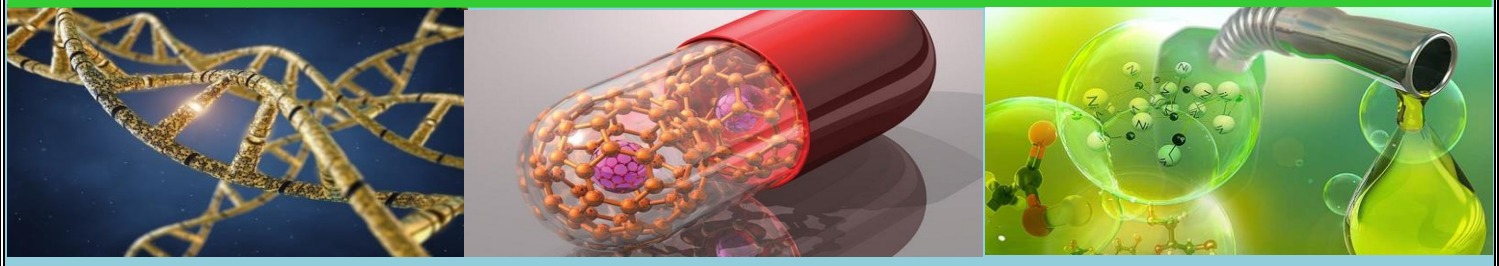
ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020

International Conference on Recent Trends in Bionanotechnology, Energy and Environment

(ICBEE 2020)



ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020 ICBEE'2020

Organised by

School of Life Sciences

B. S. Abdur Rahman
Crescent Institute of Science and Technology,
Chennai, India
&
Thassim Beevi Abdul Kader College for Women
Kilakarai, India

In association with

University of Missouri, USA

Supported By

Tamil Nadu State Council for Science and Technology

INTERNATIONAL CONFERENCE ON RECENT TRENDS IN BIONANOTECHNOLOGY, ENERGY AND ENVIRONMENT (ICBEE 2020)

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Contents

Preamble

The aim of this conference is to discuss on applications of bionanotechnology, energy and environemntwhich are going to impact the world in the upcoming years. This conference is intended to discuss current and future technical strategies and to explore the areas of potential applications during the foreseeable future. In addition to the applications of technologies, this conference *talks, presentations are focused to* update the international researchers and student community in recent trends in biotechnology.

However, at all time researchers and students are facing these critical questions: are Nanotechnology and biotechnology can be applied to solve the societal problems? What about the technology transfer aspects? how should we manage? Is there any financial support available to protect IPR?Is there any cost-effective bioremediation strategies? How to increase the oxygen availability and to reduce pollutants in urban and industrial areas?

To throw light on these questions, the School of Life Sciences at B.S Abdur Rahman Crescent Institute of Science and Technology, Chennai has organized a consensus **International conference onrecent trends in Bio nanotechnology, Energy and Environment (ICBEE 2020) is organized** on 18-19, February, 2020 in association with University of Missouri, USA and ThassimBeevi Abdul Khader College for women, Kilakarai and sponsored by Tamilnadu State Council for Science and Technology (TANSCST) at B.S Abdur Rahman Crescent Institute of Science and Technology premises.

The main objective of the conference will be to gather leading scientists, clinicians, academicians, entrepreneurs, scholars and students who are engaged actively in various aspects of biotechnology and Nanotechnology under one roof to discuss and dissipate knowledge to the aspiring student and research community. During Conference presentations up-to date research findings will be presented and receive feedback from colleagues belonging to different strata of scientific community. This will surely help in the enrichment of interdisciplinary knowledge in bionanotechnology, energy and environment.

Message from the Organizing Secretary

B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956
GST Road, Vandalur, Chennai 600 048

Dr. S. Hemalatha
Professor and Dean, School of Life Sciences,
Organizing Secretary, ICBEE-2020

Message

On behalf of the organizing committee and the School of Life Sciences, B.S Abdur Rahman Crescent Institute of Science and Technology, it is our pleasure to warmly welcome you to ICBEE 2020. This TANSCST sponsored "**International conference on recent trends in Bionanotechnology, Energy and Environment (ICBEE 2020) is organized** on 18-19, February, 2020 in association with University of Missouri, USA and ThassimBeevi Abdul Khader College for women, Kilakarai. This conference is intended specifically for biologists, nanotechnologists, environmental engineers and scientists, clinicians, pharmacists, educators and other health care professionals, basic science researchers, research scholars, academicians, entrepreneurs, drug manufactures and students.

Bionanotechnology is an interdisciplinary field and widely applied in all fields of science and Technology. The emergence of new technologies in energy production, biofuel, environmental pollution, bioremediation and waste management are helping the community. This conference is intended to connect with compatible colleagues from the scientific community to share the scientific advancement and will provide comprehensive updates, education, and information on current and emerging areas of biotechnology and the challenges ahead for researchers. This scientific gathering will serve as a platform to exchange the research ideas and to establish collaborations between the research groups and industries.

I take this opportunity to acknowledge Tamilnadu State Council for Science and Technology (TANSCST) for the financial assistance. I also extend my gratitude to the management for supporting the conference. I thank all the sponsors for providing support. I also thank all the delegates and I am confident that this conference would be a rewarding experience for all the participants.

Organizing Secretary, ICBEE 2020

Messages from the Pro Vice Chancellor

Dr. A. Peer Mohamed
Pro Vice Chancellor

B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956
Vandalur, Chennai, INDIA
ACCREDITED WITH "A" GRADE BY NAAC

MESSAGE

Biotechnology in Textile Processing is an essential resource for scientists and practitioners from the point of view of environment protection. Enzymes from living organisms are used in different chemical processes. Bio applications include implantable devices such as surgical sutures, hernia repair fabrics, arterial grafts, artificial skin, etc. As it is a fast growing area, it is right time that the students and scholars are exposed to biotechnological applications.

I congratulate the School of Life Sciences for organizing this "**International conference on recent trends in Bio nanotechnology, Energy and Environment (ICBEE 2020)** on 18-19, February, 2020 in association with University of Missouri, USA and Thassim Beevi Abdul Khader College for women, Kilakarai, supported by Tamilnadu State Council for Science and Technology.

I hope this conference will be the perfect platform where delegates from different institutions will be able to explore the recent trends in biotechnology, energy and environment.

I convey my best wishes to the delegates of this conference.

PRO VICE CHANCELLOR

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Messages from the Registrar

Dr. A. Azad
REGISTRAR

B.S. Abdur Rahman Crescent Institute of Science & Technology
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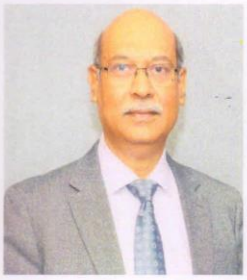

Message

Nanodevices and systems are applied in cancer diagnostics, disease therapeutics, and personalized medicine. Greater innovation and product development are required in research and development in all areas of biology to protect our environment and to produce green energy.

I appreciate the efforts taken by the School of Life Sciences for organizing this "**International conference on recent trends in Bio nanotechnology, Energy and Environment (ICBEE 2020) is organized** on 18-19, February, 2020 in association with University of Missouri, USA and Thassim Beevi Abdul Khader College for women, Kilakarai, sponsored by Tamilnadu State Council for Science and Technology. This conference will be useful to physical scientists, engineers and non-scientists to biological systems and terminology relevant to nanotechnology and current applications and new developments in bionanotechnology.

I am sure that this conference will be the perfect milieu where researchers from different institutions will be able to explore the recent trends in biotechnology and nanotechnology and work towards improving the quality of human life by creating healthy environment.

I convey my best wishes and support to all the participants of this conference.

Registrar

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Messages from the Principal of TBAKCW

THASSIM BEEVI ABDUL KADER COLLEGE FOR WOMEN
An Autonomous Institution, Affiliated to Alagappa University, Karaikudi
Sponsored by Seethakathi Trust, Chennai. Re-accredited by NAAC, ISO 9001-2008 Certified Institution
Kilakarai - 623 517, Ramanathapuram District, Tamil Nadu

Dr. S. SUMAYAA
Principal

MESSAGE

Dear Dr Hemalatha,

Greetings from TBAKCW!

I am happy that the ICBEE2020 supported by Tamilnadu State council for Science and Technology scheduled on 18th & 19th February 2020 will be an eye opener for Researchers, Students and Academicians to share their knowledge and experience to innovate new technology and products for Human welfare. The concern for energy and environment to develop new ideas, to preserve our traditional practices and approaches to preserve our mother EARTH for our progeny to live, cherish, preserve, conserve the best of everything what we have enjoyed in our childhood and to giveback once again without harming our Mother Nature! The time has come to realise the faults we have committed to our Environment and let us not dwell deeper to exploit further. It is our responsibility to preserve the best of what we have today to pass on to our Future Generation.

This two day International conference will be a mind boggling exercise to the participants and to take home exercises to work on to bring out innovations for better human excellence for peaceful Living on this Globe!

Wishing the Organisers and Participants a grand successful outcome!

Regards and wishes,

17.02.2020

17.2.2020

(Dr. SUMAYAA)
Principal
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ABSTRACTS:

INVITED LECTURES

Ref: ICBEE/I/1

Natural Derived Biopolymers for Biomedical Applications

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Utilization of natural derived polysaccharides have been increased from last seven decades and extensively studied for various biological and biomedical applications, including tissue engineering, drug delivery, and biosensor areas. Chitosan is a cationic polysaccharide and commonly derived from chitin, which is isolated from crustacean's shells with the different chemical process. Tissue Engineering is an emerging field of research with aims to develop an artificial tissue which can be used to repair or regenerate the defective tissues. The combination of biomaterials, cells and growth factors plays a major role in the construction of any tissue or organs. Bone is highly structured hierarchical tissue and construction of artificial bone can be made by the combination of ceramics and biopolymer. Chitosan with bioceramics is widely studied combination for bone tissue construction. Different kinds of composites, chitosan-polymer, chitosan-protein, chitosan-ceramics, and chitosan-growth factors have been studied extensively to construct the bone tissue. The study results showed that increases the physical and chemical properties such as porosity, water uptake and retention ability, pore size, controlled biodegradation, and superior in mechanical strength. *In vitro* study results recommend that composites showed better cell adhesion, cell proliferation, good biocompatibility, non-toxic, increases alkaline phosphatase activity, improved mineralization and excellent in osteogenic differentiation with mesenchymal stem cells. *In vivo* studies infer that early bone formation was observed with chitosan-based composite's materials. Henceforth, chitosan-based composites will be promising biomaterials to full fill the clinical requirement of bone-related issues and alternatives for autograft and allograft treatments.

Ref: ICBEE/I/2

Micro algae technology for industrial effluent treatment and restoration of polluted water bodies

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Phycoremediation is defined as the use of either macro-algae or micro-algae for the removal or biotransformation of pollutants, including nutrients and xenobiotics from wastewater. Wastewater Treatment using Micro-Algae has a variety of advantages over conventional systems. Phycospectrum Environmental Research Centre (PERC), Chennai, India, has been developing and implementing this technology in various industries in India and abroad for the past two decades. World's First large scale Phycoremediation plant was installed in 2006 by PERC at SNAP Industry, Tamil Nadu, India, which is handling high TDS effluent with a zero discharge. Right from correcting pH, colour removal, odour removal, removal of nutrients, reduction of BOD and COD and sludge reduction algae technology can help avoiding chemicals and improve the existing ETPs saving energy, chemicals and cost of operation and finally saving the environment. PERC, Chennai, has implemented this technology in a variety of industrial ETPs in India and abroad. PERC has successfully completed three major projects in Colombia and recently demonstrated the efficiency of algae based technology in restoration of a polluted drain in Barranquilla, Colombia and in restoration of polluted lakes in UP and Rajasthan, India. PERC is also taking up one of the projects in cleaning a drain in UP as part of National Mission for Clean Ganga programme in collaboration with a Delhi based organization. Valuable biomass generated through phycoremediation can be an excellent feedstock for bio-gas, bio-fuels, bio-fertilizers etc. based on the quality of biomass generated.

Ref: ICBEE/I/3

Coastal Waste for Economic Empowerment

Sundaram Ravikumar
Alagappa University, Karaikudi

Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It also offers solutions for recycling items that do not belong to garbage or trash. As long as people have been living in settlements and residential areas, garbage or solid waste has been an issue. There are 6 Main types of Solid Waste Management viz., Municipal Solid Waste (MSW), Hazardous Wastes, Industrial Wastes, Agricultural Wastes, Bio-Medical Wastes. Seven principles have been widely practiced in solid waste management which includes waste minimization; iincineration waste hierarchy, life-cycle of a product, resource efficiency, polluter-pays principle, modern era, waste handling practices; landfill and incineration are the seven principles of solid waste management. The most important reason for waste collection is the protection of the environment and the health of the population. Reducing solid waste is reducing the amount of trash that goes to landfills. Reduce; Reuse and Recycle are most common methods to reduce landfill waste.

Landfill waste poses a huge problem as it has economic and environmental impact and secondly, due to slow decomposition rate which takes thousands of years. While all of us probably believe that recycling and reusing things is a good thing, it's a question of whether or not we actually carry it out.Polluted air and water have a negative effect on the health of humans, animals and marine life.

Seagrasses are named as ecosystem engineers because they partly create their own habitat. The leaves slow down the water currents and increase the sedimentation process. The seagrass species of *Syringodiumisoetifolium* and *Cymodoceaserrulata*along the Palk Strait region have been disturbed by human activities, wave action, tide and water currents. These factors enhanced the accumulation of huge quantity of seagrass biowastes on the seashore of Thondi coastal area. Hence, the present study has been made to utilise the seagrass biowastes for the development of eco-friendly biofertilizers. Thondi area is rich in seagrass biodiversity and hence it was selected for the present study. Fresh and semi decomposed mixed seagrass species of *Cymodoceaserrulata*and*Syringodiumisoetifolium*were collected from the sea shore area along the Palk Strait of Thondi region. Further, species level identification of earthworm was carried out by present study by following molecular methods of identification. It is concluded from the present study that, the saline tolerant earthworm species of *Pontodriluslitoralis* RKAUEW1 from the Palk Strait of Thondi Coast could be effectively used for the preparation of seagrass compost for the organic farming of economically important agricultural crop plants so as to enable to utilise the seagrass biowastes there by reduce the pollution caused by the chemical fertilizers used for the agriculture purpose.

Ref: ICBEE/I/4

Bamboo as Bio-Energy Plantation

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Bioenergy is a renewable energy produced from natural sources such as energy crops, biomass, bio-waste, algae, sea weeds and aquatic plants. Sun is the basic source of energy which is captured by living organisms by the process of photosynthesis and stored into complex carbon molecules as Biomass. The biomass is convertible into different forms of energy such as heat, electricity, gas, oil and hydrogen which are low in carbon emission and best solution for climate change mitigation. Among plants, bamboo is the fastest growing and the Beema bamboo is the best among the bamboo which is capable of harnessing the sun energy to an extent of 400 to 500 million K.cal/hectare/year. Bamboo is coming up as "Energy Plantation" in different parts of the World to replace the energy from fossil fuel in industries such as power generation, cement factories, Bio-Fuel generation such as Bio-CNG, Bio-Ethanol, Bio-Petrol & Bio-Diesel. Many industry level projects have come up in India and abroad utilising Bio-Ethanol from bamboo and the sector is fast growing. Bioenergy is the best sustainable, cost effective and permanent solution for climate change adaptation.

Keywords: Bioenergy, Bamboo, Beema, Energy Plantation

Ref: ICBEE/I/5

Mariculture Development in India: An overview

Jayakumar, R., AbdulNazar, A.K*., Tamilmani, Sakthivel, M., G., Johnson, B., Anikuttan, K.K., Rameshkumar, P. and Sankar. M.

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Mariculture is the fastest growing sector in the world, which involves breeding and rearing of aquatic plants and animals in enclosures/confinements, has increased mainly due to over exploitation of aquatic resources and declining of marine fish catches in major traditional fishing grounds at a global level. Mariculture is also an emerging branch in the Indian aquaculture which has ample scope for further development as a diversification strategy from the conventional aquaculture practices, in view of the risks and recent setbacks associated with shrimp farming which is generally considered as the most lucrative segment of the Indian aquaculture scenario. Cage culture is a type of aquaculture wherein the farming of fish or shell fish is carried out in specially designed enclosures, called cages.Marine finfish farming in sea cages as well as in coastal earthen ponds/enclosures is gradually being taken up in many maritime states of India. Variety of commercially important marine fishes including, Cobia (*Rachycentroncanadum*), Asian Seabass (*Latescalcarifer*), Snappers (*Lutjanus* sp.), Carangids (*Trachinotus* sp.) and Groupers (*Epinephelus* sp.) are highly suitable for cage farming and coastal mariculture in ponds. The Central Marine Fisheries Research Institute (CMFRI) has developed and standardized technologies for breeding, seed production and farming of many high value marine food fishes, ornamental fishes and shellfishes.

Ref: ICBEE/I/6

Islet Surface Modification with BissulfosuccinimidylSuberate: A Novel Approach

Jagan Kalivarthan

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Hume Lee Transplant Center, VCU Health System, Richmond, VA, USA

Localized delivery of anti-inflammatory and immunomodulatory molecules is of major focus in the area of islet transplantation regardless of the transplant site. This is due to the deleterious side effects of systemic administration of these molecules. Bissulfosuccinimidylsuberate (BS3) is a crosslinker widely used in biological research for crosslinking proteins and also extracellular surface. BS3 is a homobifunctional molecule that has 2 NHS ester on either sides. BS3 will bind to free amines on the surface of the islets with one of the NHS ester arms, and the second NHS ester arm can be used to immobilize drugs using an Amine-PEG-conjugate. Here we have evaluated the surface conjugation potential of BS3 which may be used to immobilize drugs onto the surface of the islets for local delivery at the graft microenvironment. This study is a proof-of concept showing capability of local immobilization of bioactive molecules on the surface of islets.

Researchgrade human islets were used in the study. Islets cells were cultured in prodo standard culture media at 37 ℃ and 5%CO_2 for at least 24hrs to recover from isolation damage. Approximately 2000IEQ islet cells was used per group in a total of 9 groups. The conjugation of BS3 on islets was tested in two different concentration (1mM and 5mM). To confirm efficient surface conjugation and to visualize coverage we have utilized an Amine-PEG-Biotin conjugate. After conjugation of BS3 and amine-PEG-Biotin on islet surface, the cells were cultured for a period of 7 days and visualization of conjugation and viability determination was performed on day0, day1, day4 and day7. Functional testing of islets by glucose-stimulated insulin secretion (GSIS) was performed on day2. For visualization of BS3 and amine-PEG-Biotin conjugation on islet surface, streptavidin FITC was used. The modification of islets with BS3 was found to be exceptionally biocompatible.The viability and functional integrity of islets was not altered at 1mM BS3, but viability was depreciated at 5mM BS3. However, improved conjugation of islet surface and good coverage was noted in 5mM BS3 group. The surface modification was maintained for all 7 days tested with minimal loss of coverage. Surface modification of islets with BS3 is safe and tolerable approach that may be used for localized drug delivery strategies.The advantage of this strategy is delivery of bioactive molecules such as anti-inflammatory and immunomodulatory nano-drugs locally in the islet transplant microenvironment.This approach opens new opportunities for localized immunoprotection of pancreatic islets and other allogeneic cell therapies in the future.

ABSTRACTS:

ORAL/POSTER

PRESENTATIONS

Ref: ICBEE/1

Efficacy of Cinnamon Essential Oil Loaded Liposomal Coating for Post-Harvest Management of Apples (*Malus domestica)*

Anushka Mitra, S. Periyar Selvam and Sabah Shehabudheen

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Apples are highly demanded fruits because of their nutritional values and appearance. However, its delicate tissue and high sugar content makes it highly perishable. The aim of this study was to develop and characterize CEO loaded liposomes as an edible coating material and test its efficacy in shelf life extension and maintaining quality parameters of 'Red Delicious' apples. Liposomes were prepared using sunflowerlecithin; cinnamon essential oil and tocopherol acetate employing thin film hydration method. Liposomes were characterized for their size, morphology and zeta potential. Liposomes exhibited unilamellar and spherical shaped vesicles ranging from 70 – 800nm in size.The physiological weight loss, firmness,pH and total phenolics of the samples were analyzedto assess fruit quality during 15 days at 28±2ºC of storage. Liposomal coating was found to be significantly more effective in maintaining the lower change in pH (3.8), greater firmness (94.26 N) andhigher total phenolic content (13.25 GAE/g)during storage. It was observed that coated samples showed minimum changes in color, very less weight loss and almost nil fungal growth in comparison with un-coated samples. The results suggest liposomal coating useful for extending the shelf life and maintaining quality of apple fruits.

Keywords: Apples; shelf life;liposomes; edible coating;unilamellar

Ref: ICBEE/2

Improvement of pancreatic β- cell function in streptozotocin induced diabetic Wistar rats treated with *Aloe vera* extract

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Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycaemiaand has become health concern worldwide. Defect in pancreatic-beta cell mass or its function results either diminished secretion of insulin or dysfunctional insulin. Therefore, restoring beta cell mass and its function is of vital importance for effective therapeutic strategies. A number of plants are being used for the treatment of diabetes.

Aloe vera (*Aloe barbadensis* Miller) has been traditionally used to treat several diseases. In our study, we observed that in Streptozotocin (STZ) induced diabetic Wistar rats fed with *Aloe vera* (300 mg/kg bw), showed antidiabetic effect by alleviating fasting plasma glucose levels with concomitant increase in insulin levels.The results also showed significant decrease in plasma parameters. Morphometric analysis of pancreatic sections revealed quantitative and qualitative restoration of the pancreatic islets of diabetic rats treated with *Aloe vera* extract with benefits observed in liver and small intestine.

The results suggest that *Aloe vera* extract exerts antidiabetic effects by improving insulin secretion and pancreatic β-cell function by restoring pancreatic islet mass in diabetic rats. Further clinical studies are required to establish its clinical utility to substantiate the use of *Aloe vera* extract as nutraceutical supplement for diabetes.

Ref: ICBEE/3

*Aloe vera*gel extract suppresses inflammatory response through scavenging of oxidative stress and inhibition ofpro-inflammatory cytokines

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Aloe vera(*Aloe barbadensis miller*) is an immemorial plant which has been known for centuries for its benefits in health, beauty, medicinal and skin care.Most of the *in vitro*and*in vivo* studies have been reported individually related to either antioxidant activityor the anti-inflammatory activityof*Aloe vera* gel extract. To extend and correlate these findings we have assessedtheantioxidant& anti-inflammatory potential oftheextract.

In vitro free radical scavenging activity of *Aloe vera* gel extract was evaluated by ABTS, DPPH, hydrogen peroxide and metal chelating activity. *in vitro* studies of the extract was tested on RAW 264.7 cells and *in vivo* studies were carried on male Wistar rats through injection of Freund's adjuvant in the hind paw.

*Aloe vera*gelextract showed significant antioxidant activity against free radicals in a concentration dependent manner. Oral administration of *Aloe vera* gel extract showed potent *in vivo*anti-oxidant and anti-inflammatory activity against Freund's adjuvant induced paw edema in rats with reductionof inflammatory markers and increase of anti-oxidant enzymes These results indicate that *Aloe vera* gel extract is able to exert anti-inflammatory potential through synergetic effect with decrease in pro-inflammatory cytokine levels and increase in anti-oxidant enzyme levels.

Ref: ICBEE/4

Effect of Peptide/Polypeptide Fraction of *Aloe Barbadensis*Miller on Inflammatory Markers

Spoorthy N Babu, Ayesha Noor

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*Aloe barbadensis*Miller (*Aloe vera)* has been used for treatment of various diseases and disorders. The ethno-pharmacological evidence suggest that the plant has various therapeutic properties such as anti-diabetic, anti-inflammatory, anti-cancer, anti-oxidant, immuno-modulation etc. The properties have been linked to the presence of phyto-constituents present in the gel such as sugars, peptides/polypeptides, polyphenols, sterols etc.

Peptides or polypeptides are one of the bioactive constituents present in *Aloe vera* considered to have anti-inflammatory property. There are few reports available on the anti-inflammatory potential of peptides. Hence, the study was aimed to evaluate the anti-inflammatory potential of peptide/polypeptide fraction of *Aloe vera* through *in vitro* and *in vivo* studies.

The anti-inflammatory property of peptide/polypeptidefraction was tested through protein denaturation, membrane stabilization assays. The fraction was tested on RAW 264.7 cells*invitro*and*in vivo* studies were carried on male Wistar rats through injection of Freund's adjuvant in the hind paw.

The peptide/polypeptide fraction extract was able to reduce the levels of pro-inflammatory markers and mediators in both *in vitro* and *in vivo* studies.The results indicate that the peptide/polypeptide fraction of *Aloe vera* has anti-inflammatory property through inhibition of inflammatory markers and mediators responsible for NF-κB, mitogen-activated protein kinase pathways.

Ref: ICBEE/5

Silver Prussian Blue Nanomedicine for Future Cancer Therapy

Sudip Mukherjee,ShaguftaHaque,Rajesh Kotcherlakota,Sourav Das, SakethNuthi, Dwaipayan Bhattacharya, KunchaMadhusudana, Sumana Chakravarty, Ramakrishna Sistla,Chitta Ranjan Patra

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In the present study, we design and develop a simple, quick, practical, reasonable and eco-friendlyprocess for the fabrication of PVP [poly(N-vinyl-2-pyrrolidone)]-stabilized silver prussian blue analogue nanoparticles abbreviated as SPBANPs using prussian blue (FDA approved) and silver nitrate[1-2].Various physicochemical techniques were employed for the characterization of the as-synthesized nanoparticles along with stability. The nanoparticlesdisplayedsubstantial inhibition features when applied to cancer cells (B16F10, A549, MCF-7 and SK-OV-3). The nanoparticles without any anti-cancer drugs on being injected intraperitonially in the aggressive murine melanoma model: B16F10 (C57BL6/J mouse) exhibited comparative inhibition of tumor growth with respect to control. In addition to the anti-cancer activity, the SPBANPs displayed admirable antibacterial activity in various Gram-negative (*E. coli*, *K. pneumonia* and *P. aeruginosa*) and Gram-positive (*B. subtilis*) bacteria. The beauty of this new nanoparticle is that it itself works as a drug delivery vehicle, anti-cancer as well as an anti-bacterial agent. All the performed *in vitro* and *in vivo* experiments togetherdemonstrate that this biocompatible nanoformulation (SPBANPs) devoid of any anti-cancer drug or anti-biotic could be explored for the development as a multifunctional therapeutic agent (2-in-1) for the treatment of cancer and bacterial infections in the future.

Ref: ICBEE/6

Synthesis, characterization and *in vitro* cytotoxicity studies of macromolecular-graphene oxide conjugate of marine green algae bearing mannose as targeting ligand

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Glioblastoma is the most malignant and highly aggressive brain tumor. In this study, a novel mannose mediated targeted drug delivery system was synthesized by combining marine green algae ulvanlactua as anticancer model drug to the graphene oxide. Firstly graphene oxide was synthesized by hummer's method in order to obtain a more precise drug delivery it was functionalized by chitosan decorated with mannose (GO-CS-Ma) for targeting glioblastoma cancer. The chitosan functionalized graphene oxide (GO-CS) was characterized for its physiochemical properties by Ultraviolet spectroscopy, Fourier Transform Infrared Spectroscopy (FT-IR), X-Ray Diffraction (XRD), X-Ray photoelectron spectroscopy (XPS), and Raman analysis. The surface morphological study was carried out through Scanning electron microscopy (SEM), Transmission electron microscopy (TEM) and Atomic force microscopy (AFM).The entrapment of ulvan on GO-CS-Ma has been observed to be 92%. The biocompatibility of the nanocarrier and drug loaded nanocarrier was studied via hemolysis. The*invitro* drug release profile of ulvan showed a pH dependent drug release system observed by UV-Visible analysis. Moreover, a preliminary *invitro* proliferative studies was examined using U 87 cell line *in- vitro*. Finally, mannose decorated GO-CS carrier loaded with ulvan demonstrated to be a promising targeted drug delivery system for glioblastoma cancer treatment.

Key words: Graphene oxide, Chitosan, Mannose, Glioblastoma, Targeted drug delivery

Ref: ICBEE/7

Green synthesis of silver nanoparticles from mangrove plant *Rhizophorastylosa*and its characterization and antibacterial activity.

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The green synthesis of nano-sized particles with specific functions is of great significance in the present bionanotechnology. In this study, the biosynthesis of silver nanoparticles (AgNPs) from the aqueous leaf extractof*Rhizophorastylosa*, mangrove plantfrom southern India, and its activity against some bacterial pathogens are reported for the first time. A green procedure for the synthesis of AgNPs using the mangrove extract as reducing agent was used. Synthesized AgNPs were investigated using UV–visible spectrophotometry, transmission electron microscopy (TEM), Scanning electron microscope (SEM), X-ray diffraction (XRD)and Fourier transform infrared (FTIR) spectroscopy. The biosynthesized AgNPs were characterized byUV–visible spectrophotometry at a wavelength of 422 nm confirmed the synthesis of AgNPs. The results from the XRD analysis approved the formation of crystalline AgNPs with crystallinity percentage of 85.87. As shown by TEM evaluation, AgNPs had the same spherical morphology. The size of the biosynthesized AgNPs was between 1 and 78 nm with average size of 38.62 nm. SEM images identified silver nanoparticles ranging in size from 10 to 19 nm. Results of EDS showed the existence of carbon, silver, oxygen and chlorine in the nanoparticles synthesized from the leaf extract of R. *stylosa*. FTIR analysis distinguished different functional groups such as aromatic loops, alcohol, phenol group, alkanes and alkyl halides in the biosynthesis process. The antibacterial activity of the green synthesized silver nanoparticles against bacterial strains such as *Escherichia coli, Staphylococcus aureus, Bacillus subtilis, Klebseillapneumoniae*using well diffusion method. The results of antimicrobial activity by the well diffusion assay also clearly expressed that test extract have high concentration of active principles.The mangrove Rhizophora*stylosa* extract was found to be a suitable reducing agent for biosynthesis of AgNPs with approved antibacterial activity.

Keywords - Silver nanoparticles, Mangrove plant, *Rhizophorastylosa,* Characterization and Antibacterial activity.

Ref: ICBEE/8

Changes in Cell Wall Architecture in Cadmium and Zinc Tolerant Scenedesmus *rotundus.*

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Heavy metals are considered to be a one of the major environmental problem causing harmful effects on human life. Heavy metals are exposed to the environment through various outlets both from industry and domestic waste water. Micro algae being the first primitive organism in the web cycle are prompt for the exposed contamination. Many algae growing in metal polluted environment display an ability to tolerate high concentration of metals.The cell wall being at the interface, between the system and surrounding, provides a protective barrier to reduce the entry of the metal into the system. Most studies related to selective adsorption of metal ions to the cell wall have investigated adsorption of metals to dead algal biomass. Studies pertaining to uptake of metals by living cells and subsequent internalization are meagre.This abilityof microalgae for the survival is generally conferred by activation of various defence mechanism.The present study is aimed at understanding the effect of threshold concentration of Cadmium (0.04mM) and Zinc (0.2mM) on *Scenedesmus rotundus* isolated from Petroleum effluent. The tolerant level was of the isolated algae to the elevated level of Cadmium and zinc was determined based on the growth measurement and pigment content. The significant increase and decrease in chlorophyll and protein content indicates the fluctuation in the metabolic rate and adaptation to the change in environment. Thechanges in the structure of the cell wall was studied usingscanning electron microscopy for the determination of morphological changes.

Keywords: Microalgae, Heavy metal Stress, *Scenedesmus rotundus,* Cadmium, Zinc, Cell Wall, scanning electron microscopy.

Ref: ICBEE/9

Biodiversity and Production of Lovastatin from Endophytic Fungi Isolated from Selected Medicinal Plants in and Around Sathyamangalam

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Lovastatin is an effective anticholestrol and anticancer drug which is the potent inhibitor of HMG CoA reductase in the cholesterol synthesis pathway. It has huge demand due to its wide applications in medicine and pharma. Endophytic fungi are the best biological source for the production of lovastatin compared to traditional methods. In this study endophytic fungi isolated from *Euphorbia hirta (*L) was analyzed for biodiversity studies and production was optimized using Response surface method. Further the product was characterized by UV and HPLC.

Keywords: Biodiversity, Lovastatin, *Euphorbia hirta (*L), UV, HPLC

Ref: ICBEE/10

Evaluation of the quality of fish fillets at different storage temperatures: by use of FTIR spectroscopy and sensory evaluation

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Recently growing awareness regarding food safety and quality assessment of fish products plays a vital role in temperature control during supply chain which closely relates with health of consumers. The objective of this study was to evaluate the spectral distribution of compositional groups at different storage temperatures such as ambient temperature (28ºC±2ºC, fresh), refrigeration (5ºC ±2ºC,72 hours), and freezing (-18ºC ±-2ºC,72 hours) by FTIR spectroscopy. The selected variety belong to Scrombroid family i.e. *Scomberomorusguttatus* (Seer fish) and *Rastrelligerkanagurta* (Indian mackerel). The changes in proximate analysis was also studied by Standard AOAC. During refrigeration and freezing conditions changes in lipid content and protein content was significantly higher ($P<0.01$). Freshness of fish was determined by sensory evaluation using hedonic scale which concluded that the overall acceptability scores were higher for frozen fillet (8.91 ±0.02) and lower for fresh fillet (6.17 ±0.01) till (7±1 hour) at ambient temperature. The FTIR analysis was performed in ATR mode of operation ranging from 500-4000 cm^{-1} where in fresh samples (n=10) peak was observed in 1078-3280 cm^{-1} whereas in refrigeration temperature 1240-3288 cm^{-1} and freezing 1548-3280 cm^{-1} was observed .From the resultant data obtained it can concluded that FTIR spectroscopy is a rapid non-destructive method to determine the structural changes and spoilage components in fillets and the storage temperature conditions decreases the proximate composition of fish fillets.

Keywords-FTIR spectroscopy, Fish fillets, Proximate analysis, Food safety

Ref: ICBEE/11

Biosynthesis of iron oxide nanoparticles from dates and determination of their antimicrobial activity and cytotoxic potential

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Nanoparticle synthesis using natural biological systems, especially green synthesis has evinced great excitement and interest. Iron oxide nanoparticles were synthesized from different varieties of dates obtained from Bangalore, India. It was demonstrated that ferric chloride when exposed to the extract of dates was reduced in solution, thereby leading to the formation of iron oxide nanoparticles. Phytochemical studies of the extracts obtained from different varieties of dates was also carried out. The synthesized nanoparticles were characterized by UV-VIS spectroscopy, SEM, EDAX, XRD and FTIR methods. The bio-compatibility of the synthesized nanoparticles were tested against human pathogens such as *Staphylococcus* and *Bacillus* by turbidity method. The results reveal that maximum antimicrobial activity was observed against *Bacillus*. The cytotoxic potential of the iron oxide nanoparticles was assessed against the mouse embryo fibroblast 3T3 cell line by MTT assay. The cytotoxic response observed was in a concentration-dependent manner.

Keywords: Dates, Iron Oxide, Nanoparticles, Synthesis, Antimicrobial activity, Cytotoxic potential

Ref: ICBEE/12

Evaluation of the efficacy of anti biofilm, anti oxidant and anti bacterial assays on *Ocimumtenuiflorum* oil nano emulsion

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Nano emulsions are nano-sized emulsions, which are made for improving the delivery of active pharmaceutical ingredients. These are the thermodynamically relentless isotropic framework where two immiscible fluids are blended to shape a solitary stage by means of emulsifying agents, i.e., surfactant and co-surfactant. In this study, the extracts of essential oils from medicinal plant namely, *Ocimumtenuiflorum*(Tulasi) is used, which have antimicrobial, antioxidant, antibiofilm and anti-inflammatory activities. Nanoemulsion was formulated using non-ionic surfactant Tween 80 and ethanol as a dispersion medium by high pressure homogenization method. The physical and mechanical stability tests were carried out. The emulsions were subjected for antibiofilm assays and results were compared to estimate the antibiofilm efficacy of the emulsions. These results proposed for developed plant essential oil based nano emulsion is thermodynamically stable and formulated nano emulsion will be used in producing organic mouth wash and various biomedical, textile and food industry applications.

Keywords: Nano emulsion, emulsifying agents, Tween 20, homogenization, organic mouth wash.

Ref: ICBEE/13

Bioremediation of Chromium by Aquatic Plants

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The absorption process is one of the most commonly used biotechnological and eco-friendly methods to remove heavy metals from aqueous solutions. In recent years, various natural products have been investigated as water-purifying absorbents for replacing currently expensive water treatment processes. Such naturally available absorbents can be effectively used in water treatment plant as low cost and environment-friendly absorption agents. Several findings have disclosed that the heavy metals can be absorbedby both living and non-living biomass. Phytoremediation involves the use of plants to remove toxic elements from the environment. Two aquatic species, Hydrilla sp. and Chara sp., were studied as potential phyto removal absorbents for chromium in aqueous solutions. In this work, batch studies were conducted and the uptake of chromium from aqueous solutions were alsoinvestigated. The daily chromium uptakes were recorded, obtained results were analysed and were compared with other aquatic plants. The study revealed that Hydrilla sp. and Charasp.can be successfully used for heavy metal removal.

Keywords: Chromium, Aquatic macrophytes, UV Spectrophotometer, Biotechnology, Clean Environment.

Ref: ICBEE/14

Fabrication of Thymol-loaded Sodium alginate/Poly(2-ethyl-oxazoline)/Chitosan based Semi-interpenetrating Hydrogel for Bone Tissue Engineering

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Self-healing of bone is limited due to bone defects, which demand the external intercession to augment bone repair and regeneration. Bone tissue engineering (BTE) has evolved to accommodate natural and synthetic biomaterials for the designing of bone regenerative scaffolds along with some essential components like osteogenic progenitors, osteoinductive or osteoconductive, and bone-forming factors. It has been shown that the three-dimensional (3-D) hydrogel scaffolds that can serve as a temporary extracellular matrix (ECM) mimicking its architecture and providing a natural environment and being bioactive are sought for bone regeneration. Several phytochemicals have been shown for their stimulatory action to promote osteogenesis. Herein, the present study was aimed to determine the role of Thymol (Thy), a natural monoterpenoid phenol in osteogenesis using a polymeric hydrogel containing sodium alginate (SA) interconnected with poly (2-ethyl oxazoline) (POX) and coated with chitosan (CS). The hydrogel (SA/POX/CS-Thy) was subjected to physicochemical and material characterization studies, followed by cytotoxicity studies. The potential of the hydrogel towards its osteoblast differentiation was determined by cellular level studies. Hence, it appears that the osteo-inductive property of the Thymol loaded hydrogel (SA/POX/CS-Thy) would be beneficial to heal bone-defects in orthopedic applications.

Keywords: Chitosan, Sodium alginate, Bone defect, Thymol.

Ref: ICBEE/15

Evaluation of heavy metals in surface and ground water in Ranipet industrial zone in Tamilnadu, India using HPI model

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Ranipet, an industrial hub located 120 km away from Chennai houses around 250 tanneries besides other industries. Tanneries and Tamilnadu Chromate and Chemicals Limited (TCCL) generated and dumped tons of chromium waste on land and water bodies which is the major threat to the people living in the area for several years. In this study, heavy metal pollution in Ranipet industrial zone was estimated using the Heavy Metal pollution Index (HPI) model along with spatial distribution maps. The level of Cd, Cu, Cr, Pb, Ni and Zn in ground and surface water were measured using standard methods and the results were utilized to make the HPI model. It was observed that the metal level was in the order of Zn>Pb>Ni>Cu>Cr>Cd and Cr>Pb>Zn>Cd>Cu>Ni in ground and surface water respectively. All the ground water samples exhibited high HPI of (>38). Except one sample with low HPI (<19), and three surface water samples held in midrange (19-38) the other surface water samples displayed high HPI of (>38). The average HPI of ground and surface water are 500.42 and 523.78. The HPI and spatial distribution of heavy metals revealed that the chromium contamination in Ranipet industrial estate is originated from the premises of TCCL.

Ref: ICBEE/16

Biopolymer Capped Silver Nanoparticles Induced Aggregation and De-aggregation Based Highly Selective Detection of Two Antibiotic Drugs in Biological and Drug Samples

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This work describes the in-situ synthesis of polydopamine capped silver nanoparticles (PDA-AgNPs). The synthesized PDA-AgNPs was characterized by several techniques. PDA-AgNPs is utilized as probe for the detection of two important antibiotic drugs. Interestingly, the addition of DRUG -1 into PDA-AgNPs, has led to the decrease in the absorption, and the colour of the solution was changed to colourless from yellow (Fig.1). We confirmed the obtained spectral and colour changes are due to the aggregated particles by HR-TEM image. Further, the addition of DRUG-2 into the same solution, leads to increase the absorption (Fig.1), which is expected that due to the de-aggregation of particles. Based on the changes in SPR band, we have calculated the LOD 180 and 17 nM of DRUG-1 and DRUG-2, respectively. We also used the synthesized PDA-AgNPs as probe to detect DRUG-1 and DRUG -2 in urine, blood serum, and drug samples.

Ref: ICBEE/17

Imbalances in prophenoloxidase activity in relation to immune functionsin Marine prawn *Fenneropenaeusindicus* due to the effect of carbofuran

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Due to the high usage of pesticides in agriculture and aquaculture practices causes pollution to the environment. The continuous exposure of pesticides in the environment finally reaches the aquatic environment and causes harmful effects to the marine organisms. Recently the marine pollution was increased when compared to the older days. Hence the present investigation was carried out to assess the impact of the pesticide carbofuran in indian white prawn *Fenneropenaeusindicus.* The prophenoloxidase activity in the haemolymph was analysed and that shows significant alterations in the prophenoloxidase in the hemolymph of the experimental animal. The health status of the animal was analysed by analyzing the level of the prophenoloxidase in the hemolymph. It was very important in the proliferation of hemocytes in the hemolymph. The role of hemocytes is involved in immune function.

Key Words: Prophenoloxidase activity, Carbofuran, Immune function, Indian White Prawn.

Ref: ICBEE/18

Process efficiency enhancement of anaerobic digestion of dairy wastewater by supplementation with water hyacinth

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Water hyacinth (WH) (Eichhorniacrassipes) is the most undesirable class of fast-growing invasive aquatic weed after its eradication from the water bodies that can be used as a supplement in anaerobic digestion of dairy wastewater (DW). DW which produce low amount of biogas during mono-digestion due to acidification and has low (C:N (10-15:1)) ratio which can be co-digested with WH (C:N (20:1)) to improve the efficiency of biogas production by balancing the nutrients. In this study, an attempt has been made to determine the biomethane production potential of S1 (mono-digestion of DW), S2 (mono-digestion of WH) and S3 (co-digestion of DW+WH). The maximum biomethane yield was observed to be 509 L/Kg VSLoaded from S3, whereas S1 and S2 resulted in 156 L/Kg VSLoaded and 415 L/Kg VSLoaded respectively. Average pH was observed in S3 as 7.1±0.6 that led to high stability in digestion and subsequent biomethane production. An alternate waste valorization strategy for WH through slow pyrolysis was carried out, through which 250 mL/Kg of bio-oil was obtained that contained calorific value of 962.37 KJ/Kg and further characterization of bio-oil through GC-MS revealed significant amount of aromatic hydrocarbons that can be used for other commercial product production.

Ref: ICBEE/19

Comparison of Quality Parameters and Content of Bioactive Compounds in Selected Indian Chilli Varieties

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Indian chilli (*Capsicum annuum*) varieties -*Pusajwala* (Tamil Nadu), *Pusajwala* (Uttar Pradesh), Byadgi (Karnataka), Guntur (Andhra Pradesh) and Kanthari (Kerala) were analysedfor their quality parameters (color, pH, TSS, firmness, chlorophyll content) and bioactive compounds (total phenols, ascorbic acid, capsaicin, antioxidant activity). Guntur showed highest capsaicin content (22.54 mg/g) and the highest total phenol content (177.72 mg gallic acid equivalents/100g) while Kanthari showed highest ascorbic acid content (83.74 mg/100g) and antioxidant activity (80.96%). Byadgi showed the lowest capsaicin content (2.66 mg/g) which is almost negligible when compared to other four varieties. *Pusajwala* of Tamil Nadu showed the lowest ascorbic acid content (46.92 mg/100g) and lowest antioxidant activity (52.50%). *Pusajwala* from Uttar Pradesh and Guntur varieties were moderately rich in bioactive compounds. Careful investigation in the variability existing in the quality parameters and bioactive components among all the five varieties were carried out. The results of which can provide valuable information to growers, consumers and distributors in selecting varieties that are rich in bioactive compounds to be consumed as a spice and also for other applications in the food industry.

Keywords: Chilli, Quality parameters, Total phenols, Ascorbic acid, Capsaicin, Antioxidant activity

Ref: ICBEE/20

Evaluation of Anti-cancer activity of *Murrayakoeinji, Curcumin longa and Allium sativum* Biosynthesized Ag NP's on SaOS2 Human Osteosarcoma

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Phytosomes, an example of vesicular drug delivery system is the widely used alternative in pharmaceutical studies. The composition of phytosome is a combined herbal extract bounded by a lipid layer. The current study drags attention on developing an economical phytosome which will be an effective source for the medication of cancer. Ecofriendly green synthesis of nanoparticles was achieved from the combined extracts of *Murrayakoeinji, Curcumin longa and Allium sativum*. Phytochemical screening helps in analyzing the bioactive compounds present in the combined extract of *Murrayakoeinji, Curcumin longa and Allium sativum.* Morphological characteristics of AgNP's shows that AgNP's were small in size and highly pure in nature. Antibacterial activity of particles was tested against E.coli, *Bacillus subtilis, Saccharomyces cerevisiae*, and *Bacillus cereus*. This study reveals the invitro-anticancer and cell toxicity of *Murrayakoeinji, Curcumin longa and Allium sativum*against SaOS2 (osteosarcoma) human bone cancer cell lines compared to normal cells. It concludes this study reveals more pharmacokinetics profile in comparision with conventional herbal extracts.

Keywords: Antibacterial, osteosarcoma, Phytosomes

Ref: ICBEE/21

Coaxial Electrospun Fibers containing Veratric acid-loaded Chitosan nanoparticles for Bone Regeneration

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Reparation of bone defects has significantly evolved over the past few decades due to the advent of innovative bone tissue engineering (BTE) methodologies. Therapeutic potential of phytochemical phenolic compounds has been reported to exhibit antioxidant, anti-inflammatory, antihypertensive properties and also stimulate osteoblastic differentiation. Studies have shown that the delivery of hydrophobic compounds is often impeded in the body, thus depreciating bioavailability. In this study, a hydrophobic phenolic phytocompound (Veratric acid) was found to have osteogenic potential, and its sustained release was facilitated by encapsulation into chitosan nanoparticles (nCS) and embedded into coaxial electrospun fibers. Polycaprolactone/Polyvinylpyrrolidone (PCL/PVP) were taken as core/sheath polymers of the coaxially electrospun fibers. The fiber mats showed commendable physiochemical and material properties and were biocompatible towards mouse mesenchymal stem cells (mMSCs). Further, the cellular level evaluation was carried out with the help of von Kossa staining for determining the osteogenic potential of phytocompound. Overall, the study portrays the delivery of the phytocompound, in a sustained manner to promote bone regeneration.

Keywords: Bone tissue engineering, Polycaprolactone, Polyvinylpyrrolidone, Veratric acid, Coaxial Electrospinning.

Ref: ICBEE/22

Evaluation of Anticancer and Antibacterial activity of *Agaricusbisporus*

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Cancer is the alarming disease of this world. The cure for this after a particular stage is still impractical. There are many methods and treatments being found that could help people, but their consequences are never known. An easier way to avoid cancer was thought. The Food Supplement came into action. There are umpteen cancers occurring because of no proper food supplement taken. Thus, in this project the most available and edible mushroom *Agaricusbisporus*was taken and studied. The essential goal of this projectwas to examine the antibacterial movement, phytochemical screening and anticancer action of methanolic extraction of *Agaricusbisporus*. The qualitative investigation of phytochemical screening of watery and methanolic extricate has demonstrated the nearness of flavonoids, terpenoids, alkaloids, saponins, starches, tannins, amino acids and steroids. The anti-microbial assay also showed the zone of inhibitions to the gram positive and negative bacteria.

Keywords*: Agaricusbisporus, phytochemical screening, anti-bacterial assay, anticancer activity*

Ref: ICBEE/23

An Osteo-inductive Effect of Phytol for Differentiation of Mouse Mesenchymal Stem Cells towards Osteoblasts

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In recent years, phytochemicals have been widely researched and utilized for the treatment of various medical conditions such as cancer, cardiovascular diseases, age-related problems and are also said to have bone regenerative effects. In this study, phytol (3, 7, 11, 15-tetramethylhexadec-2-en-1-ol), an acyclic unsaturated diterpene alcohol and a secondary metabolite derived from aromatic plants was investigated for its effect on osteogenesis. Phytol was found to be nontoxic to mouse mesenchymal cells (mMSCs). At the cellular level, phytol-treatment promoted osteoblast differentiation, as seen by the enhanced calcium deposition. At the molecular level, phytol-treatment stimulated the expression of Runx2 (a bone-related transcription factor) and other osteogenic marker genes. MicroRNAs (miRNAs) play an essential role in controlling bone metabolism by targeting genes at the post-transcriptional level. Upon phytol-treatment in mMSCs, mir-21a and Smad7 levels were increased and decreased, respectively. It was previously reported that mir-21a targets Smad7 (an antagonist of TGF-beta1 signaling) and thus, protects Runx2 from its degradation. Therefore, based on our results, we suggest that phytol-treatment promoted osteoblast differentiation via Runx2 due to downregulation of Smad7 by mir-21a in mMSCs. Henceforth, phytol was identified to bolster osteoblast differentiation, which in turn may be used for bone regeneration.

Keywords: Phytol, Osteogenesis, Runx2, Smad7, mir-21a

Ref: ICBEE/24

Postharvest Application of Moringa Gum as Edible Herbal Coating on Extending Shelf Life and Quality of Guava (*Psidium guajava*)

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Edible herbal coating formulations based on Moringa gum (MG) (Concentration: 1%, 2% 3%, 4% & 5%) and cinnamon essential oil (1 mL) were developed for enhancement of shelf life and quality of guava stored at room temperature for 15 days employing 2 methods of coating; dipping & brushing. The guava was dipped and brushed in MG solution of 1%, 2%, 3%, 4% and 5% for 2 minutes. Analysis of the guavas was done at every 3 days after the treatment. The statistical results of the study indicated that coating of MG and storage period significantly ($P \leq 0.05$) affected all traits. The minimum shrinkage index (13.34±0.06 %), PLW (27.09±4.6 %), decay percent (80±0.44 %), peel colour (24.02±0.02 b*), pH (3.76±0.05), TSS (11.14±0.11 °B), mesophilic microbial count (6.72±0.02 log CFU/g) and the maximum firmness (190.72±0.02 kg/cm^2), TA (0.282±0.008 g/L), antioxidant content (15.58±0.04 %), phenolic content (15.92±0.04 mg GAE/g) and marketable fruits (11 days) were observed in C3D (Concentration 3%; dipping) coated fruits. These results suggest that application of C3D MG coating was effective for retaining physiochemical qualities and preservation of the sensory characteristics of guava during storage at room temperature.

Keywords: Herbal edible coating, moringa gum, shelf life, cinnamon essential oil

Ref: ICBEE/25

Nanocolloids: A solution to control vibriosis to improve aquaculture production

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Vibriosis is one of the devastating bacterial diseases affecting marine fishes, crustaceans and bivalves causing high mortality with severe economic losses worldwide. Members of the family Vibrionaceae are autochthonousto aquatic environments including estuarine,coastal waters and sediments, and some species arewell-known pathogens of marine organisms includingfish, crustaceans andmolluscs. The genus Vibrio includes human pathogenic species commonly associated with outbreaks of diarrheal diseasesin humans due to the consumption of raw or half cooked seafood. Vibrio infections may also occur as a consequence of exposures of skin lesions, such as cuts, openwounds, or abrasions, to aquatic environments and marineanimals. Antibiotics have been widely used to control various pathogens. Due to its uncontrollable and indiscriminate usage, pathogens have developed drug resistance towards the antibiotics. Hence, the existing antibiotics are incapable of killing some of the pathogens. ESBL genes are found to be the main cause of the resistance as it degrades the β- lactam ring of the antibiotics. This current study aims at the green synthesis of silver nanocolloids (GNcs) from herbal extract. The green silver nanocolloids were characterised by using UV-Vis spectroscopy, FTIR, DLS, Zeta potential, FE-SEM and EDX techniques. Antimicrobial assays such as Minimum susceptibility concentration, growth rate, Minimum Bactericidal Concentration and Biofilm inhibition assays were performed to evaluate the efficacy of GNcs against *Vibrio* sp isolated from infected fish. The GNcs was found to be efficient antimicrobial agent which successfully controlled the growth and biofilm formation in *Vibrio* sp. From our studies it was observed that GNcs was very effective in controlling the growth and biofilm formation in Vibriosis causing pathogens by downregulating the ESBL gene AmpC. GNcs can be formulated to control the growth of *Vibrio*sp and it can be used as alternative to prevent the outbreak of disease caused by *Vibrio*sp, which in turnhelps in aquaculture production.

Keywords: Green Silver nanocolloids, ESBL, antimicrobial agent, Multi drug resistance, Vibriosis

Ref: ICBEE/26

Antimicrobial and antibiofilm potential of novel green nanocolloids against antibiotic resistant organism isolated from Marine animal

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Nanotechnology is a modern research field about synthesis of particles ranging in nanometer size. The purpose of nanotechnology is producing nanoproducts using noble metals such as silver and making it beneficial to various sectors. Many novel applications of nanoproducts are rapidly growing rapidly in many fields, such as healthcare, pharmaceuticals, cosmetics, biomedical, food and feed, drug-gene delivery, environment, health etc. The importance of green nanotechnology has revealed with various advantages such as: eliminating the use of expensive chemicals; consume less energy; and generate environmentally benign products. With this objective we mainly focus on the synthesis of green nanocolloids using combination of herbal extracts. The formations of GNC were initially monitored by the colour changes occurring in the reaction mixture during the incubation period. As synthesized nanocolloids were characterized by UV–Visible (UV–Vis) spectroscopy and Fourier transform infrared spectroscopy (FTIR), Field emission scanning electron microscope (FESEM), EDAX, Particle size analyser and Zeta potential analyser. The antimicrobial activity of the green synthesized nanocolloids was investigated against the antibiotic resistant organisms isolated from Marine animal. According to the results of the study, GNC showed larger inhibition zones of 30mm with the concentration of 25µg/ml. Further the study was extended to calculate the minimum inhibitory concentration and minimum bactericidal concentration. This experiment confirmed that GNCs can able to inhibit the growth of organism at the concentration of 12.5µg/ml for up to 48hrs of incubation and bactericidal concentration of 12.5µg/ml. Finally, the GNCs were explored for the inhibition of biofilms at 50 µg/ml concentration showed a highest inhibition value of about 88%. So, it is concluded that the synthesized GNC might be potentially used in many applications as an alternative to antibiotics due to their antimicrobial and antibiofilm properties.

Keywords: GreenSilver nanocolloids, antimicrobial, antibiofilm, antibiotic resistance

Ref: ICBEE/27

Novel nanosuspension to control MDR pathogen, causing Bovine Mastitis

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Mastitis is a most widespread and costly disease in dairy cattle occurring throughout the world. The increased use of antibiotics has led to a global increase in the number of antibiotic-resistant microbes. Therefore, the use of antibiotics in dairy farming contributes to increased antibiotic resistance and represents a major barrier for the treatment of mastitis.Therefore, there is an urgent need to overcome the limitationsof conventional antibiotics. Recently, advancements in nanotechnology have led to the development ofnanoparticles, nanocolloids and nanosuspension to overcomerestrictions posed by conventional antimicrobial agents. Hence, Novel, environmentallyfriendly, cost-effective, biocompatible, and long-term antibacterial particles represent a promisingsolution for use in medicine and farming.Mastitis Milk samples were collected from infected cows and the organisms were isolated. The susceptibility of the organisms was screened through different antibiotics. Silver nanosuspension was synthesized by utilizing medicinal plant extract. These nanoparticles were characterized by using UV spectroscopy, Fourier-transform infrared spectroscopy, and zeta potential techniques. All the isolated strains were tested with nanosuspension and compared with antibiotics. Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC), and Biofilm assays were performed at different nanosuspension concentrations and antibacterial effects were quantified and the genes responsible for antibiotic resistance were analyzed to identify the mechanism of infection and pathways critical for causing mastitis.In our results, MIC and MBC of green nanosuspensionshowed antimicrobial activity against all the strains but at different concentrations. The results suggested that AgNS were able to penetrate the bacterial cell wall and inhibited the bacterial growth. The biofilm formation was also inhibited by AgNS in all isolated strains when compared to control. The results suggested that the inhibition of biofilm formation by green AgNS might be due to the presence of polyphenolic bioactive compounds. Our results indicated that silver nanoparticles can reduce the virulence factors responsible for infection by different bacterial strains. Green AgNs showed a significant and potentantibacterial and anti-biofilm activity against Gram negative, and Gram positive strains. This study confirmed that AgNs had the potentialto inhibit the growth of pathogenic organisms and couldbe utilized as an alternative, affordable, easily available and cost-effective sourceofantibioticsto inhibit multi drug resistant microbial pathogensincattle's.

Keywords: Mastitis, Nanosuspension, Bacteria, Pathogenesis, Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC), and Biofilm

Ref: ICBEE/28

Synthesis of Gold Nanoparticles Using the Leaf Extract of Ginkgo Biloba and its Antimicrobial activity against *Bacillus subtillis and E.coli*

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A study was designed to synthesize the gold nanoparticles using an aqueous extract of Ginkgo biloba leaves and to evaluate their antimicrobial activities. The gold nanoparticle synthesis was done by mixing the aqueous extract of Ginkgo biloba and auric chloride solution for about 24hrs. For evaluating the shape and formation of gold nanoparticles, Ultraviolet-visible spectroscopy (UV-Vis) &scanning electron microscopy (SEM) were used. The SEM analysis revealed that the nanoparticles were spherical in shape with particle size ranging from 40 nm-65 nm. Further analysis was also done by XRD and EDAX methods, in which XRD revealed formation of face centered cubic structure for gold nanoparticles while as EDAX analysis confirmed the presence of elemental gold (Au). The main objective of our study was to determine the antimicrobial activity of Gold nanoparticles against *Bacillus subtilis* and *E.coli*.. Our study concluded that Gold nanoparticles synthesized from Ginkgo biloba leaves have good antimicrobial properties and further studies needs to be carried out in this regard.

Keywords: Ginkgo biloba, SEM, *E.coli*, gold nanoparticle, antimicrobial activity

Ref: ICBEE/29

Green synthesis of Zinc oxide nanoparticles using leaf extract of *Bergenia cilliata* and their biological applications

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Zinc oxide nanoparticles were efficiently synthesized from the leaves extract of *Bergenia cilliata*. The work focuses on phytochemical studies, phytomediated synthesis and characterization of Zinc oxide nanoparticles and its biological applications. Phytochemicals present in the extract may be responsible for reducing the metal salts into their respective nanosize particles. The UV–Vis spectrum infers the formation of NPs, with absorbed peak at 350 nm. The XRD pattern showed the zinc oxide nanoparticles were crystalline in nature and the average crystalline size was 14 nm. FTIR spectrum (ZnO NPs) was recorded to identify the functional group of bio-molecules involved in synthesis. FE-SEM analysis the particles were spherical in shape. Edax analysis confirms the elemental composition of zinc in the zinc oxide nanoparticles. Zinc oxide nanoparticles were tested against human pathogens and they showed significant antibacterial activity. Further zinc oxide nanoparticles showed excellent mosquito larvicidal property against *Aedes aegypti*. The present study revealed that the bio active compounds present in the Zinc oxide nanoparticles lead its effective application in Biomedical application and drug delivery systems..

Keywords: *Bergenia cilliata,* Zinc oxide nanoparticles, FTIR, antibacterial activity

Ref: ICBEE/30

Production of Oligo-alginate adopting Plasma and their Potentials as Biomaterials

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Solution plasma process (SPP) was applied to degrade biopolymers of macromolecule that are not efficiently hydrolyzed by other methods, but exhibit various biological functions when they are degraded to have low molecular weight (LMW). LMW has been a great attention in bio-molecular chemistry, medicine, and drug delivery system in particular. Alginate is an anionic polysaccharide and its short form of polymer, oligo-alginate with lower molecular mass, are also known as useful biomaterials. Alginate at various concentrations was depolymerized to oligo-alginates using SPP by discharging for various times (15, 30, 60 min). Viscosity of the alginate solutions decreased remarkably due to depolymerization that was confirmed by the DNS assay, TLC, FT-IR, and HPAEC analyses. Antioxidant properties of the resulting oligo-alginate were proved as hydrogen (DPPH), hydroxyl, and superoxide radical scavengers. Oligo-alginates derived from 0.5% alginate (100 mg mL^{-1}) promoted growth of lettuce significantly. Interestingly, oligo-alginate derived from 0.5% alginate (100 $mg.mL^{-1}$) by discharging plasma for 30 or 60 min promoted growth of human embryonic kidney (HEK293) cells significantly in vitro. Cell numbers were greatly increased as the concentration of oligo-alginate was increased from 5 to 1,000 $\mu g.mL^{-1}$ with no toxicity against the cells. Thus, SPP was likely to be used as an efficient way to prepare oligo-alginates that can be utilized as cell growth promoting substances and other biocompatible materials.

Ref: ICBEE/31

Isolation and characterization of starch degrading bacteria

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Amylases are of great significance in biotechnological applications ranging from food, fermentation, detergent, pharmaceutical, brewing and textile to paper industries Amylases are of great significance in biotechnological ranging from food, fermentation, detergent, pharmaceutical, brewing and textile to paper industriesAmylases are starch degrading enzymes.These enzymes play a pivotal role in biotechnology industries with huge application in food, fermentation, textile and paper. Amylase enzymes breakdownstarch into sugars by acting on α- 1,4-glycosidic bonds. They are obtained from various origins like plant, animal, bacterial and fungal.Many industries lack the local production of amylase, Thus there is always a lacunae in the demand of amylase. The present study we try to isolate and characterize new strains of amylase producing bacteria to fill this lacuna. We propose to focus on optimum extraction of amylase from various samples ofwater and soil. The samples collected, are primarily screened on starch agar medium to identify the amylase producers. The promising hydrolytic strains of bacteria is isolated and selected for 16srRNA sequencing. Further investigation is carried out to characterize the amylase enzyme produced by the isolate andare also characterized for optimization of pH and temperature. The sequences of amylase genes from the identified strains are retrieved from the gene data base and the comparative and phylogenetic analysis are done to find conserved domains and motifs.

Keywords: Amylase Enzyme, Optimum pH and Temperature, 16srRNA

Ref: ICBEE/32

Abatement of Heavy Metals-(zn) from Waste Water Using Eucalyptus Seeds- A Novel Approach for Environmental Remediation.

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Water has increasingly become a scarce essential commodity and should be used judiciously. TAMIL NADU is having a severe drought and the whole country is having problems in meeting the demands of clean accessible water. Therefore, the only pragmatic approach to combat this situation of drought is water treatment. The mechanism used in this study is Adsorptive Separation. In the present study, a novel activated carbon was prepared from low-cost eucalyptus seeds, which was utilisedfor the effectively removal of toxic zinc from the water/wastewater. The prepared adsorbent was studied by Fourier transform infrared spectroscopy and scanning electron microscopic characterisation studies. Adsorption process wasexperimentally performed for optimising the influencing factors such as adsorbent dosage, solution pH, contact time,initial zinc concentration, and temperature for the maximum removal of zinc from aqueous solution. Adsorptionisotherm of zinc removal was ensued Freundlich model, and the kinetic model ensued pseudo-second order model. Langmuir monolayer adsorption capacity of the adsorbent for zinc removal was evaluated as 80.37 mg/g. The results ofthe thermodynamic studies suggested that the adsorption process was exothermic, thermodynamically feasible andimpulsive process. Finally, a batch adsorber was planned to remove zinc from known volume and known concentrationof wastewater using best obeyed model such as Freundlich. The experimental details showed the newly preparedmaterial can be effectively utilised as a cheap material for the adsorption of toxic metal ions from the contaminated water.

Keywords: Adsorption; Activated Carbon; Euclayptus Seeds; Toxic Metals; zinc

Ref: ICBEE/33

Investigation of toxicity of cerium oxide nanoparticlesusing wild-type *Drosophila* and its therapeutic potential in Alzheimer's disease model

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Cerium oxide nanoparticle ($nCeO_2$)is widely used in the biomedical field mainly due to its antioxidant enzyme –mimetic and free radical scavenging activities. Although central nervous system disorders such as Alzheimer's disease are quite common, the lack of a cost-effective yet sophisticated *in vivo* models to mimic the disease conditionis a major drawback in drug development for these diseases. *Drosophila* is one of the commonly used*in vivo*modelssince it has a short life cycle, approximately 75% sequence homology with human disease genes, and transgenic models expressing human disease proteins, such as hTau, can be easily obtained via genetic crossing.In this study, it was seen that dietary administration of $nCeO_2$ (0.1 mM and 1 mM doses) to adult flies for one month did not cause any significant toxicity, as evidenced from behavioral, biochemical, and gene expression studies. Subsequently, the gene expression of hTau studied using the GMR;hTAU transgenic model, after one month dietary administration of $nCeO_2$, revealed a significant decrease in hTau gene expression at the both the doses of $nCeO_2$tested. Therefore, $nCeO_2$ has the potential to be used as a non-toxic nanomedicine for the treatment of Alzheimer's disease in future studies.

Keywords: Cerium oxide nanoparticle, *Drosophila*, nanotoxicity, Alzheimer's disease

Ref: ICBEE/34

Screening the efficacy of myco nanoparticles against *Staphylococcus aureus* under *in vitro* and *in vivo* conditions

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Nanotechnology has attained more attraction in recent decades due to its unique physicochemical properties.Thus, this study is based on the biosynthesis of the silver nanoparticles (AgNPs) using the endophytic fungus isolated from the medicinal plant *Eupatorium triplinerve* and was identified as *Lasiodiplodiapseudotheobromae*. The ETAgNPs were characterized by using UV-Visible, FT-IR spectroscopy and SEM. The antimicrobial activity of the ETAgNPs was tested against *Staphylococcus aureus* under In vitro conditions and the MIC&MBC was noted as 25µg/ml &100µg/ml respectively.The In vivo studies of ETAgNPs was evaluated by using *C.elegans*as animal model and the toxicity studies were observed by doing various experiments.To the best of our knowledge this is the first report demonstrating the extracellular synthesis of AgNPs from *Lasiodiplodiapseudotheobromae*.Thus the results obtained suggests that ETAgNPs may be used as an antimicrobial agent against the disease causing human pathogen *Staphylococcus aureus.*

Keywords: ETAgNPs, Extracellular, Endophytic fungi, FTIR, SEM, S*taphylococcus aureus.*

Ref: ICBEE/35

Drosophila: a model organism for neurodegenerative disease and toxicity studies

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The current medical science and environmental research arena require simple and rapid system to investigate human disease mechanism, drug screening and toxicology. The constrains in ethical issues in human and mamalian models, and cost involved runnning cell culture studies has also drawn attention to more simpler and fiesable model organisms. *Drosophila melanogaster* also called as fruit fly is simple organism which has over 60% homology genes when compared to humans. It also has short lifespan and limited number of genes and chromosomes that enable multigeneration studies and gene editing respectively. Neurodegenerative diseases such as Alzheimer's disease (AD) is the most common form of dementia, associated with the deposition of amyloid beta and aggregation of tau protein in the brain. Aβ plaques and neurofibrillary tangles form the two main hallmarks of AD. Overexpression of human full length wild type tau protein in the neuron of fly, resulted in deficits in various functions such as behavioural, olfactory memory, degeneration and more importantly aggregation tau proteins. This talk will introduce studies done transgenic Drosophila studying ways to reduce tau aggregation and nanotoxicity studies.

Ref: ICBEE/36

Investigation of the antidiabetic and anticancer potential of Indian propolis-derivednovel bioactive compounds using a molecular docking approach

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Products from natural sources have played an important role in traditional medicine and continue to provide some inspiring templates for the design of new drugs. Indian propolis is known for its promising anti-diabetic and anti-tumor properties that may be mainly attributed to its flavonoids and polyphenols content but the role of individual components of Indian propolis in the realization of formulation of anti-diabetic and anticancer drug remains unknown. The objective of this study was to explore the therapeutic role of novel bioactive compounds derived from Indian propolis in targeting cancer and diabetes-associated protein receptors. Two novel bioactive compounds viz., deoxy-podocarpol and p-1-indanyl phenol were identified from Indian propolis and were investigated for their anti-diabetic and anti-cancer potential. Molecular docking analysis was carried out to predict the molecular interactions between the selected novel bioactive compounds and five cancer associated targets- BLK, BRCA1, BRCA2, MSH2, MYC genes and five diabetes associated targets.- FTO, HHEX, IRS1, PPARG, and TCF7L2 genes respectively. Biological databases like PubChem, Protein Data Bank (PDB) and the softwares namely Autodock and Python Molecular Viewer were employed for the docking studies. On the basis of binding energy and active site structure, best docked conformations were determined. The binding energy decomposition analysis was also carried out to reveal per residue contribution for each docked complexes. Results of the *in silico* molecular studies of the two bioactive novel compounds and the target receptor proteins provides a good understanding of the binding mechanism and amino acid residues involved in the interaction. The docking results revealed that the selected compounds have good binding affinity to the target receptor proteins, making interactions with their active residues and surrounding allosteric residues. Also, it was found that there is hydrogen bond formation between the two ligands and their target receptor proteins. The comparison of binding affinity revealed that the docking between receptor proteins PPARG and BRCA2 with the two ligands-deoxy-podocarpol and p-1-indanyl phenol showed the strongest binding affinity.Hence, the docking studies proved that the selected bioactive compounds derived from Indian propolis may provide better insights for designing potential anti-cancer and anti-diabetic drugs with improved efficacy and fewer side effects. Therefore, we concluded from the *in silico* molecular studies that deoxy-podocarpol and p-1-indanyl phenol are effective compounds in treatment of cancer and diabetes.

Ref: ICBEE/37

Wound Healing Profiling Studies Using Nano-Composites

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Hydroxyapatite (HA) is a biomaterial with potential orthopaedic, dental and maxillofacial applications. It has excellent biocompatibility, bioactivity and osteoconductivity. Extensive studies in synthetic hydroxyapatite holds significant osteo-inductive property. In this work HA is derived from marine sources. Nano hydroxyapatite (nHA) was synthesized by wet thermal process. Characterisation studies include FTIR-ATR; SEM-EDX; TGA; DSC. Chitosan film along with nHA was synthesized. Chitosan has been extensively used in wound healing and wound dressing applications due to its hemostatic properties, biodegradability,biocompatibility, non- antigenic, non-toxic, regenerative effect on connective tissue and promotes wound healing by promoting tissue granulation by in the recruitment of inflammatory cells such as poly morphonuclear lymphocytes and macrophages to the wound site. The following characterisations were done: FTIR, TGA, SEM, DSC,Antibacterial assay. Antioxidant assay will prove the radical scavenging activity in the chitosan and nHA films. Cell viability should be assessed using MTT assay. In vitro release studies to be done to ensure proper drug delivery system. Further investigations to be done to ensure a proper Nano –composite for various biomedical applications.

Keywords: Nano hydroxyapatite; Nano-composite; bone wound healing studies

Ref: ICBEE/38

Thymoquinone As A Potential Therapeutic for Alzheimer's Disease in Transgenic *Drosophila* Model

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Alzheimer's disease (AD) is the most common form of dementia. Cognitive dysfunction and memory loss are two main clinical symptoms of AD. *Drosophila melanogaster* models for AD that are based on overexpressing human amyloid β or tau proteins have been used to study the disease mechanism of AD and to screen therapeutic compounds. Current medicines for AD are giving only symptomatic reliefs. A huge unmet medical need exists to slow, stop or reverse the progression of AD. This research focuses on studying therapeutic against tau mediated AD. Thymoquinone (TQ),(2-methyl-5-isopropanol-1,4 benzoquinone), is an active ingredient isolated from *Nigella sativa* (NS) and has various pharmacological activities and is a potential neuropharmacological agent. TQ has anti-oxidant, anti-inflammatory and free radical scavenging properties. Due to these properties, we investigated the effect of TQ on tau protein aggregation in *Drosophila* model of Alzheimer's and could aid to find a therapeutic option for AD. Treatment with TQ shows increase in behavioral activity in transgenic R406W Tau *Drosophila* model. The biochemical assays indicate a reduction in reactive oxygen species (ROS) level and restored depleted super oxide dismutase (SOD) and Acetyl choline esterase (AchE) activity and also a significant therapeutic effect was evident in gene expression analysis.

Keywords: Alzheimer's disease, Thymoquinone, Tau.

Ref: ICBEE/39

Edible Insects as an Alternate Source of Complete Nutrition

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Insects have, since time immemorial been an essential part of the daily nutrition of humans in many parts of the world, like Africa and most of south east Asia. Insects can be easily employed in our diets to make up for the severe protein and vitamin deficiencies occurring in the population. In this study, two insect species, namely Silkworm (*Bombyx mori*) pupae (SP) and Black Soldier Fly (*Hermetiaillucens*) (BSF) were considered for the experimentation. The aim of this work is to produce insect meal from the two samples and evaluate its physicochemical, nutritional and sensory qualities. The insect meal was prepared by drying the insects in a tray drier until most of the moisture is removed and then grinding it in a blender to produce a coarse powder. Produced insect meal had a reasonable favour score on 5 point hedonic scales. The mean values of total moisture, crude protein, ether extract, crude fibre, total ash on dry matter basis (%) was found as 8.44(SP), 8.70(BSF), 57.44(SP), 42.8(BSF), 38.3(SP), 35.3(BSF), 0.25(SP), 9.4(BSF), 4.01(SP), 12.1(BSF) respectively. Proximate analysis was done as per methods of AOAC, 2000. Mineral composition analysis for the samples was done using a NOVA 400 atomic absorption spectrometer with an air/acetylene flame and respective hollow-cathode lamps was used for absorbance measurements, results were expressed in g/kg. Amino acid profiling was conducted after extraction and pre column treatment using a ZORBAX Eclipse AAA column with gradient elution. Vitamin analysis was carried out using High Performance Liquid Chromatography and was expressed in µg/g.

Keywords: Entomophagy, Proximate analysis, protein, sensory, amino acid profiling, vitamin.

Ref: ICBEE/40

Antioxidant activity of Dieffenbachia picta (Schott)

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The present study was aimed to find out antioxidant property of leaf and stem using Methanol, Acetone, Petroleum ether and Aqueous extracts of Dieffenbachia picta Scott. The phenol and Saponins content of Methanol, Acetone, Petroleum ether and Aqueous extracts were determined. The antioxidant potential of the samples was evaluated by using four in vitro assays such as DPPH free radical scavenging, Total antioxidant capacity, Reducing power and Superoxide dismuted assays. The Phenol and Saponins contents were found to present in considerable quantities. The Aqueous extract showed better ability to DPPH free radical scavenging followed by Phosphomolybdate assay in Acetone extract. It also showed good reducing power ability. The Petroleum ether extract showed better ability to Superoxide dismuted assay. The results obtained from the present study indicated that the Dieffenbachia picta extract is a potent source of natural antioxidant and all the four extracts possessed antioxidant property.

Keywords*Dieffenbachia picta*, Antioxidant, DPPH, Methanol, Petroleum ether, Acetone.

Ref: ICBEE/41

Mechanical, Barrier and Antibacterial Properties of Nisin / Silver Nanoparticles / Mmt K10 Nano Composite Coating on Surface Modifed Polypropylene for Food Packaging Applications

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In this work, the Nisin / Silver nanoparticles / MMT K10 nanocomposite coating was carried out on oxygen plasma surface modified PP film in order to evaluate the mechanical, barrier and antibacterial properties for suitable applications in food packaging. The PP film was treated for 60s, 120s, 180s, 240s, 300s with different power rates and then the contact angle was measured to characterize the wettability. It was observed that there was an increase in hydrophilicity of the PP film and then the nanocomposites coating was carried out by roller coating method with different thickness. The surface roughness of the PP films after the oxygen plasma treatment was investigated by Atomic Force Microscopy (AFM). The presence of silver nanoparticles in nisin was identified by Energy Dispersive X-ray Spectroscopy (EDX) and Scanning Electron Microscopy (SEM). The mechanical properties (Tensile and Elongation) and barrier properties (WVTR and OTR) were also analysed. The incorporation of silver nanoparticles and K10 clay with nisin increases the mechanical properties and also the barrier properties of the PP film. The Nisin / Silver nanoparticles / K10 nanocomposite coated polypropylene films exhibit strong antibacterial activity against Escherichia Coli and Staphylococcus aureus to identify the shelf life period of the packed food to ensure food safety.

Keywords: Nisin; Silver nanoparticles; MMT K10; Polypropylene; Mechanical

Ref: ICBEE/42

Isolation of Methanogenic Bacteria and Producton of Methane from Anaerobically Digested Distllery Sample

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Methanogens are organisms that are capable of producing methane under anaerobic conditions using various substrates.During coal mining process,certain amount of coal is getting deposited as waste that leads to pollution.Therefore, in order to overcome this issue, the deposited coal waste is utilized as substrate.For the growth of methanogens isolatedfrom anaerobically digested distillery sample and thereby produce methane.Further studies involving isolation of methanogenic bacteria and determining its molecular characteristics and identify the optimum conditions by varying the concentration for maximum production of methane.

Keywords: Coal, Anarobically digested sample, Methanogens, Methane

Ref: ICBEE/43

LPS sensitize RBCs at hemagglutinin concentration resulted in complete hemolysis on further addition of Jacalin; plant lectin from Jack fruit seeds.

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LPS consists of a hydrophilic polysaccharide and a hydrophobic group referred to as lipid A. LPS is known to induce hemolysis and hemagglutination and is concentration dependent. In the present study, LPS purified from *Salmonella enterica serotype typhi* was characterized by FTIR and biochemical assay. While LPS from *Salmonella enterica serotype typhi* at concentration range of ≥18.5 ng was observed to lyse the human RBCs (hRBCs); lower concentration of LPS caused agglutination of hRBCs. However, upon addition of 10 µg Jacalin to 9.3 ng LPS sensitized hRBCs resulted in complete hemolysis. Importantly, Jacalin is known to possess the ability to agglutinate the hRBCs.

Ref: ICBEE/44

Biosynthesis, Characterization of Iron Oxide Nanoparticles and Evaluation of Its Cytotoxicity in Lung Adenocarcinoma (A549) Cell Line

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The field of nanotechnology has paved a great attention due to its advantageous properties and wide range of applications in all branch of science. Further, the usage of different plant biomaterials for the biosynthesis of nanoparticles, usually called as green technology as it does not include any hazardous chemicals. In the current study, magnetic iron oxide nanoparticles (Fe_3O_4) were synthesized using a simple, green biosynthetic method by the reduction of ferric chloride with the leaf extract of *Momordica charantia* which acts as a reducing and capping agent. Colour change, UV-Visible Spectroscopy, Fourier Transform Infrared (FT-IR) Spectroscopy and Scanning Electron Microscopy confirmed the biosynthesis and characterization of the synthesized magnetic iron oxide nanoparticles. FT-IR analysis showed that the synthesized iron oxide nanoparticles was capped with the phytochemical constituents of the plant extract. From the SEM analysis, the synthesized magnetic iron oxide nanoparticles were found to be spherical in shape with some aggregation and the particle size ranges from 200-300 nm. Then checking the cytotoxicity of cancer cells by treated with A549 cells. The higher concentration of FeNPs induce stress.

Key words: Iron oxide nanoparticles, Spectroscopic techniques, FT-IR, SEM, Cancer cell cytotoxicity and morphology.

Ref: ICBEE/45

Effect of few Marine Sponges and its MosquitocidalActivity Against *Aedes aegypti, Anopheles stephensi* and *Culex quinqufasciatus*.

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The Methanolic extracts of five species of marine sponge viz., *Haliclona oculate, Callyspongiafistularis. Tedanianigrescens, Axinelladonnani*and*Aeanthellaelongata*collected off Kovalam fish landing area, Chennai were explored for vector control activity. The extracts were assayed against larvae of *Aedes aegypti*, *Anopheles stephensi* and *Culex quinqufasciatus* as per the World Health Organization protocols. The test doses varied from 0.01% to 10.0% for 24h from which LC were determined. 50 Maximum mosquito larvicidal activity was noted in the methanol extract of Acanthella elongata with the $LC_{50}$of 0.076 mg/ml. Axinelladonnani was the least active among the selected sponges. The results of present investigation suggest that A. elongata extract has the potential for developing new bioactive mosquitocidalagent.

Key words: Sponges,Mosquitocidalactivity, *Aedes aegypti*, *Anopheles stephensi* and *Culex quinqufasciatus*.

Ref: ICBEE/46

Seasonal distribution and diversity of seaweeds at Mandapam, SoutheastCoast of India

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The seasonal distribution of seaweeds for one year in the intertidal region of Mandapam showed 38 seaweeds species; of which nine species belong to Chlorophytes, nine belong to Phaeophytes and twenty belong to Rhodophytes. During post monsoon and summer season, the seaweed diversity was high when compared to pre monsoon and monsoon season. At Mandapam, the dominant genera of green algae were Caulerpa, Cladophora, Codium and Halimeda. The dominant brown algae genera were Turbinaria, Sargassum, Lobophora, Stoechospermum. The dominant Red algae genera were Gracilaria, Laurencia, Hypnea, Laurencia, Halymenia, and Kappaphycus. The seasonal changes in the distribution of seaweeds may be due to the variation in rainfall, salinity, nutrients, and light intensity.

Keywords: seaweeds,Chlorophytes,Phaeophytes and Rhodophytes

Ref: ICBEE/47

Comparative toxicology studies of commercial insecticide and synthesized nanoemulsion

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Monocrotophos is an organophosphate insecticide that acts on a broad spectrum of insects and is highly toxic to birds and humans. It has been banned in various countries because of its high toxicity, but is still available in developing countries like India. There have been many deaths recorded because of these chemical and other insecticides. So it is high time that we shift to safe alternates for the pesticides. So, an alternative nanoemulsion formulation can be used instead of the toxic insecticide. A nanoemulsion is a colloidal system consisting of mainly oil, surfactant, and water and in this experiment it has been prepared using castor oil. It is characterised by using DLS and zeta potential techniques. Then its efficacy and effects against the commercial insecticide has been compared. Plants (Spinaciaolaracea) are exposed to both the nanoemulsion and insecticide in equal concentrations (3 ml in 500ml and 3 ml in 1000ml) and are later used to prepare feeds for the fish. The feed also includes proteins, carbohydrates and other nutritional requirements. Then the fishes that are already acclimatised to the lab conditions are exposed to the prepared feed and continuous exposure is given for 7-14 days. Then the defects in the physiological factors and neurological behaviour of the fishes are studied and acute toxicity studies are conducted. This experiment is conducted to demonstrate the ill toxic effects of the insecticide and a possible alternate prepared using nanoemulsion without the harmful effects.

Keywords:Monocrotophos, Nanoemulsion, Fish feed, Acute toxicity studies

Ref: ICBEE/48

Developing a Nano Machine performing In-Vivo studies, producing signals and results from inside the Human body

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Since the dawn of this century the technology has been growing rapidly and this has in turn boosted the biological studies. The current trend has seen the countries and researchers invest their time in developing Nano chips and Nano machines which has the capacity to enter into any kind of system without affecting the metabolism of the original system.

Now the time has come to move forward to develop Nano machines which mimics the biological system so that when inserted into body of diseased person it captures the cell and runs all the necessary test inside the body and sends the results and various signals to the computer that is connected, so that it helps us to understand the biological activities of Viruses, how they manipulate our DNA and changes we could make or even find some drugs to treat diseases like HIV, CORONA, EBOLA. We could even administer drugs through these Nano machines to kill the viruses or make them act as a robot and send signals to kill the infected Virus cells and free us from Deadly diseases.

Ref: ICBEE/49

Green Synthesis of Silver Nanoparticles from Plant Extract and its Antibiofilm Activity Towards Pathogenic Bacteria

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Bacteria in a biofilm can survive harsh conditions and withstand the host's immune system. Therefore, there is a need for new treatment options to treat biofilm-associated infections. In this presentation, we emphasis the green synthesis of silver nanoparticles from calotropisprocera (CP-AgNPs). The CP-AgNPs was characterized by Fourier transform infra red spectroscopy, UV-vis spectral, High-resolution transmission electron microscopy and X-ray diffraction techniques. The synthesized CP-AgNPs is stable for 5 months. 22 nm sized CP-AgNPs have shown good antibacterial activity against pseudomonas aeruginosa (PA), staphylococcus aureus (SA), klebsiella pneumonia (KP), and bacillus subtilis (BS) bacteria. We have successfully studied the anti-bacterial study of CP-AgNPs with biofilm causing four different bacteria. Interestingly, biofilm was 80 % inhibited by CP-AgNPs. Further, it is anticipated that CP-AgNPs can grant future opportunities in the field of materials science and nanomedicine.

Ref: ICBEE/50

Preparation and Printability Characteristics of Spirulina Algae Based Ink

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Natural pigments are now in its fast growing pace to replace synthetic pigments for its safe, healthy and environmentally friendly nature and application. In this work, the water soluble eco friendly printing ink was prepared from spirulina algae along with the natural binders. The prepared ink was printed by screen printing method on paper and textile materials. It was characterized and tested with various methods. The pH of the ink plays a major role in the stability and it was also measured. The L*, a*, b* colour values of the printed algae ink was compared with the commercial ink. The curing and rub resistance of the printed ink was also calculated. The Ink drawdown and the absorbtion test was carried out and it showed the better results. The pick test for the ink was also carried out in wet and dry conditions.

Keywords: Ink; Spirulina; Screen Printing; pH; Colour

Ref: ICBEE/51

Behavior of Fuzzy Exponential Model in Tumor Growth

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Mathematical modeling has been abundantly used in recent years as a helpful technique for obtaining a better and broader understanding of a complex biological topic such as cancer.One of the emerged subject fuzzy mathematical modeling can be used to ensure objectivity, accuracy and minimize subjective factors. Fuzzy mathematical model is a systematic and objective assessment tool that can be easily adaptable. Fuzzy models play a vital role, especially for oncology, in estimating the dynamic nature of the tumor, in whichFuzzy differential equation models make it easier for us to incorporate tumor growth. It is difficult to estimate the number of cancer cells in a tumor because of the constant change in time. Cells of the tumor can proliferate, rest quietly or die.Therefore, it is striking to define the number of tumor cells as a function of time. Models of tumor growth based on a small number of ordinary differential equations have a very extensive history, dating back to the exponential growth equation. The most important case in point is the exponential growth equation itself.In this paper, a fuzzy exponential model is developed to show the tumor pathway from the beginning.This model helps us to predict the behavior of tumor growth at its initial phase. This model is designed to capture key features with a few customizable parameters.

Ref: ICBEE/52

A Review on Applications of Fuzzy Differential Equations in Tumor Dynamics

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The aim of modeling is reflecting, manipulating and communicating real-world artifacts of everyday life and allowing the visualization of complicated systems, creating hypotheses and proposing experiments in some way.Modeling cancer is one of the dynamic and unpredictable biological models.For this, fuzzy models have been studied due to their application in achieving this unpredictability.Fuzzy set theory is a valuable tool for modeling complexity in mathematical models and for analyzing ambiguous or subjective knowledge. The concepts of fuzzy differential equations have grown rapidly in recent years. The first to provide the relevant meanings of the derivative being overlooked as well as the derivative is considered. Ignoring the definition of fuzzy derivatives includes fuzzy differential inclusion theory and Zadeh's extension principle.It is well known that the complex fuzzy systems described by a collection of Fuzzy Differential Inclusion (FDI) whichis very useful tool for modeling and simulating different unpredictable systems in tumor biology.In this paper, a short review of fuzzy differential equation methods ignoring the derivative and its application in tumor modeling is discussed.

Ref: ICBEE/53

Predictive Mathematical Models of Signaling Pathways can Avoid the Development of Cancer (A Review)

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Cancer cells develop a variety of hallmark changes over the progress of the tumor process. Many of these changes map signaling pathways that regulate cell growth and division, cell death, cell circumstance, and cell flexibility and may contribute to broader signaling network disturbances that drive cancer progressions, such as tumor microenvironmental changes, angiogenesis and inflammation etc. Cell assistance in multicellular organisms is regulated by the division of cell coordination by aggressive growth modulation. In this perspective, the use of molecular indicator triggering cell division is a mystery, because a cancer cell can manipulate any molecule that induces and helps growth, disturbing cellular assistance.An important difference is that the interaction between high-level populations and normal cells in a multicellular organism that developed onhumanitarian,to be able to send signals even if it's their loss.

Effective cancer alteration must increase to be competitive, allowing the cancer cell to send out a signal resulting in higher chances of selection. The theoretical or quantitative simulation of physiological systems has become increasingly valuable in recent years, and there is now a wide range of mathematical models of signaling pathways that have contributed to some groundbreaking discoveries and hypotheses as to how this system works. Here we discuss various modeling methods and their application to the physiology of medical systems, focusing on the identification of parameters in ordinary differential equation models and their significance for forecasting cellular decisions in network modeling.In situations of global and local cell-to-cell rivalry, we quantify how this mechanism impacts a mutated cell's fixing chance of producing such a signal, and consider that this process will play a vital role in reducing cancer.

Ref: ICBEE/54

Rapid Colorimetric Method for the Detection of Mercury by Using Silver Nanoparticles

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The present study deals with the colorimetric detection of mercury (Hg^{2+}) by using silver nanoparticles (Ag NPs) in the presence of Tryptophan. The nanoparticles used in the study were synthesized by using chemical reduction method. The synthesized nanoparticles were characterized by using UV- visible spectrophotometer. The Ag NPs-tryptophan conjugate on interaction with Hg^{2+} changes from dark brown to pale yellow and finally to a colorless solution. During the colorimetric detection of mercury, a sensitive linear range for Hg^{2+} ions is obtained for a range of concentrations from 20 nM to 100 nM.The sensitivity of the probe is analyzed under different conditions of temperature, pH and salinity. The selectivity of the probe is analyzed by treating with different metal ions. The developed probe is capable of being used for the qualitative and quantitative analysis of mercury at nano molar concentrations.

Ref: ICBEE/55

Phytochemical Incorporative Scaffolds for Tissue Engineering Applications

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Bone tissue engineering finds its ubiquitous applications in the field of medical science and has been a great field of research. Many synthetic and semi–synthetic biomaterials had been found to be in use for the bone tissue replacement therapy. Naturally derived compounds were used for this replacement therapy. Most of the bone tissue replacement therapy makes use of semiconductor materials doped with some kind of impurities, which is completely a synthetic one. Advancements had been made by making of semi-synthetic materials derived from animal sources, ie. components like gelatin and chitosan came into existence. Recent researches aim at the incorporating completely natural resources and making a material which will be free of any kind of synthetic material in use so far in the medical field. This experiment aims at the synthesis of scaffolds with the use of plant extracts and incorporation of the bone strengthening materials of animal and plant source. The plant used in this experiment is *Cryptolepisdubia*whose extract had been incorporated along with chitosan and other plant sources to fabricate into a scaffold. The scaffolds being prepared were subjected to characterization to test for its efficiency enacting as a biomaterial in bone tissue engineering applications.

Ref: ICBEE/56

Effect of bacterial probiotic diet on growth performance of *labeorohita* fingerlings

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Fisheries have always played a very significant social economic role in many countries. India is the second-largest aquaculture producer in the world, dominated by carp production. About 80% of India's aquaculture production is composed of carps. Production and reliable supply of good quality fingerlings in sufficient quantity is essential to sustain this section of the aquaculture industry. The quality seeds of fishes are mostly depending on proper feed management. Spirulina as "the best for tomorrow" and is one of the most concentrated natural sources of nutrition for all animals. Experimental fishes were fed with different proportions (pb0,pb1, pb2, pb3, pb4 &pb5%) of probiotic bacteria formulated with basal diet at 1,2,3,4 and 5% concentrations as pelleted feed for 30 days. The results showed that different probiotic bacterial feed types (pb-0,pb-1,pb-2,pb-3,pb-4,pb-5%) had significant effect on the feeding parameters. Regarding the absorption, the maximum of 6.71g was observed in experimental diet (pb-3%) feed type, minimum of 2.83g was observed to control diet (pb-0%). The improvement of feed absorption for fish feed diet supplemented with probiotics ,could be due to improvement in the intestinal microbial flora balance that leads to better absorption quality, increased enzyme activity. The food conversion was higher (5.6g) in pb-3feed type.The maximum consumption rate 33.48g was observed in fish consuming pb-3% diet alone. The absorption rate and conversion rate was found to be maximum 35.61 and 4.38g in pb-3% and pb-2% feed respectively.The absorption rate and conversion rate was found to be maximum 40.71 and 5.83g in pb-3% and pb-2% feed respectively. In the present study, probiotic bacterial diet inclusion at pb-3% showed the significant SGR (0.71g). These results indicated that the mixture of probiotic bacterial diet could be the best food for *cirrhinusmirgal*a fingerlings.

Key words: Bacterial probiotic (Spirulina), fish fingerlings (*Cirrhinusmirgala*) and bioenergetic studies.

Ref: ICBEE/57

Identification of Matrix Metallopeptidase as Oral Squamous Cell Carcinoma hub gene and Verazineas its potential inhibitor - an *in-silico* and *in-vitro* analysis

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Gene expression analysis of 80 Oral Squamous Cell Carcinoma (OSCC) patient profiles from the dataset GSE74530 identified the up-regulated genes based on fold change value ≥ 5.0and cross-validation with The Cancer Genome Atlas (TCGA) revealed the up-regulation of Matrix metallopeptidase (MMP1, MMP3, MMP10 and MMP12). Protein-protein interaction network was constructed with top upregulated genes. Gene ontology and enrichment analysis were also carried out. Primary sequence analysis of MMP put light on Hemopexin (HEX) as a common domain in all MMPs and are drug targetable region. Molecular docking and dynamic simulation of HEX as target and 105 phytochemicals from *Eclipta alba* as ligands helped in identification of verazineas a promising inhibitor for MMP. Verazine (dock score = 79.06) surpassed the scores of Batimastat, Nerolidol and 5-Fu. The effect of the drug was further studied *in-vitro* using KB and Vero cell lines. The IC-50 value of the drug was inferred to be 2.5µg/10^3 cells and found that the drug was less cytotoxic to the Vero cells. Drug-induced cell death was proved using flow cytometry. It was also found that verazine induced a similar kind of effect on the genetic material of cancer cells as of 5-Fu.

Keywords: Matrix metallopeptidase, Molecular dynamic simulation, LigandFit, flow cytometry, confocal microscopy.

Ref: ICBEE/58

Antidotes against Snake bite from Herbal Plants in Coimbatore District, Tamil nadu, South India

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Systematic field surveys were carried out in various tribal settlements and rural areas of Coimbatore District during November 2017 to December 2019.Tribal and rural people of this area have authenticated knowledge and information about antidotes plants which are working against venomous snakebites. Repeated enquiries were made to understand their traditional knowledge, methods of diagnosis and treatment procedures by using herbal plants. Data were collected about part of the plants which are used, vernacular name, their composition, mode of preparation, application, dosages and food restriction during snake bite treatment period. The present study revealed about 41 common medicinal plants that belonging to 31 families which are believed to act as antidotes against venomous snakebite used by rural and tribes of Coimbatore District. These antidote plants are enumerated and arranged in alphabetical order with botanical name, family name, vernacular name (Tamil) plant parts used against snakebite. Among the recorded plant families Acanthaceae had 4 species, Amarantaceae, and Asclepidaceae had 3 species for each family. Fabaceae, Rutaceae, Lamiacea, Cucurbitaceae, Piperaceae had 2 species for each family. One species that belongs to Asteraceae, Alliaceae, Aristolochiacea, Meliacea, Brassicaceae, Apiaceae, Hypoxidaceae, Zingiberaceae, Pocaceae,Oleaceae, Lobeliaceae, Mimoceaceae, Cucurbitaceaea, Rapidaceae, Musaceae, Euphorbiaceae, Piperaceae, Apocynaceae, Agavraceae,Solanaceae, Combrotaceae and Liliaceae. The methanol extracts of root, leaves, seeds, fruits and barks of these plants were subjected to different biochemical tests separately for the identification of various active constituents present in herbal plants which can inhibit the action of snake venom.

Keywords: Anti venom, antidote, snakebite, tribal, tribal medicine

Ref: ICBEE/59

Identification of EGFR as a potential drug target in Breast cancer and inhibiting it *in-vitro*

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Breast cancer is the second leading cause of death among women. The development of breast cancer involvesvarious genes. Key genes involved can be traced by identification of master regulators. In this study, gene expression profiles of 18 breast cancer patients were studied and identified the differentially expressed genes. It became evident that the genes DMD, MAMDC2, P2RY12, ADAMTS5, ANXA1, F3, EFNA5, CLIP4, EGFR and SPRY2 were up-regulated based on the criteria fold change ≥ 2.0. Protein interaction network construction and network topology analysis using mathematical models revealed EGFR, JUN, SPRY2, EFNA5, F3, RASA1, ANXA, PLCG1 and ERBB3 as master regulators of breast cancer. Functional enrichment analysis and gene ontology studies further proved the role of these genes in breast cancer. Among the master regulators, EGFR and JUN were found to be a potential biomarker and a promising drug target for treating breast cancer. EGFR is an FDA approved drug. Hence targeting this gene can help to regulate breast cancer.*In-vitro* studies were done to inhibit the activity of EGFR. 5-hydroxy-2-(4-hydroxy-3-methoxy-phenyl)-6,7-dimethoxy-chromone was used to inhibit the EGFR using MCF-7 cell line. IC-50 value was 3.2μg/10^3cells.DNA Fragmentation using the compound proved the its efficiency in inhibiting Up-regulated EGFR.

Keywords: EGFR, up-regulated genes, protein interaction network, DNA fragmentation.

Ref: ICBEE/60

Isolation of Methanogenic Bacteria and Producton of Methane from Rumen Fluid

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Methanogens are organisms that are capable of producing methane under anaerobic conditions using various substrates.During coal mining process,certain amount of coal is getting deposited as waste that leads to pollution.Therefore, in order to overcome this issue, the deposited coal waste is utilized as substrate.For the growth of methanogens isolatedfrom rumen fluid and thereby produce methane.Further studies involving isolation of methanogenic bacteria and determining its molecular characteristics and identify the optimum conditions by varying the concentration for maximum production of methane.

Keywords: Methane, Rumen fluid, Methanogens, Coal, Substrate.

Ref: ICBEE/61

A Survey on Impact of Nutritional Status of Children Under Mid Day Meal Programme in Madurai

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Nutrition has a tremendous impact on children. The development of a child's mind is very important, and proper development is dependent on proper nutrition. With a view to enhance enrolment, retention and attendance, and simultaneously improving nutritional status among children, Mid Day Meal (MDM) programme was launched as centrally sponsored scheme on August, 1995 by the Government of India. The present study is explorative in nature, so survey research using a self-designed questionnaire cum interview schedule was administered for collecting the perceptions about MDM scheme from the beneficiaries and functionaries. The objective of the study was to assess the health and nutritional status of children. Total of 800 school going children aged 6-13 years were randomly selected from seven government schools in Madurai. 400 were beneficiaries of MDM and 400 were non beneficiaries of MDM. Nutritional status was assessed by Anthropometric, Biochemical, Clinical examination and Dietary survey. Anthropometric measurements were assessed and the scores obtained from the data were analysed and also compared with standards. On the whole anthropometric measurements were found to be better for beneficiaries than non beneficiaries.

Key Words: nutritional status, anthropometry, mid-day meal, noon meal programme

Ref: ICBEE/62

Rumen fluid microbial fuel cell – immense source of bioelectricity

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Microbial Fuel Cell (MFC) is a promising technology for the production of sustainable energy. In the present study, a mediator-less dual chambered, H-type MFC was constructed for bioelectricity production using rumen fluid, a slaughterhouse waste. The anode chamber was filled with Rumen fluid as the fuel or organic matter. The cathode chamber was filled with distilled water. The experiments were conducted and their respective potential and current readings were obtained using a digital multimeter. Various parameters like electrodes, catholytes, pH, substrates and buffers have been optimized for the maximum bioelectricity production. Carbon, acetic acid, pH-7.0, spinach and acetate buffer gave a maximum of 610mV and 530mA, 470mV and 140mA, 590mV and 420mA, 470mV and 20mA, 1.4V and 140mA respectively. The cyclic voltammetry of anodic biofilm of MFC with all the above optimised parameters were performed and the results have confirmed that the oxidation of the organic matter has taken place and the electrons were released to the electrode. Based on the positive results in small MFC's, the scale up was performed with 3 liter containers of 2.5 liters working volume. The three individual MFC's namely MFC 1, MFC II and MFC III connected in series produced 2.05V and 0.2A. The same MFC's connected in parallel, produced 0.73V and 0.62A to the maximum. This denoted that to achieve a long term voltage and current, parallel connection is favourable and for high voltage, series connection of MFC's is favourable.

Keywords: Rumen fluid, Series, Substrates, Energy, Carbon

Ref: ICBEE/63

Plant mediated nanoparticle synthesis for Antimicrobial susceptibility against the pathogens from Wet & Gas Gangrene

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Green synthesis of nanoparticles using plant extracts become an innovative in thefield of nanotechnology. Gangrene is a rare, necrotizing fasciitis of the genitals and perineum caused by a mixture of aerobic and anaerobic microorganisms. Thirty clinical samples were collected from different patients and were assayed for antibacterial activity. Five species of bacteria classified into gram-positive and gram-negative were isolated from wet & gas gangrene patients of septic operation theater in various hospitals & laboratories in Madurai. *Limoniaacidissima*(*wood apple)* plant was chosen to investigate their antimicrobial activity against five isolated bacterial species: *E. coli, Staphylococcus aureus,Klebsiella pneumoniae, Pseudomonas aeruginosa K. oxytoca.*Plant extracts were prepared by different solvents chloroform, acetone, ethanol, hydroethanol, and distilled water. In this study, the anaerobic disease-causing pathogens present in the putrified ulcers in SOT patients were analyzed for their physiological characteristics on different selective media via Foldscope microscopy, gram staining and biochemical characterization. Among the solvents used hydroethanol extract showed high Zone of Inhibition against all the five multidrug-resistant pathogens in the range 17mm to 25mm. In the present study, zinc oxide nanoparticles (ZnONPs) were synthesized using leaf extracts of*Limoniaacidissima*(*wood apple)* and biosynthesis of ZnONPs was confirmed by UV-Visible spectrophotometer. In the 'post-antibiotic era' the synergism of ZnONPs with plant extract would be an alternative therapeutic and managemental strategies should be ventured to combat the aerobic & anaerobic putrified ulcers producing bacterial pathogens.

Key words: Plant extract; Multidrug resistant; Zone of inhibition,ZnO NPs

Ref: ICBEE/64

CCCTC-binding factor (CTCF) mediated epigenetic regulation of T helper (Th) cell differentiation during lung carcinogenesis

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CCCTC-binding factor (CTCF) is 11-zinc finger highly conserved protein and also referred as a transcription factor. It can work either as a transcriptional activator, or a repressor or an insulator protein by blocking contact between enhancers and promoters. CTCF may also recruit other transcription factors that are bounded to the borders of chromatin domain. CTCF is one of the main key structural proteins that help to set up the eukaryotic genome 3D-structure and function. The analysis of CTCF-binding sites in various species has shown its role in spanning the genome. Chromosomes spatial folding and their nucleus structure have profound effects on gene expression. CTCF sites can be mutated or deleted which as result causes cancer and also CTCF: DNA binding can be modified by epigenetic changes. It has already been well documented that during tumor formation human T helper (Th)-cells are unable to activate transcription of Th1-network genes for protective immunity. Several studies also demonstrated the critical role for the transcription regulator CTCF in controlling the expression of Th2 cytokine. In the current research proposal, we found out the role of CTCF that lead to the epigenetic regulation of T helper cell differentiation during lung cancer. Our study revealed the mechanistic association between CTCF and certain epigenetic regulators for evoking protective immunity during lung carcinogenesis. Thus we claim that CTCF mediated epigenetic regulation of T helper cell differentiation associated with malignancies can provide a promising avenue for targeting lung cancer therapy.

Keywords: Transcription Activator or Repressor, Lung Carcinogenesis,Epigenetic Regulator, T helper cell differentiation.

Ref: ICBEE/65

Rhodamine with improved ROS quantum yield using NiosomalNanoformulation in Photodynamic Therapy

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Multi-drug resistance (MDR) are becoming a major challenge recently due to the resistance exhibited by microorganisms to the conventional antibiotics. Alternative therapeutic techniques are being designed in order to overcome this problem by many researchers. One of the current strategies is photodynamic therapy (PDT) which utilizes light and photosensitizers for the generation of reactive oxygen species. In the present study, we have designed and engineered nano-encapsulated rhodamine 6G (R6G) in niosome to improve the ROS quantum yield and dependent therapeutic efficacy. The synthesized Niosome encapsulated R6G was characterized using various photophysical tools. The hydrodynamic diameter of Niosomes encapsulated R6G was determined to be 52.69 nm and the singlet oxygen quantum yield was calculated using iodide method. The singlet oxygen quantum yield was determined to be 0.51 in niosomal R6G which was much higher than that of R6G in water (0.203). The outcome of our study confirmed that the niosomalnano-formulated R6G can act as a potential agent for Photo dynamic inactivation of MDR microorganism.

Ref: ICBEE/66

Enhancement of the Production of Polymeric Poly-Hydroxybutyrate (PHB) Material from Bacterial Strains Through Mutagenic Strategies and Process Optimization by Response Surface Methodologies (RSM).

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Polyhydroxyalkanoates (PHAs) and polyhydroxybutyrates (PHBs) are biodegradable, thermoplastic and bio-based polyesters synthesized by various bacteria as a carbon and energy reserve and are accumulated insidethecells when presented in an environment with an excess of carbon source but exhaustion of nitrogen source. PHB are the best alternative for conventional plastics because of its excellent mechanical properties, like high melting temperature in the range of 170-180℃ and the glass transition temperature in the range of 0-5℃, which are similar to petroleum-derived polymers like polypropylene (PP) and polyethylene (PE).

However, the high production cost of PHB creates a disadvantage for its commercialization. This study focus on the alternative strategies for the production of PHB such as isolation of potent PHB producing bacteria and strain identification through 16S rRNA, finding less expensive raw materials as carbon and nitrogen source yielding maximum PHB production, optimization of fermentation conditions like temperature, pH and studying the effect of physical and chemical mutagens on PHB accumulation by the bacteria, which are necessary to reduce the total production cost while obtaining better yield from PHB accumulating bacteria.

Ref: ICBEE/67

Anti inflammatory activity of Phytocompounds from *Gelidiellaacerosa*: An in silico, in vitro and in vivo approach

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Cancer is characterized by aberrant cell signaling and prolonged inflammation that results in the overproduction of Reactive oxygen species (ROS). Excess ROS upregulates the expression of various signaling pathways including the MAPkinase, PI3K/Akt and NFKB cascades in cancer. The constitutive expression of NFKB causes drug resistance in lung cancer. Hence, drugs that can enhance the antioxidant activity of enzymes and regulate the NFKB activity are of prime target to manage the drug resistance and inflammation in cancer. The current is aimed to evaluate the effect of Phytoconstituents from *Gelidiellaacerosa* (GAE) on inflammation and on antioxidant enzymes in lung cancer.

The anti-inflammatory activity was determined under *in silico*, *in vitro* and *in vivo* conditions. The *in silico* analysis showed that the phytoconstituents of *G.acerosa*inhibited the IKBα-NFKB-p65-p50 complex in a similar way as that of doxorubicin and dexamethasone. The expression of proteins in the NFKB cascade including NFKB, NFKB p65(phosphorylated at Ser536), proinflammatory cytokines (TNF α and IL 1β) and anti-inflammatory marker (IL 10) were analysed by Western blot under both *in vitro* and *in vivo* conditions.

The results showed that Phytoconstituents from *G. acerosa* enhanced the efficiency of antioxidant enzymes peroxidases and superoxide dismutase in A549 cells. Further,the data showed that *G. acerosa* inhibited the activation of NFKB, production of proinflammatory cytokines and upregulated the expression of IL 10. As inflammation causes cancer progression, the inhibition of inflammation inhibits tumorogenesis. Hence, based on the outcomes of the study, it can be concluded thatPhytoconstituentsfrom*G. acerosa* exerts anti- inflammatory activity through inhibition of NFKB cascade.

Keywords:*Gelidiellaacerosa,* NFKB, proinflammatory cytokines, anti-inflammatory marker, IKBα-NFKB-p65-p50 complex, ROS.

Ref: ICBEE/68

Saraca indica leaf extract assisted green synthesis of reduced graphene oxide nanosheets and its potential *in-vitro* biological effects

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A simple eco-friendly approach of producing reduced graphene oxide (rGO) using leaf extract of *Saracaindica*as a "green reducing agent"was investigated in the present study for exploring its biological applications.UV-vis spectra showed absorption peak at 292nm corresponding to deoxygenation of the GO suspension under the reduction process. XRD spectrum displayed diffraction peak (2θ) at 27°confirming high crystallinity of rGO. FTIR representedabsorption bands: 3353 cm^{-1}(OH stretching); 1621cm^{-1}(OH bending);1065cm^{-1}(C-O stretching) corresponding to oxygen functionalities present inrGO. Microscopic techniques: SEM and TEM displayed thin transparent nanosheets. EDAX spectra detected intense signals of C-77.58% and O-20.50%. DLS analysis showed zeta potential (-44.6 mV) confirming good stability of the particles with average size measured to be 117 nm.*In-vitro* anti-bacterial assay showed that rGO exhibited maximum inhibitory effect against gram postive (*Bacillus subitils*-19mm; *Staphylococcus epidermis*-9 mm) than gram negative (*E.coli*-15 mm; *Pseudomonas aeruginosa*-5mm) bacterial pathogens. In addition,MTT assay also showed maximum cytotoxic effect (51%) against lung cancer cell line (A549) at highdose concentration of rGO-500µg/ml.Overall results affirmed that *Saracaindica*leaf extract mediated reducedGOcould be used in formulation ofnanotherapeutic agents for various biomedical applications.

Keywords:*Saracaindica*; rGO; Nanosheets, Anti-bacterial; Cytotoxicity

Ref: ICBEE/69

Isolation of insecticidophilicbacetria from polluted soil

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The extensive usage of pesticides to meet the demand for food and feed has led to many environmental problems. Approximately 90% of agriculture pesticides never reach their target insects but are accumulated in the soil as soil pollutant. Owing to their toxicity and persistence in the environment, most of them are banned in the world. Bioremediation constitutes an attractive alternative to physico - chemical methods of remediation, as it is less expensive and can selectively achieve complete destruction of organic pollutants. Microorganisms play a major role in the breakdown and mineralization of these pollutants as bioremediators. For a successful bioremediation technique, an efficient bacterial strain that can degrade largest pollutant to minimum level is required. Hence this study is focused on the isolation of indigenous insecticidophilic bacteria from polluted soil.

Keywords: Bioremediation, mineralization,

Ref: ICBEE/70

Green Synthesis and Characterization of Silver Nanoparticles using *Zingiberaceae* Leaf Extract and Assessment of its *In vitro* Antidiabetic Activity

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Zingiberaceae speciesare widely used by the tribal population in the treatments of various ailments such as asthma, chronic fatigue, rheumatoid arthritis, premenstrual syndrome, irritable bowel syndrome, diabetes and cancer. The aim of the current study is to evaluate the antidiabetic activity of phyto-functionalized silver nanoparticles (AgNPs) synthesized from sprouted species of *Zingiber officinale*&*Curcuma amada*. The AgNPs were characterized using UV-Vis, SEM, EDX, XRD, and FTIR etc., and were tested against food pathogens *Listeria monocytogenes* (gram positive) and *Salmonella enterica* (gram negative).Further,different type of antidiabetic assays (α-amylase & α- glucosidase inhibitory) was performed. The cytotoxicity of the nanoparticles was assessed using MTT and glucose uptake assay on fibroblast cell line (3T3-L1). The results indicated that AgNPs have good bactericidal activity on the tested pathogens and also have significant results in antidiabetic assays. This study proved the green synthesized of phytofucntionalized nanoparticles using aqoues extract of *Z. officinale*&*C. amada,* is a highly active, non-toxic, and safe antidiabetic agent.

Keywords:*Zingiberaceae*, characterization, food pathogens, HCT15, 3T3-L1.

Ref: ICBEE/71

Subsoil manuring using semecarpus fruits –an ancient agro method in siddha medicine

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Quality and therapeutic efficacy of a herb is determined by the ecological concerns of nature of soil in which it grows and the availability of essential components for its nourishment. Availability of herbs unmatching the demands of human needs due to scarcity of potent herbs and its resources is a major unresolved issue faced by local traditional healers or pharmaceuticals. Many of the indigenous black species herbs used in Siddhamedicine comes under rare and endangered list. Such herbs are either to be protected by preserving their habitat or to scientifically find alternatives like therapeutic potentiation of common herbs, which may stand equal in potency with that of black varieties. Potentiation of normal herb species, which may analogue the competent rarespecies is discussed in ancient Siddha medicine literatures.

Here an ancient method of subsoil manuring with fruits of *Semecarpus anacardium* was selected. The manure was prepared as per the Standard Operating Procedures (SOP) and were undergone soil studies at three intervals.Studies supported the claim of a super nutrient soil manure for generating potent plant species. There was significant increase in the essential elements observed in the final sample. Most noted was the elements like Nitrogen, Phosphorous, Iodine, strontium, calcium, magnesium, Sulphur, copper and barium. The final soil sample appeared blackish typically due to the presence of Semecarpus oil. With the preliminary analysis of the soil samples, it was observed that the percentage of organic matter, moisture and water retaining capacity of the soil, ideal Ph., trace elements wouldfavor healthy growth of any medicinal plants when used this as manure.This may open to a vast field of advanced studies like biological modification and cultivation of black species, which is the one of the uniqueness of Siddha medicine.

Key Words: *Siddha* medicine, *Semecarpus* Organic manure, black species, Soil studies

Ref: ICBEE/72

Antagonistic activities of sea grass epiphytes against multi drug resistant (MDR) human pathogen

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Infectious disease is one of the leading causes of death due to the multi drug resistance organism. To overcome these problems the development of effective newer drugs without any side effect is an urgent need. In general marine plants such a sea weeds, sea grasses and marine sponges provide an excellent substratum for epiphytic microorganism. These epiphytic microorganisms are a rich source of new metabolites with a wide variety of biological activities, and some of them display significant practical applications. They produce a wide variety of chemically active metabolites that possesses antibacterial, antiplasmodial, anti fungal and anti algal properties and are also finding importance in therapeutics. Among which some of the metabolites can be used for drug development against multi drug resistant (MDR) human pathogens. The focus of this study is to explore the antibacterial potential of epiphytic bacteria from *cymodaceaserrulata* (Sea grass) against clinically pathogenic MDR bacteria.

Keywords: Sea grass, Antibacterial, Epiphytes, Multi drug resistant.

Ref: ICBEE/73

Prickly Pear Fruit Mediated Biosynthesis of Gold Nanoparticles and Its Anticancer Potential Against Human Oral Cancer Cell Line (Kb)

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In the current study, a simple, rapid, eco-friendly and cost-effective method was successfully developed through a green synthesis of gold nanoparticles (AuNPs) using Opuntia fruit extract as an anticancer agent. Opuntia aqueous extract was used as a reducing agent for synthesizing gold nanoparticles. Opuntia can reduce gold ions into gold nanoparticles within 15 min after magnetic stirring the reaction mixture at RT as observed by development of dark brown color. Biosynthesized gold nanoparticles were characterized by using different analytical techniques. Anticancer potential of AuNPs was investigated against humanoral cancer cells (KB). The cytotoxic response was assessed by MTT assay, morphological changes and COMET assay. Further, the cytotoxic response observed was in a concentration-dependent manner. Furthermore, the results also showed a significant increase in anticancer as well as anti-apoptic activity. Therefore, AuNPs may be used to treat the oral cancer.

Keywords*:* MTT assay, KB cells and COMET assay.

Ref: ICBEE/74

Mechanistic Anti-Tumor Activity Of 3-(2-(3,4-Dimethoxyphenyl)-2-Oxoethylidene) Indolin-2-One (Raji) On Triple Negative Breast Cancer Cells

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Breast cancer is the most frequently diagnosed cancer in women and the leading cause of cancer related death worldwide. Among the many sub-types of breast cancer, the treatment of the Triple Negative Breast Cancer (TNBC) has always been a challenge owing to the lack of the key receptors – Estrogen Receptor (ER), Progesterone Receptor (PR) and Human Epidermal growth factor 2 (HER2) on the surface of the cells. Hence the anti-tumor activity of 3-(2-(3,4-DIMETHOXYPHENYL)-2-OXOETHYLIDENE) INDOLIN-2-ONE (RAJI) was studied on the metastatic cell line MDA-MB-468.The IC_{50} value of RAJI on the cells were deduced by MTT assay and the cytotoxic potential was further confirmed by staining the cells with Calcein AM and Propidium Iodide post treatment of cells with the deduced IC_{50} value of RAJI. A scratch assay performed on the cell line reveals the hinderance in the migration potential of the cells post treatment with the IC_{50} value of RAJI.DNA damage in the RAJI treated cells were confirmed through the DNA fragmentation Assay.Caspase detection assay also further confirms the anti-tumor potential of RAJI treated cells in comparison to the untreated cells. Hence, RAJI poses as a potential target against TNBC cells. However, further studies are warranted to elucidate the underlying mechanistic action of RAJI on TNBC cells.

Keywords: TNBC, ER, PR, HER2, RAJI

Ref: ICBEE/75

Biological synthesis and Characterization of AgNps via endophytic bacteria isolated from Nyctanthes arbor-tristis flower

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Recently endophytes are enormously receiving so much attention as a major source of structurally novel bioactive metabolites useful not only to the plant but as also of economic importance to human in medical, industrial, agricultural and research sectors. AgNps, one out of many nanoparticles utilized in nanotechnology have launched differs, vast and amazing possible applications in almost all facets of science, in line with this, an immense number of microorganisms have been found capable of synthesizing nanoparticle. This study reports endophytic bacteria isolated and identified for the first time from the flower of one of India's wealth of medicinal plant *Nyctanthes arbor-tristis* Linn.AgNps synthesized by the isolated endophyte was characterizedby UV-Visible and Fourier-transform infrared spectroscopy spectroscopy followed by Scanning Electron Microscope analysis. Further, these AgNps have been found to possess antimicrobial effect against pathogenic bacteria E.coli. Based on research, this is the first report that shows the isolation and identification of endophytic bacteria from the flower part of NAT alongside its biogenic AgNps synthesis. Hence, this suggests that there is a possibility of using AgNps synthesized as a potent antibacterial agent.

Ref: ICBEE/76

Understanding the mechanism of embR mutations in *Mycobacterium tuberculosis*: A perspective study

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Drug resistance in *Mycobacterium tuberculosis* (MTB) is a global concern, conferred by mutations across the genome. Tuberculosis treatment is hampered with the emergence of Multi-drug resistant and Extensively drug resistant TB. MTB consists of different lineages that display a strong geographical association and vary in their propensity to transmit and cause disease. Analysis of the Whole-genome sequencing data has revealed variants in the genes which are drug targets or drug activators. Previous studies have reported numerous mutations in drug-resistant clinical isolates. Mechanism of resistance to isoniazid and rifampicin is well understood. But little is known about the mechanism of resistance to ethambutol. Ethambutol targets the embCAB operon, consisting of the embC, embA and embB genes, involved in the polymerization of cell wall arabinan. This work is focused on the study of the mutations reported in embR, which is the transcriptional activator of embCAB genes. The impact of these substitutions on protein stability, protein-protein interaction and protein-ligand interaction will be studied using bioinformatic tools. The mutations reported will be collected by literature mining. The analysis will help in understanding the mechanism of resistance and the impact of mutation on drug efficacy. Further, computational approaches such as variant calling will be used to analyse whole genome sequencing data to detect known and prospective novel mutations associated with drug resistance, thus identifying lineage-specific variants.

Keywords: Drug resistant TB; Ethambutol; homology modelling; variant calling

Ref: ICBEE/77

Mycosynthesis of silver nanoparticles and their applications in growth promotion of plants

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Silver nanoparticles (AgNPs) are widely used in many fields of science. This study aims at mycosynthesis of nanoparticles from marine sources and their capabilities to be used as plant growth promoters to aid in the agricultural field, without causing any negative impacts to the environment. Silver nanoparticles were synthesized and characterized. The preliminary screening of AgNps confirmed an accelerated degree of root growth in *Trigonellafoenum-graecum* and *Vigna radiata.* The rate of seed germination and plant growth promotion was tested against different concentrations of the nanoparticles to choose the optimum concentraion. Further biochemical tests were performed to estimate Total chlorophyll, protein, carbohydrate and reactive oxygen species (ROS) production. Gene expression analysis will be performed for genes involved in growth development and ethylene production. Based on the results, field trials will be performed on common cereal crops and legume plants.

Keywords: Silver nanoparticles, Plant growth promotion, Mycosynthesis

Ref: ICBEE/78

Isolation and identification of plant pathogenic bacteria and fungi from infected cardamom and control with green nanoparticles

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The cardamom (*Elettariacardamomum*) is popularly known as queen of spices. It is a tall perennial herbaceous plant belongs to the family zingiberaceae. India is the second largest producer of cardamom. It has more economical and commercial value.It is affected by pathogens such as bacteria and fungi and more than 25 bacterial and fungal diseases are identified in cardamom plant resulted in 40% of crop loss which affects the economy of India. Hence, the objective of the study is to isolate and identify the bacteria and fungi from infected plants and to treat them with silver nanoparticles synthesized from herbs. Nanoparticles are synthesized by biological method and characterized by physicochemical methods. The efficacy of the nanoparticles is screened at various concentrations to control pathogens of cardamom.

KeywordsCardamom, economic value, pathogens, green nanoparticle,

Ref: ICBEE/79

Isolation and identification of multidrug resistant organisms and alternate methods of control

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Multidrug resistance remains as a potential health hazard, constantly claiming a large number of lives every year. Hospitals are one of the largest breeding grounds for these kinds of organisms, due to large amounts of antibiotic consumption and efflux, along with improper waste treatment. The main aim of the study was to discover novel MDR species, and seek alternative methods of control to combat multiple drug resistance. Multidrug resistant strains were isolated from soil in waste disposal areas from 5 renowned hospitals. Bacterial colonies were isolated and identified by biochemical, microbiological and molecular characterization. Antibiotic profiling was performed using commercial antibiotics by Kirby Bauer disc diffusion method. Nanoparticles are well known for their antibiotic properties and were used to test against these organisms. Two nanoparticles synthesized from terrestrial medicinal plant sources were tested for their efficacy against the MDR organisms. MIC, MBC and Biofilm assays were performed. Both the nanoparticles were effective in curbing microbial growth and proliferation even at low concentrations in MDR bacterial pathogens.

Keywords: Multidrug resistance; hospitals; nanoparticles; green synthesis

Ref: ICBEE/80

Formulation of*Cissusquandragularis* based nano emulsion to control osteoporosis

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Osteoporosis is a chronic disease that causes bone mass reduction. Over 200 million people are suffering from osteoporosis especially post- menopausal women. Osteoporosis has no cure except for certain treatments for management. Silver nanoparticles are one of the most important materials and known for their drug delivery, diagnostics etc. *Cissusquadrangularis* is known as a traditional medicine for healing bone fractures in Southeast Asian countries especially in India. Endophytic fungi are generally harmless and known to possess similar metabolites and characteristics as its host plant and can be used for various applications. The endophytic fungi was isolated and identified by sequencing ITS region. The two species were identified as *Phomapedeiaesp and Aureobasidium pullulans.*

The *C.quadrangularis* plant extract and the endophytic fungal extract were used to synthesize silver nanoparticles which are screened with MC3T3 cell lines for anti-osteoporosis properties. These nanoparticles were characterized with various analytical methods such as UV-Vis spectroscopy, FTIR, FE-SEM, DLS and XRD. Benzene derivatives, alkane, alcohol, nitrile etc were some of the compounds identified through FTIR.The nanoparticles derived from the plant extract showed excellent antioxidant activity Since metal nanoparticles are known for their stability, ‘green synthesis’ of silver nanoparticles mediated by C. *quadrangularis* is expected to be an efficient way to treat osteoporosis.

Keywords:*C. quadrangularis,* Nanoformulation, osteoporosis,

Ref: ICBEE/81

Garlic silver nanoparticles control food borne pathogenic bacteria

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Food industries are one of the leading sectors in India. The food industries include agriculture, manufacturing, food processing, marketing etc. The presence of food borne pathogens even after complete sterilization is a major threat. Nanotechnology is one of the emerging fields which provide an alternative solution to the current problems faced by the food industries.The incrementing scope of pathogenic resistance to antibiotics has encouraged the search for nanoparticles with an antimicrobial activity. Metallic nanoparticles have been extensively investigated due to their unique size-dependent properties which make them useful in a variety of applications. Silver nanoparticles are one of the most vital and fascinating nanomaterial among several other metallic nanoparticles. AgNPs have longer-lasting antibacterial properties than bigger particles of silver. The objective of the present study was to synthesize silver nanoparticles (AgNPs) using the plant extract of garlic *Allivum sativum*.This was an eco-friendly way of synthesizing AgNPs.The potential impacts of AgNPs on food safety and control were evaluated by the antimicrobial activity of the synthesized AgNPs against common food-borne bacteria.

Keywords: silver nanoparticles; *Allivum sativum*; antimicrobial activity; food borne bacteria

Ref: ICBEE/82

Mycosynthesis of silver nanoparticles from endophytic fungi and its antibacterial activity

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The aim of this study was to synthesize silver nanoparticles from endophytic fungi isolated from medicinal plants. The extracellular synthesis of silver nanoparticles weresynthesised from endophytic fungi and were characterized by UV-Vis and FTIR spectroscopy, FE-SEM, XRD, Zeta potential and EDX techniques. The antimicrobial activity of the nanoparticles were tested against the *E.coli* by evaluating assays such as MIC,MBC, Biofilm formation and time kill assay at 6h intervals upto 48h. A standard antibiotic (Ampicillin 25ug/ml) was used as control. Based on the results the nanoparticles can be used as an alternative to antibiotics to overcome antimicrobial resistance.

Ref: ICBEE/83

Isolation and identification of pathogenic bacteria and fungi from infected pepper plants (Piper nigrum) and control my nanotechnology

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Pepper is a tropical, evergreen perennial climber to 20 feet with heart shaped leaves. Black pepper is called as “THE KING OF SPECIES” and considered to be the most widely used spice in the world. It has been used in Ayurveda, Unani and Siddha for thousands of years for the treatment of cold, fever, antimalarial treatment etc. A major problem associated with pepper production is occurrence of pathogens that causes severe diseases and significant yield losses. There are several pathogenic bacteria and fungi that affect the pepper plant production. For this current study bacterial and fungal pathoges are isolated and identified by sequencing. Nanoparticles synthesized by green technology is utilized to screen the efficacy of the nanoparticles to control both bacterial and fungal pathogens. The current research finding will help to produce novel nanoformulations to control diseases in pepper.

Keywords: Piper nigrum, pathogesns, nano formulation

Ref: ICBEE/84

Synthesis, characterization and anti-microbial activity of silver nanoparticles using banana peel extract.

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The present study is an eco-friendly, cost efficient and easy method for synthesisof silver nanoparticles using banana peel extract (BPE) from *Musa accuminata* (Red banana) which is an agricultural waste as a reducing and stabilizing agent. The different factor affecting silver reduction was investigated. The optimum conditions were silver nitrate (1.75 mM), Banana plant extract (20.4 mg dry weight), pH (4.5) and incubation time (72 h). BPE can reduces silver ions into silver nanoparticles within 5 min after heating thereaction mixture (40-100 ®C) as indicated by the developed reddish-brown colour. The UV-visible spectrum of silver nanoparticles revealed a characteristic surface plasmon resonance (SPR) peak at 433 nm. The average size of nanoparticles was 23.7 nm as determined by dynamic light scattering. Fourier transform infrared spectroscopy affirmed the role of BPE as a reducing and stabilizing agent of silver ions. Silver nanoparticlesshowed effective antibacterial activity against representative bacteria and yeast. The minimum inhibitory concentration and minimum bactericidal concentration were determined. The synthesized nanoparticles showed synergistic effect with Moxifloxacin antibiotic.

Keywords:*Musa accuminata*, reducing agent, silver nanoparticle.

Ref: ICBEE/85

Russeliaequisitiformis and its endophytic fungi mediated synthesis of nanoparticles to control lung cancer

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The present study is focused on synthesis of silver nanoparticles using *Russeliaequisitiformis* plant extract and endophytic fungal extract isolated from the aerial parts of this plant. The survey on various literature and search for medicinal plants for curing cancer has paved way to a less explored plant *Russeliaequisitiformis;* this plant is used as ritualistic medicine in Nigeria to cure malaria, cancer and inflammation. Previous studies elucidated the presence of several pharmacologically active compounds in the plant. The endophytic fungi isolated from the flower and leaf were identified as *Nigrospora lacticoloria* and *Alternata japonica*. The synthesized silver nanoparticles were characterized by using UV-vis spectroscopy, FT-IR, and other physicochemical methods.The antioxidant activity of the synthesized nanoparticles from flower extract was comparatively higher than the leaf extract. The fungal extract based nanoparticles also have good antioxidant properties and hence, we hypothesize that the nanoparticles synthesized using *R. equisetiformis* plant extract and the endophytic fungal extract from this plant could be biocompatible. Since this plant is known to cure cancer, the anticancer activity will be tested with the subtype of most common lung carcinoma, non small cell lung cancer (NSCLC) which is common when compared to the other subtype.

Keyword:*Russeliaequisitiformis*, non-small cell lung cancer (NSCLC), Nanoparticles

Ref: ICBEE/86

Screening, Enhancement, and Characterization of Taxol Production from Endophytic Fungi over Commercial grade Taxol as a potent Anti-Cancer Drug – A Molecular and Bioinformatics Approach

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Taxol is an important chemotherapeutic drug that is mostly preferred in many formulations to fight Cancer by inhibiting the depolymerisation of microtubules by increasing their assembly, thereby stopping the cell division and induces apoptosis. Due to extensive exploitation of Pacific Yew trees *(Taxus breviofolia)* for Taxol Isolation researchers have turned towards Endophytic Fungi for taxol Production. Endophytic Fungi represents a wide variety of bioactive compounds that have profound uses in many perspectives. Although only endophytes isolated from Taxus plant species have been proven to produce taxol, certain non-Taxus plant endophytes are now being studied for Taxol production. With the discovery of molecular mechanisms behind the production of Taxol in endophytic fungi, researches have been carried out to hack certain intermediary steps to induce taxol production on a large scale. ”Taxadiene synthase” is an enzyme thatcatalysesthe conversion of Geranyl Geranyl diphosphate into Taxadiene which in turn produces taxol. The goal is to isolate endophytic fungi and screen them for taxol production by culturing Fungal isolates and screening them for taxol production using HPLC and MS analysis. Enhancement of Taxol production in screened fungal cultures by gene amplification of important enzymes in the Taxol biosynthetic pathway.The overall aim is to study the key enzymes and associated genes to form an interaction framework in regulating the taxol production through Insilico analysis and to put forth Taxol isolated from endophytic fungi as a better choice over present taxol in terms of efficacy over the anti-cancer property and enhanced production.

Keywords: Taxol, Endophytic Fungi, Taxadiene synthase, HPLC

Ref: ICBEE/87

Plastic degradation by endophytic fungi

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Plastic waste is one of the major concerns and ecological threats due to its indestructibility and its inability to undergo a natural breakdown process. Certain microbial communities such as bacteria and fungi have already been employed to alleviate this problem by enhancing the degradation rate of different plastic or polymer compounds. Enzyme specific degradation mechanism of plastic has also been researched upon to identify which particular enzymes play a key role in plastic degradation, and the final by-products, whether the by-products are toxic or is it easily degradable?. Along with the information available about the microbial enzymes involved in plastic degradation and mechanisms behind it, we aim to identify and screen the plastic degrading capacity of the isolated endophytic fungi. Various biochemical tests to identify anaerobic or aerobic conditions, sole carbon usage capacity of fungi will also be analysed. Further the project focuses on the identification of specific genes that play a key role in plastic degradation and to analyse how various parameters such as pH, pressure, temperature affects the plastic degrading ability of the screened fungal isolates. And by which we could come up with a novel endophytic fungi which could be employed in environmental sources to clean up plastic waste.

Keywords: Endophytic fungi, plastic degradation, enzyme

Ref: ICBEE/88

MRSA-Antimicrobial tolerance and gene expression using antimicrobial peptides -an *in vitro* exploratory study.

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Antimicrobial resistance portrays an increasing global health issue according to World health organisation which resulted in increasing development of wide variety of novel techniques and molecules for effective therapy against it. Methicillin resistant *staphylococcus aureus* is multi drug resistant gram-positive bacteria which results in various health care and community associated infections in the past decade. So there emerged an increasing need for novel treatments and diagnosis. Antimicrobial peptides (AMP) have become novel molecules with high specificity to make progress in therapy. They have very good immunomodulatory effect. In our study, we evaluated the antimicrobial properties of viral peptides against MRSA using several assays and their haemolytic activity for safer use. We also evaluated the gene expression using PCR to know the effect of the AMP on expression of virulence gene. Thus, this study explores the antibacterial activity of AMP against MRSA which may serve as new antibiotic recipe or for the development of inexpensive effective chemical free hand wash to reduce the infections in health care hospitals.

Keywords: MRSA, gene expression, antimicrobial peptide,

Ref: ICBEE/89

Biodegradation of azo black dye by novel bacteria Isolated from tannery effluent

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Textile, leather and dyeing industries largely produce effluents contaminated with dyes. The textile dye industries consume a substantial amount of water and produce extensive amount of waste which is contaminated with dyes such as reactive dyes, azo dyes and much more non-degradable waste materials. Hence there is a pressing need to treat the tannery effluent since it contains hazardous chemicals and microorganisms and can pose a huge threat to the environment. This current work is focused to isolate and identify the bacterial species present in the effluent and further can be utilized for various applications such as enzyme production, metabolite production etc. Based on 16S rRNA sequencing, the bacterial species were identified and these bacterial species were utilized to test whether the bacteria can degrade the azo black dye, which is used in textile, tannery and paper industries. The current results suggested that few species isolated from tanneries can be utilized to degrade the dye from textile industries which can be further utilized for agriculture.

Keywords: Tannery, Azo dye, Bacteria, dye degradation,

Ref: ICBEE/90

Impact of thymoquinone incorporated levodopa in parkinson's disease to minimize drugs secondary effects

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Thymoquinone is the principal compound present in *Nigella sativa* seeds. It is considered to be an exemplary compound to treat diverse diseases. It is active against MPP^+ and rotenone activity which generally induces Parkinson's condition. Parkinson's disease is a progressive neurodegenerative disorder which causes the person to lose control over the body functions. There is no specific test to identify and cure the disease. Less likely, it has various side effects. Long term use of this drug can cause neuron degeneration.

In order to overcome the side effects, thymoquinone can be incorporated with the levodopa. The synergistic effect can be studied in primary neuronal cell line. Various molecular assays are being conducted in order to check the toxicity and motor fluctuations. Thymoquinone may be a viable option to prevent quinone formation as a result of L-Dopa auto oxidation and can reflect the effects of the thymoquinone-levodopa drug on ameliorating the downside aspects of the native drug. It can also demonstrate the neuroprotective and antioxidant effect of the compound. Thus, this current research might shed some light on the beneficial effects of thymoquinone against neurotoxicity.

Keywords: Parkinson's disease, Thymoquinone, Levodopa, L-Dopa, Neurotoxicity

Ref: ICBEE/91

Green synthesis of silver nanoparticles from medicinal plant extracts

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Nanotechnology is currently an evolving field in scientific research. Biosynthesis of silver nanoparticles (Ag NPs) using plant extracts became one of the potential areas of research. The present study describes a rapid and eco-friendly synthesis of AgNPs using medicinal plant extract. Silver has been recognized for its inhibitory effect on microbes in medical and industrial process. The biological method of synthesis has paved way for "Green synthesis" of nanoparticle and it has proven to be a better and conventional method for synthesizing due to its compatibility and stabilization. The use of environmentally benign materials like medicinal plant extract for the synthesis of silver nanoparticle as they do not contain any toxic chemicals for synthesis. Green synthesis provides advancement over chemical and physical method due to its cost effectiveness, environment friendly. In this study, the bio synthesis of silver nanoparticle was done by using Medicinal plant extract from three different plants .Thus, the significant outcome of this study is to formulate value added herbal-based nano-materials that can be applied in biomedical and nanotechnology industries.

Keywords : Medicinal plants; Silver Nanoparticle; Biofilm

Ref: ICBEE/92

Formulation and Evaluation of Herbal Anti-Aging Cream using *Vigna radiata*

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Aging is a universal concern. Skin aging is the result of continuous deterioration process, caused by cellular DNA and protein damage. Skin aging of two types i.e., "sequential skin aging", which is caused by the physiological alteration in the skin while "photo aging", caused by over exposure to UV rays from sun light, characterized by dry, shallow, pale, deep furrows caused by disorganization of epidermal and dermal components. Plants and herbs have already been using and proved its effectiveness as complementary in pharmaceutical and cosmetics field. Talking on cosmetics, skin care products are best to reduce hyper pigmentation, aging, etc, .we aim to study and formulate herbal anti-aging cream based on anti-oxidant potential of *vigna radiata* and commercial potential product. Vitamin A, flavanoids, phenols also act as a very good anti-oxidant which slows down the aging process by neutralizing the free radicals and other reactive species. *vigna radiata* are rich in flavanoids, especially vitexin and isovitexin. The biological activities of vitexin were investigated for the potential application of its anti-aging effects in the cosmetic field. vitexin can be effectively used for the prevention of UV-induced adverse skin reactions such as free radical production and skin cell damage. The project focus on extracting plant materials rich in antioxidants and formulating a herbal anti-aging cream and its evaluation.

Keywords: anti-aging, herbal cream, *vigna radiata*, flavanoids, vitamin A , antioxidant, photoaging.

Ref: ICBEE/93

Chitosan nanoparticle encapsulated with *Terminalia chebula* and its enhanced effect on *In vitro* anti-diabetics activity

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*Terminalia chebula*is an Ayurveda herb which is used as the traditional medicinal plant and provide an adverse effect in treating the disease. It is widely used in the treatment of glucose related diseases. The chitosan is a polymer that can be easily available in the form of biocompatibility and non-toxic in nature. The chitosan can be used as a biodegradable polymer and drug delivery in the pharmaceutical industry. With the help of ionic gelation method, we can obtain the chitosan nanoparticles. The detection of chitosan nanoparticle was carried out by characterization methods like UV-Vis Spectrophotometer, FE-SEM, EDS, EM, FT-IR, XRD and DLS can be performed. The alpha amylase assay and alpha glycosidase assay (glucose tolerance test) has to be very specific in nature that it can treat diabetic related diseases. The MTT assay study shows the efficiency of the drugs in three different concentrations. The cytotoxicity and the viability were understood with the biocompatible and the *T. chebula* verified with the fibroblastic cell lines. By the observation, the cancer cells are inhibited compared to normal cells by the chitosan loaded nanoparticles. Thus, the chitosan loaded nanoparticles has the potency on cancer therapy.

Keywords: *Terminalia chebula,* Chitosan nanoparticles, Glucose tolerance, *in vitro* technique, MTT assays.

Ref: ICBEE/94

Mangrove Leaf Extract as a Dental Anti-Biofilm Agent

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This present study was aimed to explore the mangrove leaf extract as a dental anti –biofilm agent. Mangroves provide a number of benefits to living communities due to the presence of several bioactive compounds. Dental Biofilm, the pale yellow plague that develops naturally on the teeth are the cause of all dental disease including caries. Biofilm surface associated EPS (Exopolysaccharieds) plays an important function in both extracellular and intracellular adherence of cariogenic organism. The leaves of*Rhizophoramucronata* was collected to prepare leaf extract with the polar solvent chloroform. Gram staining showed that most of the strains are gram positive. Catalase enzyme activity is proves that the bacteria has the ability of forming spore. Citrate utilization test is confirms that the bacterium uses citrate as sole carbon. Absence of colour change on kovac's reagent indicates that the bacterium cannot convert the tryptophan into indole. Oxidase test indicates that the bacteria use oxidase enzyme. Mannitol salt agar test indicates that the bacteria are tolerant to salt. From the biochemical characteristics the isolated microorganisms might the *staphylococcus spp*and mangrove leaves extract is effective against the dental biofilm

Ref: ICBEE/95

Studies on inhibition of amyloid aggregates of prion peptide 106-126 using small stress molecules (SSMs)

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Prion diseases characterized by the accumulation of misfolded protein aggregates in the brain of affected individual These are transmissible neurodegenerative disorders of protein conformation where the posttranslational modification of host-encoded prion protein PrP^{c} yields a high β-sheet content modified protein PrP^{sc} which further polymerizes into amyloid fibrils. PrP106-126 is a peptide present in the whole prion protein and is responsible for initiating conformational changes that leads the conversion of PrP^{c}toPrP^{sc}. Molecules which can destabilize and defunctionalize such proteins can serve as a potential therapeutic agent in combating prion diseases. In microorganisms during stressed conditions, small stress molecules are formed to prevent protein denaturation and maintain protein stability and function. Therefore, it is possible that they can prevent abnormal protein folding like amyloid formation. This work explores the effect of such small stress molecules on PrP106-126 amyloid formation. The characterization tools used for this study include turbidity, atomic force microscopy and cell viability assay. According to our results ectoine and mannosylglyceramide exhibited inhibitory effects against prion peptide aggregation and toxicity to human neuroblastoma cells. Our findings conclude that small stress molecules could be potential inhibitors for prion diseases.

Ref: ICBEE/96

Aquaponics using hydrotons

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Aquaponics is an eco-friendly system for food production utilizing aquaculture and hydroponics to cultivate fish and crop without soil. It is an inexpensive symbiotic cycle between the fish and plant. In an aquaponic system, fish waste (ammonia) is fed into the plant bed which acts as a bio-filter and takes the nitrate which is essential to grow vegetation. The fresh new water is then returned to the fish enclosure to restart the cycle. A unique advantage of an aquaponic system is conserving water more effectively compared to traditional irrigation systems. Conservation of water is accomplished by recirculating water between the plant bed and the fish habitat continuously. Organic fertilization of plants using dissolved fish waste is the other benefit of aquaponics. Utilizing plants as a natural alternative to other filters, requires less monitoring of water quality. In our project, an aquaponics system was designed and built in Lyle Center for Regenerative Studies at California State Polytechnic University of Pomona. The future purpose of our project is finding an optimized situation for the aquaponics system to produce food and save water more efficiently and eco-friendly. Fish produce waste and ammonia - these are harmful for the fish in elevated quantities and decrease the quality of the water. In aquaponics, water from the fish tank is fed to a plant growbed where the billions of naturally occurring, beneficial micro-organisms break the ammonia down first into Nitrite and then into Nitrate. Nitrate and other nutrients are absorbed by the plants to assist in their growth and in turn, serve to clean the water. Solid waste will also be filtered out of the water by either the growbeds or some other mechanical process. Clean water is now returned to the fish tank increasing the water quality and providing the oxygenated water that the fish need. This is a natural and sustainable process that mimics an ecosystem and produces high quality food without any chemical inputs.

Ref: ICBEE/97

Comparison of Machine Learning Classifiers for Wheat Seed Classification

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Wheat is a cereal grain belonging to the genus, Triticum. It forms the staple food worldwide and China is the largest producer of Wheat. India forms the second largest producer of Wheat contributing 9,85,10,000 Tonnes contributing 8.7% of total wheat production. Northern and north eastern India including Uttar Pradesh, Haryana and Punjab produces maximum yield. Classification of wheat seed is a challenging task. With a tremendous growth in the data analytics, various machine learning techniques are applied for the classification of wheat seed using the geometrical parameters of wheat. Geometrical parameters used for the data mining include area, perimeter, compactness, length of kernel, width of kernel, asymmetry coefficient, length of kernel groove. Machine learning techniques such as fine tree, linear SVM, fine Gaussian, linear discriminant analysis is carried out for the variety of wheat seed parameters available in UCI machine learning repository. Performance of the different techniques of machine learning tools used for classification of wheat seed are compared considering accuracy, prediction speed and training time. It is found that linear discriminant analysis is found to have superior performance with 96.7% accuracy and prediction speed of ~4900 obs/sec. Training time is 0.5776 second.

Ref: ICBEE/98

Non-Invasive Glucometer

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As per a survey by International diabetes federation's diabetes atlas 2017, 72.9 million people in India suffer from diabetes. India may overtake China, the present diabetic capital. Diabetes is caused by impaired insulin secretion and resistance. Diabetes affects internal organs, blood circulation, eyesight of a patient. To manage the blood glucose level, monitoring of the blood glucose is required. Most of the prevelant techniques include invasive techniques where the skin is pricked with a needle causing pain and skin injury. It is also expensive. The expense is due to the consumable test strips inserted into a reader on which blood sample is placed. Due to these reasons, many diabetic patients normally do not check blood glucose levels. Diabetes patients long for a non-invasive, non-intrusive, cheap device for checking diabetes. Non-invasive glucometer using laser diode and other LED sources are attempted in this work. Laser diode with 650nm having monochromaticity, coherence, directionality, wavelength and characteristics is to be used for detection of the diabetes. This source has excess lifetime, cheap, miniaturized and sensitive. Controller is used to access the glucose level. Gadget which can be fitted in the ear lobes or finger is designed. The results of the blood glucose level will be monitored in an android app developed.

Ref: ICBEE/99

Identification of disease in rice leaves usingpretrained Alex Net

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Rice is the topmost consumer cereal worldwide. Cultivation of rice is mainly affected by various diseases like Bacterial leaf blight, Brown spot, and Leaf smut. In this work, the dataset available in UCI Machine learning repository is used. Total of 120 leaves with 40 leaves in each category is used for the research. Leaf images were captured with white background in direct sunlight and preprocessed for usage. In recent years, deep learning an advanced artificial intelligence technique is used for the classification of images in large extent. In this proposed work, a pretrained Alex net deep learning technique is used for training the leaf diseases in rice. In an agricultural farmland running few acres, a drone can be employed to capture the rice leaf and sent to a server through IoT alongwith the GPS location. The images can be processed with the deep learning technique and an alert given to the farmer in case of any disease without the physical inspection of the leaves. Number of iterations is selected as 160 with a learning rate of 0.0001. The validation accuracy is found to be 88.89% with pretrained Alex net by a single CPU.

Ref: ICBEE/100

Intelligent medicinal plant identification used for treating respiratory diseases using Convolution neural network

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Traditional medical system of treating diseases is in existence in various Asian countries like China, Japan and India. Particularly in southern parts of India, siddha medicine is in practice from immemorial time. Respiratory diseases has become a global health issue in recent past leading to mortality. Existing allopathic medicines are inadequate and allergic for few persons. Alternately siddha medicines can solve the problem without side effects. There are many medicinal plants like kuppaimeni, celery-keerai, mukaratee, panaimaram, kaliccikkai, eukku, kungumapu, ammanpachharisi, thulasi, thippili, milagu, manathakkali, thuthuvalai, kandankatthiri, tentankotai, thandrikkai, kurinjan which are used for treating respiratory diseases. Identification of such leaves need to be automated to enable easy collection of the siddha leaves for medicinal use. World Health Organization predicts 80 percent of Asian and African population still using herbal medicines for their health care. Cost of the herbal medicine is very less compared to the pharmaceuticals. In this research work, images of above-mentioned leaves are collected with their identification. Classification of the leaves is done using Convolution neural network (CNN) which is a multilayer perceptron and a fully connected network. Here, the pre-processing and feature extraction stages are not used. Images are directly fed into the network, trained and later used for testing. CNN involves repeated pooling and ReLU operation for the feature extraction and finally classification. In this research CNN, is used for the identification of the herbal plants used for treating chronic diseases.

Ref: ICBEE/101

Evaluation of Anticancer and Antibacterial activity of *Phoenix dactylifera* aqueous extract

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Phoenix dactylifera commonly known as dates has a significant role in many applications worldwide. Silver present in the natural environment is found to be quite safe. The silver nanoparticles synthesized have various applications and is widely used against many bacteria. So the green synthesis of silver nanoparticles from Phoenix dactylifera plays a significant role in recent times. This study is based on the synthesis of silver nanoparticles from the dates seed extract. Once the silver nanoparticles are synthesized from seed extract using silver nitrate, the characterization of silver nanoparticles was performed. The UV spectrometry was performed and the greater intensity proves to be the synthesis of silver nanoparticles. The phyto chemical analysis of the silver nanoparticles was also performed to identify the phytochemicals present in them. The antibacterial screening of the silver nanoparticles showed greater resistance to different bacterial species. The FTIR analysis of the silver nanoparticles showed the capping of silver nanoparticles. Anticancer activity of the seed extract against human breast cancer MCF-7 showed effective anticancer effects which was assessed by MTT assay to evaluate the antiproliferative effects. This study concludes that *Phoenix dactylifera* used widely in medicinal field around the world.

Keywords:*Phoenix dactylifera*, Silver nanoparticle, Uv analysis, phytochemical screening, antibacterial activity, FTIR analysis and anticancer studies

Ref: ICBEE/102

Removal of Copper from Sewage Water Using *Syzygiumcumini* and Its Antibacterial Susceptibility

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Copper is one of the few metals that can be directly used in metallic form. A number of techniques are available for the treatment of sewage water contaminated with heavy metals such as copper. The aim of this study is to remove copper from sewage water using *Syzygiumcumini* (black plum). With increasing environmental awareness and legal constraints being imposed on discharge of effluents, cost-effective, eco-friendly alternative technologies are essential. Biosorption is considered as a user-friendly, effective purification and separation method because of its specific affinity, low cost, and simple design. The *S. cumini* seed powder was used as a biosorbent in this study. The aqueous extract of *S. cumini* seeds was screened for phytochemical properties, which indicate the presence of phytochemicals such as alkaloids, phenols, tannins, saponins, and terpenoids. The biosorptive activity of *S. cumini* seed powder was studied by a batch experiment and analyzed using atomic absorption spectroscopy. The aqueous extract of *S. cumini* seeds also show antimicrobial activity that has been analyzed using the disc diffusion method.

Ref: ICBEE/103

Low Cost Arduino Based Intravenous Fluid Level Indicator

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With the increased growth of the population, health care plays a vital role in leading a contented life. In hospitals, ensuring the patients' safety is the most important thing. Hence automatic health monitoring systems gives precise information while reducing the stress of the medical practitioners and the bystanders of the patient about missing certain critical data. Indicating when the intravenous fluid administered to the patient falls below a critical level is a tedious process and a tougher job. Monitoring the level of intravenous fluid level manually is a simpler job but if not done with utmost care may affect the health of the patient severely. This may lead to blood loss or backflow of blood to IV tube from their veins. If the bottle gets fully drained, air enters the tube and in turn into the vein. A system is designed such that if the Intravenous fluid reaches a critical level sensed by the LED and LDR set up and an alarm is sounded at the nurses' room indicating the room number, so the nurse can easily identify the room and go there directly to change the bottle rather than keep checking every room to notice if the fluid has reached the critical level.

Ref: ICBEE/104

Industrial Revolution 4.0

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Digitization and intelligentization of manufacturing process is the need for today's industry. The manufacturing industries are currently changing from massproduction to customized production. The term Industry 4.0 stands for the fourth industrial revolution which is defined as a new level of organization and control over the entire value chain of the life cycle of products. The rapid advancements in manufacturing technologies and applications in the industries help in increasing productivity with wireless connectivity and sensors, connected to a system that can visualise the entire production line and make decisions on its own.In essence, industry 4.0 is the trend towards automation and data exchange in manufacturing technologies is still visionary but a realistic concept which includes Cyber-Physical Systems (CPS),Internet Of Things (Iot),Industrial Internet Of Things (IIOT),Cloud Computing,Cognitive Computing and Artificial Intelligence.Industry 4.0 fosters what has been called a "smart factory". The correlation of the speed of technological development and, as a result, socio-economic and infrastructural transformations with human life allow us to state a qualitative leap in the speed of development, marks a transition to a new time era

Ref: ICBEE/105

Larvicidal Activity of Immobilized *OcimumBasilicum*Copper Ferrite Magnetic Nanoparticles Against Mosquito Larvae

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In this work, the increasing effect of larvicidal activity, reusability, and recoverability of immobilized copper ferrite nanoparticle have been studied. *Ocimumbasilicum* act as a good larvae repellent in addition to that copper metal has larvicidal activity. When *Ocimumbasilicum* immobilized into the copper metal it enhances the effect. Immobilized magnetic nanoparticles were used since it has the advantages of recoverability, reusability, stability, high surface to volume ratio, and cost-effective. By co-precipitation method, the copper ferrite nanoparticles were prepared. Then, it used to immobilize into an *Ocimumbasilicum* leaf extract by amino-functionalization. The materials were characterized by SEM,FTIR. And also larvicidal effect on immobilized copper ferrite magnetic nanoparticles was also studied.

Keywords:*Ocimumbasilicum* leaf extract, magnetic nanoparticles, copper ferrite, larvicidal activity.

Ref: ICBEE/106

Application of biosynthesized silver nanoparticles to recover "Single Cell Oil" (SCO) from *Yarrowialipolytica* for biodiesel synthesis

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Biodiesel is a renewable fuel made from various feedstocks. A novel and inexpensive feedstock Single Cell Oil (SCO) comes in handy for biodiesel production. This SCO was obtained from an oleaginous yeast isolate of *Yarrowialipolytica.* One among the many slaughterhouse wastes, Goat tallow, was provided as the carbon source to *Yarrowialipolytica* in order to acquire SCO, which is then converted into biodiesel by transesterification. SCO was acquired from the biomass, whereas the Silver nanoparticles were biosynthesized by using the supernatant. Since Silver nanoparticles are very much useful in cell disruption, they were biosynthesized and used to lyse the cell wall. Characterisation study of biosynthesized silver nanoparticles was done by UV-Vis spectrophotometer, TEM, SAED, XRD, Zeta Potential and DLS. Further, its effect on cell wall lysis was extensively analysed. Cell wall damage confirmed visually by Scanning Electron Microscope (SEM) analysis. Optimization of parameters such as time and concentration was done for enhanced lipid yield, its characterisation was done by Fourier-Transform Infrared Spectroscopy (FT-IR) and Fluorescence Microscopy. Fatty acid methyl ester analysis was done by Gas Chromatography-Mass Spectroscopy (GC- MS). This study suggests that the use of biosynthesized silver nanoparticles to recover SCO is a promising method towards producing biodiesel.

Keywords: Biodiesel, *Yarrowialipolytica*, goat tallow, single cell oil, silver nanoparticles.

Ref: ICBEE/107

Anticorrosive nature of titanium nanoparticle on microorganisms

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The unique property of the titanium oxide nanoparticles has gained major attention in nanotechnology field. Titanium is suggested for use in various medical and industrial application because of its strong resistance to corrosion from sea water. In medical applications titanium pins are used because of their non-reactive nature when in contact with bone and flesh. Many surgical instruments, as well as body piercing are made up of titanium for this reason as well. In the present study, fungal and bacterial strains have been isolated from environmental source and were subjected to titanium sheets of 1mm in thickness. Titanium oxide nanoparticles were synthesised using isopropyl alcohol and titanium iso-propoxide as the precursor molecule. They were characterised using X ray diffraction analytical technique. TiO_2 nanoparticles can be easily reproducible at an industrial level, with low economic impact for various application purposes. Titanium sheets exposed to titanium oxide nanoparticles and microorganisms were analysed for surface topographical change using scanning electron microscope.

Keywords: titanium oxide nanoparticles, XRD, SEM,environmental application

Ref: ICBEE/108

Comparative study on the antifouling activity of furanone and polymer on the clinical pathogens isolated from the dental implants

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Dental implants have become the focus ofdevice-related infection due to the fact that they are difficult to eradicate since the bacterial strains causing these infections dwell in a well-developed biofilm. Mostly biofilms are responsible for the spread of antibiotic resistivity and are characterized by the presence of sessile cells in a community of microorganisms, that are irreversibly attached to any support or embedded in a matrix of extracellular polymeric substances (EPS) produced by them. Antibiotic resistivity within agiven bacterial population occurs via the horizontal transfer of genes responsible for virulence and resistance. In the future, treatments that inhibit the transcription of biofilm controlling genes might be a successful strategy in inhibiting these infections.2(5H)-furanone and its derivatives have been intensively studied in the past few decades,amongst different compounds possessing antimicrobial and anti-biofilm activities. Furanonesexhibit diverse functions such as aquorum sensing (QS) signalling molecule, pheromones, antimicrobial agentetc.to name a few. Polymers are found to possess a broad spectrum of anti-microbial. Beingnatural polysaccharides, certain polymers exhibits biological properties such as the anti-fouling activity which makes it biocompatibleand a good candidate for biomedical applications. Thus, to prevent biofilm formation on the indwelling dental implants, a controlled drug delivery system on the dentalimplant is mandatory. The current study deals with the antimicrobial and modulatory role of QS molecule- 2(5H)-furanone on biofilm formation. The study further explores the effect of polymer against the biofilm forming activity of the clinical pathogens obtained from the dental samples.

Keywords: Dental implants, biofilm, furanone, polymer, polysaccharides, MIC, antimicrobial activity

Ref: ICBEE/109

Comparitive Studies of Phytoconstituents and Antioxidant Activity with Various Solvents, FT-IR Analysis of Leaf and Bark Extracts of *Rhizophora mucronata*fromChinna Palam Mangroves

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The present study was performed to screen the phytochemicals present in the leaf and bark extracts of ***Rhizophora mucronata*.** Analysis concluded the presence of alkaloids, phytosteroids, acids, fixed oils, carboxylic acids. It can be used as a source of phytonutrients. It also has antioxidant property and free radical scavenging activity. This study suggests that the selected plant part can be used as a source of antioxidants for pharmacological preparations. The FT – IR study of the crude and aqueous extract of both leaf and bark samples of ***Rhizophora mucronata***showed the presence of various functional groups. And the result showed that the different extracts of ***Rhizophora mucronata*** have the essential phytocompounds which can be further used for natural therapy for many diseases.

Ref: ICBEE/110

Chitosan (CS) combined with 4-[5-(4-methylphenyl)- 3-(trifluoromethyl)-1H-pyrazol-1-yl] benzenesulfonamidenanoemulsion synthesis, characterisation and ligand binding in vitro assay analysis on hepatocytes

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Liver fibrosis is the excessive accumulation of extracellular matrix proteins including collagen that occurs in most types of chronic liver diseases. Advanced liver fibrosis results in cirrhosis, liver failure, and portal hypertension and often requires liver transplantation. Knowledge of the cellular and molecular mechanisms of liver fibrosis has greatly advanced. Activated hepatic stellate cells, portal fibroblasts, and myofibroblasts of bone marrow origin have been identified as major collagen-producing cells in the injured liver. These cells are activated by fibrogenic cytokines such as TGF-β1, angiotensin II, and leptin. Celecoxib is chemically designated as 4-[5-(4-methylphenyl)- 3-(trifluoromethyl)-1H-pyrazol-1-yl] benzenesulfonamide and is a diaryl-substituted pyrazole. The mechanism of action of celecoxib is due to selective inhibition of cyclooxygenase-2 (COX-2) which is responsible for prostaglandin synthesis, an integral part of the pain and inflammation pathway. Celecoxib is widely considered to inhibit angiogenesis. The hydrophobic nature of this drug necessitates its administration in nanoparticulate form in order to elicit a perceivable pharmacological response.

Chitosan (CS)- Celecoxib nanoemulsion have to be prepared by microemulsion of celecoxib – chitosan in MCT oil . The physicochemical properties of nanoparticles must be investigated by using FT-IR, NMR, scanning electron microscope（SEM）, dynamic light scattering, UV spectrophotometer and gas chromatography – mass spectrometry before use. Bioinformatics tool must be used to analyse ligand binding, which shall lead to the identification of the cDNA and followed by using appropriate primer to carry on Real Time PCR. Angiogenesis assays and viability assay must be performed on the hepatocyte cell line used to analyse the effect of the drug nanoemulsion

Keywords: Chitosan, Celecoxib, Nanoemulsion, Characterisation, LiverFibrosis

Ref: ICBEE/111

Effective Water Quality Management Using Magnetic Nano Sponges

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Water quality management is crucial as it is the vital source for living. It remains as one of the major challenges in the present century as the quality of water play a significant role in human health, food, eco-system and economic growth and sustainability of human life. Surface and ground water contamination are major sources of water used for several purposes. Globally, there are several sources for surface water contamination such as run-off from industrial plants, municipal and commercial waste water treatment plants, modern agricultural activities, and concentrated animal feeding operations (CAFOs). Modern agricultural activities, by nature, produce more natural organic compounds (NOC) per acre and at a faster rate. Additionally, current practices utilize large amounts of synthetic organic pesticides such as metolachlor, lindane, atrazine, and glyphosate. Natural organic matters (NOM) including humic acid, tannins, fulvic acid and synthetic organic contaminants (SOC) are always present in agriculture surface water runoff. Therefore, it is vital to focus on methods to reduce or eliminate surface water contamination of point and non-point agriculture activities. We have developed an innovative nanotechnology-based technique to remove organic matter and contaminants at point sources that concomitantly will improve ground water quality. We have synthesized magnetic nanosponges (MNS) using two different magnetic nanoparticles along with commercially available coagulants and investigated their organic contaminants' removal efficiency in wastewater collected from three different CAFO lagoons. Standard parameters such as total organic content (TOC), turbidity, total suspended solids, and biological oxygen demand (BOD) were measured prior and after treatment with magnetic sponges and the time required for removal has also been calculated. The results indicate that MNS are effective in removal of TOC and turbidity from the waste water. The synthesis, characterization of magnetic nanoparticles, the process of removal of organic contaminants, and the degree of effectiveness of MNS to removecontaminants from a university CAFO waste water source will be presented.

Ref: ICBEE/112

Myconanocolloids and its antibacterial potential against *Pseudomonas aeruginosa*

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During the past few years one of the most emerging branch in nanotechnology is the synthesis of nanoparticles through biological approach, for example by usingaqueous extract of plants, using microorganisms such as bacteria and fungi and its bioactive compounds. