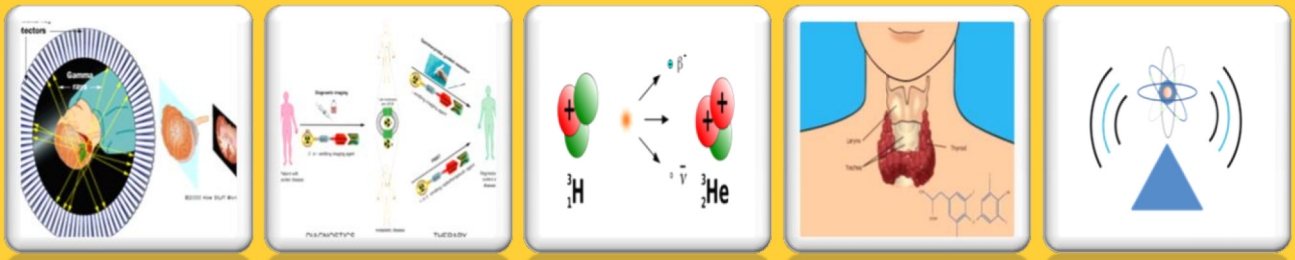
Souvenir



National Seminar

RECENT ADVANCES AND APPLICATIONS OF RADIOISOTOPES IN HEALTHCARE

March 17, 2018

Organized by

INSTITUTE OF PHARMACY

Dr. A.P.J. ABDUL KALAM UNIVERSITY INDORE

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Atomic Energy Regulatory Board, Government of India, Mumbai

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National Seminar
On
Recent Advances and Applications of Radioisotopes in Healthcare
Saturday, 17th March 2018

EVENT SCHEDULE

Time	Event	Detail Of Events
09:30 AM to 10:15 AM	Registration and Breakfast	-
10:15 AM to 10:45 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 (Vice Chancellor's) 7. Speech of Guest of Honor 8. Vote of Thanks of Inaugural function by Convener
10:45 AM to 11:00 AM	Break	
11:00 AM to 11:45 AM	Scientific Session I	1. Key Notes by Dr. S. N. Verma, Professor & Ex –Vice Chancellor, Rajiv Gandhi Proudyogiki Vishwadyalya, Bhopal, Ex-Incharge BARC Project Topic: Radioisotopes in Health care
11:45 AM to 12:00 PM	Break	
12:00 PM to 12:45 PM	Scientific Session II	2 . Scientific Lecture by Dr. Anurekha Jain, Dean, Dept. of Pharm. Sci., Jyoti Mahila Vidyapeeth Woman University, Jaipur Rajasthan. Topic: Applications of radiation and radioactive isotopes in industry and healthcare
12:45 PM to 01: 45 PM	Lunch	
01:45 PM to 02:00 PM	Cultural Event	
02:00 PM to 03:00 PM	Scientific Session III	3. Scientific Lecture by Mr. Daval Gajera, Amneal Pharmaceutical Pvt Ltd., Ahemdabad (Guj) Topic: "How to find the work you are born to do " (with especial reference to Pharmaceutical)
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 Coordinator

INSTITUTE OF PHARMACY (IOP),
DR. A.P.J. ABDUL KALAM UNIVERSITY,
INDORE DEWAS BYPASS ROAD, ARANDIA, INDORE (M.P.) 452016

Chancellors Message……

I am indeed very happy to know that Faculty of Pharmacy is going to organize the one day ***AERB sponsored*** *national seminar with the theme of ""****Recent Advances and Applications of Radioisotopes in Healthcare****" on 17th March 2018".*

Organizing an event does not come without an effort. It requires vision, mission and hard work. Seminar of such nature provide a great opportunity to Pharma fraternity, not only to update knowledge and keep obsessed with latest developmental scenario in the respective field, but also an occasion for the resource persons, delegates to exchange ideas and interact with each other.

This seminar will provide a platform to groom young scientists from all over the country and to bridge the researchers working in academia and other professionals through current technological trends. It is a high time to create research activities among the budding professionals.

I take this opportunity to congratulate the organizing committee and to extend warm welcome to the resource persons and delegates. I thank all the delegates who have come from various parts of the state and across the country and we consider it as our privilege and honor to have you all over here.

I wish you all for the grand success of this wonderful event.

Dr. Shruti Kumari

Dr. A.P.J Abdul Kalam University

Vice Chancellor Message.....

It gives me great pleasure that Faculty of Pharmacy is organizing the one day national seminar ***sponsored by AERB*** *with the theme of ""**Recent Advances and Applications of Radioisotopes in Healthcare**" on 17th March 2018.*

A Pharmacy profession is a Nobel profession and is emerging day by day with development of innovative techniques and trends which will certainly benefits to our society. This seminar would provide opportunities to the delegates to exchanges their ideas and involvement towards radiopharmacy.

I profoundly wish the seminar for every success.

Dr. Sandeep Salodkar
Dr. A.P.J Abdul Kalam University

"Learning gives creativity, creativity leads to thinking, thinking leads to knowledge and knowledge makes you competent."

Warm Greeting to All !!!!!

*It gives me an immense pleasure that Faculty of Pharmacy is organizing the national seminar on 17th March 2018 with the theme of "**Recent Advances and Applications of Radioisotopes in Healthcare**" sponsored by Atomic Energy Regulatory Board and supported by Dr. A.P.J.Abdul Kalam Univesity, Indore.*

Over the past three decades, the discipline of nuclear pharmacy or radio pharmacy has become highly specialized and contributed positively to the practice of nuclear medicine. 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 recent research and development in the field of radioisotope in healthcare so that the novel aspects in nuclear medicine can be explore.

I hope that this seminar will provide an excellent opportunity for the budding pharmacists to enrich their knowledge in today's fast changing scenario and come out with new cutting edge technologies for radioisotopes in diagnosis and therapy.

I extent my warm welcome to young researchers, budding Pharma professionals, speakers, eminent scientists, guests, faculties, and industrialists in this splendid seminar and wish the seminar a great success

JAI HIND

Regards
Dr. Arun Gupta
Organising Chairman
Dean Faculty of Pharmacy,
Dr. A.P.J.Abdul Kalam University, Indore

Convener Message.....

Dear Colleagues,

"The Pessimist Sees Difficulty in Every Opportunity. The Optimist Sees Opportunity in Every Difficulty"

*On behalf of the Faculty of Pharmacy, Dr. A.P.J.Abdul Kalam Univesity, Indore, I heartily welcome you all the delegates to this AERB sponsored national seminar with the theme of "**Recent Advances and Applications of Radioisotopes in Healthcare**" on 17th March 2018.*

Radioisotopes are radio labelled compound and biochemicals that are pharmaceutically and radiologically safe for administration in the body for diagnosis and treatment are called radiopharmaceuticals. The application of radioisotopes in medicine is many folds. It is a competitive subject in the global scenario, to provide proper direction to young generation of researchers and scientists to create more awareness about recent advances, challenges in the development and proliferation of application of radioisotopes in healthcare. The seminar will increase the awareness toward applications of radioisotope technology and clinical application of radiopharmaceuticals in healthcare amongst all participants.

The seminar is aimed to provide interactive forum for expressive exchange of information and to discuss the applications of radioisotopes in health care amongst varied range of participants including eminent speakers, Industrialist, renowned scientist, young researchers and students. This seminar offers an excellent opportunity for the participants to interact with eminent scientists and there would also be a poster presentation on recent advances in radiopharmaceuticals where participant can interact with each other on different areas of radiopharmaceuticals with a special focus on radiation technologies and applications of radioisotopes in the health care.

I am so honored to be the convener and on behalf of ***Institute of Pharmacy****, Dr. A.P.J.Abdul Kalam Univesity once again welcomes you all to Indore to have a great time and entertainment. I hope that the interactions amongst you will create opportunities for collaborations in Pharma health professionals.*

Regards
Dr. Revathi A Gupta
Convener,
Principal, Institute of Pharmacy
Dr. A.P.J.Abdul Kalam University, Indore

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AERB/RAARHC/2018/001

Radioactive Material Handling and Its Biological Effect

S.N Varma*
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ABSTRACT

Radiations are electromagnetic radiation having wide impact on the biological system. Thorium 232, Neptunium-237, Uranium 238 and Uranium 235 are widely used naturally available radioactive materials. All the living beings on the earth are continuously being exposed to the natural external and internal sources of radiations which they must receive and are very difficult to avoid. Persons who opt willingly for an occupation involving exposure to radiations must know the radiation exposure risks and permissible doses of radiations. Proper training to work in radiation areas can minimize the radiation exposure. In biological organisms, radiation damage occurs due to the ionisation of atoms and molecules in cells. The production of ions can result in chemical reactions which break molecular bonds in proteins and other biological molecules. Biological damage can subsequently result either by cells being killed or mutating (which can result in cancer). Genetic and teratogenic effect is also often observed in certain cases. The optimized exposures from any radiation source within a practice shall be done so that the magnitude of individual doses, the number of people exposed and the likelihood of incurring exposures should be taken care as low as reasonably achievable. For detecting and measuring ionizing radiation scintillation counter are used in which the excitation effect of incident radiation on a scintillator material were detected by the resultant light pulses

AERB/RAARHC/2018/002

Applications of Radiation and Radioactive Isotopes in Industry and Healthcare

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ABSTRACT

Applications of radioisotopes have significant meaning in economic development, people health protection, as well as in scientific research in world. Radioisotopes have been used in various fields, especially in Medical industry, Pharma industry and health care. In this presentation main applications of radiation and radioactive isotopes in industry and healthcare has discussed. In order to monitor and control industrial processes, the sealed source and radioactive tracer techniques have been utilized. For medicine purpose, main activities are focused on thyroid function studies, nuclear cardiology, brain scans, gastrointestinal studies, bone scans, etc. Radioisotopes and radio-pharmaceuticals used in medicine departments are produced at the nuclear research reactor by different techniques.The reactor is today an important scientific tool in world for developing nuclear techniques and radioisotope applications for socio-economic progress.

AERB/RAARHC/2018/003

Critical requirements for regulatory aspects of Radiopharmaceuticals

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ABSTRACT

Radiopharmaceuticals are the pharmaceuticals drugs which have radioactivity and are used for diagnostic and therapeutic agent. The safety and efficacy is important concern in the regulatory systems in radiopharmaceuticals. The radiopharmaceutical should be safe to the human beings and environment while the use of radiopharmaceuticals should be effective in therapeutic and diagnostic aspects. The facility and procedures for the production, use and storage of radiopharmaceuticals are of important concern for its safety and efficacy. The purity of radiopharmaceuticals is indicated by labeling efficiency of radioisotopes. Radiopharmaceuticals are officially included in the monograph of Indian Pharmacopoeia (I.P.). Numbers of analytical methods are used for radiopharmaceutical products such as paper chromatography, thin-layer chromatography, instant thin-layer chromatography (ITLC), electrophoresis, size-exclusion chromatography, gas chromatography and liquid chromatography. Amongst number of analytical methods Instant thin-layer chromatography (ITLC) is commonly used to determine the labeling efficiency of radiopharmaceuticals. It is easy to use, rapid and can be incorporated easily in a routine quality control program. Automatic-plotting instrument or a digital counter is used for radioactivity measurement. The ratios of the areas under the peaks give the ratios of the radioactive concentration of the chemical substances.

AERB/RAARHC/2018/004

QSAR Studies on Pyrrolidine Analogs as Neuraminidase Inhibitors

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ABSTRACT

The present study describes development of quantitative structure activity relationship analyses was performed and investigate the role of its structural features. A suitable set of molecular descriptors was calculated and multiple linear regression was employed to select the descriptors that resulted in the models with the best fit to the data. The series was subjected to QSAR studies using CS Chem-Office 8.0. Structures of all the compounds were sketched using builder module of the programme. The good QSAR model was selected having a correlation coefficient (r^2) of 0.7861 and cross-validated correlation coefficient (q^2) of 0.6873. The contributed dipole moment and LUMO descriptor were found to be important role play to for an increase of biological activity.

AERB/RAARHC/2018/005

Anti-Anemic Activity of Hydro-Alcoholic Extract Fruit of *Allium cepa* in Phenylhydrazine Induced Anemic Rats

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ABSTRACT

This research was done to evaluate out the anti-anemic activity in hydro-alcoholic extract of fruit of *Allium cepa* in phenylhydrazine induced anemic rats. Phenylhydrazine (40mg/kg) was given intraperitoneally in rats for two days to induce anemia. The animal were divided into 5 groups of 6 animal each. Group 1 was known as normal control group, Group 2 was known as anemic control group, Group 3 was known as standard reference control group given with Vit. B_{12}, Group 4 was known as test control-I given with 100mg/kg of hydro-alcoholic extract of fruit of *Allium cepa*, Group 5 was known as test control-II given with 200mg/kg of hydro-alcoholic extract of fruit of Allium cepa. All the test drugs were given for 28 days through oral route once in a day. On 29th day blood was taken out through tail puncture and was subjected to the estimation of RBC, Hb and percentage Haematocrit. Both the hydro-alcoholic leaves extract of and Vit. B_{12} significantly increase the HB, RBC & percentage Haematocrit level which shows that *Allium cepa* fruit exhibits the anti-anemic activity.

