, FTIR, Drug content, Particle size, Zeta potential and drug efficiency. Further, it can be evaluated by in vitro drug release and in vivo study in suitable animal modeling. In this review article, we have focused on basic methodology of nanogels, evaluation terms, and their application in industry with future prospects for the researchers.

Keywords: Nanogel, methods of nanogel preparation, evaluation parameters and their applications

NS2019C03

***Lantana Camara* plant extract of mediated synthesis of silver nanoparticles and its antimicrobial potential**

D.M. Dhabarde*, N. Gaydhane, A. R. Ingole and Dr. J.R. Baheti

Kamla Nehru College of Pharmacy, Butibori, Nagpur

Email ID – dishamandave@gmail.com

Contact - 9881228644

Abstract

Nanotechnology is the most fascinating area of research in the field of material science. Metal nanoparticles have a high specific surface area and high specific surface area and a high fraction of surface atoms. Because of the unique physicochemical characteristics of nanoparticles, including catalytic activity optical properties, electronic properties, antibacterial properties and magnetic properties. Nano silver particles is tremendously used in biomolecular detection, diagnostics, antimicrobials, therapeutics, catalysis, and microelectronics. Synthesis of nanoparticles by using plant extract is the most adopted method of green, ecofriendly production of nanoparticles and also has a special advantage that the plants are widely distributed, easily available, much safer to handle and act as a source of several metabolites. Microorganism can also be utilized to produce nanoparticles but the rate of synthesis are slow compared to routes involving plants mediated synthesis. Very recently plant extract of marigold flower, ziziphorateniour, solanumtricobatum, beet root, meliadubia, etc. shows high level of antibacterial activity. *Lantana-camara* is species of flowering plant within the verbena flowering plant within the verbena family (verbenaceae). Silver nanoparticles synthesized using plant extract have been used for analyzing their antimicrobial activities against different microbes. Hence attempt has been made and Silver nanoparticles synthesized using plant extract, analyzed their antimicrobial activities against different microbes. Silver nanoparticles prepared by using crude drug and silver nitrate solution. Silver nanoparticles estimated by ultraviolet spectroscopy and Antimicrobial activity determined by using Agar disc diffusion method.

Keywords: Silver Nanoparticles, plant extract, Antimicrobial activity

NS2019C04

Study the therapeutic activity and chemistry of benzimidazole derivatives

Durga Prasad Patel

Department of Pharmacy, Sant Gahira Guru University, Ambikapur, Sarguja, (C.G)

durgapatel1991@gmail.com

Abstract

Benzimidazole is a heterocyclic aromatic organic compound. This bicyclic compound consists of the fusion of benzene and imidazole. Benzimidazole is a heterocyclic aromatic organic compound. It is an important pharmacophore and privileged structure in medicinal chemistry. It plays a very important role with plenty of useful therapeutic activities such as: antiulcers, antihypertensives, analgesic, anti-inflammatory, anti-virals, antifungals, anticancers, and antihistaminics. The review of the literature shows that the benzimidazole derivatives are outstandingly effective compound and number of reviews available for biochemical and pharmacological studies conformed that their molecules are useful against a wide variety of micro-organisms. Benzimidazole derivatives are known to have numerous properties. Such compounds are currently employed in different fields of life; they can be used in medicine, pharmacy, agriculture and other aspects. In this study, we synthesized some benzimidazole derivatives using rapid, simple and inexpensive method. The yields of synthesized compounds were in the range of 68- 90%. The purity of the synthesized compounds was assessed by TLC and melting points. The assigned structures were further established by UV, IR spectral analysis. Some of the synthesized compounds were found to have potent anti-fungal activity. Compounds exhibited more activity when compared to other benzimidazole derivatives. Hence, it can be concluded that the benzimidazole derivatives can potentially be developed into useful anti-fungal agents, which can prompt future researchers to synthesize a new series of benzimidazole derivatives containing a wide substituents, with the aim of producing a novel heterocyclic system with enhanced activity. From the data of the Table of antibacterial and anti-fungal activity it is clearly concluded that the synthesized compounds are promisingly significant, good antimicrobial and anti-fungal agents. As per the results of screening it is clearly indicated that all the synthesized novel benzimidazole derivatives have shown good antibacterial and antifungal activity equipotent with the standard drugs. This is because of the presence of groups like OCH₃, CH₃, -N-(CH₃)₂, at the different positions of phenyl nucleus and heterocyclic system attached to benzimidazole nucleus which is attached to benzimidazole molecule.

Key Words: Benzimidazole, Therapeutic Activity, o-Phenylenediamine, p-Amino Benzoic Acid, ClCH₂COCl.

NS2019C05

An integrated computational method for designing and developing novel HDAC inhibitors

Ekta Shirbhate, DivyaSahu, Preeti Patel, Vijay K Patel, Harish Rajak

Institute of Pharmaceutical Sciences

Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.), 495009

ekta.shirbhate@gmail.com, Contact no. 6264507400

Abstract

Histone deacetylase (HDAC) inhibitors are recognized as a novel class of anticancer agent. The HDAC enzyme plays a vital role in gene transcription for regulation of cell proliferation, migration and apoptosis, immune pathways and angiogenesis. A series of 57 hydroxamate derivative with available IC_{50} data were analyzed by computational method for the identification of leads. The 3D-QSAR and Pharmacophore modeling investigation were accomplished to identify crucial pharmacophoric features and correlate 3D-chemical structure with HDAC inhibitory activity. The e-pharmacophore script and phase module were used for development of pharmacophore hypotheses, which characterized the 3D arrangement of molecular features necessary for the presence of biological activity. The 3D-QSAR analysis were carried out for five partial least square (PLS) factor model with excellent information and predictive ability, acquired $R^2=0.9824$, $Q^2=0.8473$, with low standard deviation $SD=0.2161$. Molecular docking studies showed intermolecular interactions between small molecules and some amino acids, such as GLY140, Zn501, HIS132 and PHE 141 with good glide score as compared with that of SAHA.

NS2019C06

Trivia in the approval of Radiopharmaceuticals – A Regulatory perspective

Authors

Ankush Ranglani¹, Indrajeet Sahu¹, **Gunjan Kalyani**^{*1}

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111,
Chhattisgarh, India

*Presenting Author Email Id: kalyani.gunjan@yahoo.in Phone No: +91–8349204583

Abstract

Radiopharmaceuticals are the pharmaceutical formulation which consists of radioactive substances; these molecules are labelled with radioisotopes. They are intended to use either for diagnostic or for therapeutic purposes. In recent times, there has been a noteworthy growth with special reference to branch of nuclear medicine. There are numerous novel radionuclides and radiopharmaceuticals used for the treatment of metastatic bone pain, neuroendocrine and other tumours. Embracing research by the scientific fraternity has led to the invention of many radiopharmaceuticals which are of immense clinical importance. The increasing availability of radiopharmaceuticals should be in accordance with regulatory action in order to back up the permissible foundation for their commercial use. It is therefore imperative for a radiopharmaceutical to have an approval from regulatory authority to qualify for human use. The present paper highlights various regulatory requirements for approval of radiopharmaceuticals in USA, Europe, and particularly India, which does not have guidelines for their approval, and intensifies the concern for a harmonized regulatory platform of global acceptance.

Keywords: Radiopharmaceuticals, Nuclear Medicine, Approval, Commercial use, Guidelines, Regulatory authority.

NS2019C20

Regulatory outline of Radiopharmaceuticals: Recent significance, opportunities and commendations

Authors

Indrajeet Sahu^{*1}, Gunjan Kalyani

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111, Chhattisgarh, India

*Presenting Author Email Id: jeetsahu290@gmail.com Phone No: +91–9165105459

Abstract

Radiopharmaceuticals are the new buzzword in the pharmaceutical industry and are truly an index of the modern medicine and a high-tech industry. The exponential rise in radiopharmaceutical domain can be attributed to their dual application as diagnostic as well as therapeutic agent. They are special group of pharmaceuticals containing a short lived radionuclides in their final form and are general used intravenously. This mandates utmost care during their manufacturing, dispensing, storage and disposal due to inherent hazardous nature of radionuclide on one side and the associated concern regarding radiation safety for patient as well as staff handling them on the other side. Their production should conform to latest principles of Good Manufacturing Practice at each stage as majority of them cannot be reprocessed. Therefore radiopharmaceuticals need to cater to the regulatory requirement of pharmaceutical regulator as well as nuclear regulator. Major regulatory bodies across the globe have their different perspective on radiopharmaceutical manufacturing, subsequent dispensing, their transport, storage and disposal etc. However regulatory framework of radiopharmaceuticals is still in its infancy stage in many developing countries. The present article aims at providing insight into current regulatory framework surrounding radiopharmaceuticals in major countries across the globe and attempts to provide recommendations so that high quality radio pharmaceutical are delivered in the most cost effective manner.

Keywords: Radiopharmaceuticals, Regulatory outline, Significance, Recommendations

***A. spinosus* Root has Excellent Pharmacological Antirolithiatic Action on Ethylene Glycol Induced Male Rats**

Khemkaran Ahirwar^a, Junaid Khan^b, Beena Gidwani^c

^{a,b} Sant Gahira Guru University Sarguja, Ambikapur Chhattisgarh, India,

^c Columbia Institute of Pharmacy Raipur, Chhattisgarh, India

E-mail: khempharma@yahoo.co.in

Abstract

Objectives: Urolithiasis is that the presence of calculi (stones) within the tract. *Amarathus spinosus* L is beneficial in treating urinary calculi. Thus, the current study, created to determine the scientific validity for the antirolithiatic activity of caryophylloid dicot genus *spinosus* L. Wistar rats divided into four teams containing six in every and unbroken in metabolic cages singly for entire length of the experiment. All animals had free access to regular rat chow and water impromptu. cluster I served as traditional. Group II received antifreeze for thirty days. Once administration of antifreeze for fifteen days, cluster III received cystone, group IV were treated with binary compound extract of caryophylloid dicot genus *spinosus*. On thirtieth day of the experiment, animals were housed in metabolic cages and 24 hour piddle samples and blood serum samples were collected. At the top all the animals were sacrificed. The urine and blood serum samples were used for estimation of organic chemistry parameters like metal, phosphorus, creatinine, uric acid was determined. Deposition of crystal is indicated by hyperbolic blood levels and small urinary levels of organic chemistry parameters like creatinine, acid with a decrease in blood level of metal and an increase urinary level of calcium. Administration of binary compound extract increased the excretion of organic chemistry parameters and reduces their concentration in blood. lastly, the information unconcealed were advised that caryophylloid dicot genus *spinosus* L. possess vital antirolithiatic activity.

Key finding: Various medicines will slow the results of antirolithiatic action. Most of the antirolithiatic agents developed for urinary organ stones have shown the practicability of speedy and noninvasive identification, furthermore as effective and specific treatment in animal models.

Summary: Current medications for urolithiasis and potential the herbal medication developed for the illnesses are mentioned within the current review. Further investigations stay to be applied to realize clinical translation of Anti urolithiasis agents for nephritic stones.

Key words: Kantabhanji, Antilithiatic herbal plant, *Amaranthus spinosus* root, Urinary Stone, Choulibhanji

NS2019C08

Personalized Medicines: Impacting Patient Care

Manish Kamble*¹, Dr.Prafulla Sabale¹

Manish.kamble21@gmail.com

Univ. Deptt of Pharmaceutical Sciences R.T.M.N.U. Nagpur (M.H.) India-440033

Abstract

Personalized medicine sometimes referred to as precision or individualized medicine, is the tailoring of medical treatment to the individual characteristics of each patient and recently an emerging field of medicine in the identification of genetic profile by using diagnostic tools as specific biological markers, often genetic, to help assess which medical treatments and procedures will be best for individual patient. The approach relies on scientific developments in our understanding of how a person's unique molecular and genetic profile makes them prone to certain diseases. The treatment is equipped with more precise tools and on the basis of patient's molecular profile, physicians can select a therapy or treatment protocol ensuring minimize harmful side effects and a more successful outcome, Also, the protocol is costs compared with a "trial-and-error" approach to disease treatment. Personalized medicine has the potential to change the way of thinking about identification and managing health problems. Personalized medicine already had exciting impact on both clinical research and patient care, and as technologies improve this impact will grow. To make healthcare more safe and effective, personalized medicine demands use advances knowledge about genetic elements and biological mechanisms of disease coupled with unique considerations of an individual's patient care needs. As a result of these contributions to improvement in the quality of care, personalized medicine impacting a key strategy of healthcare reform.

Keywords: Personalized Medicines, Biological marker, Diagnostic tools, Genetic profile.

NS2019C09

Mouth Dissolving Tablets – An Update Prospects for Oral Drug Delivery System

Poonam Verma*, Rudra Pratap Singh Rajput

Department of Pharmaceutics,

Columbia Institute of Pharmacy, Raipur – 493111, Chhattisgarh

priyaverma1326@gmail.com

Abstract

Fast dissolving drug delivery system is the process to deliver a drug in a case of severe pain, attack gives the rapid action and this type of tablets rapidly dissolve in saliva within a 15sec to 3 min without need of water. It's regarded as the safest economical and most convenient method of drug delivery system in its having the higher patient compliance. In this article, Different methods are described for the preparation of fast dissolving tablets such as a methods are- freeze drying, direct compression, Durasolv technology etc. and analytical parameters are a size, shape, thickness, weight uniformity, friability, dissolution test, disintegration etc. This review article are a focused on mainly advantages, disadvantages, synonym, methodology, ideal characteristics and analytical parameters of fast dissolving tablets at laboratory level.

Keywords: Mouth dissolving tablet, fast dissolving drug delivery system, methodology and analytical parameters.

NS2019C10

Design, synthesis and evaluation of novel hydroxamic acid based derivatives as anticancer agents

Preeti Patel*, Harish Rajak

Medicinal Chemistry Research Laboratory, Institute of Pharmaceutical Sciences,
Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur-495009, (C.G.) India

Email: ppatelpharma@gmail.com

Abstract

Hydroxamic acids as histone deacetylase (HDAC) inhibitors have emerged as the promising therapeutic approach for treatment of cancer. The HDAC enzyme plays an important role in gene transcription for regulation of cell proliferation, migration and apoptosis, immune pathways and angiogenesis. A series of novel hydroxamic acid based analogues were designed rationally and synthesized for investigation of their anticancer activities. The synthesized compounds were purified, characterized and evaluated for their anticancer activity by *in-vitro* method using sulfordamine (SRB) assay against breast (MCF-7), leukaemia (K562) and cervix (HeLa) cell of human cancer cell lines. All the synthesized compounds showed varying degree of anticancer activity in the micromolar range. Few compounds showed significant activity against MCF-7, leukaemia (K562) and HeLa cell lines with cytotoxicity activity less than 10 µg/ml. Molecular docking, free energy calculation and dynamic simulation studies were also performed to explore the putative binding modes of these compounds with receptor for antitumor activity. The analysis of molecular docking was completed by comparing docking pose, RMSD, accuracy and area of contacts of docked ligand with the cocrystallized structure. The present work leads to the development of novel hydroxamic acid derivatives as potent anticancer agents. Established SAR and docking results provides spatial fingerprints which would be beneficial for the development of potent hydroxamic acid based derivatives as anticancer agent.

Keywords: Histone deacetylase, QSAR, Docking, SRB assay, Anticancer.

An Updated Review: Application and Future Prospects of Hydrogels

Rishabh Sahu*, Rudra Pratap Singh Rajput

Department of Pharmaceutics

Columbia Institute of Pharmacy, Raipur – 493111, Chhattisgarh, India

rishabhsahu315@gmail.com

Abstract

Hydrogels are three-dimensional, hydrophilic, polymeric networks capable of absorbing large amounts of water or biological fluids. Due to their high water content, porosity and soft consistency, they closely simulate natural living tissue, more so than any other class of synthetic biomaterials. This route of drug administration is used for local as well as systemic delivery of drug. These biomaterials can integrate large quantum of biological fluids and swell. When swelled, they are soft & rubbery and resemble the living tissue, exhibit in excellent biocompatibility. A hydrogel is a network of polymer chains that are hydrophilic, sometimes found as a hydrogel in which water is the dispersion medium. Hydrogels are highly absorbent (they can contain over 90% water) natural or synthetic polymeric networks. Hydrogels also possess a degree of flexibility very similar to natural tissue, due to their significant water content. Hence the preparation techniques of hydrogel biomaterial and the evaluation of the properties are of almost significance. Literature reveals that this three dimensional architecture could be homo-polymeric, co-polymeric, semi- interpenetrating and interpenetrating polymer networks (IPN) based on preparation methods. Polymeric blends like semi-IPN have also been investigated to satisfy the specific needs of biomedical field. Such blends have shown superior performances over individual polymers. Hence, the evaluation of swelling, mechanical and biocompatible properties consider more attention before the hydrogels are applied. In this review article, an attempt has been made to describe the available methods of hydrogel synthesis, its applications along with future prospects.

Keywords: Hydrogels, Method of Preparation, Advantages, Evaluations, Applications, Future Prospects.

A Review on Application of Phospholipids as Unique Carrier for Drug Delivery Systems

Rudra Pratap Singh*¹, Chinmoyi Chakravarty², H V Gangadharappa³

Department of Pharmaceutics

¹Columbia Institute of Pharmacy, Raipur – 493111, Chhattisgarh, India.

²Jeypore College of Pharmacy, Rondapalli - 764002, Odisha, India.

³JSSAcademy of Higher Education & Research, Mysuru - 570015, Karnataka, India

rudra.p.s007@gmail.com

Abstract

The aim of this review is to draw attention on potential applications of phospholipids in drug delivery system through different sources, structure, properties and as carrier. Phospholipids have the exceptional biocompatibility and remarkable amphiphilicity characteristics that make phospholipids the major and suitable agent or excipient for the formulation and to achieve better therapeutic applications in drug delivery system. The applications of phospholipids in the drug delivery systems are enhancement of bioavailability of drugs with low aqueous solubility or low membrane penetration, an improvement or alteration the uptake and release profile of drugs, protection of sensitive active agents from degradation in the GIT tract, reduced the side effects and masking of bitter taste of drugs. These properties offer various possibilities in formulation and potential applications.

Keywords: Drug delivery system, Phospholipids, Bioavailability, Drug release, Applications.

NS2019C13

Insight into Nuclear Medicine

Authors

Sagar Sahu*¹, Gunjan Kalyani¹, Beena Gidwani¹

¹Columbia Institute of Pharmacy, Raipur - 493111, Chhattisgarh, India

Presenting Author's Mail Id: callmesagarsahu@gmail.com

Abstract

Nuclear medicine is a branch which deals with radioactive tracers are used to assess bodily functions, diagnosis and treatment of disease. The tracer or radiopharmaceutical is produced through addition of a radioactive isotope to pharmaceuticals specific to the organ being imaged or examined. Nuclear medicine was developed in the 1950s by physicians with an endocrine accentuation, initially using Iodine-131 to diagnose and then treat thyroid disease. The field of Nuclear Medicine also covers therapy procedures. A high dose of therapeutic radiation is delivered through administration of a radiopharmaceutical specific to the diseased target organ is benefit for treatment of cancer. Iodine-131, Iridium-192, iodine-125 or palladium-103 are some commonly used to treat thyroid cancer or non-malignant thyroid disorders, head and breast and prostate cancer respectively. The use of radiopharmaceuticals in diagnosis is growing at over 10% per year. Five Nobel Prize winners have been closely involved with the use of radioactive tracers in medicine. Currently, Radionuclide therapy has progressively become more successful in treating persistent disease and doing so with low toxic side-effects. The present paper focuses on the recent advancements and pros & cons associated with the Nuclear medicine.

