ABSTRACT BOOK

NATIONAL SEMINAR

ON

Regulatory aspects & Clinical application of radiopharmaceuticals

Saturday, 06th May 2017

SPONSORED BY
ATOMIC ENERGY REGULATORY BOARD
GOVERNMENT OF INDIA, MUMBAI

SUPPORTED BY
Dr. A.P. J. ABDUL KALAM UNIVERSITY,
INDORE-DEWAS BYPASS ROAD, INDORE

COLLEGE OF PHARMACY (COP)
(FORMERLY KNOWN AS CENTRAL INDIA INSTITUTE OF PHARMACY)
DR. A.P.J. ABDUL KALAM UNIVERSITY,
INDORE DEWAS BYPASS ROAD, ARANDIA,
INDORE (M.P.) 452016

National Seminar On Regulatory Aspects & Clinical Application of Radiopharmaceuticals
Saturday, 06th May 2017

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EVENT SCHEDULE

Time	Event	Detail Of Events
09:30 AM to 10:30 AM	Registration and Breakfast	-
10:30 AM to 11:00 AM	Inauguration Ceremony	1. Floral Welcome 2. Saraswati Vandana 3. Pharmacist Oath 4. Introductory Speech of Organizing Chairman 5. Release of abstract Book 6. Speech of Chief Guest 7. Speech of Guest of Honor 8. Vote of Thanks of Inaugural function by Convener
11:00 AM to 12:00 PM	Scientific Session I	1. Key Notes by Dr. R.K.Sharma, Director, Defence Food Research Laboratory, Mysore Topic: Radiopharmaceuticals: Current scenario and the way forward
12:00 PM to 01:00 PM	Scientific Session II	2 . Scientific Lecture by Dr. K.S. Yadav , Principal, Smriti College of Pharmaceutical Education , Indore Topic: Radio labeling for Biodistribution and Pharmacokinetics studies
01:00 PM to 01: 45 PM	Lunch	-
01:45 PM to 02:30 PM	Scientific Session III	3. Scientific Lecture by Dr. Vinay Tripathi, Managing Director, Epoch Pharmaceutical Pvt.. Ltd Topic: Pharmaceutical & Pharmacy the largest Picture
02:30 PM to 03:00 PM	Scientific Session IV	4. Scientific lecture by Mr. Jitendra Jain , Associate Vice President, Amneal Pharmaceutical Pvt Ltd., Ahemdabad (Guj) Topic: GMP Guideline for Radio Pharmaceuticals
03:00 PM to 04:00 PM	Poster Presentation	--
04.00 PM to 04.30 PM	Open Discussion	--
04:30 PM to 05:00 PM	Valedictory and High Tea	Vote of Thanks by Organizing Secretary

Chancellor message……

It is inspiring to know that Faculty of Pharmacy is going to organize one day **AERB sponsored** national seminar with the theme of "Regulatory Aspects and Clinical Applications of Radiopharmaceuticals on 6th May 2017".

Today, Pharmaceutical Industries have keen interest in developing novel radiopharmaceuticals for diagnosis and therapy. After realizing the tremendous impact of radiopharmaceuticals and to provide the right platform to unveil the novel frontiers in radiopharmaceuticals this seminar is planned

The seminar fosters the better understanding of latest scientific researches by providing a global exposure to its participants where they can associate with relatable professionals. The seminar will provide a good opportunity for those who have a thirst in knowing the present technological developments and also share their ideas. The seminar aims to bridge the researchers working in academia and other professionals through current technological trends. It also provides the platform to get ample of opportunities to widen your knowledge and network.

I exhort you to participate and extend my heartfelt wishes for grand success of this splendid event.

Dr. Shruti Kumari

Dr. A.P.J Abdul Kalam University

"Let us reform our Education, and we shall find little need of reform in our prisons."

It is matter of immense pleasure that Atomic Energy Research Board (AERB) and Dr. A.P.J.Abdul Kalam Univesity has generously given chance to Faculty of Pharmacy to organise the national seminar on Regulatory Aspects and Clinical Applications of Radiopharmaceuticals on 6th May 2017.

Radiopharmaceuticals are unique medicinal formulations containing radioisotopes which are used in major clinical areas for diagnosis and therapy. Pharmaceutical Industries have keen interest in developing novel radiopharmaceuticals for diagnosis and therapy. After realizing the tremendous impact of radiopharmaceuticals and to provide the right platform to unveil the novel frontiers in radiopharmaceuticals this seminar is planned.

The topic of seminar is bottleneck of current research and is highly interdisciplinary which will surely benefit the student's, researcher's, faculties' and Industrialist's actively involved in hospital, clinical and industrial Pharmacy & Healthcare sectors. The seminar will provide researchers to present their analysis and research in the form of poster presentation. I am sure that the seminar will provide most up to date findings, feedbacks and possibilities of cutting edge research to all participants.

I heartily welcome speakers, guests, faculties, researchers and industrialists in the seminar and wish the seminar a grand success

Regards

Dr. Arun Gupta

Organising Chairman &

Dean Faculty of Pharmacy, Dr. A.P.J.Abdul Kalam University, Indore

" Though no one can go back and make a brand new start, anyone can start from now and make a brand new ending."

Dear All

Radiopharmaceuticals (RPs) have attracted tremendous interest over the past decade especially for its applications in diagnosis and as biomarkers in drug development. Radiopharmaceuticals (RP) are a special group of drugs which have to be handled in a legal framework that is mainly suited for conventional drugs and manufacture. Radiopharmaceuticals are unique medicinal formulations containing radioisotopes which are used in major clinical areas for diagnosis and/or therapy.

I heartily welcome all the delegates who have share their valuable time to participate in the program. The present seminar is dedicated to discuss the newer aspects in radiopharmaceuticals. The national seminar has been focuses to enhance knowledge dissemination amongst varied range of participants including eminent speakers, renowned scientist, Industrialist, young researchers and students.

The conference will accommodate for in depth discussion in radiopharmaceutical preparation, radionuclide generator, kits for radiopharmaceutical preparation, radiopharmaceutical precursors and review on the procedures for diagnostic and therapeutic use of radiopharmaceuticals.

The main objective of the seminar is to provide platform to the budding students, faculties and industrialists of profession rolling in the direction of academic development & scientific research to understand the

regulatory aspects, preparation, storage, clinical application and importance of radio pharmaceutical so that the novel aspects in nuclear medicine can be explore. The participant will get opportunity to attend numerous exciting talks and poster sessions while at the seminar.

I on behalf of college of Pharmacy (COP), Dr. A.P.J.Abdul Kalam University express warm welcome to this scientific endeavor.

Regards

Dr. Raghvendra Dubey

Convener & Coordinator,

Principal, College of Pharmacy

Dr. A.P.J.Abdul Kalam University, Indore

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AERB/RACARP/2017/ Keynote /01

Radiopharmaceuticals: Current scenario and the way forward

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Radioisotopes have short to ultra-short half-lives and undergo decay with the emission of characteristics particles/radiation. The unique properties of the radioisotope allow them to be traced or imaged, thus providing a modality for obtaining both anatomical images as well as functional information. Transit and release characteristics of a variety of pharmaceutical dosage forms and quantification of drug release could be followed using Nuclear Medicine techniques. Pharmacoscintigraphic studies can provide vital information regarding the extent, rate, site, and mode of drug release. It permits repeated measurements and allows use of same organism as its own pre-treatment control. It permits non-invasive monitoring of pharmacokinetics (PK) and functional processes in intact organisms at tracer concentration.

It also provides insight into the fate of delivery system and its morphology & integrity, and enables examination of relationship between resultant pharmacokinetics and in vivo performance. Moreover, it is possible to extend pharmacoscintigraphy studies in human patients also, thereby making it a pre-clinical screening modality of choice. The ultimate pharmacological and / or therapeutic response at the region of interest could be obtained from the information of the site of release, integrity of formulation and percentage of drug released/absorbed.

Over the past decade, there has been great development arising in the field of Molecular imaging and Nuclear medicine using innovative Radiopharmaceuticals. The developed countries largely dominate the share of the Radiopharmaceutical market, but the Asian- Pacific countries have also attained a sizable growth during the twenty-first century. It is noteworthy that Indian market of radiopharmaceuticals is also expanding thereby raising the need for framing guidelines and regulatory approval processes.

Radiopharmaceuticals are the pharmaceutical preparation comprising of the radioisotopes stickered molecules or individual radioisotopes intended for use either in diagnosis or therapy. Radiopharmaceutical as a diagnostic modality, are very useful for tracing abnormal biochemistry and metabolism even before the appearance of the anatomical lesions and malformations. Therapeutic

Radiopharmaceuticals are molecules that specifically deliver a therapeutic dose of ionizing radiation by localizing in the specific organ and destroy malfunctioned cells.

Radioactive pharmaceuticals require specialized techniques in their handling and testing in order that correct results may be obtained and hazards to personnel be minimized. Radiopharmaceuticals should be sterile and pyrogen-free, and should undergo all quality control measures required of a conventional drug. In a nuclear pharmacy radiopharmaceuticals are prepared, stored, and dispensed by a designated, qualified, and trained person. A complete system of process controls is required to assure sterility of radiopharmaceuticals. There is a need for the implementation of strict guidelines to assess the quality, safety, and efficacy of Radiopharmaceuticals.

The facilities for the production, use, and storage of radioactive pharmaceuticals are generally subject to licensing both from Atomic Energy Regulatory Board and Drug Control Authorities. Each producer or user must be thoroughly cognizant of the applicable regulations of the Drugs and Cosmetic Act, and any additional requirements of the Department of Atomic Energy and Indian Pharmacopoeia. In Indian Pharmacopoeia 2014, a General Chapter on Radiopharmaceuticals and following 19 Radiopharmaceutical monographs have been included:-

1. Fludeoxyglucose (18F) Injection
2. Sodium Pertechnetate (99mTc) Injection (Non-fission)
3. Sodium Pertechnetate (99mTc) Injection (Fission)
4. Technetium (99mTc) Medronate Complex Injection
5. (131I) Meta-Iodobenzyl Guanidine Injection for Diagnostic Use
6. (131I) Meta-Iodobenzyl Guanidine Injection for Therapeutic Use
7. Sodium Iodide (131I) Capsules for Diagnostic Use
8. Sodium Iodide (131I) Capsules For Therapeutic Use
9. Sodium Iodide (131I) solution
10. Samarium (153Sm) Ethylene Diamine Tetramethylene Phosphonate (EDTMP) Injection
11. Sodium Fluoride (18F) Injection
12. Sodium Phosphate (32P) Injection
13. Technetium (99mTc) DTPA Injection
14. Technetium (99mTc) ECD Injection
15. Technetium (99mTc) Glucoheptonate Injection

16. Technetium (99mTc) Mebrofenin Injection
17. Technetium (99mTc) MIBI Injection
18. Technetium (99mTc) DMSA Injection
19. Technetium (99mTc) EC Injection

Ten more monographs were added in its 2015 Addendum and another 3 in 2016 Addendum of IP-2014.

In India, Radiopharmaceuticals enjoys immunity from the ambit of the Drugs and Cosmetic Act 1940 despite their diverse role in biomedical research and healthcare. Radiopharmaceuticals are kept in Schedule K of Drug and Cosmetic Act 1940 and therefore, as per Rule 123 are exempt from the provisions of Chapter IV. So, there is a need to remove 'Radiopharmaceutical' from Schedule K of Chapter IV so that it is given as a status of the DRUG in Drug & Cosmetic Act 1940. Moreover, with the inclusion of 32 monographs of Radiopharmaceuticals in Indian Pharmacopoeia, the issue of Licensing and regulations by qualified and trained persons need to be immediately addressed by the Drug Controller General of India.

AERB/RACARP/2017/ Keynote /02

Radiolabeling for Biodistribution and Pharmacokinetics studies: *Technetium-99m for Radiolabeling of Nanoparticles*

Dr. Khushwant S. Yadav

Professor & Principal, Smriti College of Pharmaceutical Sciences, Indore, (M.P.)

Radiolabeling is incorporation of a radioactive element into a compound. Radiolabeling studies on drugs and drug delivery systems have recently gained importance for studying their biodistribution and their fate in the body. The use of nuclear medicine applications in oncology is of particular importance as a rapidly developing therapeutic and diagnostic multimodality. Numerous investigations have shown that incorporating anticancer agents in nanoparticulate carriers would provide a useful means for controlling the cellular distribution profiles of these agents. The rationale behind these approaches is to combine a drug controlled release fashion with a targeted delivery in order to provide more efficient and less harmful solutions, thus, surmounting the limitations often encountered in conventional chemotherapy. Technetium-99m is so far the most commonly used radionuclide in nuclear imaging. More than 80% of all usually used radiopharmaceuticals contain this short-lived metastable radionuclide. This is due to the highly interesting physical properties of 99mTc among which its short half-life (6 h) and gamma photon emission of 140 keV, which is advantageous for both effective imaging and patient safety perspectives. Nuclear medicine facilitates the understanding of various physiological and functional events in the human body. In nuclear medicine, imaging is done by ensuring the uptake of radioactive material in the target organ. The present talk will focus on radiolabeling for carrying out biodistribution and pharmacokinetics studies with special emphasis on radiolabeling using Technetium-99m.

AERB/RACARP/2017/ Keynote /03

GMP requirement for determination of labelling efficiency of Radiopharmaceuticals

Nikhil Bhatwadekar

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The labeling efficiency of Radiopharmaceuticals indicates the radiochemical purity of the product. The determination of radiochemical purity requires separation of the different chemical substances containing the radionuclide and estimating the percentage of radioactivity associated with the declared chemical substance. As conventional methods any method of analytical separation may be used in the determination of radiochemical purity of product. The monographs for radiopharmaceutical products includes number of analytical method such as paper chromatography, thin-layer chromatography, instant thin-layer chromatography (ITLC), electrophoresis, size-exclusion chromatography, gas chromatography and liquid chromatography.

Thin-layer and paper chromatography are mostly used in laboratory scale. In both methods as very small quantities of the radioactive material applied, a carrier may be added to increase volume. After development of the chromatographic plate radioactive areas are detected by autoradiography or by collimated counters .The positions of the spots or areas permit chemical identification.

Apart from above method another common method is Instant thin-layer chromatography (ITLC) which is used to determine the labeling efficiency of radiopharmaceuticals. The assay uses specific cellulose backed silica gel chromatography strips as solid phase. ILTC method offers advantages such as easy to use, rapid and can be incorporated easily in a routine quality control program. Radioactivity may be measured by integration using an automatic-plotting instrument or a digital counter. The ratios of the areas under the peaks give the ratios of the radioactive concentration of the chemical substances.

AERB/RACARP/2017/01

Recent uses and future prospects of radiotracers in herbal medicine

S.N. Dwivedi

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ABSTRACT

Radionuclides have been widely used to follow physical, chemical and biological processes almost from the time of their discovery. The biggest application with the impact has been in the medical field where radionuclides have been incorporated into biologically active molecules and used to diagnose a wide variety of diseases and to treat many disorders. Apart from the medical field the radio-isotopes have been incorporated with the seedling of plant which will be useful in the growth and profile of medicinal plants. Also, they will interfere with the medicinally active constituents and may increase or decrease the active moiety. This present paper deals with the use of various radio-isotopes and tracer techniques employed in the bio-synthetic pathway and development of active phyto-constituents.

Keywords: Radiotracers, Herbal medicine, Phyto-constituents

AERB/RACARP/2017/02

Effects of radio isotopes on the active constituents of marine flora and fauna

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ABSTRACT

Marine flora and fauna are of prime important due to bioactive constituents present to treat various diseases viz., blood pressure, diabetes, cancer etc. There are a number of important factors that determine the environmental effects of radionuclides. Radioactivity is a form of energy released from radioactive elements and the potential for damage depends on the amount of energy absorbed by an organism. Factors affecting the absorbed dose are the identity of the radionuclide, the type of radioactivity, the chemical form of the radionuclide, the exposure pathway to the organism and the biochemistry of the organism. This biochemical reaction results in decomposition of bioactive constituents responsible to the treatment of diseases. Several flora such as algae, sea grasses, sea weeds etc. and fauna such as Octopus, whale, shark, sponges etc. were actively used in the human ailments but the radioisotopes will affect these active bio-constituents. All these aspects have been highlighted in the present paper.

Keywords: Radio-isotopes, Marine, Flora, Fauna

AERB/RACARP/2017/03

Use of Radioisotopes and other imaging agents during Lactation

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ABSTRACT

X-rays, MRIs, CAT scans, Intravenous Pyelogram (IVP), ultrasound, mammograms, etc. do not affect breastfeeding or breast milk. Barium is sometimes used as a contrast agent; it is not absorbed orally and thus does not affect breastfeeding. Use of radioisotopes sometimes requires temporary weaning. The length of time will depend upon the type of radioactive material used, the dose and the age of the baby, whether baby is getting anything other than breast milk, and how often mom expresses milk. If use of a particular radioisotope requires that wean temporarily and want to pump regularly while the radiation is working out of the system to reduce radiation exposure to breast tissue. At least 97% of the radioactivity is gone from your body in 5 half-lives – after this point it is generally considered safe to breastfeed (but other factors may also need to be considered). The more often feeding mother pumps, the more quickly the radioactivity will be eliminated from the body. It may be possible to have milk tested for radioactivity, perhaps by the radiology, to help determine when it is safe to return to breastfeeding. Traditionally, lactating women receiving intravascular gadolinium or iodinated contrast (as opposed to radiolabeled iodine) are advised to discontinue nursing for 24 hours. However, a minimal amount (0.04%) of the intravenous dose reaches human milk, and, of that, less than 1% to 2% is absorbed by the infant. Therefore, breastfeeding can be continued without interruption after the use of iodinated contrast or gadolinium. Because of the very small percentage of iodinated contrast medium that is excreted into the breast milk and absorbed by the infant's gut, it is believed that the available data suggest that it is safe for the mother and infant to continue breast-feeding after receiving such an agent. The present paper deals with all these aspects of use of radio-isotopes during lactation.

Keywords: Radio-isotopes, Lactation, breast feeding

AERB/RACARP/2017/04

Traditional Herbal Medicine for Gynecological Disorders

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ABSTRACT

Herbal Medicine is used to cure specific ailments by the people throughout the globe from the ancient times. It is a fact that the village people and tribes are generally rely on the medicine developed from the plants directly or indirectly. Gynecologic disorders are disorders that affect the female reproductive system. The most common symptoms of gynecologic disorders include pelvic pain, vaginal itching, vaginal discharge, abnormal vaginal bleeding and breast pain. In the developing countries like India the prevalence of gynaecological disorders are very common and alarming. Due to the social custom, the women do not disclose the same. In traditional system of medicine herbal healers treat these diseases using the plants which have immense medicinal potentiality. Despite various available allopathic formulations, the relief from the disease is temporarily and has some side effects if used for the longer duration. Therefore, to avoid and minimized the side effect of available allopathic medicine, the women are in search of traditional herbal medicine. The present paper deals with the enumeration of 25 traditional herbal medicine viz., *Achyranthes aspera, Nigella sativa, Tachyspermum ammi, Asparagus racemocus, Abrus precatorious, Lepidium sativum* etc. used in the treatment of women ailments.

Key-words: Gyanecological disorders, Traditional Herbal Medicine

AERB/RACARP/2017/05

Insilico Aldose Reductase Inhibitory activity of some phytoconstituents with special reference to binding energy

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ABSTRACT

Diabetes mellitus is one of the leading causes of death across the world. Hyperglycemia in diabetic patients results in a diverse range of complications such as diabetic retinopathy, neuropathy, nephropathy and cardiovascular diseases. Aldose reductase, the major rate limiting enzyme in the polyol pathway, plays a critical role in diabetic complications. The polyol pathway is a two-step metabolic pathway in which glucose is reduced to sorbitol, which is then converted to fructose. Aldose reductase belongs to the aldo-keto reductase enzyme superfamily. The enzyme is a single polypeptide domain composed of 315 amino acid residues. In the present work an attempt is made via *insilico* approach for predicting and analyzing interactions between the aldose reductase protein and ligands (phytoconstituents). The structure of aldose reductase protein with peptide substrate was obtained from PDB data bank, which was energy minimized and prepared as PBQBT file for docking. The structures of Phytoconstiuents were drawn using chemsketch software. Docking studies on phytoconstituents were carried out using Autodock 4.2 software against the receptor aldose reductase. Three important parameters like binding energy, inhibition constant and intermolecular energy were determined. The binding energy between phytoconstituents and aldose reductase ranged from -9.42 to -4.12 K cal/mol. Among which the binding energy of flavanoids was ranges between -9.42 kcal/mol to -6.76 kcal/mol. The results clearly indicate flavanoids to be more potent bioactive constituent's attributing aldose reductase activity.

Keywords: Aldose reductase inhibition activity, Insilico approach, Docking, Binding energy

AERB/RACARP/2017/06

Radionuclide Chromic Phosphate P 32: Potent Nuclear Medicine in Cancer Therapy

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ABSTRACT

Nuclear medicine is a prime focus for the research in the treatment of cancer. In past few decades a lot work has been carried out in evaluation of radio nuclides in clinical diagnosis and treatment. In the same regard Chromic phosphate P 32 (brand name Phosphocol P32) is a salt of chromium and phosphoric acid, containing a radioactive form of the element phosphorous, 32 P is used to treat fluid accumulations and leakage that can result from lung, ovarian, or uterine cancers. It is also used to kill cancer cells that remain following surgery for uterine cancer. Chromic phosphate P 32 is a suspension that is delivered through a catheter, or tube, inserted into the sac surrounding the lungs, or into the abdominal or pelvic cavities. The usual dosage is 10-20 millicuries. Chromic phosphate P 32 may also be injected into the ovaries or prostate. The suspension of Chromic Phosphate P32 undergoes pure beta decay and emits radiation in form of electrons. The depth of penetration of radiation from P32 is approximately 1.4 to 3.0mm. The average energy of P32 is 0.69 Mev and half life is of 14.3 days. The suspension is commercially available in single dose and multiple dose containers with a label specifying the time and date of calibration, caution of radioactive material and use indicating intracavitary application only. Local radiation by beta emission into cavities is effectively used for the treatment of the peritoneal or pleural effusions due to metastatic cancer.

AERB/RACARP/2017/07

Anti microbial studies on extracts of *Ziziphus nummularia* on Pathogens causing UTI Infection

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ABSTRACT

The aqueous, ethanolic and saponin extracts of *Zizyphus nummularia* (Z. Rotundifolia) stem barks has been screened for antimicrobial activities against some human vaginal pathogens causing Urinary tract infections (UTIs). Pathogens such as *Staphylococcus aureus*, *Pseudomonas aeruginosa, streptococcus facecalis, klebsiella pneumoniae, Escherichia coli, Enterobacter faecalis*, *Enterobacter faecium* and *Proteus mirabilis* were identified & isolated from patient samples & were sub-cultured in nutrient broth, nutrient agar, macconky agar and blood agar media. The relative zone of inhibition and minimum inhibitory concentration of different extracts were estimated by disc diffusion assay on Muller Hinton agar media. Extracts were found to produce significant inhibition against all the pathogens which were compared with standard drug. The result clearly indicates that the saponin extract were observed to be more active against pathogen than ethanol and aqueous extracts.

Key Words: Ziziphus Species, Human Vaginal Pathogens, Aqueous & Ethanolic Extract.

AERB/RACARP/2017/08

Zika Virus Infection in Humans: Immunological Responses Involved

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ABSTRACT

Zika virus is categorized under the virus family *Flaviviridae* and the genus Flavivirus. The virus is transmitted via *Aedes* mosquitoes, such as *A. aegypti* which remain active during daytime. The name of the etiology is derived from the Zika Forest of Uganda from where the virus was first isolated in 1947. The extrinsic incubation period of the virus in the vector is about 10 days. The virus can be transmitted from a healthy to suspected human being by sexual contacts and across the placenta to the foetus. The virus is transmitted by the mosquitoes belonging to the genus *Aedes*. It is believed that the virus have a relation with microcephaly in newborn babies which is vertically transmitted from infected mother to newborn/ child.[1]

Keywords: Immunology, Mosquito-borne, Transcription, Zika virus

AERB/RACARP/2017/09

Hybridoma Technology: An Overview

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ABSTRACT

The term hybridoma was coined by Leonard Herzenberg in the laboratory of César Milstein's in 1976–1977. Hybridoma technology is the method in which large quantity of identical antibodies are produced which are also known as monoclonal antibodies. It is done by the administration of antigen in mouse which produces an immune response. The B-cells producing antibodies are then harvested from the injected mouse. The harvested B-cells are then fused with B cancer cells which remain immortal. This produces hybrid cell line called hybridoma which possesses the antibody-producing ability of the B-cell. The hybridomas can be grown in culture with one viable cell which produces cultures having genetically identical hybridomas. It produces monoclonal antibodies. It retains the ability to grow in tissue culture and do not possess antibody producing capability.