Keywords: Anemia, anti-anemic activity, hydro-alcoholic extract, *Allium cepa*, Vit. B_{12}.

AERB/RAARHC/2018/006

Anti-Anemic Activity of Hydro-Alcoholic Extract of Peppercorn of *Piper nigrum* in Phenylhydrazine Induced Anemic Rats

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ABSTRACT

The motive of this current research was to evaluate the anti-anemic activity in hydro-alcoholic extract of peppercorn of *Piper nigrum* in phenylhydrazine induced anemic rats. To induce anemia phenylhydrazine (40mg/kg) was administered intraperitoneally in rats for two days. The animal were divided into 5 groups containing 6 animal each. 1st group was served as normal control group, 2nd group was served as anemic control, 3rd group was served as standard reference control administered with Vit. B_{12} complex, 4th group was served as test control-I administered with 100mg/kg of hydro-alcoholic extract of peppercorn of *Piper nigrum* and 5th group was served as test control-II administered with 200mg/kg of hydro-alcoholic extract of peppercorn of *Piper nigrum.* All the test drugs were given for 28 days daily through oral route. On 29th day blood was withdrawn, through tail puncture and subjected to the estimation of RBC, Hb and percentage Haematocrit. Both the hydro-alcoholic peppercorn extract of *Piper nigrum* and Vit. B_{12} significantly increase the Haemoglobin, Red Blood Cells & percentage Haematocrit level which conclude that *Piper nigrum* peppercorn exhibits' the anti-anemic activity.

Keywords: Anemia, anti-anemic activity, hydro-alcoholic extract, *Piper nigrum*, Vit. B_{12}.

AERB/RAARHC/2018/007

Nanoformulations as Drug Delivery System for Oral Bioavailability Enhancement: Issues and Solutions

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ABSTRACT

A large amount of new drug candidates are practically insoluble in aqueous solvents and are even simultaneously poorly soluble. The delivery of drugs through the oral route is regarded as most optimal to achieve desired therapeutic effects and patient compliance. However, poor pharmacokinetic profiles of oral drug candidates remains an area of concern, and approaches to enhance their bioavailability are widely cited in the literature. Traditionally, the approaches have been confined to molecular optimization of the drug molecule, which has gradually evolved into development of microsized and nanosized formulations. Nanoformulations, by virtue of their nanosize, are widely acclaimed for circumventing the obstacles of poor pharmacokinetics. In this article, an attempt has been made to discuss existing challenges of bioavailability and approaches to overcome the same, with in-depth compilation of the literature on nanoformulations. The nanoformulations reviewed include nanocrystals, nanoemulsions, polymeric nanoparticles, self-nanoemulsifying drug delivery systems, dendrimers, carbon nanotubes, polymeric micelles and lipid nanocarriers. Despite the promising benefits, nanomedicines are associated with hazards to human health. Hence, the review also deals with toxicological consequences of nanomedicines, and with in vitro/in vivo screening methods to assess bioavailability as per regulatory considerations.

AERB/RAARHC/2018/008

Herbal Mosquito Repellent Formulation from the Essential Oil: A Review

Deepak Kumar Gupta*, Manohar Chouhan, Revathi A. Gupta

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ABSTRACT

Mosquitoes are the most important of insects in terms of public health importance which transmit a number of diseases such as dengue, chikungunya, Japanese Bencephalitis, filariasis and malaria, causing millions of deaths every year. Mosquito control and personal protection from mosquito bites are currently the most important measures to prevent these diseases. Essential oils from plants have been recognized as important natural resources of insecticides because some are selective, biodegrade to non-toxic products and have few effects on non-target organisms and environment. Essential oils are volatile mixtures of hydrocarbons with a diversity of functional groups, and their repellent activity has been linked to the presence of mono - terpenes and sesquiterpenes. In some cases, these chemicals can work synergistically, improving their effectiveness.The commercially marketed repellents basically consist of essential oils from plants *Cymbopogon nardus, Eucalyptus maculata, Cymbopogon excavatus, Mentha piperita, Azadirachta indica.* The present article envisaged to review the reports of essential oils on its effectiveness as repellent.

KEYWORDS: Repellent, pesticide, mosquito repellent, essential oil.

AERB/RAARHC/2018/009

Study on Newer Liquisolid Technique to Enhance Solubility and Dissolution Profile of Poorly Water Soluble Drugs

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ABSTRACT

"Liquisolid Technique" is considered as newer, safer and economic technique to enhance solubility and dissolution rate of poorly water-soluble drugs. It is also known as "Powder Solution Technology. This technique is based on the admixture of liquid medication with appropriate carrier and coating materials. Liquid medication includes drug loaded solutions or suspensions in non-volatile hydrophilic solvents such as PEG 400, PEG 600, Tween 80 etc. These hydrophilic non-volatile solvents cause improved wettability and ensure molecular dispersion of the drug in the formulation that leads to enhanced solubility. On the other hand, liquid medications containing drug loaded emulsions using hydrophobic nonvolatile solvents (vegetable oils), one can modify release (sustained release) of drugs by this technique. Liquid medication is combined with a carrier material (Avicel PH 102) having good absorption properties and coating material (Aerosil 200) having high adsorptive properties to obtain nonadherent, free-flowing readily compressible powder. It is further mixed with disintegrants to form immediate release compacts. Hence both immediate and sustained release of drug can be achieved with the help of liquisolid technique. The liquisolid powder system can be transformed to conventional solid dosage forms by compressing into tablets or filled into capsules. By using this technique, solubility and dissolution rate can be improved for poorly water-soluble drugs. The postulated mechanism for improved solubility may be improved wettability and greater surface area of drug exposed to the dissolution media, resulting in an increased dissolution profile and bioavailability. Hence, this technique proved an alternative method for formulating water-insoluble drugs.

Keywords: Liquisolid technique, carrier material, coating material, solubility

AERB/RAARHC/2018/010

Docking Analysis of Heterocyclic linked Chalcones with Antimicrobial Activity

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ABSTRACT

Chalcone is an aromatic ketone that forms a central core for a variety of important biological compounds. They possess varied pharmacological activities like antibacterial, antifungal, anti-inflammatory and anti-tumour etc. depending on the substitutions carried out on them. Docking is a computational technique that places a small molecule (ligand) in the binding site of its macromolecular target (receptor) and estimates its binding affinity. The present work focuses on molecular docking studies of a series of heterocyclic linked chalcones with antimicrobial activity on Glucosamine-6-phosphate synthase complexed with natural co-crystallized ligand, glucosamine 6- phosphate (PDB ID: 1MOQ, resolution 1.57 Å) using SYBYL X 2.1.1 software. The nitrofuran linked chalcone with cyclohexyl ring as ring A (NFLC_R_5) displayed best dock score and was found to interact with Thr355 and Thr352 of Glucosamine-6-phospahte synthase. These molecular docking studies could aid in the designing of novel heterocyclic linked chalcones with anti-microbial activity.

AERB/RAARHC/2018/011

Current Concepts and Prospects of Herbal Nutraceutical

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ABSTRACT

Nutraceuticals are food or part of food that provides medical or health benefits including the prevention and/or treatment of a disease. Nutraceutical has advantage over the medicine because they avoid side effect, have naturally dietary supplement, etc. Nutraceutical; on the basis of their natural source, chemical grouping, categories into three key terms -nutrients, herbals, dietary supplements, dietary fiber, etc. The most rapidly growing segments of the industry were dietary supplements (19.5 percent per year) and natural/herbal products (11.6 percent per year). Global nutraceutical market is estimated as USD 117 billion. FDA regulated dietary supplements as foods to ensure that they were safe. In 2006, the Indian government passed Food Safety and Standard Act to regulate the nutraceutical industry. Herbal nutraceutical is used as a powerful instrument in maintaining health and to act against nutritionally induced acute and chronic diseases, thereby promoting optimal health, longevity, and quality of life.

Keywords: Dietary supplement, Global market, Nutraceutical, regulation

AERB/RAARHC/2018/012

H-QSAR and CoMFA Analysis of Novel Amide Derivatives Containing Ferrocenyl Pyrazol-Moiety

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ABSTRACT

Herein we report the quantitative structure-activity relationship analysis of thirty eight novel amide derivatives containing ferrocenyl pyrazol-moiety for its anticancer activity using both 2D and 3D QSAR methods. Firstly, the compounds were sketched in Chemdraw module and transformed into 3D structure using Chem3D ultra module of Chemoffice software package. n The compounds were imported to SYBYL base and energy minimized using MMFF (tripos force field) and the compound 10 was used as template for molecular alignment. H-QSAR and CoMFA analysis were carried out on these energy minimized compounds. HQSAR results suggest that A/B/C structural features are important predictor variables of anticancer activity (prostate carcinoma) and CoMFA contour suggest that steric bulkiness and electrostatic charges on the scaffold is most favorable regions for design of novel analogues. The HQSAR and CoMFA models generated for these novel analogues are found to be statistically significant and valid.

AERB/RAARHC/2018/013

HQSAR, CoMFA and CoMSIA Analysis of Quinazoline Derivatives as Animalarial Agents

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ABSTRACT

In this study A SERIES OF quinazoline derivatives was selected and hologram quantitative structure-activity relationship (HQSAR), comparative molecular field analysis (CoMFA) and comparative molecular similarity indices analysis (CoMSIA) methods were performed as anti malarial agents. The LOO cross-validated q^2 values of HQSAR, CoMFA and CoMSIA models were found to be 0.702, 0.782 and 0.713, respectively. The predictive capability of the generated models was validated further by a test set of eleven compounds. The predicted pIC_{50} values were in good agreement with the experimentally determined pIC_{50} values. The best HQSAR model was obtained using atoms, bonds, connection, donor and acceptor as fragment distinction parameter with fragment size (**5-8**) using a hologram length of 417 and 6 components. The fragment contribution map of HQSAR showed the presence of quinazoline ring, bulky group like long alkyl chain at R_1 position and presence of electronegative group at R_2 position is favorable for antimalarial activity. The results of CoMFA and CoMSIA are in good conformity with HQSAR results.

AERB/RAARHC/2018/014

Synthesis and Anti-oxidant Activity of Methoxylated Chalcones

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ABSTRACT

An increased generation of reactive oxygen /nitrogen species (ROS/RNS) and reduced capacity of body to counteract their harmful effects is responsible for emergence of oxidative stress. The pathogenesis and pathophysiology of a number of diseases, viz. cardiovascular and inflammatory diseases, neurodegenerative conditions (Parkinson, Alzheimer's disease), cancer etc. can be explained with the help of free-radical induced damage in oxidative stress. Methoxylated chalcones have displayed a significant number of pharmacological activities like antimalarial, anticancer, antiprotozoal, anti-inflammatory, antibacterial, antifilarial, antifungal, antimicrobial, anticonvulsant, antioxidant activities. A series of eleven methoxylated chalcones was synthesized utilizing Microwave assisted Claisen Schmidt condensation between substituted benzaldehydes and substituted acetophenones in presence of sodium hydroxide and ethanol. IR, ^{1}H NMR and Mass spectra were interpreted to set the identity of synthesized compounds. The synthesized compounds were evaluated for their antioxidant potential by utilizing DPPH free radical scavenging assay. The evaluation of antioxidant activity for the synthesized compounds exhibited that compound PD9 with 2,4-dihydroxy on A-ring and 2,4-dimethoxy group on B-ring has shown the most promising antioxidant activity. Thus, the presence of hydroxy groups on A-ring greatly increases the antioxidant activity. The synthesis and evaluation of these newly synthesized methoxylated chalcones opens up the opportunity to their further *in vivo* studies, pharmacokinetic studies and clinical studies, which in turn may find purposeful applications of these newly synthesized methoxylated chalcones.

AERB/RAARHC/2018/015

Development and Evaluation of Transdermal Patches of Cinnarizine for the Treatment of Allergy

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ABSTRACT

The objective of the present study was to develop transdermal matrix patch of cinnarazine and assess its feasibility for transdermal application. Cinnarizine is a medication derivative of piperazine, and characterized an antihistamine and a calcium channel blocker, it is also known to promote cerebral blood flow, and so is used to treat cerebral apoplexy, post-trauma cerebral symptoms, and cerebral arteriosclerosis. The results of cinnarazine transdermal matrix patch showed that the most promising formulation was HE1 (formulation containing Drug: HPMC:EC:Span:PG; **(**1:(2:8)). Thus optimized transdermal matrix patch of cinnarazine using polymers such as HPMC and EC with Span & PG as permeation enhancers demonstrated their ability to give sustained release, because of excellent release and permeation of drug and its influence on efficacy on allergy. The developed formulation of cinnarazine is expected to improve the patient compliance, form better dosage regimen and provide maintenance therapy to patients suffering from allergy. These promising results showed the feasibility of delivering cinnarazine through transdermal matrix patch. The developed transdermal patches of cinnarazine may prove to be a better alternative to conventional dosage forms in allergy as revealed by the results.

Key-words: Cinnarazine, Transdermal Patch, Allergy

AERB/RAARHC/2018/016

Pharmacological and Phytochemical Profile of *Abelmoschus moschustus* Medik.

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ABSTRACT

Abelmoschus moschatus Medik. is an aromatic and medicinal plant in the Malvaceae family, which is native to India. It is an erect hispid herbaceous trailing herb that grows up to 1.5m tall with a long slender tap root. Leaves are alternate, rough, hairy and heart-shaped. They have 3 to 5 lobes and can grow to 15cm long. Flowers resemble those of the hibiscus and are usually watermelon pink, although they are sometimes white or cream in colour. They last for only one day and their flowering depends on the timing of the wet season. Seeds are contained within hairy capsules up to 8 cm long, which are tough but papery. The seeds have a sweet, flowery, heavy fragrance similar to that of musk. The present paper deals with review on pharmacological and phytochemical profile of *Abelmoschus moschatus* Medik.

Key-words: *Abelmoschus moschatus*, Pharmacological, Phytochemical

AERB/RAARHC/2018/017

Medical Uses of Radioactive Isotopes: Current Needs and Future aspects

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ABSTRACT

Radioactive isotopes are widely used in the field of nuclear medicine to provide the diagnostic information about the functioning of humans or information on how to treat them. Approximately ten millions of nuclear medicine procedures are performed each year and the demand for radioisotopes for medical use is increasing rapidly day by day. There are many amazing applications of radiation and radioisotopes in medical. The main area where these radioactive isotopes are used included sterilization of medical products, new drug testing, medical imaging, therapy, X-ray, MRI, CT Scan etc. The present review focus on the medical use of 25 radioactive isotopes.

Key-words: Medical, Radioactive isotopes, Radiations

AERB/RAARHC/2018/018

Comparative Solubility Prediction in Four Binary Solvent Using Extended Hildebrand Solubility Approach (EHSA)

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ABSTRACT

Solubility of etodolac was predicted and compare in four binary solvent systems (ethanol, methanol, dioxane and PEG with water) in term of solute solvent interaction using extended Hildebrand solubility approach (EHSA). In EHSA the solubility equation employs the term interaction energy (W) to replace the geometric mean (δ1δ2), where δ1 and δ2 are the cohesive energy densities for the solvent and solute, respectively. The energy term obtained for all binary systems were regressed against a polynomial in δ1. The ideal solubility of Etodolac was calculated by heat of fusion and absolute melting point was obtained from DSC data reported in literature. Using floatation & experimentally solubility method, the Molar volume and solubility parameter of Etodolac were calculated from Fedor fragmental constant. Tiscon Sonicator A-72 & UV-Visibile spectrophotometer shimadzu UV-1700 were used in experimental evaluation of solubility of Etodolac. The result indicate that the solubility of Etodolac in all binary solvents appear as a bell-shaped profile with a solubility maximum below the ideal solubility of the drug. This is an attribute to solvation of the drug with the binary mixtures, and indicates that the solute-solvent interaction energy is larger than the geometric mean (δ1δ2) of regular solution. It was observed that in all binary systems (20-40%) maximum solubility occurs between 11.24δ to 14.80 δ.

AERB/RAARHC/2018/019

Alpha Amylase Inhibiiton Assay of Extracts of *Ziziphus nummlaria* Linn.

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ABSTRACT

The leaves of *Ziziphus nummularia* Linn were subjected to successive solvent extraction and specific saponin extraction to obtained petroleum ether, methanolic, aqueous and saponin extract. Different concentrations of dried extracts were treated with alpha amylase enzyme in phosphate buffer (pH 6.9) using 1% starch solution substrate. The spectroscopic estimation was done at 540nm after stopping the reaction with DNS reagent. All the extracts have produced significant enzyme inhibition and their IC_{50} value was observed to be 114.16 µg/ml ± 1.30 to 137.87 µg/ml ± 1.82.

AERB/RAARHC/2018/020

Role of Aldose Reductase in Secondary Diabetes Complications

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ABSTRACT

Diabetes is a metabolic disorder of carbohydrate in which numbers of enzymes are involved. Amongst all, aldose reductase enzymes, a cytosolic NADPH-dependent oxidoreductase enzyme is rate-limiting enzyme involved in reduction of glucose to sorbitol using NADPH as a cofactor which was further catalyzes to fructose in the presence of sorbitol dehydrogenase. Sorbitol is responsible for secondary diabetic complications i.e. diabetic retinopathy and neuropathy as it is impermeable through the biological membranes and accumulates inside the tissues leading to osmotic stress results in ionic imbalance and protein insolubilization. In neuropathy the intracellular accumulation of sorbitol in the nervous tissue increases the intracellular fluid mortality and water influx which results in cellular damage and nerve fibre degeneration. The same osmotic damage to tiny blood vessels in the retina, leads to diabetic retinopathy due to which leaking or haemorrhage (bleed) of blood vessels occurs and leads to loss of vision.

AERB/RAARHC/2018/021

Phytochemical Screening and Wound Healing Potential of *Cuscuta reflexa* Roxb.

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ABSTRACT

The present study has been designed to investigate pharmacognostical, and pharmacological evaluation of stem of *Cuscuta reflexa* Roxb.Standard procedures have been followed for the evaluation of pharmacognostical and wound healing potential of Cuscuta reflexa Roxb. Albino Wistar rats weighing 150-200 g (either sex) were taken and made to acclimatize by providing them appropriate room conditions in the experimental room. Excision wound model has been selected. for wound healing activity.The macroscopic and microscopic studies showed the various characteristic features of stems. Preliminary phytochemical screening reveled alkaloids, glycosides, flavonoids are the major groups present in the successive extract. Water and ethanolic extracts of stem *Cuscuta reflexa* Roxb. at 200 mg/kg and 400 mg/kg was able to healing wounds.The present study concluded that the stems of Cuscuta reflexa Roxb have marked therapeutic potential to heal wound. This may provide the pharmacological basis for its folk uses.

Keywords: Pharmacognostical, Soframycin, wound healing, Stem, *Cuscuta reflexa* Roxb.

AERB/RAARHC/2018/022

Dendrimers: The Molecule of Millennium

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ABSTRACT

Dendrimers acclaimed its fascinating position in the nanoworld. By virtue of its unique polymeric architecture, it exhibits precise compositional and constitutional properties. The combination of a discrete number of functionalities and their high local densities make dendrimers as multifunctional platforms for amplified substrate binding. As a result of their unique architecture and construction, dendrimers possess inherently valuable physical, chemical and biological properties. Versatility of dendrimers, showing promise in the therapeutics arena, and there is a great deal of commercial activity, with a few products hitting the market. Together with recent progress in the design of biodegradable chemistries, has enabled the application of these branched polymers as anti-viral drugs, tissue repair scaffolds, targeted carriers of chemotherapeutics and optical oxygen sensors. Pattering other functional groups, will facilitate further development of this system for novel applications. Beginning to make significant inroads into the commercial world. Several products using dendrimers as platform have been developed and commercialized upon the approval of the FDA. There are also some others applications like: for cellular transport, as artificial cells, for diagnostics and analysis, as protein / enzyme mimics or modeling, for manufacture of artificial bones, for development of topical microbicide creams; antimicrobial, antiviral (e.g. for use against HIV) and antiparasitic agents, for biomedical coatings (e.g. for artificial joints), as artificial antibodies and biomolecular binding agents, for carbon fibre coatings and ultra thin films, as polymer and plastics additives (e.g. for lowering viscosity, increasing stiffness, incorporating dyes, compatibilisers, etc.) for creation of foams (i.e. synthetic zeolites or insulating material), as building blocks for nanostructured materials, as dyes and paints, as industrial adhesives, for manufacture of nanoscale batteries and lubricants, as decontamination agents (trapping metal ions), for ultrafiltration, molecular electronics for data storage, 3D optical materials, for light-harvesting systems, quantum dots, liquid crystals, printed wire boards, etc.

Keywords: Nanoscale, Nanostructured materials, Multifunctional platforms

AERB/RAARHC/2018/023

Optimization and Evaluation of Mucoadhesive Microspheres of Domperidone by using Chitosan

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ABSTRACT

Objective of the present investigation was to optimize and evaluate mucoadhesive microspheres of domperidone by using Orifice-ionic gelation technique. Domperidone through its conventional dosage form such as tablet and suspension to give poor oral bioavailability (18%) due to extensive first pass effect, where as on rapid I.V.injection it has been shown to cause cardiac arrhythmiasis. In the present research work an attempt has been made to design efficacious and prolong release mucoadhesive microspheres of domperidone by using chitosan polymer to avoid first pass metabolism, to reduce dosing frequency, patient complaience and improve bioavailability.The formulation was found to be efficient with good recovery yield and percent drug entrapment which conventional the drug release i.e. 87.35 ± 1.67 % at the end of 12 hours. This study was shows that ionic gelation microspheres have promising properties for use as mucoadhesive nasal carrier of an antiemetic drug.

Keywords: Domperidone, Mucoadhesion, Orifice- ionic gelation technique, Chitosan.

AERB/RAARHC/2018/024

Evaluation and Formulation of Antidandruff Hair Gel using Clotrimazole

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ABSTRACT

Clotrimazole, sold under the brand name Canesten among others, is an antifungal medication. It is used to treat vaginal yeast infections, oral thrush, diaper rash, pityriasis versicolor, and types of ringworm including athlete's foot and jock itch. This research designed to stimulate hair growth, help to remove heat from the scalp and prevent dandruff and scalp infections.anti-dandruff gels useful for prevention of dandruff, hair nourishment and a cooling and nourishing scalp massage. This formulation is prepared by using Clotrimazole, Carbopal 940, Polyethyeneglycol, Methyl peraben, Polyvinyl pyrrolidone, manthol, triethanolamine, Glycerin and water, this is evaluated by The physical appearance was visually checked,The pH of hair gel formulations were determined by using the digital pH meter.Brook fielqd viscometer was used to determine viscosity. For estimating the drug content of the hair gel formulations for to the common procedure was followed. About 500 milligrams of the above hair gel formulations were separately weighed and then each hair gel formulation is separately dissolved in 50ml of methanol. Then the above volumetric flask containing formulation should shake for15 minutes for the extraction of drug from the gel. Then dissolved drug was titrated with per caloric acid as the method described inB.P.1 ml of 0.1M per choleric acid is equivalent to34.48 mg of C22H17ClN2. The amount of clotrimazole present was calculated and depicted. The in-vitro diffusion of drug from the different gel preparations were studied using the classical standard cylindrical tube fabricated in the laborator,. The diffusion cell membrane was applied, The hair gel formulation which showed optimal release was subjected to antifungal activity by adopting disc diffusion method. Antidandruff hair gel containing 1.5% of Clotrimazole with Corbopol 940 base could be used as an effective in treatment of Dandruff on scalp.

Keywords: Antidandruff Gel, Scalp, Clotrimazole

AERB/RAARHC/2018/025

Preparations and Evolutions of Herbal Foot Cream

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ABSTRACT

A cream is a preparation of a medication for topical use (on the skin) that contains a water base. Essentially, it is a preparation of oil (often lanolin or petrolatum) in water. An ointment is a preparation of a medication for topical use that contains an oil base - essentially a preparation of water in oil.Herbal cosmetics are the preparations used to enhance the human appearance. Ultimate goal of this formulation is healthy and beautiful skin. The foot creak and make heal good in appearance and smooth. Among the available formulation we used cream for these preparations. The objective of this formulation, To formulate and evaluate Herbal foot cream". The chandras for wound healing activity, glycerine for moisture, suhaga for antifungal activity and haldi (turmeric) for antiseptic property, camphor for cooling sences and for fragences, and coconut oil and paraffin mom used for base material. In this preparation chandras used 1%, glycerin 2%, haldi & suhaga 0.5%, paraffin mom 1.5%, camphor 0.5%, coconut oil 4 %., pH of formulation is netural,which is suitable for skin. For the cream evaluation test we evaluated the foot cream by the different parameters like nature of cream, colour, stability test, pH test, irritant test, spredibility test and other parameters. All parameters are found to be in range.

Key words: Foot cream, Antifungal activity, antiseptic property,chandras.

AERB/RAARHC/2018/026

Exploring the Relationship between Physicochemical Parameters and Antitubercular Activity of Pyrazoline and Benzoxazole Derivatives: A QSAR Approach

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ABSTRACT

Tuberculosis is considered as one of the most dangerous chronic infectious disease and is responsible for at least 2 million deaths globally per year. The major challenge for many anti mycobacterial agents is the ability of *Mycobacterium tuberculosis* strains to develop resistance. Effective new anti-TB drugs with new mechanism of action have not been identified in last forty years. Spurred by the need for new antimycobacterial agents, an effort has been made to understand the essential structural requirements for antitubercular activity. In the present study quantitative structure activity relationship (QSAR) performed on the series of substituted pyrazoline and benzoxazole analogs. The derived QSAR models have been statistically validated internally by means of the Leave One Out (*LOO*) cross-validation and Y-scrambling techniques, as well as externally by means of an external prediction set.

$pMIC = 7.347(\pm 1.317) + Mor31v\ [-2.794(\pm 0.970)] + Mor32u\ [-4.204(\pm 1.327)] + PJI_2\ [-2.886(\pm 1.457)] + Mor11v\ [-1.589(\pm 1.018)]$ (*Eqn. 1*)

n=24, $r = 0.894$, $r^2_{adj} = 0.756$, $SEE = 0.207$, $F = 18.828$, $Q^2 = 0.676$

The developed models were found to be statistically robust and had good predictive power which can be successfully utilized for designing of new molecules. These models also provide some beneficial clues in structural modification for designing new inhibitors for the treatment of tuberculosis with much higher inhibitory activities against *MTB.* The results obtained from this study would be useful in both understanding the some imperative determinants for the inhibitory activity of pyrazoline and benzoxazole analogs as well as in rapidly and accurately predicting the activities of newly designed inhibitors on the basis of QSAR study.

AERB/RAARHC/2018/027

Formulation and Evaluation of Herbal Powder Shampoo

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ABSTRACT

Herbal Shampoo is a hair care product which contain herbs, The present study was aimed to formulate an herbal shampoo containing herds and to evaluate its physicochemical properties. Main ingredient of herbal powder shampoo is, shikakai powder, bhringraj powder, amla powder, areetha powder, and brahmi powder. The following evaluation parameter performed like physical appearance, p^H foaming ability and powder characteristics like flow property and other evaluation is also performed, so as per experimental analysis and traditional uses of all ingredients it clearly indicate that the herbal powder shampoo is having a satisfactory results show silky and shiny hairs . All the ingredients used to formulate shampoo are safer and the physicochemical evaluation showed ideal results.

Kewards: Powder shampoo, brahmi, bhringraj

AERB/RAARHC/2018/028

Formulation and Evaluation of Floating Tablet of Oxcarbazepine

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ABSTRACT

The floating tablet of oxcabazepine were prepared by dry granulation method based on effervescent tablet.The low bioavailability (15%) and good solubility of Oxcarbazepine in acidic pH following oral administration favours development of a gastro retentive formulation. Gastroretentive floating matrix tablets of Oxcarbazepine were successfully prepared with hydrophilic polymers like HPMC K4M, HPMC K15M and HPMC K100M.. The drug release from most of the formulations it was clearly observed that the floating tablets showed a gastric residence of nearly 4.5 hrs in fed state. Hence from the present study it can be concluded that (HPMC K4M,HPMCK15, HPMCK100M) & (Oxcarbazepine)in proper concentration can be used to develop sustained release floating tablet of oxcabazepine by incorporating appropriate concentration of sodium bicarbonate for gas generation such system can remain buoyant & along with the sustained drug release for the same direction. From the preformulation studies for drug excipients compatibility it was observed that there was no compatibility problem with the excipients used in study.

Keywords: Oxcarbazepine, floating tablets, gastric residence time, gastroretentive drug delivery. Sustained release, sodium bicarbonate.

AERB/RAARHC/2018/029

HERBAL COSMECEUTICAL FOR SKIN CARE

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ABSTRACT

Cosmeceuticals are the advances made within the world of dermatological products. They are cosmetic products containing biologically active ingredients purporting to offer (intentionally or non-intentionally) a pharmaceutical therapeutic benefit. These active ingredients act on the skin cellular structure through topical application with either therapeutic, disease-fighting or healing properties. Skin disease is a common ailment frequently affecting all ages from neonate to the elderly and cause harm in number of ways. Botanical plants are gaining popularity because of several advantages such as often having fewer side-effects, better patient tolerance, being relatively less expensive and acceptable due to a long history of use. Ayurveda describe various herbs, minerals and fats recommended to enhance health and beauty of the skin. Besides herbal medicines provide rational means for the treatment of many skin diseases ranging from itching to cancer that are obstinate and incurable in other systems of medicine. The present review aims to highlight the herbal plants containing various bioactive used in formulation and treatment of skin care.

AERB/RAARHC/2018/030

Formulation and Characterization of Lipid Vesicles Containing Thiocolchicoside for Transdermal Delivery

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ABSTRACT

The aim of the current investigation is to evaluate the transdermal potential of novel vesicular carriers i.e. liposomes, ethosomes, transfersomes, having thiocolchicoside. Drug exhibits higher water solubility and higher degradation in GI tract. It is a muscle relaxant drug with lesser transdermal permeation. Drug loaded liposomes and transfersomes were prepared by thin film hydration method by using phosphotidylcholin, surfactant and ethanol as solvent. Ethosome were prepared by ethonolic injection method. Vesicles were characterized for entrapment efficiency, vesicular size, zeta potential, *invitro* skin permeation studies. The ethosome formulation showed the significantly higher entrapment efficiency (23.16 ± 1%) with significantly small particle size (502 ± 5nm) then liposomes and transfersomes. FT-IR and DSC studies revealed no interaction between the drug and components. Zeta sizer revealed that the ethosomes are sufficiently stable formulation. The *invitro* skin permeation studies were performed on liposomes, ethosomes, transfersomes formulation, aqueous drug solution and marketed ZYFLEX® thiocolchicoside gel. The results of this study showed, ethosome formulation showed higher cumulative percentage of drug permeation (90 ± 5%) after 24 hours than the other formulations and aqueous drug solution. Ethanol may provide the vesicles with soft flexible characteristics which allow them to more easily penetrate into the deeper layers of skin. Ethanol may enhance drug permeation from ethosomes as compared to liposome and transferosome. However, there was no significant improvement in drug permeation through ethosomes over marketed ZYFLEX®. Results suggest that ethosomes are efficient carrier for transdermal delivery of thiocolchicoside when compared to liposomes and transfersomes. Further *in-vivo* evaluations of the comparative formulations are envisaged.

Keywords: Muscle Relaxant, Thiocolchicoside, Transdermal Delivery, Ethosomes

AERB/RAARHC/2018/031

Applications of Radiation in Health Care-A Review

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ABSTRACT

Radiation emitted by Radioisotopes has the ability to observe an organ functioning from outside the body. Every day applications of radiation medicine help millions of patient worldwide. It is used for controlling or eliminating cancerous growths formed by rapidly dividing cells. For radiotherapy to affect a cure, it is essential that the correct amount of radiation be delivered to the patient. The radiation source is placed in a shielded housing and a well-defined beam of radiation emanating from the source is directed towards the tumour for treatment. Intense Cobalt-60 sources ranging from 9000 to 12000 curies encapsulated and supplied by Board of Radiation and Isotope Technology (BRIT) are being used in most of the 225 teletherapy units set up in 62 cities in India for cancer treatment Now-a-days, electron accelerators are being widely used for radiotherapy. Over 10,000 hospitals worldwide use radioisotopes in medicine, and about 90% of the procedures are for diagnosis. The most common radioisotope used in diagnosis is technetium-99 (Tc-99), with some 40 million procedures per year, accounting for about 80% of all nuclear medicine procedures worldwide.

Keywords: Radioisotopes, diagnosis, medicine, radiation.

AERB/RAARHC/2018/032

Chemotherapy a Last Resort for Cancer Treatment

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ABSTRACT

Chemotherapy deals with various types of therapeutic techniques such as antimicrobial chemotherapies, gynecological cancers, squamous cell carcinoma, tumorigenesis, chemo resistance, radiotherapy, electro chemotherapy used to treat several dreadful diseases. Imatinib and Nilotinib resistant gene identified in the chronic myeloid leukemia patient. Authors H Cheng et al. found a new mutation N796S in the BCR (exon 10) domain with T315I and F359V mutations, it was evaluated by the next generation exon sequencing technique. The change imposed by mutations was evaluated by measurement of hematologic, cytogenetic and molecular responses. Many studies exerted to explore the function of this new mutation N796S, is unknown and hence study suggests further to be explored in TKIs resistance.

Keywords: Antimicrobial chemotherapiesgynecological cancers squamous cell carcinoma tumorigenesis chemo resistance radiotherapy electro chemotherapy

AERB/RAARHC/2018/033

Polymeric Microparticles Containing Herbal Plant Extracts for Managemet of Diabetes

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ABSTRACT

Diabetes cannot be cured completely, incidence of diabetes mellitus increasing day by day. Synthetic drugs which are used for the treatment of diabetes have many side effects and frequency of dosing is more. To overcome such problems novel carrier system has been chose. Herbal extracts have been widely accepted as the potential medicines with less side effects as compared to synthetic drug molecules. Biodegradable polymers are having wide use for the preparation of vesicular system to control the drug release pattern of drugs. "Polymeric microparticles" considered as novel carrier technique to control the release of herbal plant extracts from vesicular system. Extraction of crude drug (*Aegle marmelos*) done with successive solvent extraction method by using different solvents like Petroleum ether, ethyl acetate, chloroform, methanol, and ethanol. In phytochemical screening we found different constituents of the plant but Dihydromyricetin, a flavonoid isolated, which decreases blood glucose level. Polymeric microparticles formulated with hot melt method and emulsification method. After characterization the microparticles which are made from hot melt method shows good results of drug release and entrapment efficiency. In the current research work micoparticles has been developed of chitosan employed to enhance the drug release. Polymeric micopartcles were characterized and evaluated for antidiabetic activity. *Aegle marmelos* decrease the blood glucose level in albino rats.

AERB/RAARHC/2018/034

Radiosynovectomy in the Treatment of Arthritis by Erbium Isotopes

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ABSTRACT

Arthritis, especially rheumatoid arthritis is a common, chronic disease and systemic and local drug treatments are used. Radiosynovectomy is the best therapeutic option for the local treatment of arthritis. Rheumatic conditions tend to involve pain, aching, stiffness, and swelling in and around one or more joints .In radiosynovectomy radioactive labeled particles with a size of 0.05–2 μm are applied directly in the articular cavity. The radioactive particles are transported in the depth of synovial and phagocytized from macrophages and other inflammatory cells. The first treatment of arthritis using radioactive gold (^{198}AU) .The problem of ^{198}AU in radiosynovectomy is the high leakage rate after treatment caused by the small sizes of particles. In the last 20 years the radiosynovectomy showed a renaissance using erbium-169 citrate (^{169}Er) in small joints. Several constant synovitis of interdigital joints opposed to suitable conventional anti-inflammatory treatment could benefit from radio-synoviorthesis through erbium-169. Erbium-169 synoviorthesis be technically simple to perform and free of side effects.

Key wards: Arthritis, Radiosynovectomy, Au(Gold) Er (Erbium) , Free Side effects.

AERB/RAARHC/2018/035

Targeted Drug Delivery system for the treatment of Cancer with Isotopes

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ABSTRACT

Nano medicine is poised to make a major impact on the diagnosis and treatment of many diseases.Nanoparticles is uniquely suited for the treatment of cancers. Nanotechnology can be used for better cancer diagnosis, more efficient drug delivery to tumor cells, and molecular targeted cancer therapy. Many diseases classical methods that are used in diagnosis X-rays, tomography or mammography require using mutagenic agents on cells that cause cancer one of the significant missions of passive liposomal drug delivery is to cancer cells. Nanoparticles can be programmed for recognizing the cancerous cells and giving selective and accurate drug delivery avoiding interaction with the healthy cells. This review focuses on cell recognizing ability of nanoparticles by various strategies having unique identifying properties that distinguish them from previous anticancer therapies. It also discusses specific drug delivery by nanoparticles inside the cells illustrating many successful researches and how nanoparticles remove the side effects of conventional therapies with tailored cancer treatment.

Key Wards: - Nano medicine, Tomography, Mutagenic, Cancer.

AERB/RAARHC/2018/036

Docking & COMFA, COMSIA Studies of Benzimidazole Analogues as α-Gucosidase Inhibitors

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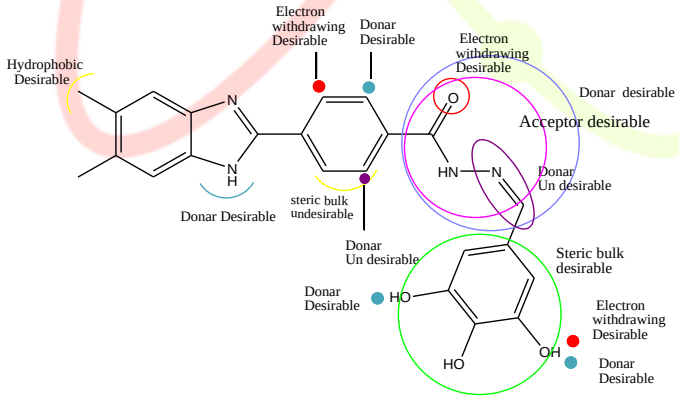
ABSTRACT

The major goal of the drug discovery is to predict behaviour of newly synthesized and pharmacologically evaluated derivatives. Alpha glucosidase enzyme as competitive reversible inhibitors are used for the digestion of carbohydrate that enzymes are found in the brush boarders of the small intestine. It is one of the clinically validated target for the treatment of type 2 diabetes since its inhibition delays the intestinal glucose absorption process. In view of it, for the present study, eighty-four benzimidazole derivatives were selected from the different literature and their properties were studied by DOCKING, CoMFA and CoMSIA. The values of statistical parameters in CoMFA and CoMSIA q^2 and r^2 for significant models of CoMFA and CoMSIA were found to be 0.606, 0.879 and 0.577,0.814, respectively, The difference between r^2 and q^2 is less than 0.3 which showed the statistical significance of both the models and docking highest score 7.7894 ,crash value -1.0095 and polarity1.7438 interaction PHE570 on PDB 4UBP for urease inhibitor and highest score 8.868,crash value -2.5911 and polarity 2.1098 interaction ARG315,TYR158 on PDB 3Aj7.Further, structure activity relationship was generated from the contour maps of DOCKING & CoMFA ,CoMSIA and it will be used for the designing of novel benzimidazole derivatives with improved pharmacological activity with lesser side effects.



Keywords: Benzimidazole, α-Glucosidase inhibitors, CoMFA, CoMSIA, Docking

AERB/RAARHC/2018/037

A Statistical Study of Radio Isotope In-111 WBC Imaging in Musculoskeletal Sepsis

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ABSTRACT

Musculoskeletal sepsis is infection of bone, joints, muscles, and skin and often occurs after open fractures. Thus, the main objective in the treatment of open fractures in restoration of function and prevention of infection. So, this report/study evaluated the accuracy and utility of the Indium-111(In-111) labelled WBC imaging in a series of patients who were suspected of having musculoskeletal sepsis The labelling of the WBCs was patterned after a method previously described, in which the WBCs are labelled with In-111 oxine in plasma. The WBCs from 100 ml of blood are separated and incubated with In-111 oxine complex, and then 500 ..mu..Ci. of the labelled cells were re-injected into the patient. Images of the areas in question were obtained at 24 hrs. In some instances, 48 hour images were also obtained. Images were interpreted using consistent criteria. Forty imaging procedures were done on 39 patients. These included 39 total joint prostheses, and 17 other images to evaluate possible osteomyelitis, septic arthritis or deep abscesses. Of these studies, 15 were positive, and 42 negative. The findings were then correlated with operative culture and pathology in 21, aspiration cultures and gram stains in 14, and with clinical findings in the remaining 21. This correlation showed 41 true negatives, 12 true positives, 1 false negative, and 2 false positives. The sensitivity was 92.9% and the specificity was 95.2%l. The false negative occurred in a patient on chronic suppressive antibiotic therapy for an infected total hip replacement. The false positive images occurred in a patient with active rheumatoid arthritis and in a patient imaged one month post operative placement of the prosthesis. These images were very useful in several septic patients who had many possible sites of infection. The authors conclude that In-111 imaging is an accurate and useful non-invasive method of evaluating musculoskeletal sepsis.

Key word: Musculoskeletal sepsis, In-111 oxine, Joint prostheses, Rheumatoid arthritis

AERB/RAARHC/2018/038

Validation of Developed UV-spectrophotometric Method for the Determination of Terbinafine Hydrochloride in Bulk Dosage Form

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ABSTRACT

The main objective was to develop and validate the UV-spectrophotometric method for the estimation of terbinafine hydrochloride in bulk dosage form as per ICH guidelines. The λmax of terbinafine hydrochloride in water was found to be 283 nm. The drug follows linearity in the concentration range 2 to 15µg/ml with a correlation coefficient value of 0.999. The proposed method was applied to pharmaceutical formulation and % amount of drug estimated was 99.05% and was found to be in good agreement with the label claim. The accuracy of the method was checked by recovery experiment performed at three different levels, i.e., 80%, 100%, and 120%. The % recovery was found to be in the range of 98.75-99.97%. The low values of % RSD are indicative of the accuracy and reproducibility of the method. The precision of the method was studied as an intraday; interday variations, and repeatability. The % RSD was found to be < 2 which indicates that the method is precise. Ruggedness of the proposed method was studied with the help of two analysts. The above method was a rapid tool for routine analysis of terbinafine hydrochloride in the bulk, in the pharmaceutical dosage form and this method can also help in bioanalytical method development.

Keywords: UV-Spectrophotometer; Quantitative determination; Terbinafine Hydrochloride; validation; Reproducibility

AERB/RAARHC/2018/039

Diagnostic and Therapeutic Use of Radioisotopes for Bone Disease in Prostate Cancer: Current Practice

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ABSTRACT

Nuclear medicine techniques continue to be important non-invasive imaging tools assisting to the diagnosis, monitoring and in other some cases like treatment of prostate cancer. Bone scintigraphy was the premier modality to have an extensive role in the staging of prostate cancer and has remained an integral tool for over three decades in the assessment of newly diagnosed disease or in follow-up staging. Therapeutic treatment and palliation of disseminated disease, particularly in the skeleton, has also been successful with several radioisotopes including strontium-89 chloride. Despite advances in nuclear medicine techniques and molecular imaging technology such as positron emission tomography (PET) and radioimmuno scintigraphy, bone scintigraphy still remains the gold standard in the assessment of osseous metastatic disease in prostate cancer. Thus, it is important to continually review the modalities that have remained important over time and not just to focus on newer technologies.

Keyword: Nuclear medicine; positron emission tomography; prostate cancer; Bone scintigraphy; strontium-89 chloride.

AERB/RAARHC/2018/040

Radioisotope as Nuclear Medicine

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ABSTRACT

Many elements which found on earth exist in different atomic configurations and are termed isotopes which have same atomic number but differ in their atomic mass. This unstable element decay by emission of energy such isotopes, which emit radiation, are called radioisotopes. Using of these isotopes in various sectors like industries, agriculture, healthcare and research centres has got a great importance at present. In health care sector, these isotopes are used in nuclear medicine as diagnostic and therapeutic modalities. Radionuclide imaging (or functional imaging) is a branch of medicine which provides the only means of assessing physiologic changes that is a direct result of biochemical alterations and is based on the radiotracer method. In nuclear medicine procedures, radionuclides are combined with other chemical compounds or pharmaceuticals to form radiopharmaceuticals. These radiopharmaceuticals, once administered to the patient, can localize to specific organs or cellular receptors. This unique ability of radiopharmaceuticals allows nuclear medicine to diagnose or treat a disease based on the cellular function and physiology rather than relying on the anatomy.

Keywords: Radioisotope as Nuclear medicine, Radioisotope, Nuclear medicine, Radiopharmaceuticals, Radionuclide imaging.

AERB/RAARHC/2018/041

Radiopharmaceuticals in Pharmacy: An Overview

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ABSTRACT

Radiopharmaceutical consists of a drug component and a radioactive component. Most radionuclides contain a component that emits gamma radiation. Substances that have varying numbers of protons and neutrons as compared to stable elements are called radionuclides. Nuclides may be stable or unstable; those that are unstable are radioactive because their nuclei undergo rearrangement while changing to a stable state and energy is released. A radiopharmaceutical can be used for either diagnostic or therapeutic purposes depending on its specific physicochemical and radiation properties. The characteristic of radioactive decay is what makes radioisotopes useful in their medical applications; however, different applications will take advantage of radioactive emissions in different ways. Radioactive materials are regularly used to treat medical conditions, diagnosis pathology, visualize and measure physiological functions, and localize structures and pathways. This review describes both the therapeutic as well as diagnostic uses of radiopharmaceuticals.

Keywords: Radiopharmaceutical, Radionuclide, Neutrons, Protons

AERB/RAARHC/2018/042

Potential Efficacy of Root Extracts of *Curcuma zedoaria* on DMBA-Induced Skin Tumorigenesis in Swiss Albino Mice

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ABSTRACT

Curcuma zedoaria is commonly known as white turmeric, traditional in Siddha medicine. The root has been used in the treatment of cancer. The aim of this study was to evaluate potential anti-cancer effects of petroleum ether and ethanol extracts of *C. zedoaria* root on DMBA-induced skin tumorigenesis in Swiss albino mice. The *C. zedoaria* root powder was successively extracted with petroleum ether (40-60°C) and ethanol. Each extract of *C. zedoaria* 200 mg/kg b.w.p.o. was administered to animals. The results indicate petroleum ether and ehanolic extracts showed significant inhibition of papillomas in DMBA + croton oil treated group and also found to be effective in decreasing the rate of tumor incidence compare with control. Furthermore, cumulative number of papillomas, tumor yield and tumor burden were also found to be reduced. The glutathione level in the blood and liver was recovered with *C. zedoaria* root extract treated groups. However, the ethanolic extract of *C. zedoaria* showed highly against DMBA induced papillomas in mice. The present study indicates the chemopreventive role of *C. zedoaria* root extracts against DMBA-induced paillomas induced cancer in Swiss albino mice.

Key words: Skin carcinogenesis *C. zedoaria* Papilloma Chemoprevention Glutathione

AERB/RAARHC/2018/043

Virtual Screening of Some Schiff Base Derivative Antimicobial Agent

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ABSTRACT

Molecular docking of some Schiff base derivative are done on two PDB, one on PDB 3U2D which act against Antibacterial agent and another on PDB 1AOE as Antifungal agent. Ten designed compounds was dock on both the PDB. The best five dock score and alignment where observed.

AERB/RAARHC/2018/044

Antimicrobial Potential of *Tageteserecta* Leaves Silver Nanoparticles and its Antioxidant Activity

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ABSTRACT

Nanotechnology is the technology employed for the synthesis of nanosized (10^{-9}m) particles & use of these particles in various therapeutic, diagnostic purposes, material sciences & engineering. Nano silver particles are among the most attractive nanomaterial which have been widely used in range of biomedical applications including diagnosis, treatment, drug delivery, medical device coating and also for personal health care. With the increasing application of nano silver particles in medical context, it is becoming necessary for a better understanding of mechanism of nano silver particle's biological interactions & their specific potential toxicity. Various routes are used for synthesis of nano silver particles like physical, chemical, biological or green synthesis. In this review, firstly the green synthesis of nano silver particles was done using *tageteserecta*leaf extract& then its antimicrobial & antioxidant activity is studied which can be applied for various diagnosis & treatment of infections.

AERB/RAARHC/2018/045

Review on Radiopharmaceuticals in Nuclear Medicine and Recent Developments

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ABSTRACT

Nuclear medicine is returning to its origin by studying more and more metabolic signals using new positron or single-photon-emitting radiopharmaceuticals. The history of nuclear medicine over the past 50 years highlights the strong link between investments in chemistry and the development of radionuclide's and radiolabeled compounds. The traditional lack of techniques suitable for *in vivo* imaging has induced a great interest in molecular imaging for preclinical research. Nuclear cardiology has experienced exponential growth within the past four decades with converging capacity to diagnose and influence management of a variety of cardiovascular diseases. Myocardial perfusion imaging (MPI) with technetium-99m radiotracers or thallium-201 has dominated the field; however new hardware and software designs that optimize image quality with reduced radiation exposure are fuelling a resurgence of interest at the preclinical and clinical levels to expand beyond MPI. These advances have had a major impact on the practice of health care. According to the Society of Nuclear Medicine, 20 million nuclear medicine procedures using radiopharmaceuticals and imaging instruments are carried out in hospitals in the United States alone each year to diagnose disease and to deliver targeted treatments. These techniques have also been adopted by basic and clinical scientists in different fields (infection, immunology, gastroenterology, cardiology, oncology, neurology, psychiatry, and others) for diagnosis as well as for scientific tools.