Keywords: Nuclear Medicine, Diagnosis, Radioactive isotope, Radiopharmaceuticals

NS2019C14

Therapeutic Applications of Radiopharmaceuticals in Health Care System

Authors

Shubham Yadu*¹ Ankush Ranglani¹, Indrajeet Sahu¹, Gunjan Kalyani¹

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111,
Chhattisgarh, India

*Presenting Author Email Id: shubhamyadu1998@gmail.com Phone No: +91–8959876915

Abstract

Radiopharmaceuticals play an imperative role in the field of medicine. There is a significant increase in the global demand of radiopharmaceuticals, with the increasing incidences of cardiac, neurological and cancer disease. Radiopharmaceuticals, as the name suggests, are pharmaceutical formulations consisting of radioactive substances (radioisotopes and molecules labelled with radioisotopes), which are intended for use either in diagnosis or therapy or diagnosis. Recently, however, there has been a significant growth of this branch of nuclear medicine with the introduction of a number of new radionuclides and radiopharmaceuticals for the treatment of metastatic bone pain, neuroendocrine and other tumours. This paper focuses on the production of radiopharmaceuticals, their applications, labelling, packaging and storage.

Keywords: Radiopharmaceuticals, Applications, Health care System

NS2019C15

A Review on Preparation, Evaluation and Applications of Herbosome

Suman Sahu*, Rudra Pratap Singh Rajput

Columbia Institute of Pharmacy, Raipur – 493111, Chhattisgarh, India

suman.i.sahu8@gmail.com

Abstract

The herbal therapeutic agents are widely used to treat and prevent disease and disorders. Recently introduced new herbal formulation for better action such as herbosomes, liposomes, niosomes, ethosomes, cubosomes etc. Herbosomes have enhanced absorption rate, producing excellent bio-availability, good penetration power. In this article includes complete description of advantage, disadvantages, and methods of herbosome preparation and evaluation of herbosome. Different type of techniques used for preparation of herbosome such as solvent evaporation technique, anti-solvent precipitation technique, rotary evaporation technique, ethanol injection technique. An evaluation parameter is physicochemical evaluation, microscopical evaluation and in-vitro, in-vivo evaluation. Through this review article we are concluding that the article would be helpful for the researchers in terms of the preparation and evaluation of nanotechnology-based drug delivery system.

Keywords: Drug delivery system, Plant drug delivery system, Herbosome, Application, Marketed formulations

NS2019C16

Recent Developments in Nanodevices for Genomics and Proteomics and its applications

Tejaswini Selwate*¹, Manish A Kamble²

¹School of Pharmacy, SRTMU, Nanded (M.S.)

²University Dept. of Pharmaceutical Sciences. R.T.M.N.U. Nagpur. (M.H.) 440033

*Author email: tejaswiniselwate958@gmail.com

Abstract

Genomic and Proteomic information is finding increasing application in many areas such as the understanding of cancer, drug discovery, etc. Due to lab or intensive and expensiveness of conventional genome and proteome analysis devices, fast and low-cost analysis techniques are in great demand. New technologies are necessary to bridge the gap from massive amounts of genomics information to its application in future personalized medicine. Labs-on-a-chip and micro total analysis systems (μ TAS) are some of the best available resources for such applications. Recent developments in nanotechnology and nanofabrication techniques have greatly influenced the miniaturization of biomedical devices for genomics and proteomics. Newly developed nano-devices promise to overcome some of the basic limitations in such miniaturized systems. Although the combination of nanotechnology with genomics and proteomics is very young and has not yet been used in real biomedical applications, it has great growth potential and it is not difficult to imagine some commercially available nano based devices in the near future.

Keywords: Nanotechnology, Genomics, Proteomics, Biomedical applications, Nano-device

NS2019C17

**Designing Aspect of Combretastatin A-4 and HDACs Analogs as
Multi-targeted Anticancer Agents**

Vijay Kumar Patel*, Harish Rajak.

S.L.T. Institute of Pharmaceutical Science, Guru Ghasidas Central University, Bilaspur
(C.G.) 495009, India.

E-mail: vijay0305@gmail.com, Mob. No: +918770989302

Abstract

The drug research and development nowadays is focussing on multi-targeted agents. Single-targeted drugs are often less effective in controlling complex polygenic diseases with multiple pathogenic factors, such as cancer, diabetes, inflammation, and CNS disorders. Multi-targeted agents, which are able to interact with several drug targets simultaneously, lead to new and more effective medications for a variety of complex diseases particularly cancer even with relatively weak activities. The structure and ligand based computation approach including pharmacophore, docking, and de novo-based methods, virtual screening method guided multi-target drug designing strategy are used. A number of *in-silico* methods *i.e.*, molecular docking, pharmacophore matching, the use of structure-activity relationships (SAR) and quantitative structure-activity relationship (QSAR), similarity searching, and combinations of these methods used extensively as lead discovery tools against individual targets. The knowledge-based lead generation approach termed as 'framework combination' integrating the frameworks via 'linked', 'fused' or 'merged' depending upon the extent to which the frameworks and underlying pharmacophores of two molecules, each selective for a different target of interest, into a single molecule with dual activity would be used. De novo drug design can be structure-based or ligand-based, depending on whether the explicit target-ligand interaction is considered during the design process would be employed.

NS2019C18

An Insight to Radiopharmaceutical Science (RPS)

Authors

Devendra Sahu^{*1}, Ankush Ranglani¹, Shubham Yadu¹, Ankur Dhurandhar¹, Akash Verma¹,
Gunjan Kalyani¹

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111,
Chhattisgarh, India

*Presenting Author Email Id: devendrasahu2036@gmail.com Phone No: +91–8889331577

Abstract

Radiopharmaceutical science is a multidisciplinary field, encompassing chemistry, physics and biology. It is the science of incorporating a suitable radionuclide into a pharmaceutical or other biologically active molecule in such a way as to enable it to trace or mimic certain in vivo physiological or biochemical processes. The resulting radiopharmaceuticals are used in diagnostic imaging or therapy of patients.

A Radiopharmaceutical Scientist (RPS) is a specialist professional with a chemistry, pharmacy or sciences background and is involved in the design, manufacture and analysis of radiopharmaceuticals. By utilising their scientific knowledge and analytical skills, RPSs also provide knowledge and guidance on the safe and efficacious use of these products to ensure their suitability for clinical use.

RPSs generally work in Nuclear Medicine departments, together with a team of specialist physicians, medical physicists, medical radiation scientists (nuclear medicine technologists) and nurses, all trained in the safe use of radionuclides for medical applications. RPSs may also work in commercial radiopharmacies, medical cyclotron facilities and research institutions.

Keywords: Radiopharmaceutical science, Nuclear medicine, Medical applications

NS2019C19

Nuclear Medicine in Diagnosis

Authors

Jay Prakash Sahu^{*1} Ankush Ranglani¹, Shubham Yadu¹, Indrajeet Sahu¹, Devendra Sahu¹,
Gunjan Kalyani¹

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111,
Chhattisgarh, India

*Presenting Author Email Id: jayprakashsahu816@gmail.com Phone No: +91–9111248402

Abstract

Nuclear medicine is used to diagnose a wide range of conditions. The patient inhales, swallows, or is injected with a radiopharmaceutical. This is a radioactive material. After the administration patient will lie down on a table, and a camera clicks the pictures. The camera focuses on the area where the radioactive material is concentrated, and this shows any ailment if found. Types of imaging techniques include Positron Emission Tomography (PET) and single-photon emission computed tomography (SPECT). PET and SPECT scans can provide detailed information about how a body organ is functioning. This type of imaging is particularly helpful for diagnosing thyroid disease, gall bladder disease, heart conditions, and cancer. It can also help diagnose Alzheimer's disease and other types of dementia and brain conditions. Earlier, diagnosing internal problems often needed surgery, but nuclear medicine makes this unnecessary. After diagnosis, and when treatment starts, PET and SPECT can show how well the treatment is working. PET and SPECT are also offering new insights into psychiatric conditions, neurological disorders, and addiction. Other types of imaging involved in nuclear medicine include targeted molecular ultrasound, which is useful in detecting different kinds of cancer and highlighting blood flow; and magnetic resonance sonography, which has a role in diagnosing cancer and metabolic disorders.

Keywords: Nuclear medicine, Diagnosis, Radiopharmaceutical, Radioactive material

NS2019C20

Regulatory outline of Radiopharmaceuticals: Recent significance, opportunities and commendations

Authors

Indrajeet Sahu^{*1}, Gunjan Kalyani

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village – Tekari, Raipur - 493111, Chhattisgarh, India

*Presenting Author Email Id: jeetsahu290@gmail.com Phone No: +91–9165105459

Abstract

Radiopharmaceuticals are the new buzzword in the pharmaceutical industry and are truly an index of the modern medicine and a high-tech industry. The exponential rise in radiopharmaceutical domain can be attributed to their dual application as diagnostic as well as therapeutic agent. They are special group of pharmaceuticals containing a short lived radionuclides in their final form and are general used intravenously. This mandates utmost care during their manufacturing, dispensing, storage and disposal due to inherent hazardous nature of radionuclide on one side and the associated concern regarding radiation safety for patient as well as staff handling them on the other side. Their production should conform to latest principles of Good Manufacturing Practice at each stage as majority of them cannot be reprocessed. Therefore radiopharmaceuticals need to cater to the regulatory requirement of pharmaceutical regulator as well as nuclear regulator. Major regulatory bodies across the globe have their different perspective on radiopharmaceutical manufacturing, subsequent dispensing, their transport, storage and disposal etc. However regulatory framework of radiopharmaceuticals is still in its infancy stage in many developing countries. The present article aims at providing insight into current regulatory framework surrounding radiopharmaceuticals in major countries across the globe and attempts to provide recommendations so that high quality radio pharmaceutical are delivered in the most cost effective manner.