Keywords: B-cells, Hybridoma, Monoclonal antibodies

AERB/RACARP/2017/10

Oral acute toxicity (LD50) study of different solvent extracts of *Abelmoschus moschatus* Medik. in wistar rats

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ABSTRACT

Abelmoschus moschatus leaves and seeds have been used in traditional medicine for the treatment of a variety of diseases including infection, inflammation, pain etc. It has also been shown to have various useful pharmacological effects. In this study, oral acute toxicity of the aqueous, ethanolic, Petroleum ether and Chloroform extracts were investigated. Acute oral toxicity of extracts was determined as per Organization for Economic Cooperation and Development (OECD) guidelines 423. A single oral dose (5, 50, 300, and 2000 mg/kg) of extracts was administered to four mice groups and was observed individually at least once during the first 30 min, periodically during the first 24 h, with special attention given during the first 4 hours and daily thereafter, for a total of 14 days for abnormal signs, diarrhea, and food and water intake. Histopathological results reveal pathological changes in the organs examined, revealing a possible hepatotoxicity, cardiotoxicity and nephrotoxicity of the extracts at the oral limit dose.

Keywords: *Abelmoschus moschatus,* Seeds, Leaves

AERB/RACARP/2017/11

Formulation and Evaluation of Sustained release pellets of Mesalamine

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ABSTRACT

The main aim of this research work was to develop an efficient delivery of therapeutic agents for management of Inflammatory Bowel Disease (IBD).Enteric coated Sunstained Release Pellets of Mesalamine was prepared and when they were administered will release Mesalamine in colon to provide relief against IBD by lowering down inflammation which is also thought to alleviate the IBD. Hence the patient can get marked relief after the administration of the developed Pellets system. Mesalamine was obtained as a gift sample from Ipca Laboratories, Ratlam and MCC, HPMC 15cps, and Eudragit NE D_{35} was provided from Unijules life science, Nagpur. Pellets were formed by Wet Granulation method followed by Extrudation, Spheronization and Pan coating process. Characterization of pellets was done through evaluated Particle size, Percentage Yield, Drug content, Drug release, Flow properties etc. Drug release gives highly acceptable values. The variation being observed in data was due to volumetric, manual and instrumental error. Overallr esearch Concluded that Sustained Release pellets is highly acceptable by providing drug release value in controlled targeted drug delivery system (CTDDs).

Keywords: Mesalamine, HPMC, MCC, Eudragit

AERB/RACARP/2017/12

Radioisotopes in the treatment of Cancer: An Overview

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ABSTRACT

In the treatment of cancer, radiation can be administered to the malignant tissues in several different ways: for example, needles of radium or cobalt-60 can be implanted directly into the tumor, or (in a rather limited number of cases) a radioisotope in liquid form (e.g . gold-198) can be injected, knowing that it is likely to concentrate in a specific tissue. However, by far the most important therapeutic technique is teletherapy (or beam therapy) in which the source of radiation remains outside the body and the beam of radiation is directed at the tumor through the overlying tissue. The source of radiation may be an X-ray tube, a "supervoltage" machine such as a betatron or a linear accelerator, or a radioisotope which emits high energy gamma-rays. The two iso - topes commonly used for this purpose are cobalt-60 and cesium-137. Radiation treatment of malignant growths is not, of course, a novel procedure; both radium implants and X-rays generated at medium voltages (up to 250 kV) have been used all over the world for many years. However, large scale production of radioisotopes in atomic reactors has made radiotherapy available for the first time in less developed areas of the world. Moreover, the treatment has been simplified and, in many cases, made more effective. Radioisotope therapy delivers radiation directly into the cancer cells. Radioisotope or radionuclide usually as a capsule, drink or injection into a vein. Cancer cells absorb the radioactive substance more than normal cells. There are different types of radioisotope treatment depending on type of cancer. Some common examples are: **Iodine-131** is used to treat certain types of thyroid cancer and some rarer types of cancer. You may need to stay in hospital for this treatment. **Strontium-89 and samarium-153** is used to treat some types of secondary bone cancer. They can help reduce pain. **Radium-223** is a new radioisotope therapy that is used to treat secondary. All these aspects are highlighted in present communications.

Key-words: Cancer, Radio-isotopes, Radiations

AERB/RACARP/2017/13

Radio-iodine therapy in the treatment of thyroid cancer

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ABSTRACT

Radioiodine therapy is a nuclear medicine treatment for an overactive thyroid, a condition called hyperthyroidism, and also may be used to treat thyroid cancer. Small dose of radioactive iodine I-131 (an isotope of iodine that emits radiation) is swallowed; it is absorbed into the bloodstream and concentrated by the thyroid gland, where it begins destroying the gland's cells. Thyroid gland absorbs nearly all of the iodine in body. When radioactive iodine (RAI), also known as I-131, is taken into the body in liquid or capsule form, it concentrates in thyroid cells. The radiation can destroy the thyroid gland and any other thyroid cells (including cancer cells) that take up iodine, with little effect on the rest of your body. The radiation dose used here is much stronger than the one used in radioiodine scans, which were described in Tests for Thyroid Cancer. This treatment can be used to ablate (destroy) any thyroid tissue not removed by surgery or to treat some types of thyroid cancer that have spread to lymph nodes and other parts of the body.

Key-words: Thyroid Cancer, Radio-isodine, Radiations

AERB/RACARP/2017/14

Some important Radio-isotopes used as Medicine

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ABSTRACT

Radioisotopes are radioactive isotopes of an element. Different isotopes of the same element have the same number of protons in their atomic nuclei but differing numbers of neutrons. They can also be defined as atoms that contain an unstable combination of neutrons and protons. There are various radio-isotopes which are used as medicine in the treatment of various human and veterinary medicine. Some of the important radio-isotopes used as medicine are mentioned in present paper.

Key-Words: Radio-isotopes, Medicine

AERB/RACARP/2017/15

A review on radioisotope therapy in bone disorders

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ABSTRACT

Bone disease and disorders is a major clinical and therapeutic problem especially in developing countries like India. Several severe bone diseases include arthritis; gout and even cancer are very common. Taking into account the diversity of the consequences of skeletal metastases, multidisciplinary patient care should be provided. Among the available treatment methods, radionuclide therapy plays a significant role. Various radio-isotopes have been employed for the treatment of bone diseases. Strontium-89 and samarium-153 are some common radio-isotopes frequently uses. The present paper enumerates all the possible radio-isotopes used in the treatment of bone diseases.

Key-Words: Radio-isotopes, bone disorders

AERB/RACARP/2017/16

Design and development of liquid –solid compacts of Etravirine

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ABSTRACT

With the increasing number of poorly water-soluble compounds in contemporary drug discovery pipelines, the concept of supersaturation as an effective formulation approach for enhancing bioavailability is gaining momentum. This is intended to design the formulation to yield significantly high intraluminal concentrations of the drug than the thermodynamic equilibrium solubility through achieving supersaturation and thus to enhance the intestinal absorption. The major challenges faced by scientists developing supersaturatable formulations include controlling the rate and degree of supersaturation with the application of polymeric precipitation inhibitor and maintenance of post-administration supersaturation. This review is intended to cover publications on this topic since April 2009. Scientific publications associated with characterization of supersaturatable systems and related preclinical and clinical pharmacokinetics (PK) studies are reviewed. Specifically, this review will address issues related to assessing the performance of supersaturatable systems including: (1) Diversified approaches for developing supersaturatable formulations, (2) meaningful *in vitro* test methods to evaluate supersaturatable formulations, and (3) *in vivo* PK study cases which have demonstrated direct relevance between the supersaturation state and the exposure observed in animal models and human subjects.

Keywords: Biorelevant *in vitro* testing, poorly water-soluble drugs, supersaturation

AERB/RACARP/2017/17

Formulation and Evaluation of activated charcoal peel off mask

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ABSTRACT

Skin is a very sensitive and protective layer of the human body which is exposed to environmental pollution hence, it is very essential to protect the skin. The facial skin can be protected by applying various cosmetics intended especially for facial application, It can be a cream, lotion face mask or peel off mask etc. Peel off mask is the type of dosage form which is gently applied onto the facial skin surface and is peeled off after few minutes of its application. It is used as the remedy to treat facial skin related problems such as wrinkles, ageing, acne and mainly used to open the closed pores due to deposition of dust. Its main role is to stimulate the metabolism due to its occlusive effect. Activated charcoal is being added as an active ingredient in this formulation. The most important characteristic of an activated carbon is its adsorbant activity using it as an active ingredient in peel off mask, it adds to its value by enhancing the role of peel off mask by absorbing dust particles and opening the clogged pores. Literature survey reveals many papers related to formulation of herbal peel off masks, but no any reported paper was found on Activated Charcoal peel off mask. In this paper, we have formulated Activated Charcoal peel off mask and Evaluated it by using various tests methods. The formulation showed overwhelming results after its application on healthy female volunteers.

Keywords: Activated Charcoal, Peel of mask, Skin, Absorbent.

AERB/RACARP/2017/18

Medical uses of Radiopharmaceuticals

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ABSTRACT

This review described both the therapeutic as well as diagnostic uses of radiopharmaceuticals. A radiopharmaceutical is a preparation intended for in-vivo use that contains a radionuclide in the form of a simple salt or a complex. It may exist as a solid, liquid, gas or a pseudo gas. The chemical and physical identity and a form of a radiopharmaceutical are very important because in each case, once administered the radiopharmaceutical is intended to target certain tissues, binding sites, biochemical pathways. Radioactive materials are regularly used to treat medical conditions, diagnosis pathology, visualize and measure physiological functions, and localize structures and pathways. This review describes both the therapeutic as well as diagnostic uses of radiopharmaceuticals. 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

Key words: Radioactive, radionuclide, radioactive, radioisotopes

AERB/RACARP/2017/19

Guideline to regulation for Radiopharmaceuticles in early phase Clinical trials in the EU and regulatory aspects of stability testing

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ABSTRACT

The purpose of this guideline is to help investigators by giving an overview of relevant current EU requirements concerning the quality of starting materials and final drug products (the radiopharmaceuticals), the non-clinical safety studies and dosimetry considerations whilst designing a human clinical trial which includes the use of radiopharmaceutical compounds.

The stability data requirements for human pharmaceuticals in the European Community (EC) are based on a series of Directive and Regulation requirements and on a series of advisory guidelines that have been developed and adopted through the International Conference on Harmonization (ICH) procedures or, where there is no relevant ICH project, through the Committee for Proprietary Medicinal Products (CPMP). There are relevant requirements that cover new drugs and finished products containing them and also for existing active ingredients and products containing them. The sources of the relevant information and the data requirements are discussed and summarized.

Keywords- Radiopharmaceuticals Early phase Clinical trials Regulations Quality requirements Toxicology Dosimetry Under the auspices of the Drug Development Committee of the European Association of Nuclear Medicine.

AERB/RACARP/2017/20

Role of Radio-isotopes in the treatment of Human disease

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ABSTRACT

Radiopharmaceuticals are drugs that contain radioactive materials called *radioisotopes*. They may be put into a vein, taken by mouth, or placed in a body cavity. Depending on the drug and how it's given, these materials travel to various parts of the body to treat cancer or relieve its symptoms. They put out radiation, mostly in the form of alpha and beta particles that target the affected areas. They're most often used in small amounts for imaging tests, but larger doses can be used to deliver radiation. The present paper deals with the use of various radio-active isotopes in the treatment of certain Human disease.

Key-words: Radio-isotopes, Human disease

AERB/RACARP/2017/21

Medical Applications of Radioactive Tracers: An Overview

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ABSTRACT

A radioactive tracer, or radioactive label, is a chemical compound in which one or more atoms have been replaced by a radioisotope so by virtue of its radioactive decay it can be used to explore the mechanism of chemical reactions by tracing the path that the radioisotope follows from reactants to products. Radiolabeling is thus the radioactive form of isotopic labeling.

Radioisotopes of hydrogen, carbon, phosphorus, sulphur and iodine have been used extensively to trace the path of biochemical reactions. A radioactive tracer can also be used to track the distribution of a substance within a natural system such as a cell or tissue,or as a flow tracer to track fluid flow. Radioactive tracers are also used to determine the location of fractures created by hydraulic fracturing in natural gas production. Radioactive tracers form the basis of a variety of imaging systems, such as, PET scans, SPECT scans and technetium scans. Radiocarbon dating uses the naturally occurring carbon14 isotope as an isotopic label.

Key-words: Radioactive tracers, Medical, Disease

AERB/RACARP/2017/22

Synthesis and Antibreast Cancer Activity Testing of Some N-Arylidene-4-Phenyl-1*H*-Pyrazol-3-Amine Derivatives

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ABSTRACT

Breast cancer is one of the most commonly diagnosed cancers among women and it is the second leading cause of cancer deaths in women worldwide. The present study describes the synthesis and cytotoxic activity testing of a series of N-arylidene-4-phenyl-1*H*-pyrazol-3-amine derivatives (**3a**-**3s**) as potential antibreast cancer agents. Nineteen derivatives synthesized were tested for cytotoxicity against one breast cancer cell line (MCF-7) and one normal cell line (MDCK). The MTT assay results indicated that compound **3p** with 2-chloro substitution in the phenyl ring linked to the amino group of 4-phenyl-1*H*-pyrazol-3-amine moiety showed promising anticancer activity (66.4 µM) against the studied MCF-7 cell line. Furthermore, the compound did not show any significant cytotoxicity (> 100 µM) against normal cell line making it a selective cytotoxic agent. Overall, the findings of the present research highlight **3p** as a potential new lead molecule for the development of novel anticancer agents with therapeutic benefits in breast cancer.