Keywords: nuclear medicine, radiopharmaceuticals, MPI.

AERB/RAARHC/2018/046

Evaluation of Formulated Herbal Antidandruff Shampoo

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ABSTRACT

Dandruff is a common disorder affecting the scalp condition caused by yeast Pityrosporum. Dandruff cannot be completely eliminated but can only be managed and effectively controlled. A shampoo is a preparation containing surfactant which when used under the specified conditions will remove surface grease, dirt, and skin debris from the hair shaft and scalp without adversely affecting the user. Various anti-fungal agents are employed in hair care preparations for the treatment dandruff. These products show many side effects like loss of hair, increased scaling, itching, irritation, nausea, and headache. Hence an attempt was made to formulate herbal anti-dandruff shampoo which is effective in terms of safety and treating the dandruff condition better than the chemical based anti-dandruff shampoo. Herbal anti-dandruff shampoos were formulated using herbal based ingredients like Lemon Grass Oil, Neem oil, Henna, Aloe Vera gel, camphor and other ingredients for preparing base shampoo. The formulated shampoos were subjected to evaluation parameters like visual inspection, pH, viscosity, Percentage of solids contents, Dirt dispersion, Surface tension, Foaming ability and foam stability, anti-fungal activity test using Pityrosporum Ovale strain. Formulation (F2) exhibited good antifungal activity i.e., maximum zone of inhibition. The (F2) exhibited good safety without any irritation and sensitivity. Stability studies for a period of three months were conducted for F2 formulation and showed negligible changes in their physicochemical properties.

Keywords: Stability studies, Dandruff, herbal anti-dandruff shampoo, Neem Oil.

AERB/RAARHC/2018/047

Radioisotopes - Biomedical Importance

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ABSTRACT

When the nucleus loses a neutron, it gives off energy and is said to be radioactive. Radioactivity is the release of energy and matter that results from changes in the nucleus of an atom. As a radioisotope tries to stabilize, it may transform into a new element in a process called transmutation. Radioisotopes study is very critical yet challenging. Important characteristics of radioisotope for use as tracer are its half life, type, energy of radiation and availability. Radioisotopes are also used in radiotherapy (radiationtherapy) to treat some cancers and other medical conditions that require destruction of harmful cells. Radio-isotopes upon decay emit radiations like alpha, beta or gamma particles and transformed their nuclei to a stable state. This decaying property of radioisotopes is called half-life. Thus radioisotopes could be used for numerous biomedical purposes such as cancer treatment, imaging, biochemical assays, biological labeling, sterilization, clinical diagnostics, radioactive dating etc.

Keywords: Radiation therapy, transmutation, biochemical assay, biologicallabeling, sterilization, clinical diagnostic.

AERB/RAARHC/2018/048

A Review on Gastrointestinal Tract Tuberculosis

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ABSTRACT

I have studies the two theories share many things in common but differ in how they interpret the data and in their emphasis on different aspects of the disease process. The immune deficiency theory emphasizes defects in innate immunity that predisposes to infection and suggests that therapy should be directed at enhancing immunity rather than suppressing it. Although a specific pathogen is not identified, the pattern of the immune response suggests an intracellular organism that infects macrophages and dendritic cells. The mycobacterial theory emphasizes the role of Mycobacterium avium paratuberculosis as a specific pathogen that elicits an excessive and ultimately destructive inflammatory response producing the CD phenotype. The autoimmune theory assumes that a specific pathogen does not exist, emphasizes the dysregulated, excessive immune response and hypothesizes that immune regulatory dysfunction allows otherwise benign bacteria to drive the destructive disease process. The concepts associated with these two theories are intertwined. Not only would immune deficiency predispose to a mycobacterium infection, but pathogenic mycobacterium are known to further dysregulate and suppress immunity. Due to the lack of characteristic specific symptoms and signs and the fact that laboratory findings are commonly non-specific or show no abnormality, diagnosing such cases is difficult. A notable clue is the presence of abdominal pain co existing with active pulmonary TB, but such lung involvement is present in less than one fifth of the cases. The most common site of infection is the ileocaecal region, for which colonoscopy with ileoscopy plus biopsy is the diagnostic tool of choice. Surgery is usually reserved for patients with complications or those whose diagnosis cannot be ascertained by other means.

Keyword: Gastro Intestinal tract, Mycobacterium, Paratuberculosis, Macrophages, Dendritic cells

AERB/RAARHC/2018/049

Review on Type 2 Diabetes Mellitus with Prevention and Control by Changing Life Style

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ABSTRACT

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. No cure has yet been found for the disease; however treatment modalities include lifestyle modifications, treatment of obesity, oral hypoglycemic agents, and insulin sensitizers like metformin, a biguanide that reduces insulin resistance is still the recommended first line medication especially for obese patients. Other effective medications include non-sulfonylurea secretagogues, thiazolidinediones, alpha glucosidase inhibitors, and insulin. Recent research into the pathophysiology of type 2 DM has led to the introduction of new medications like glucagon-like peptide 1 analogoues: dipeptidyl peptidase-IV inhibitors, inhibitors of the sodium-glucose cotransporter 2 and 11ß-hydroxysteroid dehydrogenase 1, insulin-releasing glucokinase activators and pancreatic-G-protein-coupled fatty-acid-receptor agonists, glucagon-receptor antagonists, metabolic inhibitors of hepatic glucose output and quick-release bromocriptine. Inhaled insulin was licensed for use in 2006 but has been withdrawn from the market because of low patronage. with proper testing, treatment and lifestyle changes, healthy eating as a strategy, promote walking, exercise, and other physical activities have beneficial effects on human health and prevention or treatment of diabetes, promoting adherence to this pattern is of considerable public health importance.

Keywords: Diet, lifestyle, non-communicable disease, public health, type-2 diabetes

AERB/RAARHC/2018/050

Wound Healing Activity of the Hydro-alcoholic Extract of *Physalis minima* Fruits in Albino Rats

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ABSTRACT

The process of repair that follows injury to the skin and other soft tissues is known as wound healing. Following injury, an inflammatory response occurs and the cells below the dermis begin to increase collagen production. Later, the epithelial tissue is regenerated. The process of wound healing includes inflammation, proliferation, and remodeling. The wound-healing efficacy of Hydroalcholic extracts of *Physalis minima* was evaluated in excision wound models. *Physalis minima* fruit were dried, crushed in coarse powder hydro-alcoholic extract was obtained and turned to 10% ointment form. In the course of this study, 18 male wistar albino rats weighing approximately 150 - 180g were used in this research. Group 1 as control group, Group 2 as reference control were treated topically with Povidone-Iodine Ointment USP, Group 3 as test control were treated with 10% *Physalis minima* ointment. Wound healing was monitored on days 5, 10, 15, 21 and evaluation was carried out on the samples. Fruit extract of *Physalis minima*promotes wound healing via bactericidal activity.

Key words: Wound healing; *Physalis minima* (fruits); hydro-alcoholic extract; ointment; bactericidal activity.

AERB/RAARHC/2018/051

Cytogenetic Evaluation for Chemoprotective Potential of Some Traditionally Used Herb As Tonic

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ABSTRACT

Chemotherapy is always associated with side effects. Many researchers have proved significant protective potential of components from herbal origin against these chemotherapeutic agents induced mutagenencity. Since ancient time herbs are considered as rich source of medicine. Traditional knowledge of use of herbs in treatment of various ailments is still lacking exploration. Folk lore healers are using many herbs as tonic to rejuvenate body. In present study by ethnobotanical survey and literature survey few herb were selected on the basis of their use as tonic. Effect of hydroalcoholic extracts of selected herbs was assessed on the basis of modulation of chromosomal aberration and microneucleas in bone marrow of *Swiss albino* mice due to cyclophosphamide administration. Each extract was given at 200mg/kg. It was observed that most of the selected herbs produced significant protection against Cyclophosphamide induced mutagenecity. Thus from study it can be concluded that herbs can work as a rich source for providing a potent chemoprotective agent.

Key words: Mutagenecity, Herbs, Cyclophosphamide, Bone marrow, tonic

AERB/RAARHC/2018/052

Formulation and Characterization of Orodispersible Tablets of A Model Calcium Channel Blocking Drug

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ABSTRACT

In the recent past unbelievable advances in the field of medical sciences have occurred, most of which some might have not been thought of a decade back. This was made possible by some simple but tremendously innovative achievements in the field of pharmacy. The conclusion drawn from the present investigation is given below; Preformulation studies of Diltiazem HCl were performed. From the FT-IR, the interference was verified and found that Diltiazem HCl did not interfere with the polymers used. Nine batches of fast disintegrating tablets of Diltiazem HCl were successfully prepared using sodium starch glycolate, crosscarmellose and crospovidone by direct compression method. The tablets were evaluated for parameters like thickness, hardness, friability, in vitro dispersion time, wetting time, water absorption ratio, and % drug content and in- vitro drug release studies. Based on the results, formulation containing 4.5% crospovidone (DF9) was identified as ideal and better formulation among all formulations developed for Diltiazem HCLfast disintegrating tablets of DF9 was found to be 95.72% drug release within 10 min. with in vitro dispersion time being 25 sec. The final optimized formulation (DF9) was compared with marketed product of Diltiazem HCl tablets (Dilzem) which shows 92.53% drug release in 1 hr. From this observation it was concluded that the formulated tablets of Diltiazem HCl (DF9) were superior and effective in achieving patient compliance.

Keywords: Drying Lyophilisation, Tablet Moulding, Spray Drying, Direct Compression.

AERB/RAARHC/2018/053

Anti-Anemic Activity of *Piper nigrum* Seeds in Phenylhydrazine Induced Anemic Rat

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ABSTRACT

The present study was conducted to evaluate the effect of *Piper nigrum* seeds on experimentally induced anemia in wistar strain albino rats. Twenty four rats were divided into 4 groups of 6 rats each. Group I received 0.1% CMC solution and served as control, all other groups were given 40 mg/kg of phenyl hydrazine i.p. for 2 days to induce anemia. Group II received 40 mg/kg phenylhydrazine and served as anemic control, Group III received standard drug "vitamin B_{12}" (100mg/kg), Group IV received seed extract of *Piper nigrum* (100mg/kg) for 13 days the standard and test drug was given orally. On completion of activity blood was collected through tail vein in EDTA (K3) coated tubes for further determination of parameters i.e., RBC count, Heamoglobin count & percentage hematocrit.

Keywords: Anemia, Anti-anemic, Phenylhydrazine, Vit. B_{12}, *Piper nigrum* seeds.

AERB/RAARHC/2018/054

A Review on Stem Cell Therapy a Beginning of New Revolution

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ABSTRACT

Stem cell therapy is evolved as a revolutionary, new way to treat disease and injury, with wide-ranging medical benefits. It aims to repair damaged and diseased body-parts with healthy new cells provided by stem cell transplants. Stem cells are distinctive and versatile type of cells that can divide indefinitely and have a unique capacity to renew them and to give rise to specialized cell types. Self-renewal and totipotency is characteristic feature of stem cells. The adult stem cells possess multipotency and differential plasticity which can be useful for future generation of therapeutic purpose. Disease and disorders with no therapies or at best, partially effective ones, are the cure of the pursuit of stem cell research. The therapeutic usage of stem cells in the form of neuron regeneration, treatment of bone defect, drug testing, gene therapy and cell based therapy in the form of muscle damage, spinal cord injury, cancer therapy etc. Cell based therapies in future become most important therapies for various life threatening diseases.

Key words: Stem cell, adult stem cell, stem cell therapy.

AERB/RAARHC/2018/055

Aquasomes: A Novel Drug Delivery System

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ABSTRACT

Aquasomes are nanoparticulate carrier systems but instead of being simple nanoparticles these are three layered self assembled structures, comprised of a solid phase nanocrystalline core coated with oligomeric film to which biochemically active molecules are adsorbed with or without modification. Nanoparticles which are fabricated from ceramics consist of a hydroxyapatite core whose surface is noncovalently modified by oligosaccharide on which bioactive material/drug can be absorbed. Aquasomes are spherical in shape with 60–300 nm particles size used for drug and antigen delivery. These structures are self assembled by non covalent and ionic bonds. Three types of core materials are mainly used for producing aquasomes: tin oxide, nanocrystalline carbon ceramics (diamonds) and brushite (calcium phosphate dihydrate). The solid core provides the structural stability, while the carbohydrate coating protects against dehydration and stabilizes the biochemically active molecules. This property of maintaining the conformational integrity of bioactive molecules has led to the proposal that aquasomes have potential as a carrier system for delivery of peptide, protein, hormones, insulin, hemoglobin, enzyme like serratiopeptidase, antigens and genes to specific sites. It is widely used for the preparation of implants for drug delivery. Properties like protection and preservation of fragile biological molecules, conformational integrity, and surface exposure made it as a successful carrier system for bioactive molecules like peptide, protein, hormones, antigens and genes to specific sites.