Keywords: Radiopharmaceuticals, Regulatory outline, Significance, Recommendations

NS2019C21

Upgraded Radiopharmaceuticals: A Miraculous Tool in Medical Science

Authors

Sandhya Mishra*¹, Disha Kesharwani¹

¹Columbia Institute of Pharmacy, Near Vidhan Sabha, Village –Tekari, Raipur-493111,
Chhattisgarh, India

Presenting Author: sandhyamishra2911@gmail.com

Abstract

Radioactive substances are atoms that decay naturally with the emission of alpha particles, beta particles and gamma radiation. However these emissions from radioactive substances play a major role in certain diagnostic and therapeutic purposes. Diagnostic purposes commonly involve using the radiation to provide information about the functioning of a person's specific organs which results in diagnosis of many dreadful disease and deformities of many organs. This involves the use of tomography, radioactive tracers and PET-CT(Positron Emission Tomography-Computed Tomography) as a powerful and significant tools for diagnostic purposes. Radioactive substances can also be used to treat many medical conditions like cancer, arthritis, cancer-induced bone pain, hyperthyroidism and many more. Pharmaceutical research and development also focuses on using radioisotopes in many non-clinical and clinical studies for the development of compounds for different therapeutic areas, such as central nervous system diseases (e.g. Dementia, Alzheimer's disease , and Parkinson's disease), oncology, and metabolic diseases (e.g. diabetes mellitus).This review mainly focuses on various diagnostic and therapeutic application of radioactive substances with specific reference to certain drugs and disease. Additionally, this review also focuses on recent patents in the field of radioactive substances for treatment and diagnosis.

Keywords: Radioactive substances, radioisotopes, Tomography, Oncology

Iodine as an Industrial Radioactive Tracer

Pratiksha Fulzele^{1*}, Swati Pandey², Shiv Shankar Shukla³, Ravindra Pandey⁴

¹Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

²Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

³ Department of Pharmaceutical Analysis and Quality Assurance, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

⁴ Department of Pharmacognosy, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

Presenting Author's Email: fulzele.pratiksha96@gmail.com

Abstract

Iodine and its compounds are primarily used in nutrition. Due to its high atomic number and ease of attachment to organic compounds, it has also found favor as a non-toxic radio contrast material. Because of the specificity of its uptake by the human body, radioactive isotopes of iodine can also be used to treat thyroid cancer. Iodine radioisotopes have half-lives less than 60 days, and four of these are used as tracers and therapeutic agents in medicine. These are ¹²³I, ¹²⁴I, ¹²⁵I, and ¹³¹I. All industrial production of radioactive iodine isotopes involves these four useful radionuclide's. Iodine ¹³¹I is an important radioactive isotope of iodine which has half life about 8 days. It associated with the nuclear energy, medical diagnostic and treatment procedure and natural gas production. It also plays an important role as a radioactive isotope present in nucleuse fusion products and was significant contribution to the health hazard from open air atomic bomb testing. Iodine-¹³¹I became one of the most commonly used gamma- emitting industrial radioactive tracers with application in isotopes hydrology and leak detection. Isotope hydrology is a field of geochemistry and hydrology that uses naturally occurring stable and radioactive isotopic techniques to evaluate the age and origin of surface and groundwater and the process within the atmospheric hydrologic cycle. Isotope hydrology application are highly diverse and used for informing water use policy aquifers, consuming water supplies, assessing source of water pollution and increasingly are used in eco hydrology to study human impact on all dimensions of the hydrological cycle and eco system services.

Keywords: Iodine, Gamma- emitting, Isotopes, Hydrologic cycle

Genotoxic Hazards allied with Radiopharmaceuticals

Swati Pandey¹, Shiv Shankar Shukla², Ravindra Pandey³

¹Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

² Department of Pharmaceutical Analysis and Quality Assurance, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

³ Department of Pharmacognosy, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

Presenting Author's Email: dubeyswati326@gmail.com

Abstract

The rapid development in molecular biology is opening up a range of new potential targets in the treatment and diagnosis of various diseases within the field of oncology, cardiology, and neurology. In this context, combinatorial chemistry together with high-throughput screening technology produces a large number of drug candidates. Radiopharmaceuticals are one such drug that can be genotoxic, whereas it is well established that ionizing radiation coupled to the molecule is genotoxic, and that the mechanism that causes cancer is similar to certain genotoxic chemicals. As ensured by the analysis by positron emission tomography that an API carries a mass less than the acceptable levels of genotoxic impurities. It has been also proven that the projected level of genotoxic hazard of a radioactive pharmaceutical is 10-100 times higher than administered chemicals. Cosmic radiation in addition to natural radioactivity provides an obvious radiation background, which corresponds to an extra cancer risk of 10–5 per year. The chemical structure of genotoxic drugs is well understood, and new drug candidates can, before their use, be classified into groups of different genotoxic hazard. Specific radioactivity of radiopharmaceuticals is an important variable in relation to discussions on genotoxicity. A certain amount of radioactivity is needed in diagnostic imaging using radiopharmaceuticals. The conclusion is that the regulatory demands on radiopharmaceuticals produced at high specific radioactivity should be reconsidered in order to facilitate the use of the micro dosing concept for drug development. As radiation doses at this level are accepted in clinical trials, the conclusion is that the regulatory demands on radiopharmaceuticals produced at high specific radioactivity should be reconsidered in order to facilitate the use of the micro dosing concept for drug development.

Keywords: Radiopharmaceuticals, Genotoxic hazards, Micro dosing, Radiations

NS2019C24

Nanosized Drug Delivery System: Novel Nomenclature of Radiopharmaceuticals for Treatment of Cancer

Neeraj Kumar Karmakar¹, Swati Pandey², Shiv Shankar Shukla³ Ravindra Pandey⁴

¹Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

²Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

³ Department of Pharmaceutical Analysis and Quality Assurance, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

⁴ Department of Pharmacognosy, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

Corresponding Author's Email: dubeyswati326@gmail.com

Abstract

Cancer is the second leading cause of death in the world. Radiolabeled nanocarriers or nanoparticles can be designed and used for cancer diagnostic and therapeutic purposes when tagged with appropriate radionuclides. The major nanocarriers include liposomes, dendrimers, quantum dots, iron oxide and carbon nanotubes. In addition, the combining of tumor specific multifunctional and multimodality nanocarriers will hopefully achieve earlier tumor detection and better tumor treatment. We emphasize the efforts on the development of radiolabeled nanoparticles (NPs) for cancer treatment, i.e. theranostic tools based on nanotechnology and nuclear medicine. The ionizing radiation from radionuclides (not provided by drugs) can kill cells or inhibit the growth in the periphery and the inaccessible center of cancerous lesions. Sites of damage comprise all cellular levels, especially DNA in the nucleus of cells. In addition, recent developments in nanotechnology have made it possible to conjugate NPs to biological moieties for targeted therapy. This enables the more specific radiation dose delivery, preventing damage to healthy tissues. Due to the development in electronic and computer engineering technology; new imaging modalities are going into routine usage in nuclear medicine practice for molecular imaging. The crucial point is the detection of molecular targets of diseases, which is different from normal tissues, such as an increase or decrease of the number/amount of a receptor, transporter, hormone, enzyme, or formation of a new target. Recently, development of radiolabeled, specific molecular targeted probes has been investigated for diagnosis of diseases more accurately by different imaging modalities.

Keywords: Cancer, Radiolabeled nanocarriers, Radionuclides, Targeted Therapy, Theranostic tools.

Radio Pharmacy: A Potent Technique for the treatment of Cardiovascular Disease

Beyant Singh¹, Swati Pandey², Shiv Shankar Shukla³, Ravindra Pandey⁴

¹Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

²Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

³Department of Pharmaceutical Analysis and Quality assurance, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

⁴Department of Pharmacognosy, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

Email: sbeant500@gmail.com

Abstract

Cardiovascular disease (CVD) is the leading cause of death and disease burden worldwide. 17.9 million People die each year from CVD, an estimated 31% of all death worldwide. Phenomenal advances in the application of principles of radioactivity in medicine and pharmacy have been registered over the last decade. The rapid advances in instruments have been more than matched by radiopharmaceutical development. This technique highlight the attributes that make rest/stress myocardial perfusion PET both preferred and recommended in the era of high value initiatives for appropriate patients. Myocardial perfusion PET image quality, high diagnostic accuracy that is relatively independent of body habits, ability to accurately risk stratify patients with a wide array of clinical presentations, short acquisition times, safety by virtue of low radiation exposure, and its unique ability to quantify myocardial blood flow. The range of modalities are stress echocardiography, calcium scoring, coronary computed tomography angiography (CCTA), stress cardiac magnetic resonance (CMR), and invasive coronary angiography for stable ischemic heart disease has been used extensively to perform diagnosis, monitor therapies, and predict cardiovascular events. Cardiac CT is done to evaluate the anatomy of the coronary artery and myocardial perfusion. This technique provides information of the coronary anatomy and coronary perfusion by one modality. These techniques are desired to spread widely in clinical practice. Solutions of Cardiovascular disease problem require enhanced novel research that can address each of these problems. In future there are lots of applications of nuclear pharmacy as an effective treatment for cardiovascular diseases.

Keywords: Cardiovascular disease (CVD), Nuclear Pharmacy, myocardial perfusion, cardiac magnetic resonance

NS2019C26

Quality Control of Radiopharmaceuticals

Shivani Sharma¹, Swati Pandey², Shiv Shankar Shukla³, Ravindra Pandey⁴

¹Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

²Research Scholar, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

³Department of Pharmaceutical Analysis and Quality assurance, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

⁴Department of Pharmacognosy, Columbia Institute of Pharmacy, Tekari, Raipur, C.G.

Presenting Author's Email: shivani23sharma1997@gmail.com

Abstract

A radiopharmaceutical is only as good as the care taken in each preparation step throughout the compounding process. With diagnostic radiopharmaceuticals it is important to have a product with acceptable quality control (QC) parameters in order for the nuclear medicine study to be effective yet deliver unnecessary radiation exposure to the patient. The overwhelming majority of radiopharmaceuticals used for diagnosis and therapy in Nuclear Medicine are administered to patients as intravenous. Radiopharmaceuticals can be divided into two main categories: those purchased from a manufacturer and administered unchanged, and those prepared in-house. The quality control of radiopharmaceuticals administered unchanged is primarily the responsibility of the manufacturer. As medicine relies more on advanced technology, regulatory requirements and quality assurance programs have become increasingly important to verify and maintain the accuracy of complex methodologies. Quality control of radiopharmaceuticals is therefore necessary for 2 distinctly separate but linked reasons as they relate to pharmaceutical parameter and radioactive parameters. Pharmaceutical parameters designed to ensure that there is no microbiological, pyrogenic or particulate contamination can harm patients. Radioactive parameter designed to ensure that the intended radiation exposure of patients is kept to a minimum by confirming that the radioactivity, radiochemical and radionuclide purity are assured. These additional factors have an effect on the overall radiation dose to the patient, as impurities of the radionuclide and/or its chemical composition may affect the biodistribution of the injected radiopharmaceutical and consequently the radiation dose to any one particular organ or the whole body dose (ED – Effective Dose).

Keywords: Radiopharmaceuticals, Quality Control, Radionuclide purity, Radioactive Parameters, Pyrogenic Microbiological

NS2019C27

Nuclear Medicine - Application in Diagnosis and Treatment of Various Disorders

Akhilesh Kumar Sahu*, Amit Roy, Pushpa P. Gupta

Department of Pharmacology, Columbia Institute of Pharmacy, Tekari, Raipur, (CG), PIN
493111

Abstract

Nuclear medicine uses radiation to provide diagnostic information as well as for therapeutic purpose. Radiotherapy can be used to treat some medical conditions, especially cancer, using radiation to weaken or destroy particular targeted cells. Over 40 million nuclear medicine procedures are performed each year, and demand for radioisotopes is increasing at up to 5% annually. Nuclear medicine' is the medical specialty, which utilizes the nuclear properties of radioactive substances in diagnosis, therapy and research to evaluate metabolic, physiologic and pathologic conditions of human body. Now-a-days, nuclear medicine offers procedures that are immensely helpful to a broad spectrum of medical sciences ranging from oncology to cardiology to psychiatry. Nuclear medicine imaging procedures often identify abnormalities at the very early stage of the progression of the disease, long before it could be detected by other alternative diagnostic modalities and this allows the disease to be treated early in its course. Although the field of nuclear medicine is dominated by the diagnostic procedures, it also has valuable therapeutic applications, which include treatment of hyperthyroidism, rheumatoid arthritis, Hodgkin's disease and a wide range of cancers, like cancers in breast, ovary, prostate, liver, colon, lung and endocrine glands. Nuclear medicine has also been extensively used to treat various heart ailments, leukemia and for providing pain relief to the patients suffering from metastatic bone cancer. Nuclear medicine has always been perhaps the most exciting area of investigation in medicine.

Keywords: Nuclear medicine, Radioisotopes, Hyperthyroidism, Rheumatoid arthritis, Hodgkin's disease

NS2019C28

Therapeutic Radionuclides in Nuclear Medicine: Current and Future Prospects

Rajendra Kumar*, S. Prakash Rao, Santosh Kumar Prajapati, Mahendra Kumar

Department of Pharmacology Columbia Institute of Pharmacy, Raipur – 493111,
Chhattisgarh, India

rajendrakumarsahu640@gmail.com

Abstract

The potential use of radio nuclides in treatment has been recognized for several decades. Variety of radio nuclides, like iodine (131I), phosphorous-32 (32P), strontium-90 (90Sr), and yttrium-90 (90Y), are successfully used for the treatment of the numerous benign and malignant disorders. Recently, the ascension of this branch of medicine has been excited by the introduction of variety of recent radio nuclides and radio pharmaceutical drugs for the treatment of metastatic bone pain and system and numerous malignant or non-malignant tumours. Today, the area of radio nuclide treatment is enjoying an exciting section and is poised for larger growth and development within the returning years. An example, in Asia, the high prevalence of thyroid and liver diseases has prompted several novel developments and clinical trials practice targeted radio nuclide treatment. This paper reviews the characteristics and clinical applications of the commonly getable therapeutic radio nuclides, additionally due to the issues, and problems concerned in translating novel radio nuclides into clinical therapies.

Keywords: radio nuclides, Malignant tumours, Treatment

NS2019C29

Radionuclides and Nuclear Medicines Used in Treatment of Bone Malignancy

Tripti Naurange*, Sanjib Bahadur

Department of Pharmaceutics,
Columbia Institute of Pharmacy, Raipur- 493111, Chhattisgarh
triptinaurange@gmail.com

Abstract

Bone malignancy is abnormal growth of cells and tissue in bone or neoplastic growth of tissue in bone. It's also known as bone cancer, bone tumour. Most common types primary bone cancer is osteoblastoma, Ewing's sarcoma and chondrosarcoma. Secondary bone cancer is cancer that spreads to bone from another part of the body like lung, breast and prostate. The radioactive nuclides and nuclear medicines used for detection and treatment of bone malignancy, some radionuclides used in therapy of bone cancer ^{89}Sr , ^{223}Ra , ^{32}P and ^{89}Sr . The skeleton is a potential metastatic target of many malignant tumours. Up to 85% of prostate and breast cancer patients may develop bone metastases causing severe pain syndromes in many of them. In patients suffering from multilocular, mainly osteoblastic lesions and pain syndrome, radionuclide therapy is recommended for pain palliation. Low-energy beta-emitting radionuclides (^{153}Sm -ethylenediaminetetramethylenephosphonate (EDTMP) and ^{89}Sr) most commonly used nuclear medicine used for bone tumours therapy.

Keyword: Radionuclides, nuclear medicine, bone malignancy, chondrosarcoma, osteoblastoma and Ewing's sarcoma.

NS2019C30

A review update: Radionuclide drug interactions

Manisha Sahu*, Sanjib Bahadur

Department of Pharmaceutics

Columbia Institute of Pharmacy, Raipur 493111, Chhattisgarh

manishasahu0411@gmail.com

Abstract

Radiopharmaceuticals play a critical role in cutting-edge remedy primarily for diagnostic purposes, but also for monitoring disease development and reaction to treatment. As using photograph has been multiplied, so has the usage of prescription medicines. These trends increase the threat of interactions between medications and radiopharmaceuticals. These interactions which have an effect on photograph through competing with the radiopharmaceutical for binding web sites for example can cause fake poor outcomes. Capsules that boost up the metabolism of the radiopharmaceutical can have a high-quality impact (i.e. speeding its clearance) or, if repeating photograph is wanted, a bad effect. in some instances, as an example in cardiac photograph amongst sufferers taking doxorubicin, those interactions may additionally have a healing advantage. The prevalence of drug-radiopharmaceuticals destructive reactions is unknown, seeing that they will now not be said or maybe diagnosed. right here, we compiled the medical literature, the use of the standards of a scientific evaluation hooked up by the cochrane collaboration, on pharmaceutical-drug interactions to offer a precis of documented interactions by using organ machine and radiopharmaceuticals. The purpose is to provide a reference on drug interactions that could tell the nuclear medicinal drug group of workers in their each day recurring. efforts to boom adverse occasion reporting, and ideally consolidate reports global, can provide a seriously wished resource for prevention of drug-radiopharmaceuticals Interactions.

Key words: Radiopharmaceuticals, Radiopharmacy, Drug interaction

NS2019C31

Inflammasomes: Their role in inflammation and cancer

Renuka Verma*, Pushpa P Gupta, Amit Roy

Department of Pharmacology, Columbia Institute of Pharmacy, Tekari, Near Vidhansabha,
Raipur -493111Dist-Raipur (C.G.) India.

Presenting Author: renu8326@gmail.com

Abstract

An Inflammasome is a multimolecular complex, composed of a NOD-like protein (NLR), the adaptor apoptosis-associated speck-like protein containing a caspase recruitment domain (ASC), and caspase-1 associated with various stages of tumor development. It also has significant impacts on tumor immunity and immunotherapy. Inflammasomes are protein complexes that are formed within a cell and has important innate immune pathway critical for the production of active IL-1 β and interleukin 18, as well as the induction of pyroptosis. Research output revealed that, inflammasomes play a vital role in infectious and autoimmune diseases and their role in tumor progression remains elusive. Recent studies demonstrated that, inflammasomes promote tumor progression in skin and breast cancer. These results indicated that inflammasomes can promote and suppress tumor development depending on different types of tumors, specific inflammasomes involved, and downstream effector molecules. There are numerous studies on the involvement of toll-like receptors (TLRs) or interferon (IFN) pathways in tumor development. The complicated role of inflammasomes paved the way for new opportunities and challenges to manipulate Inflammasome pathways in the treatment of cancer.

Keywords: Inflammasome, Inflammation, Tumor immunity, cancer, signaling pathway

NS2019C32

Reactivation of Protein 53: Target to Treat Cancer

Ruchi Bhattacharya*, Shiv Shankar Shukla, Ravindra Pandey

Department of Pharmacology, Columbia Institute of Pharmacy, Tekari, Near Vidhan sabha,
Raipur - 493111 Dist - Raipur (C.G.) India.

Presenting author's Email id: ruchibhattacharya1994@gmail.com

Abstract

Tumor Protein 53 or Protein 53 (P53) is the single most frequently altered gene in human cancers, with mutations being present in approximately 50% of all invasive tumors. However, in some of the most difficult to-treat cancers such as high-grade serous ovarian cancers, triple-negative breast cancers, esophageal cancers, Small cell lungs cancers and squamous cell lung cancers, p53 is mutated in at least 80% of samples. Clearly, therefore, mutant p53 protein is an important candidate target against which new anticancer treatments could be developed. Although traditionally regarded as undruggable, several compounds such as p53 reactivation and induction of massive apoptosis-1 (PRIMA-1), a methylated derivative and structural analogue of PRIMA-1, i.e. APR-246, 2-sulfonylpyrimidines (PK11007), pyrazoles such as PK7088, zinc metallochaperone-1 (ZMC1), a third generation thiosemicarbazone developed by Critical Outcome Technologies Inc. (COTI-2) as well as specific peptides have recently been reported to reactive mutant p53 protein by converting it to a form exhibiting wild-type properties. Consistent with the reactivation of mutant p53, these compounds have been shown to exhibit anticancer activity in preclinical models expressing mutant p53.

Keywords: Protein 53, invasive tumors, small cell cancer, anticancer activity, Cancer therapy

NS2019C33

Design and *In vitro* characterization of phase transition system using Rivastigmine tartrate for nasal drug delivery system

Payal Dhok*¹, Chetan Kadam², Darshan Telenge²

Department of Quality Assurance, Columbia Institute of Pharmacy, Tekari, Near
Vidhansabha, Raipur -493111 Dist-Raipur (C.G.) India

Department of Quality Assurance, S.K.B College of Pharmacy, Kamptee, behind Kamptee
Railway station, Nagpur-441001 (Maharashtra) India

Presenting author E- mail ID - payaldhok123@gmail.com

Abstract

Aim of present research was to overcome the limitations of nasal cavity like low residence time by using in situ gel forming nasal drug delivery system. prepared from polymer that exhibit phase transition (sol-gel) and pseudo-plastic behavior to minimize interference with the mucociliary clearance. Such system can be formulate as liquid dosage form suitable to be administered by instillation into nose, which upon exposure to physiological condition shift to the gel phase, thus increasing of delivery residence of the delivery system and enhancing bioavailability. The objective behind this research is to formulate the phase transition system for nasal drug delivery that can be easily administered and attain semisolid properties in nasal mucosa. Phase transition system was formulated by using various polymers like Sodium alginate, Hydroxy propyl methyl cellulose, Gellan gum, Carbopol, Chitosan Hcl, Sodium glycerophosphate in which sodium alginate polymers and there concentration where selected for formulation of batches. Formulation of phase transition system prepared in three different formulation firstly preliminary batches, combination and finally prepared factorial batch. Thus, it was concluded the prepared phase transition system of Rivastigmine tartrate may have safe and effective, drug release study over extended period of time which can reduce dosing frequency.

Keywords: Rivastigmine tartrate, Phase transition system, sodium alginate

NS2019C34

Effect of radiofrequency radiation release by cell phone on human health

Bibekananda Meher*, Pushpa Prasad Gupta, Poonam Sahu

Columbia Institute of Pharmacy, Raipur, Chhattisgarh: 493111

Abstract

Now a day's radiation exposure is a challenging task for our society. Technology has been growing over time and use of radio waves also increasing day by day. In 2011, the International Agency for Research on Cancer (IARC) reviewed the published literature and categorized radiofrequency radiation as a "possible" (Group 2B) human carcinogen. It has been reported that radiofrequency radiation is responsible for large number of adverse effect on human health. It was also observed that in experimental animals' radiation exposure can increases the incidence like: Schwannomas and malignant gliomas, as well as mitochondrial DNA damage. It is also observed that radiofrequency radiation can affect more in developing children than adult. When a cell phone is held against head because of the thin skull bone of children i.e. absorption in children is 10 times more than adult. In adult life when a person keeps cell phones in their trouser it significantly lowers the sperm motility which can be responsible for sterility. It also can also damage mitochondrial DNA. As per the current knowledge it is the responsibility of the personnel in-charge of human health and Government to aware the people regarding the harmful effect of cell phone. Large number of people can be benefitted and a number of human lives can be saved.

Keywords: Radiofrequency radiation, Exposure, Carcinogen, Chromosomal DNA damage

NS2019C35

Application of Radiopharmaceuticals in the treatment of cancer

Dr. Pushpa Prasad Gupta

Columbia Institute of Pharmacy, Raipur (C.G.) 493111

Abstract

Radiopharmaceuticals are the unique formulations containing radioisotopes. These isotopes bound to specific biological molecules able to target specific organ, tissue or cells in the human body. They are used in diagnosis and treatment of various diseases. Various International (International Atomic Energy Organization- IAEA and International Commission on Radiation Protection- ICRP) and National organization (Govt. of India- Atomic Energy Regulatory Board (AERB)) provide an infrastructure that support nuclear technology. In cancer the application of radionuclide depends on its ionizing radiation i.e. ability to destroy cells at particulate emissions. Radionuclide reduces the cytotoxic effects by arresting the radiation at the point of proliferation of cells without causing serious damage to normal surrounding cells. Ionizing radiation can be administered in three different ways- Teletherapy, Brachytherapy and Radionuclide therapy. Radionuclide therapy is the most accepted and effective method to overcome multiple side effects of analgesics used to reduce pain of skeletal metastases. In last decade, targeted radionuclide therapy involves molecular carriers such as peptides, antibodies and hormones for the treatment of various cancers. Radioimmunotherapy based on radiolabeled monoclonal antibodies (MoABs) is a useful procedure to treat different kind of cancers. In the recent past years a new term was introduced in radiopharmaceuticals i.e. "theranostics" (combination of two words – therapeutic + diagnostics). Presently several radiopharmaceuticals are being investigated for determining their suitability for theranostic applications.

Keywords: Radiopharmaceuticals, Radionuclide, Theranostic, Cancer

NS2019C36

Radio pharmaceutical in Renal Therapy

Dr. Shashikant Chandrakar*

Columbia Institute of Pharmacy, Raipur, Pin-493111

Email-shashikant.py@gmail.com

Abstract

Radio pharmaceuticals are used in the management of various renal diseases since decades. For diagnosis of urinary tract obstructions and assessment of its function, radionuclide imaging is used in both adults and children. The different functional aspects of the kidneys are examined by radiotracer technique. Renal scintigraphy is used to diagnose various kidney diseases. In this technique radiopharmaceutical are injected into patient that emits small amount of radioactivity. The radio pharmaceutical used are Tc-99m dimercapto succinic, Tc-99m mercapto acetyl triglycine and Tc-99m diethylene triamine pentaacetic acid. Apart from structural and functional information, this method can also be used for assessment of glomerular filtration rate. Newer methods are also developed that depends on positron emission tomography, which generates images with higher resolution. By these techniques absolute evaluation of biological processes are possible.

Keywords: Radiotracer, Scintigraphy, Radiopharmaceutical, Tc-99m, Radionuclide

NS2019C37

Transferosome: An Exalted Vesicular System for the Treatment of Rheumatoid Arthritis by Topical Route

Disha Kesharwani^{1*}, Sandhya Mishra¹, Swarnali Dash Paul², Rishi Paliwal³, Trilochan Satapathy⁴

¹Columbia Institute of Pharmacy, Tekari, Raipur, Chhattisgarh, India

²FPS-SSTC-SSGI, Bhilai, C.G, India

³IOP, Indira Gandhi National Tribal University, Amarkantak, M. P, India

⁴IOP, RITEE, Raipur, C. G. India

Abstract

Arthritis is a chronic autoimmune disorder which is characterized by a chronic inflammation of synovium and severe joint destruction. After a vast study and development in the field of arthritis, the disease is still incurable. The conventional treatment methods suffer from poor bioavailability, and severe adverse effects. Hence RA requires rapid onset of action for immediate pain relief and delivery of drug directly to the site of action. Transferosomes also known as “the ultra- flexible lipid vesicles” can resolve these drawbacks by making the drug available directly to the affected site of the body. Transferosomes can accommodate drug molecules with wide range of solubilities and facilitate topical delivery of low as well as high molecular weight drugs. Transferosomes can deform and pass through narrow constriction (from 5 to 10 times less than their own diameter) without measurable loss and provide better penetration of intact vesicles. In recent years, the use of lipid vesicles as carriers for topical drugs has attracted great attention due to their ability to overcome the barrier properties of the skin. They can penetrate the skin easily and overcome the barrier function by squeezing through the intracellular lipid of the stratum corneum. This review highlights the importance of transferosomal system for the treatment of Rheumatoid arthritis from topical route.

Key words: Transferosome, Autoimmune disorder, Rheumatoid Arthritis

NS2019C38

Producing and Operating a Radiochemicals

Ravikant Patel*

Rungta College of Pharmaceutical Sciences and Research, Bhilai, Durg, CG

Abstract

Nuclear medicine is especially devoted to the diagnostic and therapeutic use of radioactive compounds. At the present time almost all radiopharmaceuticals compound in radiopharmacies are ^{99m}Tc compounds. These compounds have half-lives of 6 hours and shelf-lives of from 2 to 24 hours, which means that the preparations must be made daily. Thus in order to run a modern nuclear medicine obtaining radioactive isotope and preparing it for injection into patients has become very important. Every dose of radiopharmaceutical should be checked in a dose calibrator prior to administration to patient. There is considerable evidence that the biodistribution or pharmacokinetics of radiopharmaceuticals may be altered by patient medication.

Keywords: Nuclear Medicine, Radiochemicals, Biodistribution, Radioisotope

NS2019C39

Current Trends and Developments for Nanotechnology in Cancer

Neha Baghel*, Dr. Bina Gidwani

Department of PA and QA

Columbia Institute of Pharmacy, Raipur – 493111, Chhattisgarh, India

nehabaghel0912@gmail.com

Abstract

Cancer is a deadly disease caused by an uncontrolled division of abnormal cells in a part of the body. Despite the continuous development of medicine and technology cancer is one of the leading causes of death worldwide. Every year 7 lakh people die in India due to cancer in which Bihar, Uttar Pradesh, and Jharkhand is the main state. Thus, in the recent years, nanotechnology has been applied to the field of medicine, opening new avenues to the treatment, diagnosis, and monitoring of cancer diseases. This horizon has become closer with a considerable number of nanoformulations being recently approved for commercialization or reaching preclinical and clinical stages. In this context, remarkable advances in nanotechnology led to the emergence of nanodelivery systems that can specifically target an extensive variety of malignant tissues, control precisely the release of the cargos, as well as to improve the biological effects of the immunostimulatory molecules via different mechanisms for cancer immunotherapy. Nanotechnology is one of the fastest areas of growth and development in the 21st century, where several material types (e.g., organic, inorganic, and polymeric based), medicines and devices are used to manipulate matter with size in the range of 1–100nm (Reddy, 2011). Nanotechnology has brought new hope for cancer detection due to the development of nanosized probes. Nanomedicines are being used as vehicles to deliver therapeutic agents to a specific location in the body. The selective nanomedicines for cancer treatment have revolutionized the research field of cancer and technology due to the possibility to precisely synthesize nanoparticulate systems with variable size, shape and physicochemical properties. The current nanoplatfroms used for the purpose of targeting drug delivery to cancer tissues can also be addressed to selectively deliver imaging agents.

Keywords: Nanotechnology, nanomedicine, drug delivery, targeting, cancer immunotherapy, diagnostics, imaging

NS2019C40

Prediabetes diagnosis and treatment

Poonam Sahu* Dr Bibekanand Meher, Shiv Kumar Bhardwaj

Columbia Institute of Pharmacy, Tekari, Near Vidhansabha, Raipur

Abstract

Prediabetes is a health condition that means when blood glucose levels (blood sugar) are higher than normal, but not high enough to be diagnosed as type 2 diabetes. Prediabetes can cause heart disease, stroke and diabetes type 2. Insulin is a hormone produced by the pancreas that acts as a key to allow blood sugar levels to enter cells for use as energy. If a person has prediabetes, the body's cells do not normally respond to insulin. The pancreas produces more insulin to try to make the cells respond and increases blood sugar. Prediabetes tests include the fasting glucose test, the oral glucose tolerance test or the hemoglobin A1C test. Lifestyle change has proven to be an effective tool to reduce the risk of developing type 2 diabetes. Losing a small amount of weight when overweight and exercising regularly can reduce the risk of developing type 2 diabetes. Eat a healthy diet, stop smoking, and treat high blood pressure and high cholesterol. Take medications like Metformin (glucophagus) an oral diabetes medicine that helps control blood sugar levels if a person has a high risk of diabetes.

Keywords: Prediabetes, diabetes, pancreas, blood sugar, Lifestyle.

NS2019C41

Modulation of Calcium Homeostasis and Insulin Secretion in Pancreatic Beta-Cells

Shiv Kumar Bhardwaj, Dr. Pushpa Prasad Gupta, Dr. Bibekanand Mehar, Poonam Sahu

Columbia Institute of Pharmacy, Near Vidhan Sabha, Raipur, 493111, India

Abstract

Disrupted pancreatic beta (β) cell function is a key event in the pathogenesis of diabetes mellitus, a metabolic disorder resulting in elevated blood sugar levels. Pancreatic beta cells are responsible for the secretion of insulin, which promotes the uptake of blood glucose into peripheral tissues. These cells are unique cells that secrete insulin in response to an increase in glucose levels, play a significant role in glucose homeostasis. Additionally, autocrine insulin signalling contributes to the maintenance of properly functioning β -cells. The insulin receptor tyrosine kinase is activated by many ligands and recruits insulin receptor substrates to its intracellular domain. These substrates can activate two major signaling pathways, the Protein Kinase B (PKB) Pathway and the Mitogen Activated Protein Kinase (MAPK) Pathway. Both signaling branches are suggested to be involved in the maintenance of β -cell function and survival. Depolarization leads to the opening of voltage-gated Na^+ channels and subsequently voltage-dependent Ca^{2+} channels. The increase in intracellular Ca^{2+} triggers the exocytosis of insulin-containing vesicles. Thus, electrical activity of pancreatic beta cells plays a central role in Glucose-stimulated insulin secretion. This approaches, we focus on the principal ionic channels involved in Glucose-stimulated insulin secretion and how classic and new proteins, hormones, and drugs regulate it.

Keywords: Pancreatic beta cells, Insulin, Glucose homeostasis, PKB and MAPK.

NS2019C42

Nuclear Medicine: New World of Diagnosing and Treating Illness

Chandrakant Yadav*, Shashikant Chandrakar,

Department of Pharmaceutics, Columbia Institute of Pharmacy, Tekari Raipur (C.G.), PIN
493111

Abstract

Nuclear medicine is a medical specialty that uses very small amounts of radioactive materials (radiopharmaceuticals) to diagnose, guide management and treat disease. Most nuclear medicine procedures are molecular imaging procedures that use radioactive substances. Molecular imaging procedures are highly effective, safe and painless diagnostic imaging and treatment tools that present physicians with a detailed view of what's going on inside an individual's body at the cellular level. Molecular imaging/nuclear medicine specialists can safely, effectively and painlessly determine if certain organs, such as the heart, brain, kidneys, liver, thyroid and lungs, are working properly. A molecular imaging/nuclear medicine procedure commonly used in diagnosing and guiding treatment of cancer patients is PET/CT scanning (see also "PET/ CT Scanning: Get the Facts"). When very small amounts of radioactive materials are introduced into the body by injection, swallowing or inhalation, specific body organs can be targeted. These trace radiopharmaceuticals are detected by special cameras that work with computers to provide pictures of an area of the body, offering information about an organ's physiology or function. The presence of disease is determined based on biological or molecular changes, rather than changes in anatomy. Radiopharmaceuticals go directly to the organ being targeted and are also used as treatment for hyperthyroidism, certain types of cancer such as thyroid and lymphoma, blood imbalances and pain relief for certain types of bone cancer.

Keywords: Radiopharmaceuticals, Nuclear medicine, radioactive, Hyperthyroidism

NS2019C43

Traditional Plant and Intellectual Property Rights

Ashish Majumdar *, Ravindra Pandey , Shiv Shankar Shukla

Columbia Institute of Pharmacy

Email: - ashishmajumdar27@gmail.com

Abstract

The rise of modern information technologies has led to an increasing awareness of the value of traditional knowledge, including in particular traditional medicine. Ethnopharmacological information is an important component in both traditional health systems and for future medicine development. Contribution of the traditional and indigenous peoples to the conservation of the world's biodiversity and related traditional medicinal information is immense. Everyday ethnobotanical and related surveys and researches provide new information about the cure of various diseases, body improvement and skin care remedies, natural oils and other health care objects. The value of plants for medicines is more widely recognized and the "intellectual property rights" (IPR) connected with their use have been debated worldwide. "Convention on Biological Diversity" (CBD) which was signed in Rio in 1992, enforces protection of the rights of local people and local knowledge as well as conservation of the biological resources which forms the basic of all those health systems. Insufficient documentation of the traditional medicine is against the lately documented areas since they loose the priority in IPR. Generally, the intellectual property rights are protected under the patent systems in many countries, whereas accesses to such legal procedures are not easily available for most of the indigenous communities.

Keywords: Traditional Medicine; Medicinal Plants, Intellectual Property Rights, Convention on Biological Diversity

NS2019C44

Nuclear medicine –application in diagnosis and treatment of various diseases

Manisha Thakur*, Pushpa P. Gupta

Department of Pharmacology, Columbia Institute of Pharmacy, Tekari, Raipur (CG) PIN

493111.

Abstract

The multiple aspects of radioligand–receptor interactions do not only show a major impact of certain cell surface-bound receptors in the pathophysiology of human disease: the concept of radioligand–receptor interactions has also been extended to the clinic. In particular, naturally occurring peptides, when radiolabelled, are clinically useful for the imaging diagnosis of human disease and have future implications for the treatment of tumour expressing certain target receptors using radiolabelled peptide tracers. The finding that receptors for VIP (vasoactive intestinal peptide) and SST (somatostatin) are overexpressed on tumour cells presents a breakthrough into this direction. Recent data indicate that [123I]-VIP receptor scintigraphy is clinically useful for the in vivo localization of small primary adenocarcinomas, liver metastases and certain endocrine tumours of the gastrointestinal tract. After the successful clinical introduction of the SST analogues [123I]-Tyr3-octreotide and [111In]-DTPA-D-Phe1-octreotide for localization diagnosis of neuroendocrine tumours in 1989, P829, labelled with the more cost-effective radionuclide ^{99m}Tc, nowadays promises to be a potential novel diagnostic imaging agent for tumours expressing SST/VIP receptors. Furthermore, the novel SST analogue [90Y]-MAURITIUS is entering the clinic for treatment of VIP/SST receptor-expressing tumours.

Keywords: Mauritius, octreotide, p829, radioligand, radioimaging, receptor, somatostatin, tumor, VIP

NS2019C45

Nuclear medicine used in the diagnosis of various diseases

Jharna Sahu*, Amit Roy, Pushpa P. Gupta

Department of Pharmacology, Columbia Institute of Pharmacy, Tekari, Raipur, (CG)

PIN - 493111

Abstract

Thyroid gland has the unique ability to concentrate iodine. This phenomenon offers a perfect background for a wide range of diagnostic tests utilizing radioactive iodine nuclides of iodine and technetium. Despite the very good availability of ultrasonography and other imaging modalities, radionuclide methods are still inevitable in a various cases of thyroid disease. In this article, a comprehensive review of all these methods used in the diagnosis of benign thyroid diseases is presented. Iodine and technetium uptake tests are briefly described. Indications to thyroid scan in the context of iodine supply are also presented. Finally, the significance of thyroid findings in PET images is pointed out. The article is illustrated by some typical patterns of radionuclide thyroid images.

Keywords: Iodine uptake, Goitre, Graves' disease, Thyroid nodule

NS2019C46

Radioisotopes in Medical Diagnosis and Treatment

Prachita Joshi*, Pushpa P. Gupta

Department of Pharmacology, Columbia Institute of Pharmacy, Tekari, Raipur (C.G.), Pin
493111

Abstract

Nuclear medicine is a field of medicine that uses a trace amount of radioactive substances for the diagnosis and treatment of many health conditions such as various types of cancer, and neurological and heart diseases. Over the previous decade, the medical sector has seen critical advances, especially in the understanding of natural and obsessive procedures at the atomic level. In worldwide, the increase of chronic diseases including cancer and cardiovascular diseases has led to the development of a new biomedical research discipline, which is called as 'molecular imaging', which enables the visualization, characterization and quantification of the biological processes in the living human body. Radioisotopes are widely used to diagnose or disease and as effective treatment tools. For diagnosis, the isotope is administered and then located in the body using a scanner of some sort. The amount of isotope taken up by the body can then give information as to the extent of the medical problem. An isotope of iodine (I-131) is used in both the diagnosis and treatment of thyroid cancer. The thyroid will normally absorb iodine to produce the iodine-containing thyroid hormones. An overactive thyroid gland will absorb the radioactive material which can then destroy excess thyroid tissue or any cancer of the thyroid. The material is sometimes used to image cancers in other parts of the body.

Keywords: Radioactive substance, Radioisotopes, Iodine (I-131), Cancer, Hyperthyroidism

NS2019C47

Solid dispersion: Novel approach for solubility enhancement of poorly aqueous soluble drug

Monika Bhairam, Ravindra Pandey, Shiv Shankar Shukla

Columbia Institute of Pharmacy, Raipur. Chhattisgarh

Email: monikab430@gmail.com

Abstract

Oral drug delivery is most convenient mode of drug administration due to patient compliance, flexibility in formulation and ease of administration etc. However in case of the oral route there are several hurdles such as limited drug absorption resulting in poor bioavailability and poor pharmacological response resulting into insufficient and erratic oral absorption. Drug with poor solubility will typically exhibit dissolution rate limited absorption, and a drug with poor membrane permeability will typically exhibit permeation rate limited absorption. Hence, pharmaceutical research that focus on improving the oral bioavailability of active agents include enhancing solubility and dissolution rate of poorly water-soluble drugs and enhancing permeability of poorly permeable drugs. The solid dispersion has become an established solubilization technology for poorly water soluble drugs. So the preparation of solid dispersion from the drug which shows poor solubility in water with carriers having good water solubility has decrease the occurrence of such problems and increase dissolution. Solid dispersion is one of the better technique which is used for improvement of solubility of poorly water soluble drugs. This article reviews various methods and concept of solid dispersion, criteria for drug selection, advantage and disadvantage, characterization, and application.

Keywords: Bioavailability, Solubility, Novel strategies, Absorption

NS2019C48

Advanced Lipid Drug Delivery as Self Emulsified Systems

Pragya Baghel*¹, Amit Roy¹, Sanjib Bahadur¹

¹Columbia Institute of Pharmacy, Raipur, C.G.

Email – pragyabaghel88@gmail.com

Abstract

In regards with the lipid drugs and new molecules, technologies and strategies have been developed and reported in literature including nano-formations, solid dispersions, etc. These advancements include the approach of Self Emulsification systems, which is gaining popularity for the enhancement of Bioavailability with reduced dose. SEDDS are isotropic mixtures of oil, surfactants, solvents and co-solvents/surfactants, which on coming to contact with GIT forms a self-emulsified systems. They are capable of forming oil-in-water emulsions/microemulsions upon mild agitation with aqueous media. The major rate-limiting step for lipophilic drugs is their dissolution rate, which further retards the solubility, oral absorption and bioavailability of such compounds. Thus, by the formation of systems capable of enhancing the oral absorption of drugs, like SEDDS, the Bioavailability of lipophilic compounds can be improved.

Keywords: Solubility, Bioavailability, Lipophilic drugs, Oral Absorption, Emulsification.

NS2019C49

Nanocarriers for Diagnosis and Imaging of Neurodegenerative Diseases

Turkane D.R.¹, Kaur CD¹, Banafar A², Bhairam M³

¹Department of Pharmacology, Shri Rawatpura Sarkar Institute of Pharmacy, Kumhari, Durg

²Department of Pharmaceutics, Rungta College of Pharmaceutical Sciences and Research,
Raipur. C.G

³Department of Pharmaceutics, Columbia College of Pharmacy, Raipur, C.G.

Corresponding Author – turkanedhanushram@gmail.com

Abstract

Early diagnosis and imaging is essential for early and effective therapy. Neurodegeneration involves a series of process resulting in the loss of nerve structure and function. This degeneration generally results in loss of cognitive abilities such as loss of memory and decision-making. Neurodegenerative diseases cover a variety of diseases which generally increases with getting older. Formulation of multifunctional nanocarriers is gaining acceleration for both imaging and therapy of different neurodegenerative diseases. By targeting disease specific molecular targets such as receptors, transporters, hormones, and enzymes, molecular imaging and efficient therapy can be achieved with design and surface modification of efficient multifunctional carriers like liposomes, niosomes, sphingosomes, micelles, nanoparticles, nanobubbles, nanocapsules, gold nanoparticles, microspheres, microcapsules, microbubbles, dendrimers, polymeric systems, quantum dots, and superparamagnetic particles. These nanosized systems are very proper for either imaging or therapy or both as theranostics depending on convenient properties such as biodegradability, biocompatibility, non-toxicity, enhanced drug encapsulation, and ability to modify with suitable radionuclides or contrast agents.

Keywords: Neurodegeneration, nanocarriers

NS2019C50

Recent Approaches For Enhance Lymphatic Drug Delivery through Nanocarriers

Saurabh Shrivastava*, Chanchal Deep Kaur

Shri Rawatpura Sarkar Institute of Pharmacy, Kumhari, Durg (C.G.), 490042

Email: saurabhshri1991@gmail.com

ABSTRACT

The lymphatic system is a key mark in the biomedical research field due to its unique composition and vast contributing physiology within the body. It extends throughout the whole body and is considered as one of valuable targets for proficient drug delivery. The lymphatic drug delivery has been vigorously studied yet because administered drugs can avoid the first-pass metabolism in the liver, consequential in the enhancement of oral bioavailability. The drugs should be hydrophobic in nature to be transported into the lymphatics because the lipid absorption mechanism is involved in the lymphatic delivery. The lymphatic imaging techniques and potential therapeutic candidates are engaged in evaluating disease states and conquering these conditions. The novel nanocarriers such as nano-lipid carriers, solid lipid carriers, nanostructured lipid carriers, nanoparticles, liposomes, etc are in use for delivering drugs by using the lymphatic system. This review summarizes newly reported information on the development of nanocarriers for the lymphatic delivery and covers significant determinants for successful lymphatic delivery.

KEYWORDS

Bioavailability, Lymphatic delivery, Nanocarriers, Novel target, Targeting approach

NS2019C51

**A review on lenalidomide derivatives (isoindoline-1,3-dione scaffold)
having potent anti-angiogenesis activity**

**Ajay Singh Sarthi*, Shailendra Saraf, Swarnlata Saraf
ajaysinghsarthi@gmail.com**

University Institute of Pharmacy, Pt. Ravishankar Shukla University, Raipur, C.G.

Abstract: This review is an effort to summarize recent developments in researches providing lenalidomide derivatives with promising anti-angiogenesis activity. Anti-angiogenesis activity is the most widely reported activity of thalidomide analogues however they also possess anti-microbial, anti-inflammatory and anti-diabetic activities etc. In this review we comprise the design, synthesis and biological evaluation of lenalidomide derivatives as anti-angiogenesis activity. Researches of new lenalidomide derivatives as bioactive agents are related with modifications of substitution at *N*-position and by increasing its bulkiness by methylation at different position. This review endeavour's to highlight the progress in the chemistry and biological activity of thalidomide, predominately after the year 2000. In this review is also discussed synthesis and biological activity of fused thalidomide ring annulated with other heterocyclic ring.

Keywords: Phthalimide, Anti-angiogenesis, Pathway.

TELEPHONE : (022) 25990613
E-MAIL: shyla@aerb.gov.in

वेबसाइट/WEBSITE: www.aerb.gov.in



नियामक भवन / भवन/NIYAMAK BHAVAN,
अणुशक्तिनगर/ANUSHAKTINAGAR,
मुंबई/MUMBAI-400094



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Executive Committee Subcommittee -7 (EC-SC-7)

No. AERB/EC-SC-7-34/2019/1574

6/14/2019

Dr. Bina Gidwani
Convener
Columbia Institute of Pharmacy, Vadlamudi
Raipur, Chattisgarh-493111
Email: ravindraiop@gmail.com

Sub: Request for financial assistance for "Implications and pitfalls in Nuclear Pharmacy through nanosized cargoes for treatment of diseases", September 20-21, 2019

Sir/Madam,

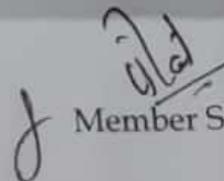
This has reference to your application for financial assistance for the above event.

The Atomic Energy Regulatory Board has approved sanction of an amount of Rs. 25,000 (Rupees Twnty Five thousand only) as assistance for the event subject to the following:

- (i) A complimentary copy of the proceeding should be supplied to the AERB.
- (ii) A certificate to the effect that the amount has been utilized either partly or fully for the purpose for which it was granted and an audited statement of accounts should be sent to AERB.
- (iii) The unspent balance, if any, rounded off to the nearest rupee shall be returned by demand draft drawn in favour of Accounts Officer, AERB payable at Mumbai.

The sanctioned amount shall be paid after Member Secretary, EC SC-7, AERB receives from you a claim (in duplicate) in the format shown in the Annexure. This Sanction will lapse if claim form is not submitted within 90 days after conducting the event.

Yours faithfully,


(P. Shylamoni)
Member Secretary, EC SC-7

Annexure
CLAIM FORM

Sub: Request for financial assistance for "Implications and pitfalls in Nuclear Pharmacy through nanosized cargoes for treatment of diseases, September 20-21, 2019

1. This refers to your letter (sanction letter AERB/SC-Sc-7-34/2019 dated 11-06-2019) offering Rs. 25,000 (Rupees Twnty Five thousand only) for holding the above event.
2. I accept the following conditions stipulated in the sanction letter.
 - (i) A complimentary copy of the proceeding should be supplied to the AERB.
 - (ii) A certificate to the effect that the amount has been utilized either partly or fully for the purpose for which it was granted and an audited statement of accounts should be sent to "Pay & Accounts Officer AERB" with a copy marked to Member-Secretary, EC-SC-7.
 - (iii) The unspent balance, if any, rounded off to the nearest rupee shall be returned by demand draft drawn in favour of Accounts Officer, AERB payable at Mumbai.
3. Details for transfer of grant by NEFT

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Branch Name	:	
Account Name	:	
Account Number	:	
IFSC Code	:	
Cash Credit A/c or Current A/c	:	
Status of the organization (please mention whether Government or private organization)	:	

Seal of the organizing official

Dr. Bina Gidwani
Convener

Dr. P. Shylamoni

Member-Secretary, Executive Committee Subcommittee -7 (EC-SC-7)

Atomic Energy Regulatory Board

Niyamak Bhavan, Anushakti Nagar

Mumbai-400 094.

E-mail: shyla@aerb.gov.in; Phone No. 022 25990613