AERB/RACARP/2017/23

Effect of gamma irradiation on germination, growth, and biochemical parameters of *Guizotia abyssinica* (L.f.) Cass.

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ABSTRACT

The impact of gamma irradiation on *Guizotia abyssinica* (L.f.) Cass., is one of the potent medicinal plants used in the treatment of wounds, inflammation. The seeds of *Guizotia abyssinica* (L.f.) Cass. were irradiated with different doses of gamma radiation ranging from 0 to 200 Gy using the ^{60} Co source. The effect of gamma radiation on the growth and biochemical constituents were compared with the control plants. Germination speed at 25 Gy was found to be 0.55. An increase in germination percentage, vigor index, and relative growth rate, in terms of dry weight was noticed at lower doses of the radiation treatment. The proline content increased with increasing doses. The chlorophyll content was found to have increased compared to the control level. Hence, lower doses of radiation treatment may be used to increase the germination, growth, and vigor, and also the enhancement of plant metabolites of *Guizotia abyssinica* (L.f.) Cass.

Key-words: Gamma irradiation, germination, growth, *Guizotia abyssinica* (L.f.) Cass.

AERB/RACARP/2017/24

Formulation and evaluation herbal antidiabetic tablet of cinnamon

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ABSTRACT

Traditional medicines derived from medicinal plants are used by about 60% of the world's population. This research focuses on Indian herbal drugs and plants used in the treatment of diabetes, especially in India. Diabetes mellitus have been recorded, but only a small number of these have received scientific and medical evaluation to assess their efficacy.. A hypoglycemic action from some treatments has been confirmed in animal models and non-insulin-dependent diabetic patients, and various hypoglycemic compounds have been identified. A botanical substitute for insulin seems unlikely, but traditional treatments may provide valuable clues for the development of new oral hypoglycemic agents and simple dietary adjuncts. And related beneficial effects and of herbal drugs used in treatment of diabetes is compiled. These include Cinnamomumcassia, Cinnamomum verum.The active component in cinnamon responsible for its insulin-like activity is a water-soluble chemical compound called methylhydroxychalcone polymer, or MHCP**.** They found that MHCP was highly effective, providing essentially the same biological activity as insulin itself.[2] It was effective not only in increasing the uptake of glucose (blood sugar) by cells, Cinnamon extract MHCP was administered at different dosages (50, 100, 150 and 200 mg/kg) for 6 weeks. It was found that blood glucose concentration is significantly decreased in a dose-dependent manner ($P < 0.001$) with the most in the 200 mg/kg group compared with the control the tablet is formulated by wet granulation method and evaluated by friability, weight variation, disintegration, and hardness.

Key-words: Medicinal plant (*Cinnamon cassia*) Antidiabetic drugs, Herb

AERB/RACARP/2017/25

A Review on recent therapeutic and diagnostic Approaches of Radiopharmaceutical

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ABSTRACT

Radiopharmaceuticals play a critical role not only in modern medicine primarily for diagnostic purposes, but also for monitoring disease progression and response to treatment. As the use of image has been increased, so has the use of prescription medications. These trends increase the risk of interactions between medications and radiopharmaceuticals. The use of specific radiotracers for imaging organ function and disease states is a unique capability of nuclear medicine. Unlike other imaging modalities such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and Ultrasonography (US), nuclear medicine procedures are capable of mapping physiological function and metabolic activity and thereby giving more specific information about the organ function and dysfunction. The widespread utilization and growing demands for these techniques are directly attributable to the development and availability of a vast range of specific radiopharmaceuticals. Many of the radiopharmaceuticals used for the diagnostic purpose like C^{14} for pancreatic study and breath test, Cr^{51} used for red cell volume and GFR measurement, Co^{57} used for gastrointestinal absorption, I^{123} for thyroid uptake and renal imaging. We review the literature on radiopharmaceuticals so as to gather the more information on utilization of radiopharmaceuticals, its regulatory aspects and guideline for using the radioisotopes.

Key-Words: Radiopharmaceuticals, Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and Ultrasonography (US),radioisotopes. etc.

AERB/RACARP/2017/26

Development and Evaluation of Multi Unit Particulate System (MUPS) for Paracetamol and Rizatriptan Benzoate

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ABSTRACT

At present time pharmaceutical research and development showing its interest on drug delivery. Which enhances therapeutic action while minimizing side effect. Use of multi-particulate is the gift of that research which achieve delayed or controlled release with low risk of dose dumping, flexibility of blending to attain different release pattern like sustained release pellets of Rizatriptan benzoate and immediate release pellets of Paracetamol as well as reproducible and short gastric residence time. The present study aimed at development and evaluation of Multi Unit Pellet System (MUPS) of Paracetamol and Rizatriptan benzoate pellets (Immediate and sustained release),for effective treatment of Migraine. To arrive at an optimized formula six different batches with respect to each drug were formulated. It was observed that in case of immediate release pellets of Paracetamol (Batch P6)and sustained release pellets of Rezatriptan Benzoate(Batch R5) formulation were selected out of six batches on the basis of evaluation results i.e. these batches (pellets) are passes good physical parameters (excellent flow properties and %yield 89% and 88% respectively) along with desirable drug release patterns (immediate release pellets of Paracetamol (Batch P6)and sustained release pellets of Rizatriptan benzoate(Batch R5) formulation) were 70.3%DR(Batch P6) in first 1 hour and79%DR(Batch R5) in 24 hrs.respectively.These could be due to the more amount of Sodium starchglycolate (superdisintegrants) and Ethyl cellulose (matrix forming polymer) respectively.

Key Words-MUPS (Multi Unit Pellet System), Rizatriptan benzoate, Paracetamol, Migraine, Sodium starchglycolate, Ethyl cellulose etc.

AERB/RACARP/2017/27

Diverse Therapeutics and Biological activity of Radiopharmaceuticals: A Review

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ABSTRACT

The Radioactive agents used in the nuclear medical field are called radiopharmaceuticals and are required to exhibit high & specific localization of radioactivity into target organs. While Radionuclides are used in Radiopharmaceuticals Tc^{99m} plays biological role as radio nuclides. A radionuclide (radioactive isotopes) produced for the radiolabelling process with a resultant radiopharmaceutical preparation The use of specific radiotracers called radiopharmaceuticals for imaging organ function and A modality where radiopharmaceuticals are administered to patients for diagnosing, managing and treating number of diseases.The targeting characteristics of, combined with the ease of radionuclide conjugation to, monoclonal antibodies makes them ideally suited for the selective delivery of potentially cytotoxic radioactivity to cancer. Generally the term "radioactivity" is used to describe the phenomenon of radioactive decay and to express the physical quantity (activity) of this phenomenon. The nature and energy of the radiation emitted may be determined by several procedures including the construction of an attenuation curve and the use of spectrometry. A very heavy radionuclide may attain stability by shedding some nucleons. Such transformations may involve emission of charged particles, capture of electron from the extra-nuclear orbits by the nucleus, also known as electron capture (EC). The charged particles emitted from the nucleus may be alpha (α), beta (β) and gamma (γ) . Regulations concerning radiopharmaceutical preparations include the application of current Good Manufacturing Practices (GMP).

Key Words: Radionuclides, Radiolabelling, Radioactivity, Specrometry, Radiopharmaceuticals.

AERB/RACARP/2017/28

Radiopharmaceutical treatment of malignant pheochromocytoma

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ABSTRACT

Apart from relieving effects of secreted catecholamines, treatments of malignant pheochromocytoma have achieved little success. When the radiopharmaceutical, meta-[131I] iodobenzylguanidine (I-131 MIBG), was found to concentrate in some malignant pheochromocytomas, we calculated that this agent could impart therapeutic doses of radiation to these tumors. We therefore treated five patients with two to four doses of I-131 MIBG prepared in high specific activity, 8-11 Ci/mmol. Individual doses were given at 3- to 10-mo intervals and in 97- to 197-mCi amounts. Two patients exhibited subjective and objective benefits. Their tumors declined in size (to 28% and 30% of original volumes) and in hormone secretion (to 50% or less of baseline rates). The other three patients manifested few symptoms before treatment and showed few or no objective improvement afterward. The tumors of the patients who responded to I-131 MIBG (a) appeared to be more rapidly growing, (b) received more cumulative rads, and (c) were more predominantly in soft tissues (in contrast to bone) than those in the patients who obtained little benefit. No toxic effects were encountered during the treatments, and only minor and temporary untoward responses were seen later.

Keywords- Catecholamines, meta-[131I] iodobenzylguanidine (I-131 MIBG), I-131 MIBG, radiopharmaceutical

AERB/RACARP/2017/29

Evaluation of Antipyretic activity of *Pisonia aculeata* bark

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ABSTRACT

The plant *Pisonia aculeate* belongs to the family Nyctaginaceae,has been reported to have great medicinal value in Indian medicine. The study was designed to evaluate antipyretic activity of ethanolic and aqueous extracts of bark of *Pisonia aculeata*. The antipyretic activity of *Pisonia aculeata*was evaluated to Brewer's yeast induced pyrexia in rats with respect to control group. The antipyretic activity of the extract was compared with the standard drug Paracetamol.

AERB/RACARP/2017/30

Validation of a developed RP-HPLC method for the estimation of Saroglitazar in Tablet dosage form

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ABSTRACT

An isocratic reverse phase high performance liquid chromatographic (RP-HPLC) method was developed and validated for estimation of Saroglitazar in tablet dosage form. A Kromasil C18 column (150 x 4.6mm x 5µm) was used as a stationary phase with a mobile phase containing a mixture of buffer (1ml of ortho phosphoric acid was diluted to 1000ml with water) and acetonitrile in the ratio of 32:68v/v. The flow rate was 1.0ml/min. The effluent was monitored at 295nm and eluted at 3.120min. Calibration curve was plotted with a range from 10-60µg/ml for Saroglitazar and the correlation was found to be 0.9998.The accuracy range was found between 98.97% and 101.35%. The %RSD values for both intraday and interday precision were less than 2.0. The limit of detection (LOD) and limit of quantification (LOQ) were found to be 0.615µg/ml and 1.987µg/ml respectively. The method was validated for the parameters like specificity, system suitability, precision, accuracy, robustness and ruggedness. The proposed method can be useful for the routine determination of Saroglitazar in pharmaceutical dosage form.

Keywords: Saroglitazar, Estimation, RP-HPLC, Dosage form, Calibration.

AERB/RACARP/2017/31

Formulation and evaluation of herbal Face Pack

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ABSTRACT

Ultimate goal of this formulation is healthy and beautiful skin. The facepack and make skin good in appearance and smooth. herbal face pack or masks are used to stimulate blood circulation, rejuvenates the muscles and help to maintain the elasticity of the skin and remove dirt from skin pores. The objective of this formulation, To formulate and evaluate Herbal face pack". The real for wound smooth activity, The formulation made by haldi (30%) , chandan (10%), majistha (20%) , masur dal (20%), dahi (20%) Besan (20%) pH of formulation is natural ,which is suitable for skin. Formulation was creamish yellow in colour and had semisolid consistency. The formulation was found homogenous, easily washable and also had very slightly alkaline pH which were compatible with normal skin physiology. evaluated the prepared face pack by the different parameters i.e. pH was found to be in range of natural which is good for skin and no grittiness is found and formulation show good. From the above study it's concluded that the real herb in the form of face pack for suitable for skin for improve appearance.

Key words: Masur dal , Dahi, Besan

AERB/RACARP/2017/32

Regulatory aspects of Radiopharmaceuticals and their application- A review

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ABSTRACT

Radiopharmaceuticals are the pharmaceutical formulations consisting of radioactive substances (radioisotopes and molecules labelled with radioisotopes), which are intended for use either in diagnosis or therapy. 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. Many of the radiopharmaceuticals used for the diagnostic purpose like C^{14} for pancreatic study and breath test, Cr^{51}used for red cell volume and GFR measurement, Co^{57} used for gastrointestinal absorption, I^{123} for thyroid uptake and renal imaging. We review the literature on radiopharmaceuticals so as to gather the more information on utilization of radiopharmaceuticals, its regulatory aspects, guideline for using the radioisotopes and their applications.

Keywords: Radiopharmaceuticals, radioisotopes, regulatory aspects, guideline, diagnosis

AERB/RACARP/2017/33

QSAR Studies of Dipeptidyl peptidase-4 inhibitors using geometrical and topological indices descriptors

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ABSTRACT

We attempted to formulate quantitative structure activity modeling of according to calculated molecular descriptors were taken as DPP-4 inhibitors in order to get insight into their structural requirements responsible for high affinity. Various molecular descriptors such as physicochemical, constitutional, geometrical, and topological indices of such compounds have been calculated and QSAR models have been developed considering biological activities. The best model was selected having a correlation coefficient (r^2) of 0.7874, cross-validated correlation coefficient (q^2) of 0.7126. The descriptors lowest unoccupied molecular orbital energy suggest that a good percentage of the total variance in biological activity. Based on the findings of the QSAR study, novel compounds for DPP-4 inhibition can be synthesized.

Keywords: QSAR, multiple linear regressions, Chem-Office 8.0, DPP-4 inhibitors

AERB/RACARP/2017/34

Preparation and Evaluation of herbal shampoo powder

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ABSTRACT

The study aimed to formulate a pure herbal shampoo and to evaluate its physicochemical properties. The formulated shampoo powders contains Amla fruit, Hibiscus leaves, Neem leaves, Brahmi leaves, Tulsi leaves, Shikakai fruit, Henna leaves, Lemon peel powder, Fenugreek seed, Ritha fruit, Bengal gram powder and Almond powder. The main objective of our herbal shampoo formulation is to eliminate the harmful effects which are caused due to the synthetic shampoos available in the market. Herbal shampoo powder was formulated and subjected to organoleptic studies, general powder characteristics, physicochemical evaluation, ash and alcohol soluble extractives, moisture content determination, pH determination, cleaning action, foaming capacities, dirt dispersion, wetting time and studies on nature of hair after wash. The formulation offered a suitable practical approach and achieved a better usage. General powder characteristics showed results in specified limits. Physicochemical evaluations, pH determination, ability to remove grease, foaming capacity, dirt dispersion, wetting time and nature of hair after wash were found to yield satisfactory results. The present work confirmed the successful preparation of herbal shampoo powder by mixing method without using other excipients.

Key-words: Herbal shampoo powder, Organoleptic properties, Formulation and evaluation methods

AERB/RACARP/2017/35

Medicinal plants used in the treatment of tuberculosis

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ABSTRACT

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. Tuberculosis generally affects the lungs, but can also affect other parts of the body. Tuberculosis (TB) remains one of the most difficult ailments to control in the world today. The emergence of drug resistant strains has made previously effective and affordable remedies less effective. This has made the search for new medicines from local traditional medicines urgent. In this study, we have studied about the various plants having antituberculosis properties. This study therefore, illustrates the importance of medicinal plants in the treatment and management of TB.

Key Words: Tuberculosis, *Mycobacterium tuberculosis*, ailments

AERB/RACARP/2017/36

Formulation and evaluation of herbal soil shampoo

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ABSTRACT

Dry shampoo is a type of shampoo which reduces hair greasiness without the need for water. It is in powder form. The present study was aimed to formulate & evaluate herbal hair powder shampoo using commonly available herbs for treat hair problems. The preparation was formulated using amla, brahmi, shikhakai, aritha, black soil, sandal wood, fenugreek seeds. Herbal hair shampoo powder was successfully evaluated using different standard parameters like ash value, swelling index, foaming index, P^H to ensure its quality and purity of such type of herbal powder shampoo. Black soil is very useful for hair to enhance smoothness of the hair. The results showed that the formulated herbal hair shampoo powder. It may be safer compared to synthetic hair shampoo powder.

AERB/RACARP/2017/37

Recent advancement in Oral suspension by using Natural Polysaccharide

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ABSTRACT

The objective of this work was to develop and evaluate reconstitutable suspensions of Paracetamol microspheres prepared with Natural polysaccharide using TSP. To prepare reconstitutable suspension formulation. Xanthan gum was chosen as the suspending agent for the suspension formulations. Polysorbate 80 was used to impart palatability of suspensions. The amount of poly-sorbitol 80 affected sedimentation volume and redispersibility properties of suspensions Tamarind Polysaccharides. The highest improving effect was shown with 20.0% and 25.0%concentrations. It was observed that dispersion media of suspensions showed non-Newtonian flow characteristics. To ensure minimum drug leakage from the microspheres into the suspension, the pH was buffered at 3.60. This result indicated that no leakage of drug occurred from the microspheres in the suspension on storage. This study suggested that stable suspensions of paracetamol loaded microspheres could be formulated with 0.6% w/v xanthan gum by the addition of 20% w/v Polysorbate 80.

Key Words:Tamarind, Microspheres, Suspension, Paracetamol

AERB/RACARP/2017/38

Antidiabetic activity of *Woodfordia fruticosa* flowers

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ABSTRACT

Diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia and by disturbances of carbohydrate, fat, and protein metabolism. It is associated with an absolute or relative deficiency in the secretion and/or action of the hormone insulin. Diet, exercise, modern drugs including insulin and oral administration of hypoglycemic drugs such as sulfonylurea's and Biguanide manage the pathogenesis of diabetes mellitus. It has been estimated that about 80-85% of population both in developed and developing countries rely on traditional medicine for their primarily health care needs and it is assumed that a major part of traditional therapy involves the use of plant extracts or their active principles. In present study, *Woodfordia fruticosa* flowers were used for the evaluation of antidiabetic activity. *Woodfordia fruticosa* belongs to the family Lythraceae. Methanolic extracts of *Woodfordia fruticosa* exhibited Significant anti-hyperglycemic activities in alloxan induced hyperglycemic rats without significant change in body weight and the renewal of beta-cells in diabetes has been studied in animal models. In our studies, the damage of pancreas in alloxan-treated diabetic control rats and regeneration of beta-cells by Glibenclamide was observed. The comparable regeneration was also shown by methanolic extracts of *Woodfordia fruticosa* flowers. This effect may be due to the Steroids and glycosides which were reported to be constituent of *Woodfordia fruticosa*. Photomicrographical data in our studies reinforce healing of pancreas, by extracts, as a plausible mechanism of their Antidiabetic activity.

Key Words: *Woodfordia fruticosa,* Extract, Diabetes

AERB/RACARP/2017/39

Recent Research and Future prospects in Pharmacology of radiopharmaceutics

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ABSTRACT

Radiopharmacology or medicinal radiochemistry is radiochemistry applied to medicine and thus the pharmacology of radiopharmaceuticals (medicinal radiocompounds, that is, pharmaceutical drugs that are radioactive). Radiopharmaceuticals are used in the field of nuclear medicine as radioactive tracers in medical imaging and in therapy for many diseases (for example, brachytherapy). Many radiopharmaceuticals use technetium-99m (Tc-99m) which has many useful properties as a gamma-emitting tracer nuclide. In the book *Technetium* a total of 31 different radiopharmaceuticals based on Tc-99m are listed for imaging and functional studies of the brain, myocardium, thyroid, lungs, liver, gallbladder, kidneys, skeleton, blood and tumors

The term *radioisotope*, which in its general sense refers to any radioactive isotope (radionuclide), has historically been used to refer to all radiopharmaceuticals, and this usage remains common. Technically, however, many radiopharmaceuticals incorporate a radioactive tracer atom into a larger pharmaceutically-active molecule, which is localized in the body, after which the radionuclide tracer atom allows it to be easily detected with a gamma camera or similar gamma imaging device. An example is fludeoxyglucose in which fluorine-18 is incorporated into deoxyglucose. Some radioisotopes (for example gallium-67, gallium-68, and radioiodine) are used directly as soluble ionic salts, without further modification. This use relies on the chemical and biological properties of the radioisotope itself, to localize it within the body.

Key Words: Radiopharmacology, Radio-isotopes, Medical

AERB/RACARP/2017/40

Radiochemical purity: An important parameter in quality control of Radiopharmaceuticals

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ABSTRACT

Radiopharmaceuticals are unique medicinal formulations containing radioisotopes which are used in major clinical areas for diagnosis and/or therapy. A chemical product which undergoes a labeling procedure using a certain radionuclide with the adequate nuclear characteristics for the desired use in nuclear medicine is considered to become a radiopharmaceutical product. The quality of radiopharmaceuticals administered for a patient is primarily related for the radiation dose delivered to achieve optimizing diagnostic imaging or therapeutic efficacy. Radiopharmaceuticals with different half-lives, decay modes (alpha, beta, gamma, and electron capture), and biochemical properties (of ligands) can determine their utilities in medicine. Moreover, chemical and radiochemical impurities in a radiopharmaceutical can produce a serious trouble of diagnosis or treatment. Therefore, different requirements, regulations and instrumentations have been developedfor ensuring their high quality and high safety. The concept of purity applied to radiopharmaceutical compounds implies three aspects such as radionuclidic purity, radiochemical purity and chemical purity.Radiochemical purity analysis can be performed by gas chromatography, high-performance liquid chromatography (HPLC), or thin-layer chromatography (TLC).Radiochemical impurities are separated due to differing affinities to the TLC media. In this review, we present different aspects of quality control parameters regarding the radiochemical purity determination for the radiopharmaceutical products.

Key word: Radiopharmaceuticals, HPLC, Radiochemical Purity, Quality Control

AERB/RACARP/2017/41

Pharmacophore Modeling and Docking Studies of Some Selective Estrogen Receptor Modulators (SERMs)

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ABSTRACT

Breast cancer and osteoporosis are the most commonly occurring diseases of post-menopausal women. Estrogen and related hormones are responsible for these diseases. Selective Estrogen Receptor Modulators (SERMs) have been used as first line treatment in estrogen responsive breast cancer and osteoporosis. To design and develop promising SERMs, the present study has been focused on pharmacophore modeling and molecular docking study that can explore 3D features and configurations of structurally diverse ligands and receptors that are responsible for biological activity. The study indicated that five combinations of five chemical features were common in all most active ligands ($pIC_{50} \geq 9$). PHASE scores the hypotheses for survival of active ($pIC_{50} \geq 9$) and inactive ligands ($pIC_{50} \leq 6.5$). The high ranking hypotheses were used for CPH based 3D-QSAR model building and validation. APRRR-223 was identified as the best hypothesis on statistical grounds (R^2 = 0.923, standard deviation = 0.317, Fischer significance F = 154.7, and chance correlation $P = 4.47 \times 10^{-44}$). Survival numbers of active and inactive ligands for the best CPH model were 43.1 and 42.5, respectively. Accordingly, it can be said that the CPH-based 3D-QSAR model should be highly reliable and thus give accurate predictions. In addition, our computational models based on molecular docking uniquely offer the ability to distinguish active ligands and inactive ligands from large pool compounds and they can be utilized in virtual screening.

AERB/RACARP/2017/42

Formulation and evaluation of Xylazine Hydrochloride mouth dissolving film

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ABSTRACT

Xylazine hydrochloride is widely used in the treatment of multiple sclerosis spastic diplegia back pain or certain injuries to the spine or CNS, Xylazine hydrochloride has been found to be effective other antispasmodic drug and has superior tolerability to that baclofen and diazepam. The present study is deals with formulation, and evaluation of Xylazine hydrochloride mouth dissolving films. Xylazine hydrochloride is one of the drug which is used in the treatment of above The mouth dissolving films was prepared by using solvent casting method. The concentration of Sodium alginate, Glycerol, Tween 80 were kept constant in all formulations (F1-F4) and varying concentration of all the formulations were evaluated for surface pH, weight uniformity, folding endurance, drug content, disintegration time, in-vitro dissolution studies. The formulation 'F3' was found to be optimized formulation. It shows results for all evaluation parameters such as weight variation 84.56±0.22 mg, surface pH 6.10 ±0.45, folding endurance > 100, drug content 84.10±0.20%, disintegration time 28±0.50 sec, and in-vitro dissolution study 63.71 % at the end of 5 min. From all of observation we can conclude that the formulation F3 shows better results.

Keywords: Sclerosis, antispasmodic, tolerability

AERB/RACARP/2017/43

Herbal approach for protection of adverse effect from Radiation therapy

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ABSTRACT

Ionizing radiations produce deleterious effects in the living organisms and the rapid technological advancement has increased human exposure to ionizing radiations enormously. There is a need to protect humans against such effects of ionizing radiation. Attempts to protect against the deleterious effects of ionizing radiations by pharmacological intervention were made as early as 1949 and efforts are continued to search radio protectors, which may be of great help for human application. This review mainly dwells on the radio protective potential of plant and herbal extracts. The results obtained from *in vitro* and *in vivo* studies indicate that several botanicals such as *Gingko biloba*, *Centella asiatica*, *Hippophae rhamnoides*, *Ocimum sanctum*, *Panax ginseng*, *Podophyllum hexandrum*, *Amaranthus paniculatus*, *Emblica officinalis*, *Phyllanthus amarus*, *Piper longum*, *Tinospora cordifoila*, *Mentha arvensis*, *Mentha piperita*, *Syzygium cumini*, *Zingiber officinale*, *Ageratum conyzoides*, *Aegle marmelos* and *Aphanamixis polystachya* protect against radiation-induced lethality, lipid peroxidation and DNA damage. The fractionation-guided evaluation may help to develop new radio protectors of desired activities

Keywords: radiation therapy, radio protectors, radiation-induced lethality

AERB/RACARP/2017/44

Learning & memory enhancing activity of aerial parts of *Moringa oleifera*

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ABSTRACT

Human brain is the most evolved complex structure in the body. Various neurodegenerative diseases like alzemiers disease, Dementia, attention deficit, were set as tough challenges in the medical field. The current medical research studies focuses on the potential usage of herbal drugs. The present study was carried out with an interest and contribution for herbal medicines as essential potent drugs. *Moringa oleifera* is glabrous, evergreen tree commonly grown in gardens and various parts of the plant were used in the indigenous system of medicine for the treatment of various disorders. To validate the ethnotherapeutic claims of the plant for its use as a brain tonic, the Learning & memory enhancing activity of ethanolic and aqueous extracts of aerial parts of *Moringa oleifera* was evaluated by Elevated plus maze apparatus in mice. The effect of transfer latency (TL) due to extracts (ethanolic& aqueous at 200,400 mg/kg) and standard drug (Piracetam 200mg/kg) were compared to that of control and negative control (Diazepam 5mg/kg). The effect of herbal extracts was evaluated on elevated plus maze apparatus in Diazepam induced amnesia in mice. It is observed that the ethanolic & aqueous extracts at various doses(200 mg/kg) has significantly reduced the transfer latency in mice compared to control and negative control groups in a dose dependent manner and results were comparable to the standard Piracetam treated group. From the results obtained, it is evident that the traditional herbal extracts have significant learning and memory enhancing property.

Keywords: Neurodegenerative, dementia, glabrous, ethanotherapeutic, *Moringa oleifera*

AERB/RACARP/2017/45

Anti-stress and Nootropic activity of aqueous extract of *Artocarpus heterophyllus* fruit, and y-maze test in rodents

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ABSTRACT

Artocarpus heterophyllus also known as jack fruit or kathal , belongs to family Moraceae. Fruits of this plant have been used traditionally to treat a variety of diseases. The current study was done to evaluate anti-stress activity in rats subjected to forced swim stress one hour after daily treatment of *Artocarpus heterophyllus* extract. Anti-stress and nootropic activity activities of aqueous extract of *Artocarpus heterophyllus* fruit extract were estimated as locomotor and working memory in rats in a Y-maze apparatus. The *in vitro* antioxidant activity was determined based on the ability of the *Artocarpus heterophyllus* to scavenge free radicals. Daily administration of aqueous extract of *Artocarpus heterophyllus* at doses of 100, 200 and 300 mg per kg body weight one hour prior to induction of stress increased the stress-induced urinary biomarker levels in a dose-dependent manner. *Artocarpus heterophyllus* treatment showed significant dose-dependent variation in non-invasive biomarker levels in urine samples of rats taken after 24 h. Cognition, determined by working memory and locomotor activity results, were shown to be dose-dependent. The results of this study suggest anti-stress and nootropic activity effect of *Artocarpus heterophyllus* in rodents.

Key words: Antioxidant activity, anti-stress activity, nootropic activity, *Artocarpus heterophyllus*, rats, Y-maze test.

AERB/RACARP/2017/46

Anti-Anemic Activity of Hydro-alcoholicextract Fruit of *Solanum lycopersicum* in Phenylhydrazine Induced Anemic Rats

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ABSTRACT

The aim of the present study is to evaluate the anti-anemic activity of hydro-alcoholic fruit extract of *Solanum lycopersicum* against phenylhydrazine induced hemolytic anemia in rats. Phenylhydrazine (60mg/kg) was administered intraperitoneally for 2 days to induce anemia in rats. The animals were divided in to four groups of 6 animals each. Group I served as normal control, group II as anemic control, group III as reference control administered with Vitamin B_{12} and group IV animals were treated with 200mg/kg, of hydro-alcoholic fruit extract of *Solanum lycopersicum.* All the test drugs were administered once daily for 28 days through oral route. On 29th day blood was withdrawn, through tail puncture under phenobarbitone anesthesia and subjected to the estimation of RBC, Hb and percentage Hematocrit. The hydro-alcoholic fruit extract of *Solanum lycopersicum* and Vitamin B_{12} significantly increased the RBC, Hb and Hematocrit levels which conclude that, fruit extract of *Solanum lycopersicum* exhibits anti-anemic activity.

Keywords: Anemia, Anti-anemic activity, fruit extract of *Solanum lycopersicum* and Vitamin B_{12}.

AERB/RACARP/2017/47

Formulation and evaluation of pantoprazole effervescent tablets for the treatment of peptic ulcer

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ABSTRACT

Pantoprazole is proton pump inhibitor, belongs to group benzimidazole. Pantoprazole sodium was prepared by direct compression method using different concentration of microcrystalline cellulose as filler; mannitol and dicalcium phosphate as diluents; cross carmellose sodium as disintegrating agents; magnesium stearate as a glidant and talc was used as a lubricant. The direct compression is economic compare to the wet granulation as it requires fewer unit operations. This means less equipment, lower power consumption, less space, less time and less labour leads to the reduced production cost of tablets. The prepared tablets were evaluated for hardness, weight variation, friability and drug content uniformity and it was found that the results comply with official standards.

Key words: Pantoprazole, Direct compression, Proton pump inhibitor

AERB/RACARP/2017/48

Herbal Approaches for Cardiovascular Disease Treatment

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ABSTRACT

The cardiovascular diseases (CVDs) have been the major cause of morbidity and mortality in developed countries over the last several decades and developing countries are rapidly catching up with this epidemic. The underlying pathology is athermanous vascular disease, resulting in coronary artery disease (CAD), cerebrovascular disease, and peripheral vascular disease, and the subsequent development of heart failure and cardiac arrhythmias. The major risk factors for these disorders were recognized over many years and it includes high level of low-density lipoprotein (LDL) cholesterol, smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, insufficient consumption of fruits and vegetables, excess consumption of alcohol and lack of regular physical activity. A wide variety of plant extracts have been used in traditional medicine over the centuries such as digoxin, have been adopted in conventional medicine. In this section, we concentrate on those plants and herbs for which there is some evidence, supporting their value in the prevention or treatment of CVD. The general desire for good health and wellness, disease prevention, the increasing cost of conventional medicines and the traditional belief that complementary and alternative medicine (CAM) is safer and more effective than allopathic drugs that commonly have adverse effects. In this review, we highlight commonly used herbs such as *Azadirachta indica, Cassia fistula, Cedrus deodara, Cocos nucifera, Myristica fragrans, Picrorhiza kurrooa, Terminalia chebula, Elephantopusscaber* in cardiovascular disease.

Keywords: Cardiovascular agents, complementary therapies, herbal medicine, herb-drug interaction

AERB/RACARP/2017/49

A review of Aromatherapy

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ABSTRACT

Aromatherapy is the art, and science of using plant essences called essential oils. It gently brings changes in body, mind and spirit. It can assist in reducing stress, bring relief to muscular aches and pains, help with skin care and skin related problems. It activates the limbic system and emotional centers of the brain, activate thermal receptors, and kill microbes and fungi.

Therapy also encourages emotional peace and calm with a gently calming effect on mind, body and emotions. It gently stimulates the body's natural powers to heal itself. As these forces are awakened the body is encouraged to return from a state of disease to a state of balance or health. Aromatherapy differs from Orthodox/Conventional/Allopathic medicine in that the whole person is treated rather than a disease. Aromatherapy is used in the treatment of various diseases such as bronchitis, fatigue, migraines, respiratory ailments, acne, arthritis, muscular aches and pains, cystitis, cold and flu. The present paper enumerates the various aspects, methods, composition of volatile oils and principles of aromatherapy.

Keywords: Aromatherapy, Essential oil, Herbal plants

AERB/RACARP/2017/50

A review on plethora methods for *in vitro* determination of Antioxidant activity

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ABSTRACT

Oxygen free radicals induces damage due to peroxidation to biomembranes and DNA, which leads to tissue damage thus induces number of diseases. Antioxidants may be synthetic or natural neutralize the effect of free radicals through different ways and may prevent the body from various diseases. 1, 1-diphenyl-2-picrylhydrazyl (DPPH), 2, 2′-azino-bis-3-ethylbenzthiazoline-6-sulphonic acid (ABTS), Nitric Oxide Radical Scavenging Activity**,** superoxide dismutase assay and iron chelation are analytical methods measure the radical scavenging activity of antioxidants. Most of the assays employ the same principle: a synthetic colored radical or redox-active compound is generated; and the ability of a biological sample to scavenge the radical or to reduce the redox-active compound is monitored by spectrophotometer, applying an appropriate standard to quantify antioxidant capacity.

Keywords: DPPH, ABTS, Nitric oxide, Superoxide Dismutase, iron chelation.

AERB/RACARP/2017/51

A review on Superbugs different stains & their susceptibility

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ABSTRACT

Superbugs are strains of bacteria that have changed (or mutated) after coming into contact with fourth generation antibiotics. On February 27th 2017, WHO published list of antibiotic-resistant "priority pathogens" – a catalogue of 12 families of bacteria that pose the greatest threat to human health. After a long exposure to these antibiotics frequently they have been develop resistance over them by altering their structure, which means the antibiotic can't kill the bacteria or stop them from multiplying. Antimicrobial resistance may be developed because of high consumption of antibiotic or by not following proper procedure to take antibiotic Every day the cases of superbug infections has been increasing and the most terrific condition is that they are resistant to advanced antibiotics also. Some of the most worrisome superbugs developed are MRSA, MDR-TB, *Enterobacteriaceaei* family species etc. In this review article, WHO list of deadly superbugs, various researches going on for their treatment such as vancomycin, oritamycin & Oritavancin prevention and control on AMR are discussed here.

Keywords: AMR, MRSA, AMR (AntiMicrobial Resistance), Nanomedicines, vancomycin, oritamycin & Oritavancin

AERB/RACARP/2017/52

Screening of *Psidium guajava* (L.) fruits for locomotor activity by narcotic-like principle in mice

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ABSTRACT

Psidium guajava (L.) is a large evergreen shrub or small tree has vitality as medicinal plant and food crop in tropical and subtropical countries, widely used as food and folk medicine around the world. This aims a comprehensive of chemical constituents, pharmacological and clinical uses. Also have been identified the medicinally important phyto-constituents. A number of metabolites in good yield and some have been shown to possess useful biological activities belonging mainly to phenolic, flavonoid, carotenoid, terpenoid and triterpene. Fruit hydro alcoholic extracts, have useful pharmacological activities. A literature survey shows *P. guajava* (L.) leaves are mainly known for its CNS depressant property, supporting its traditional uses. Therefore present study has been carried by fruit extract on the suppression of both exploratory and spontaneous locomotor activities in mice.

The results were compared by chlorpromazine 3mg/kg *i.p.*as standard reference drug by observing locomotor activity using mice for 10 minutes. Results were found significant ($p < 0.05$-0.001) and hence reveals the CNS depressant property, present in *P. guajava* (L.) fruits.

Keywords: *Psidium guajava,* CNS, depressant, locomotor

AERB/RACARP/2017/53

Molecular Modeling studies of some new benzimidazole derivatives antimicrobial: CoMFA, CoMSIA, HQSAR and Docking studies

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ABSTRACT

Three dimensional Quantitative Structure Activity Relationship (QSAR) analyses on a series of 34 molecules of united benzimidazole nucleus antimicrobial activity were performed. In this studies we are performed 3d QSAR (CoMFA and CoMSIA), 2D QSAR (HQSAR) and protein drug interaction (Docking studies). The training set of 21 compounds in CoMFA, CoMSIA and HQSAR models gives cross validated $r^2(q^2)$ of 0.470, 0.572 and 0.639 and conventional r^2 of 0.982, 0.809 and 0.960 respectively. The predicted r^2 values 0.618, 0.657 and 0.636 for CoMFA, CoMSIA and HQSAR respectively, shows that the generated models are reliable and appropriate for further designing. Observation of generated QSAR models provide contribution of descriptors regarding structural surrounding and requirement leads to rise of molecules having enhanced biological response. Adaptation of rationale regarding requisite substitution on common structural scaffold provides preferential regions to increase antimicrobial activity. In addition to this work the docking studies was performed on pdb 5EQB (14-α-demhylase inhibitor) which is further explore the binding affinity towards active site of protein receptor. Final results serve as a guiding tool for creation of more potent and efficient compounds towards microbial stress.

Keywords: CoMFA; CoMSIA; HQSAR; docking; benzimidazole antimicrobials.

AERB/RACARP/2017/54

Formulation and evaluation of Bilayer tablets of Metformin and Rosuvastatin

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ABSTRACT

It was found that with the designing of bilayer tablet of Metformin HCl and Rosuvastatin Ca^{+2} in which Rosuvastatin Ca^{+2} in one layer releases instantly due to the presence of Cros Carmelose sodium as superdisintergrating agent and Metformin HCl follow the release slowly by HPMC high molecular weight matrix in the order to match with the innovator product. Finally it was concluded that Bilayer tablet of Metformin HCl and Rosuvastatin Ca^{+2} can be prepared by using optimized level of high viscosity of HPMC in sustained release layer and cros carmelose sodium in instant release layer.Three main excipients were selected for the purpose of improving desired characterization of granules and tablets such as solvent used, Methocel (K 4M and K 100M), and Lubricant. Eight batches (F1 to F8) were prepared with different excipients in varied concentration along with the The simulation of the drug release profile of developed product with innovetor's product was obtained in batch F8 by manipulating the process in which Methocel K100M was added in the formulation in two parts. F8 good flow property of granules and the desired drug release profile as similar to innovator's product. The project work was mainly aimed to design the formulation of immediate release tablets of Rosuvastatin. In batch R1 to R3 SSG was used in increased manner shows decrease in the disintegration time and in batch R4 to R6 Crospovidon XL was used in increased manner shows improve in disintegration time and better release profile in R6.

Key word: metformin tablet, bilayer tablet, met-ros bilayer, antidiabetic tablet, met granule.

AERB/RACARP/2017/55

Designing and molecular docking study of some chalcones as *pf*KASI/II inhibitor

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ABSTRACT

In this research work some chalcones were designed to evaluate their binding affinity in the active site of the enzyme *pf*KASI/II of *P.Falciparum*. In the designing of compounds R_1 position was substituted with hydroxy substituted phenyl ring, whereas R_2 position was substituted with halogen (such as F,Cl and Br) substituted phenyl ring. As the crystal structure of *pf*KASI/II enzyme is not available in protein data bank, therefore the three dimesional structure of the *pf*KASI/II enzyme was derived through homology modeling. The designed compound was subjected for docking in the active site of the modeled enzyme. Compound **07** and **09** was found to be the potent inhibitor of enzyme *pf*KASI/II of *P.Falciparum*.

AERB/RACARP/2017/56

GMP requirement for determination of labelling efficiency of Radiopharmaceuticals

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ABSTRACT

The labeling efficiency of Radiopharmaceuticals indicates the radiochemical purity of the product. The determination of radiochemical purity requires separation of the different chemical substances containing the radionuclide and estimating the percentage of radioactivity associated with the declared chemical substance. As conventional methods any method of analytical separation may be used in the determination of radiochemical purity of product. The monographs for radiopharmaceutical products includes number of analytical method such as paper chromatography, thin-layer chromatography, instant thin-layer chromatography (ITLC), electrophoresis, size-exclusion chromatography, gas chromatography and liquid chromatography.

Thin-layer and paper chromatography are mostly used in laboratory scale. In both methods as very small quantities of the radioactive material applied, a carrier may be added to increase volume. After development of the chromatographic plate radioactive areas are detected by autoradiography or by collimated counters .The positions of the spots or areas permit chemical identification.

Apart from above method another common method is Instant thin-layer chromatography (ITLC) which is used to determine the labeling efficiency of radiopharmaceuticals. The assay uses specific cellulose backed silica gel chromatography strips as solid phase. ILTC method offers advantages such as easy to use, rapid and can be incorporated easily in a routine quality control program. Radioactivity may be measured by integration using an automatic-plotting instrument or a digital counter. The ratios of the areas under the peaks give the ratios of the radioactive concentration of the chemical substances.

AERB/RACARP/2017/57

Evaluation of Anti-nociceptive effect of *Psidium guajava* (L.) fruits by chemical & thermal induced models

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ABSTRACT

Psidium guajava (L.), Myrtaceae known as the poor man's apple of the tropics, has a long history of traditional use, much of which is being validated by scientific research. This aims a comprehensive of chemical constituents, pharmacological and clinical uses. Chemical constituents have been possessed useful biological activities belong mainly to phenolic, flavonoid, carotenoid, terpenoid and triterpene. The literatures show that *P. guajava* (L.) leaves possess anti-inflammatory and anti-nociceptive activities, supports its traditional uses. In an effort to scientifically apprise some of the ethno medical properties of *P. guajava* (L.) fruit and probe its efficacy and safety, the present study was undertaken to examine the anti-nociceptive property of fruit hydroalcoholic extract in experimental animal paradigms "chemical & thermal induced model".

The results were observed and compared by reference drug as diclofenac sodium 5mg/kg *i.p.*, by counting writhes produced by induction of acetic acid 1% v/v, 1ml/100gm *i.p.* The effects observed for 10 minutes, in chemical model. Moreover, by using same reference drug, jumping response observed by induction of heat. The cut off period was 10 seconds, for thermal model. Hence results were found significant ($p < 0.001$) and hence showed the anti-nociceptive effect for *P. guajava* (L.) fruits, by chemical & thermal model.

Keywords: *Psidium guajava,* anti-nociceptive, analgesic, writhing effect, Eddy's hot plate, CNS

AERB/RACARP/2017/58

Reducing Radiation Exposure with Natural Remedies

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ABSTRACT

There are multiple harmful effects of radiation, and many of them go unnoticed in the body. Over time, low level exposure can lead to major digestive imbalance, blood alteration and even the destruction of many cellular structures in the body's key organ and tissue systems. Common signs of low level radiation exposure include symptoms such as fatigue, headaches, nausea, scalp tenderness, scalp discoloration, and dry/itchy skin. In extreme cases, low exposure of radiation may also cause brain damage, memory problems, mood changes and reduced listening capacities, psychomotor abilities and information processing times. All good reasons to consider protecting ourselves from this type of exposure. There are various natural remedies viz., mineral, plants and some synthetic chemicals which will be useful in reducing radiation exposure. Several natural remedies such as calcium, magnesium, DMSO, Zeolites, clays, papain, bee pollen, beets etc. were used in reducing radiation exposure in the body. All these aspects have been highlighted in present communication.

Keywords: Radiations, Natural Remedies, Exposure

AERB/RACARP/2017/59

Cytotoxic effect of *Gmelina arborea roxb* (Gambhari) on HL-60 Cell Lines

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ABSTRACT

Gmelina arborea Roxb. commonly known as 'Gambhari' tree, the various parts of the plants are widely used in diarrhoea, anti-pyretic, thirst, anemia, leprosy, ulcers, consumption, strangury and vaginal discharges. We tested the cytotoxic potential of *Gmelina arborea* roxb in HL-60 cells. Aqueous Extract of *Gmelina arborea* roxb (AEGA) was tested at the various concentrations 5, 10,15 and 20 mg in Cell Viability assays and clonogenic assay. Our study shows that AEGA inhibits cell growth and decrease the cell viability. The AEGA very significantly decreased the cell viability of HL-60 Cells after 24 and 48 h compared to the control cells. In the semisolid culture, the number of colonies decreased significantly ($p<0.01$) in a dose-dependent manner. Overall, AEGA has shown a substantial and significant anti cancer activity in all the models. This protective effect might have been mediated by apoptosis mechanisms.

Key words: Cell viability assays, clonogenic assay, cytotoxicity, AEGA, HL-60

AERB/RACARP/2017/60

Molecular Docking Study of 1, 4 Dihydropyridinesas Anti-tubercular Agents

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ABSTRACT

Tuberculosis is one of the most common infectious diseases worldwide as about one third of the total population of the world is estimated to have tuberculosis infection.1, 4-Dihydropyridine (DHP) is a multifunctional lead molecule and acts as a calcium channel modulator exhibit various pharmacological activities such as antihypertensive, anticancer, MDRr, antianginal, antitubercular, antioxidant, analgesic and anti inflammatory, antithrombotic, anticonvulsant, stress protective, antimicrobial, antidyslipidemic and antiulcer.The molecular docking study was performedto observe the interaction of 1, 4-Dihydropyridines with the Enoyl-ACP(CoA) reductase enzyme. The results of the study will be helpfultodesignnew analogues that exhibitpotentanti-tubercular activity.

Keywords: Docking, 1, 4-Dihydropyridine (DHP), antitubercular.

AERB/RACARP/2017/61

Formulation and Evaluation of Herbal Anti acne Cream

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ABSTRACT

The flowers of the marigold (*Calendula officinalis* L.) are widely used in the domestic and foreign medicine as anti-inflammatory, regenerating, choleretic, expectorants as flavonoids, sesquiterpene glycoside, carotenoids and saponins phytopharmaceuticals. In the proposed project, object is to formulate the Herbal Anti Acne cream & evaluates it. Our herbal skin care product with natural anti-oxidant sustain long lasting healthy skin, ageless beauty and are appropriate for sensitive skin. These free active radical are highly reactive and can start a chain reaction under sensitive skin's surface inducing damage. We encourage you to use our other herbal body care product, which help to nourish, rejuvenate and restore your skin as well as to protect it from environment. The evaluation parameter of the Formulated cream were reported as cream was stable at 120 rpm for 3-4 week with neutral pH 6-7 & no phase separation occurs, evenly spreadability.

AERB/RACARP/2017/62

Treatment of Alzheimer's disease by using herbal drugs

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ABSTRACT

Alzheimer's disease is characterized by profound memory loss sufficient to interfere with social and occupational functioning. It is the most common form of dementia, affecting more than 20 million people worldwide. Alzheimer's disease is characterized by an insidious loss of memory, associated functional decline, and behavioral disturbances. Patients may live for more than a decade after they are diagnosed with Alzheimer's disease, making it the leading cause of disability in the elderly. The first neurotransmitter defect discovered in Alzheimer's disease involved acetylcholine (ACh). As cholinergic function is required for short-term memory, the cholinergic deficit in Alzheimer's disease was also believed to be responsible for much of the short-term memory deficit.

Keywords: Herbal Drugs, Alzheimer 's disease, Acetylcholine, Neurotransmitters

AERB/RACARP/2017/63

Evaluation of Antibacterial activity of *Moringa oleifera Lam.* fruit extracts against gram-positive and gram-negative bacteria

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ABSTRACT

Plants have been a valuable source of natural products for maintaining human health. So, today, the world is gradually turning to herbal formulations, which are known to be effective against a large repertoire of diseases and ailments. Therefore the present study was designed to evaluate the antibacterial activity of *Moringa oleifera* Lam. fruit extracts in different solvents (methanol, ethanol and aqueous) were studied against two gram-positive (*Micrococcus luteus* and *Bacillius subtilis*) and one gram-negative (*Escherichia coli*) bacterial strains by agar well diffusion assay (AWDA) method. In the present investigation, aqueous extract gave the highest yield percentage as compared to the methanol as well as ethanol extracts. The crude fruit extracts with different solvents showed remarkable antibacterial activity against the tested both types of bacterial strains. Among the tested bacterial strains, *M. luteus* was found more sensitive to the fruit extract as compared to the *B. subtilis* as well as *E. coli*. The methanol extract showed higher antibacterial activity as compared to the ethanol and aqueous extracts. The commercially available, standard antibiotic streptomycin offers relatively higher inhibition as compared to the tested various solvent extracts. Screening of crude extract showed notable minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) at concentrations range of 12.5-100 mg/ml. The remarkable antibacterial activity of the *M. oleifera* fruit extract against tested gram-positive and gram-negative bacteria suggests that there is a scientific basis for its utilization as antibacterial agents in designing and developing new drugs.

AERB/RACARP/2017/64

Advancement in Brain Targeting- A Review

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ABSTRACT

Brain is extremely delicate organ. It is represented by endothelial cells with tight junctions, presence of active efflux transporter such as P-gp efflux and enzymatic activity due to which drug delivery to brain still remains major challenge now days in treatment of several CNS disorders. This article mainly reviews on barriers to CNS delivery, drug uptake mechanisms and techniques to facilitate Brain uptake by employing novel, practical, simple & non invasive techniques such as Biological methods, Chemical methods, Colloidal drug carriers, Intrathecal/Intraventricular delivery, Intracerebral implants, Blood Brain barrier disruption with special emphasis on Intranasal delivery to brain by olfactory and trigeminal nerve pathway. The advancements & progresses using these methods are reviewed in this article.

Keywords: Barriers of brain, drug uptake mechanisms, newer targeting approaches to increase brain uptake, Olfactory & Trigeminal nerve pathways.

AERB/RACARP/2017/65

Designing and molecular docking study of thiadiazole derivatives as α-glucosidase inhibitor

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ABSTRACT

In this research work some thiadiazole derivatives were designed to evaluate their binding affinity in the active site of the enzyme α-glucosidase. In the designing of compound R_1 position was substituted with halogen substituted phenyl ring, however R_2 position was substituted with different alkyl groups. As the crystal structure of α-glucosidase enzyme is not available in protein data bank, therefore the three dimesional structure of the α-glucosidase enzyme was derived through homology modeling. The designed compound was subjected for docking in the active site of the modeled enzyme. Compound **06** and **10** were found to be the promising inhibitor of enzyme of α-glucosidase.

AERB/RACARP/2017/66

Comparative molecular docking study of 4-thiazolidinone analogues between $EGFR^{WT}$ VS $EGFR^{T790M}$ mutant

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ABSTRACT

Epidermal growth factor receptor (EGFR), is a kind of ligand induced activation of receptor tyrosine kinase, serves an important role in many cell signaling process, that regulate numerous functions of cell growth, differentiation and angiogenesis. The mutations of EGFR, lead to its overactivity are associated with variety of cancers. In approximately 60% of the people, resistance is developed against EGFR due to EGFR kinase domain mutation at the gatekeeper position Thr^{790} to Met^{790} (T790M) residues. The main aim of this study is to overcome the drug – resistance and toxicities of first and second generation EGFR receptor inhibitors and to find out more potent antiproliferative agents against $EGFR^{T790M}$ and wild type EGFR receptor. This goal was achieved by employing structure based drug design studies or docking studies on pdb Id :1t46(WT) and pdb Id: 3IKA ($EGFR^{T790M}$) via Molegro Virtual Docker (MVD)1.2 software. The docking study was performed to observe the interaction of compounds with the receptor and to examine the agreement between the docking pattern and predictive activity of the validated pharmacophore. Docking study revealed that compound thiazolidine-4-one analogues was nicely bound with both $EGFR^{WT}$ and $EGFR^{T790M}$ receptor via H-bonding and steric interactions. Docking study suggested that designed compound exhibit significant enzymatic inhibitory activity against $EGFR^{WT}$ and $EGFR^{T790M}$ receptor.

Keywords: Tyrosine kinases, EGFR, Docking, Hydrogen bonding interaction, Steric Interaction.

AERB/RACARP/2017/67

Radio-surgery for Brain Tumor: An overview

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ABSTRACT

Radiosurgery is surgery using radiation, that is, the destruction of precisely selected areas of tissue using ionizing radiation rather than excision with a blade. Like other forms of radiation therapy (also called radiotherapy), it is usually used to treat cancer Radio surgery was originally defined by the Swedish neurosurgeon Lars Leksell as "a single high dose fraction of radiation, stereo tactically directed to an intracranial region of interest". In stereotactic radio surgery (SRS) the word "stereotactic" refers to a three-dimensional coordinate system that enables accurate correlation of a virtual target seen in the patient's diagnostic images with the actual target position in the patient.

Key-words: Radio-isotopes, Human diseases

AERB/RACARP/2017/68

Formulation and Evaluation of Chitosan based Microparticles of Gefitinib

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ABSTRACT

Gefitinib, Epidermal Growth Factor - Tyrosine Kinase Inhibitor (EGFR-TKI); has promisingly shown activity against Non Small- Scale Lung Cancer. Currently the formulations of this drug available are in Tablets, Capsules and liposomal suspensions taken by oral route. These have certain disadvantages in gastrointestinal disorders like irritation of GI mucosal layer, bleeding, non-patient compliance and low bioavailability due to low aqueous solubility and thus low bioavailability. The purpose of this study was to formulate and evaluate Chitosan based Microparticles of Gefitinib for maintaining the therapeutic index and limits its side effects. Chitosan microspheres cross-linked with gluteraldehyde were prepared by spray drying technique which is then analyzed for its particle size, encapsulation efficiency, swelling index, x-ray diffraction. The release rate of the drug can be increased by using chitosan based carrier system which will enhance its bioavailability. The mucoadhesive property was also being assessed to release the drug upto its maximum extent and thus increase the absorption. By this work, the anticancer activity of Gefitinib in non small- scale lung cancer will be successfully determined.

AERB/RACARP/2017/69

Homeopathy: For pediatric dental care

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ABSTRACT

Homeopathy is a system of medicine created by Samuel Hahnemann. It works on the principle that "like cures like" i.e. substance that can cause the symptoms of a disease in healthy person would cure similar symptoms in diseased person. This system of medicines are has quick recovery period, reduced risk of adverse side effects, cost effective and noninvasiveness also. In dentistry, as an adjunct to conventional treatment, usage of homeopathy to treat dental problems has been reported since ancient time. However, the scope of homeopathic medicine in the field of Pediatric dentistry has not been highlighted till now. Homeopathic medicines are suggested to be useful for a wide range of treatments like dental anxiety, dental caries and tooth pain, Dental abscess etc. Homeopathy cannot replace the system of dentistry, but it might make the procedure much more relaxed for both the child and the dentist .Hence, the purpose of the present review is to highlight the basics of homeopathy medicines and to discuss its possible applications in Pediatric dental practice.

Keywords: Children, Dentistry, Homeopathy.

AERB/RACARP/2017/70

Resveratrol: A Promising Future Anticarcinogenic Drug

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ABSTRACT

Resveratrol, a polyphenolic naturally occurring compound, which gives a superior health. Being a naturally occurring compound it gains its impotence for the treatment of many diseases including various cancers. This compound can be found in many plants species such as grapes, peanuts and berries .It is found abundantly in *Polygonum cuspidatum* (Japanese knot weed).It's the in-vitro studies of resveratrol that lays concrete foundation to the evidences that it has anticarcinogenic activity. This review marks the in-vivo effect of resveratrol treatment on breast, colon, liver and prostate cancer. Depending upon resveratrol's dose, route of administration and tumour model positive, negative, as well as neutral results were obtained on animal models. Cell culture research shows promising effects of resveratrol despite the evidences from rodent and human are inconsistent. From the limited clinical trial data, it is clear that a much more human research is needed before resveratrol can be considered as an option for the cancer prevention or therapy.

Keywords: - Resveratrol, Colon, Prostate, Anticarcinogenic, Clinical Trials

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Relevance of Gold nano-rods in pharmaceutical and biological grassland

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ABSTRACT

This article provides an overview of current research into the synthesis and properties of gold nanorods. Interest in rod-shaped nanoparticles stems from their unique optical properties. Some of the most innovative research dealing with surface modification and chemical reactivity of gold nanorods is highlighted, together with new directions such as the synthesis of core-shell particles and the interactions of gold nanorods with biomolecules. Gold nanorods having an anisotropic shape such as a rod-like morphology are of particular interest because they have two distinct plasmon bands: one as a result of light being absorbed transversely (short axis) and the other due to longitudinal (long axis) absorption. As the rod length increases, so does the plasmon frequency position. As in pharmaceuticals Gold nano rods shows their wide application in pharmaceutical world in sensing, Tracking ,Imaging, drug delivery, control release, suatain release etc. In the next several years scientists from biology, chemistry, nanotechnology, physics, and engineering will continue to form extensive collaborations in an effort to facilitate the ongoing development of these materials within the biological community.

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Virtual Screening of Chemical Scafolds toward Aldose Reductase Inhibitory Activity

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ABSTRACT

Aldose reductase, play an important role in the pathogenesis of diabetic complications such as neuropathy, nephropathy and retinopathy. Numerous synthetic organic compounds with diverse structures have been reported as potent aldose reductase inhibitors (ARIs). However, most of them have been retreated since undertaking clinical assays, because of unfavorable side effects, low efficacy, or toxicity. Thus, there is an urgent need to develop new ARIs, which may alter the physicochemical properties and enhanced the bioavailability as well as devote from the adverse effects. On the basis of extensive literature study set of virtual compounds such as benzimidazole carboxylic acid, hydroxy phenyl acetic acid and indole acetic acid analogs were designed (1000 analogs). Virtual compounds were subjected to molecular modelling study using docking. The detailed interaction study of designed analogs and ALR enzyme was carried out through *Glide* module of *Schrodinger* suite. Docking studies of these compounds were carried out, which revealed that the phenylacetic acid moiety deeply influenced the key p-p stacking while acetic acid group contributed in hydrogen bond interactions with Tyr 48, His110 and Trp 111. The phenyl ring of scaffold showed π-π sticking with Trp111. The structural insights obtained from the docking study gave better understanding of phenyl acetic acid analogs and macromolecular interaction and will help us in further designing and improving of ALR inhibitory activity.

Key Words: Aldose Reductase Inhibitors; Phenyl acetic acid analogs; Diabetic complications

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Potential applications of carbon nanotubes and nanofibers

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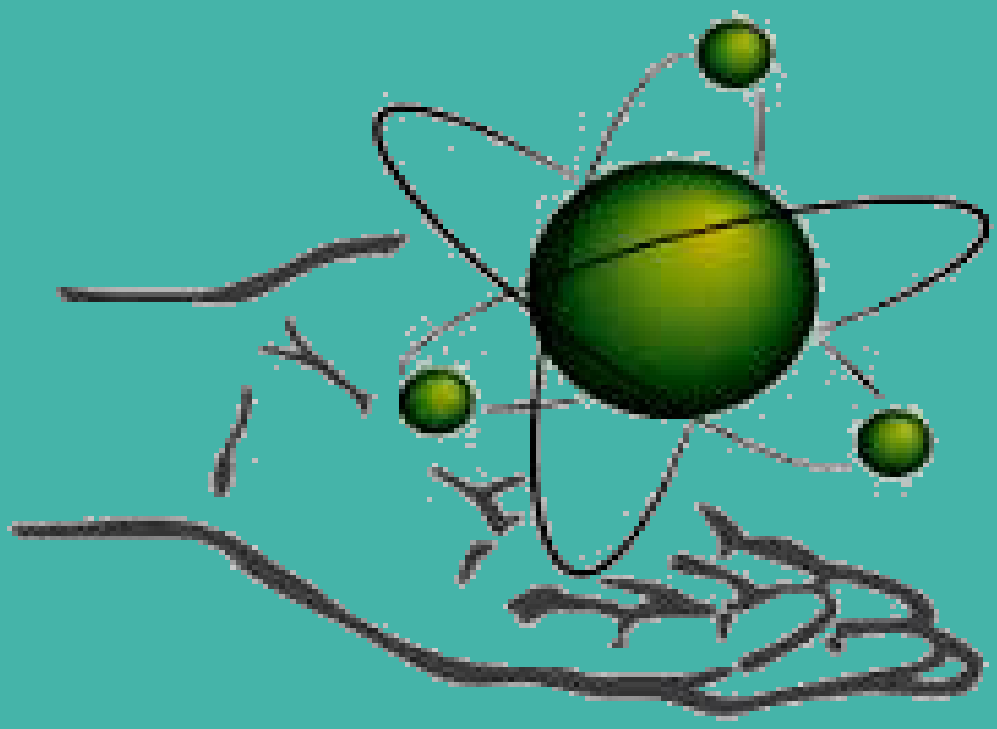
ABSTRACT

Nanomaterials, which are materials with structural units on a nanometer scale in at least one direction, are the fastest growing area in materials science and engineering. Material properties become different on the nanoscale: for example, the theoretical strength of materials can be reached or quantum effects may appear. One-dimensional and quasi-one-dimensional materials such as nanotubes and nanowires demonstrate many extreme properties that can be tuned by controlling their structure and diameter. Carbon can be made to form tubular microstructure called filament or fiber. The unique properties of carbon fibers have expanded the science and technology of composite materials in recent decades. Nanotubes, nanowires, and nanofibers are not only excellent tools for studying one-dimensional phenomena, but they are also certainly among the most important and promising nanomaterials and nanostructures. The role of nanomaterials in industries is growing. Nanofibers are already used for insulation and reinforcement of composites, and many materials and structures incorporating nanotubes and nanowires are under development. Nanotechnology is one of the most important technologies in this century and it is evoking a new industrial revolution. Nanotechnology is changing basic research in the fields of information technology, biological science, environmental science, energy sources, material science, and others. The trend of industrial elements toward small features, high density, fast transmission, low energy cost and high production rate has generated a greater requirement of miniaturization for elemental materials. Nanomaterial containing nanostructures are the best material to fulfil these needs. Carbon nanotubes are among the most broadly discussed, researched and applied. Carbon nanotubes are microscopic, tube-shaped structures, which essentially have a composition of a graphite sheet rolled into a tube.

Key words: Carbon Nanotubes, Nanofibers, Nanomaterials, Nanotechnology.



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