Keywords: Aquasomes, nano particles, implants, oligomeric film

AERB/RAARHC/2018/056

Transdermal Patches Using Chitosan Polymer: A Review

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ABSTRACT

A transdermal drug delivery system drug may be directly reaches to the systematic circulation. It is a medicated patch deliver a drug sustained and control manure and maintained the peak plasma concentration. It is also self contained discrete dosage form deliver a drug directly to the skin at pre determined rate and avoidance of hepatic first pass metabolism and increased the patient compliance. Chitosan has good film forming and permeation enhancing polymer .it is a natural biopolymer for developing films due to their non-toxic biocompatibility, biodegradability and also antimicrobial properties along with permeation enhancing and good adhesive properties. Hence this review article focus on various transdermals patches using chitosan polymer.

Keywords: Transdermal Patches, Chitosan, Systemic Circulation

AERB/RAARHC/2018/057

Effect of Various Polymers and Their Concentration on Release Rate of Metoprolol Tartrate Matrix Tablet

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ABSTRACT

The present study was aimed to evaluate the different concentrations of various polymers on in vitro drug release from sustained release matrix tablet. HPMC K15 M (Hydrophilic) and ethyl cellulose (Hydrophobic) were used as rate controlling polymer for controlled release drug delivery system. Matrix tablets of Metoprolol tartrate were fabricated by varying the concentrations of both polymers via wet granulation method. Tablets were characterized for physical properties like loose bulk density, tapped density, angle of repose, Carr's index, Hausner´s ratio; all formulations showed satisfactory properties. Tablets were evaluated for uniformity of weight, thickness, hardness, percentage (%) friability and in vitro release studies. The in vitro release of metoprolol tartrate was evaluated and found that the preliminary batches containing the decrease amount of rate controlling polymer (HPMC K15 M) showed the faster release and the tablet were completely dissolved in 5-6 hours. For extending the release profile added ethyl cellulose, it increases the dissolution rate and the drug is sustained release up to 12 hrs using HPMC K15M and EC in 1:1 ratio. The release rate of Metoprolol tartrate from matrix tablets followed nearly Higuchi kinetics via non-Fickian diffusion controlled mechanism. This study reveals that a combination of HPMC K15M and ethyl cellulose in the ratio of 1:1 (F-5) showed best grade for controlling the release rate. The optimized formulation has drug release profile up to 12 hours.

Keywords: hydrophilic, Hydrophobic , Extended release, Wet Granulation

AERB/RAARHC/2018/058

Antidepressant Activity of Hydroalcoholic Extract of *Prunus domestica*

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ABSTRACT

The main aim present study was to evaluate the effect of *Prunus domestica* hydro-alcoholic extract as well as its interaction with conventional anxiolytic and antidepressant drugs using tail suspension test and forced swim test (FST) and to evaluate the possible mechanisms involved in its actions. The fruit of *Prunus domestica* were collected and authenticated. The extract of *Prunus domestica* showed the significant antidepressant activity comparable to the standard drug. The oral administration of *Prunus domestica* extract at 100 mg/ kg and 200 mg/kg respectively as compared to the control treated group showed an antidepressant activity comparable to that of standard drug. The antidepressant effects of *Prunus domestica* extract seem to be mainly associated with the activation of dopamine system and possess potential anxiolytic and antidepressant activities.

Keywords: Antidepressant activity, *Prunus domestica*, forced swimming test, tail suspension test.

AERB/RAARHC/2018/059

Diuretic Activity of Hydroalcoholic Extract of *Capsicum annuum* L in Wistar Albino Rats

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ABSTRACT

Capsicum annum are small shrubs belonging to family solanaceae. Capsicum mainly contains anti-oxidants such as tocopherols, ascorbic acid and b-carotene which are effective against cancer, heart disease and cataracts. . The present study was aimed to evaluate the diuretic activity of hydroalcoholic extract of leaves of *Capsicum annuum* fruits in wistar rats. Diuretic activity of hydroalcoholic (70:30) extract of *Capsicum annuum* fruits (200 mg/kg and 300 mg/kg body weight orally) was studied in wistar albino rats (n=6). Furosemide (10 mg/kg) orally was used as the standard. Total 24 hours urine volume was measured using metabolic cages. The concentration of Na^+, K^+ in the urine at the end of 24 hours was estimated. Data was analyzed by One-way ANOVA followed by Dunnett test. Hydroalcoholic extract of Capsicum annuum fruits showed a significant ($P < 0.05$) dose dependent increase in urine volume (8.1 ± 0.97ml/100g/24hr and 9.7±0.75 ml/100gm/24hr). At 500 mg/kg Hydroalcoholic extract of Capsicum annuum fruits increased the excretion of sodium but decreased the excretion of potassium significantly compared to control. This preclinical study showed a potential diuretic activity but further studies regarding the mechanism of action is required to validate this finding.

Keywords: Capsicum annuum, diuretic, furosemide, potassium sparing effect

AERB/RAARHC/2018/060

Prevention of Alzheimer's Disease: An Overview

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ABSTRACT

Alzheimer's disease (AD) is one of the most common neurodegenerative diseases and is considered to be the main cause of cognitive impairment in elderly people. The major symptom of AD is progressive dementia that eventually results in dysfunction of daily life and is histologically characterized by the accumulation of extracellular amyloid plaques and intracellular neurofibrillary tangles throughout the brain. Immunotherapy has been favored and many mechanisms have been shown to clear toxic amyloid and tau aggregates and improve memory. These mechanisms may differ depending on the antibodies target and administration route. Moreover, an approach of combinatorial immunotherapies against different amyloidogenic proteins, at distinct levels of the disease progression, might offer an effective therapy in many neurodegenerative diseases.

AERB/RAARHC/2018/061

A Comprehensive Study on Progressive Hemifacial Atrophy

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ABSTRACT

Progressive hemifacial atrophy is also known as Parry-Romberg syndrome (PRS), is a craniofacial disorder characterized by slow progressive atrophy of one side of the face. The disease primarily involves the skin, subcutaneous fat, muscles and bones which mainly affects female more than male. Hemifacial Atrophy is typically unilateral facial distortion with unknown etiology and pathogenesis. The cerebral disturbance of fat metabolism is the primary cause which results in trophic malformation of cerebral sympathetic nervous system. The common sign and symptoms of Hemifacial Atrophy involve characteristic thinning of the various tissues on one side of the face and also eye problems include changes to the eyelid and eye socket. In addition, the neurological complications and darkening of skin (hyperpigmentation) are also observed in patients. The common risk factors trauma, autoimmunity, viral infection, heredity, endocrine disturbances, and autonomic dysregulation are contributed in the pathogenesis of Hemifacial atrophy. Eventhough there is no specific test for the diagnosis of hemifacial atrophy however; commonly the syndrome is diagnosed by magnetic resonance imaging (MRI) and biopsy. The main treatment used for Hemifacial atrophy is plastic surgery when the progression of disease has stopped or disease become stable. The various surgical treatments include simple or composite grafts, local or free flap surgery, and injection of autologous tissues/lipofilling. This article provides the complete knowledge of the nature and prognosis of the disease hemifacial atrophy.

Keywords: Progressive hemifacial atrophy, Carnifacial disorder, Parry-Romberg syndrome, fat grafting.

AERB/RAARHC/2018/062

Assorted Medicinal Application of Radioisotopes in Nuclear Medicine Diagnosis: A Review

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ABSTRACT

Radioisotopes are an essential part of medical diagnostic actions. In permutation with imaging devices which chronicle the gamma rays emit from within, they can study the dynamic processes taking place in various parts of the body. Nuclear remedy uses radiation to provide diagnostic information about the functioning of a person's specific organs, or to treat them. Diagnostic procedures using radioisotopes are now routine. Radiotherapy can be used to treat some medical circumstances, especially cancer, using radiation to weaken or destroy particular targeted cells. Nuclear medicine uses radiation to provide information about the implementation of a person's specific organs, or to treat disease. Radioactive isotopes have lots of useful applications. In therapeutics, for example, cobalt-60 is extensively employed as a emission source to hold the growth of cancer. Other radioactive isotopes are used as tracers for diagnostic purposes as well as in research on metabolic processes.

Key Words: Radioisotopes, Radiotherapy, Nuclear Medicine, Cancer, Cobalt-60.

AERB/RAARHC/2018/063

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/RAARHC/2018/064

Design, Development and Evaluation of Bilayer Tablet of Metformin HCl and Rosuvastatin Ca^{+2}

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ABSTRACT

The objective of present work is to formulate safe, convenient Dosage form which prevent interference in release profile of both drug with each other. In order to achieve objective, a bilayer tablet is envisaged consisting of Rosuvastatin as an immediate release layer and Metformin as an extended release layer. The immediate release layer was prepared using super disintegrate croscarmellose sodium and extended release layer was prepared using matrix polymer hydroxyl propyl methylcellulose (HPMC K 100 M/ K 4 M).The design, development design, development and evaluation of bilayer tablet of metformin Hcl& rosuvastatin studies carried out on preparation and evaluation It was found that with the designing of bilayer tablet of Metformin Hydrochloride and Rosuvastatin Ca^{+2} in which Rosuvastatin Ca^{+2} in one layer releases instantly due to the presence of CrosCarmelose sodium as superdisintergrating agent and Metformin Hydrochloride follow the release slowly by HPMC high molecular weight matrix in the order to match with the innovator product. Finally it was concluded that stable Bilayer tablet of Metformin Hydrochloride 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.

Keywords: Metformin Hydrochloride ,Rosuvastatin, HPMC.

AERB/RAARHC/2018/065

Impacts of Gamma Radiation in Pharmaceuticals and Healthcare: An Overview

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ABSTRACT

Gamma irradiation is highly effective which inactivates the microorganisms leading to microbial death or chemical reactions. It was found useful for various domestic and industrial applications. Gamma radiation processing offers a unique opportunity to improve upon the microbial cleanliness of the raw materials and finished products of the pharmaceutical industry. Gamma, electron beams, X-rays and hot steams are the main sterilization procedures used in biomedical object technology; all are safe and effective technologies for sterilization of medical products. It is a clean, non-residue producing technology that is environmentally friendly and safe for the worker and the community. Gamma rays is particularly damaging to rapidly dividing cells (cancer cells) such as radioactive iodine to treat cancer in the thyroid gland. Several isotopes emitting g-rays can, and have been used for diagnostic purposes such as I^{131}.This review is focused on the effects and applications of gamma radiation such as sterilization of pharmaceuticals, decomposing of toxic molecular substances, package medical materials and bioburden reduction. Furthermore, industrial aspects related to risks and benefits of gamma irradiation were underlined.

AERB/RAARHC/2018/066

Molecular Diagnosis of Malignant Catarrhal Fever (MCF) Virus by the Use of Radiolabeled Isotope

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ABSTRACT

Malignant catarrhal fever is a generalized viral disease of domestic cattle, buffaloes and many species of wild ruminants characterized by high fever, profuse nasal discharge, corneal opacity, several inflammation etc. The etiological agent of MCF is AHV-1 (alcelaphine herpesvirus-1) and Ovine herpesvirus-2 (OvHV-2). The virus multiplies in peripheral blood lymphocytes (PBL). The infected blood was collected and PBL was separated using erythrocyte lysis buffer. The DNA was extracted from PBL using Promega's DNA extraction kit. The extracted DNA was subjected to PCR amplification using OIE recommended Primer sets. The PCR product was cloned in pGEM-T easy vector and transformed in JM109 competent cells. Further the plasmid extraction and PCR amplification of plasmid with recommended primer sets was performed and separated in agarose gel. The southern blot on nylon membrane of PCR product was prepared using vacu-gene apparatus (Amersham pharmacia). The Blot was hybridized using radiolabelled probe ^{33}P and the hybridization tube was kept in incubator at 42^{o}C for 16 hours to effect the DNA-DNA hybridization. An X-ray film was exposed with the blot for 16 hours at -20^{o}C deep freezer. The film was developed and signal were analysed and recorded. The positive hybridization signals of DNA confirms the presence of MCF viral genome in test sample.

Key Words: Malignant catarrhal fever, AHV-1, OvHV-2, radiolabelled probe ^{33}P, Hybridization.

AERB/RAARHC/2018/067

A Potential Treatment of Pancreatic Cancer

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ABSTRACT

Pancreatic cancer is an aggressive disease, characterised by the accumulation of cancer cells which forms solid tumors in the tissue of pancreas. Recent study demonstrates that pancreatic cancer is the fourth most common cause of death due to cancer. The most common symptoms are weight loss, pain in the upper abdomen, loss of appetite, yellowing colour of skin, depression, blood clots and new-onset diabetes. Adenocarcinoma and pancreatic endocrine tumors are the two main tumor types of pancreatic cancer. A current study estimates that the pancreatic cancer cause 331000 deaths per year in both sexes but it is slightly higher in men as compare to women. The most common causes of pancreatic cancer are found to be such as smoking, excess alcohol consuming, obesity, diabetes, mutations in the DNA, chronic inflammation and accumulation of ascetic fluid in pancreas. The pathophysiological factors such as inactivation of tumor suppressor genes, activation of oncogenes and deregulation of unwanted cell lifecycle are responsible for the development of pancreatic cancer. The following drugs are used for the treatments for the pancreatic cancer Capecitabine, Erlotinib, Fluorouracil, Gemcitabine, Irinotecan, Leucovorin, Nab-paclitaxel, Nanoliposomalirinotecan, Oxaliplatin. The other therpay involves surgery, radiation and targeted stem cell therapy.

Keywords: Surgery, Radiation therapy, Stem Cell Therapy and Pancreatic Cancer.

AERB/RAARHC/2018/068

Role of Radiolabeled Nanocarriers in the Treatment of Cancer

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ABSTRACT

Cancer is the second leading cause of death in the world. Radiolabeled carriers can be designed and used for cancer diagnostic and therapeutic purposes when tagged with appropriate radionuclides. The major nanocarriers include liposomes, dendrimers, quantum dots, iron oxide and carbon nanotubes and Radioisotopes are therapeutically design to deliver therapeutic dose of ionized radiation to specific disease site such as cancerous tumors with specificity in the body. Radioisotopes are used to treat thyroid cancer, prostate cancer, graves disease, hyperthyroid and palliation associated with skeletal .some of the radioisotopes therapy delivers radiation directly into the cancer cells like strontium-89 and samarium-153 is used to treat secondary bone cancer and they can help to reduce pain, radium 223 is a new radioisotopes therapy that is used to treat cancer and likewise iodine 131 is used to treat certain types of thyroid cancer etc. In the radiopharmaceuticals focus on the radioisotopes therapy which uses radioactive substances known as radionuclides or radioisotopes. These are given by mouth as a drink or capsules form or injected into veins and cancer cells absorb the radioisotopes more than normal cell and also receive higher dose of radioactivity these eventually destroys the cancer cells and the aim is to provide detail about the development of nanotargeted radiopharmaceuticals in cancer imaging and therapy.

Keywords: Nanocarriers, radioisotopes, therapeutic, tumors

AERB/RAARHC/2018/069

Neuroprotective Effect of *Butea monosperma* Leaves in Amnesic Rats

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ABSTRACT

The present study was to evaluate neuroprotective effect of *Butea monosperma* extract in amnesic rats (scopolamine induced amnesia). The extract of *B.monosperma* extract was administered in two different doses (100 and 200 mg/kg) for 7 days. Piracetam (120 mg/kg) was used as a standard nootropic agent. Brain biomarker like superoxide dismutase (SOD), catalase (CAT), contents of thiobarbituric acid reactive substances (TBARS) and reduced glutathione (GSH) in whole-brain homogenates and Acetylcholinesterase (AChE) activity was determined. *B.monosperma* extract administration reduced lipid peroxidation products and elevated glutathione. Short-term orally supplementation of *B.monosperma* extract showed elevated brain antioxidant enzymes as well as inhibited AChE activity.

Keywords: *Butea monosperma*, Superoxide dismutase (SOD), catalase (CAT), contents of thiobarbituric acid reactive substances (TBARS) and reduced glutathione (GSH)

AERB/RAARHC/2018/070

Radioactive-isotopes in the Treatment of Human Disease and Disorders: An Overview

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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 and their associate disorders.

Keywords: Radio-isotopes, Human diseases

AERB/RAARHC/2018/071

Phytochemical Investigation of Some Indian Medicinal Plants and Antibacterial Activity

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ABSTRACT

Our research objective is to analyze the carbohydrate present in Boswellia Serrat. The existence will be assured by paper chromatography. Sugar content were found to 3.12% monosaccharide and disaccharide had found in it. D-Galactose-D-Mannose-D-Glucose-D-Fructose-Maltose-L-Rhanose-sucrose and other amino acid and experimented against of several Gram(+) and Gram(-) bacteria.

AERB/RAARHC/2018/072

Radioisotopes for Management of Brachytherapy

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ABSTRACT

Brachytherapy (sometimes referred to as curietherapy or endocurietherapy) is a term used to describe the short distance treatment of cancer with radiation from small, encapsulated radionuclide sources. This type of treatment is given by placing sources directly into or near the volume to be treated. The dose is then delivered continuously, either over a short period of time (temporary implants) or over the lifetime of the source to a complete decay (permanent implants). Most common brachytherapy sources emit photons however; in a few specialized situations neutron emitting sources are used. Intracavitary, in which the sources are placed in body cavities close to the tumour volume, Interstitial in which the sources are implanted within the tumour volume Intracavitary treatments are always temporary, of short duration, while interstitial treatments may be temporary or permanent. Temporary implants are inserted using either manual or remote after loading procedures. Other, less common forms of brachytherapy treatments include surface plaque, intra-luminal, intraoperative and intravascular source applications; for these treatments either a or b emitting sources are used.

Keywords:- Brachytherapy,Tumour,intra-luminal,intravascular.

AERB/RAARHC/2018/073

Radioactive Iodine in the Treatment of Thyroid Cancer: An Overview

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ABSTRACT

Thyroid cancer represents a spectrum of biological and molecular activity. This makes metastatic thyroid cancer challenging to manage. In advanced rapidly progressive thyroid cancer new agents and multimodality care represent promising therapeutic options for patients. The present paper reviews the use of radioisotopes in the treatment of thyroid cancer

Keywords: Radio-isotopes, Medicine, Thyroid cancer

AERB/RAARHC/2018/074

Pharmacometabolomics in Drug Discovery: Role and Importance

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ABSTRACT

Pharmacometabolomics is a field in which stems from metabolomics as well as the quantification and analysis of metabolites produced by the body are studied and also known as pharmacometabonomics. Metabolomics is a novel "omics" platform and powerful tool for the discovery of clinically useful biomarkers and biochemical processes to improve diagnosis and therapy. Pharmacometabolomics is focused on the use of individual metabolic signatures for the prediction and evaluation of drug efficacy and safety, eventually accelerating clinical pharmacology toward personalized drug therapy. It refers to the direct measurement of metabolites in an individual's bodily fluids, in order to predict or evaluate the metabolism of pharmaceutical compounds, and to better understand the pharmacokinetic profile of a drug. It is useful for scientists because of its intrinsic advantages and promising potentials in drug discovery and development. After several years of development, pharmacometabolomics now provide seamless incorporation to various individual steps in drug discovery and development such as Potential of Diagnosis and Biomarker, Drug Target Identification & Validation, ADMET Screening etc.

Keywords: Pharmacometabolomics, Metabolomics, Biomarker, ADMET Screening

AERB/RAARHC/2018/075

Surfactants and Their Pharmaceutical Applications: An Overview

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ABSTRACT

Surfactants or Surface-active agents are substances which at low concentrations adsorb onto the surfaces or interfaces of a system and alter the surface or interfacial free energy and the surface or interfacial tension. Surfactants are the most important chemical products. They have become a subject of research and their production and their use are on the increase. Flocculation, wetting of solids, solubilization and emulsification, bactericidal, dispersion of solid in solution, micellization & detergency are the properties of surfactants. Because of their unique functional properties, surfactants find a wide range of uses in pharmaceutical preparations. These include, depending on the type of product, improving the solubility or stability of a drug in a liquid preparation, stabilizing and modifying the texture of a semisolid preparation, or altering the flow properties of a granulate, thus aiding in the processing of the final tablet dosage form. In addition to their use as excipients to improve the physical and chemical characteristics of the formulation, surfactants may be included to improve the efficacy or bioperformance of the product. Surfactants can alter the thermodynamic activity, solubility, diffusion, disintegration, and dissolution rate of a drug. Surfactants may reduce the effectiveness of antimicrobials or preservatives included in a formulation. Surfactants are most widely used in molecular biology. The overall effect of inclusion of a surfactant in a pharmaceutical formulation is complex and may be beyond those initially intended.

Keywords: Flocculation, micellization, excipients, bioperformance

AERB/RAARHC/2018/076

Family of Flowering Plant: Brassicaceae or Cruciferae A Review

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ABSTRACT

Brassicaceae or Cruciferae, commonly known as the mustards, the crucifers, or the cabbage family is a medium-sized and economically important family of flowering plants. It includes about 300 genus and about 3700 species. Brassicaceae can be found almost on the entire land surface of the planet, but it is absent from Antarctica, and in some areas in the tropics i.e. north-eastern Brazil, the Congo basin, Maritime Southeast Asia and tropical Australasia. This family has a genetic self-incompatibility system (sporophytic type). It is used economically as a crop, ornamental, weedy and pest species. The plants belongs to this family has various medicinal uses also such as *Nasturtium indica* seeds are used for treating asthma, *Eruca sativa* oil extracted from the plant is used for treating burns etc.

AERB/RAARHC/2018/077

Modulation of Intestinal Transporters Activity by Excipients in Drug Disposition

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ABSTRACT

The transport proteins present in the intestine are one of the major factors influencing oral drug bioavailability, particularly for the drugs that undergo absorption by active transport mechanism. Apart from the active pharmacologically active agents, many of the added excipients in formulation are reported to modulate the activity of these protein transporters either by enhancing or decreasing the drug absorption and its systemic bioavailability. Even though these excipients are considered pharmacologically "inert" and have been used in pharmaceutical formulations for several years had affected the drug disposition by altering the transporters activity. Now a day there is an appreciable interest had been developed on the data showing the role of excipients in altering the drug absorption across the intestine. A proper selection of excipient can enhance the drug bioavailability and thus its therapeutic efficacy without increasing its dose. Similarly for locally acting drugs having systemic side effects can be reduced by a proper excipient by decreasing its systemic absorption. This work is focused on the current findings of the excipients identified to modulate the activity of transporters, their mechanism of modulating the transporter's activity and various formulation strategies using these excipients to enhance drug absorption.

Key words: Transporters, drug transport, excipients, bioavailability, absorption.

AERB/RAARHC/2018/078

Development and Evaluation of Novel Dry Powder Inhaler Device

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ABSTRACT

Dry powder inhalers (DPIs) are devices through which an active drug is delivered as a dry powder formulation for local or systemic effect via the pulmonary route. An ideal DPI should be a device, which is simple to use, cost effective, convenient to carry, sufficient moisture protection, accurate and uniform dose delivery, deliver optimal drug particle size, and high fine particle fraction (FPF) and low flow rate dependency. There are over 20 different DPI devices, single or multiple dose devices, breath activated and power driven, available in the market. However, these devices have significant limitations. This study was focused on designing, developing and validating a novel in house DPI. The result shows that *in vitro* performance was better to that of the reference product. The *in vitro* deposition studies indicated that the device geometry have a significant effect on aerosol dispersion performance. Our DPI prototype has improved aerosolization performance without significant increases in device resistance.

Key Words: Dry powder Inhaler, aerosol, pulmonary delivery, salbutamol, particle fraction

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Hepato-protective Activity of Methanolic Extract of *Persea americana* *L*eaves in Albino Rats

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ABSTRACT

The present study aimed to determine the hepatoprotective activity of a methanolic extract of *Persea americana leaves* using CCl_4 induced hepatotoxicity. Ten groups of rats (n=6) were given orally administration of 10% dimethyl sulfoxide (negative control), 200 mg/kg silymarin (positive control), or *Persea americana leaves* (50, 250, or 500 mg/kg) daily for seven days followed by induction of hepatotoxicity using carbon tetrachloride. Blood samples and livers were collected for biochemical and microscopic analysis. Based on the results obtained, *P. americana leaves* extracts exhibited a significant ($p < 0.05$) hepatoprotective activity against inducer, as indicated by an improvement in the liver function test. These findings were correlated with the histopathological studies. In conclusion, *P. americana leaves* possessed hepatoprotective activity, which could be due to phytochemical constituents and antioxidant activity.

Keywords: *Persea americana,* CCl_4, Hepatoprotective

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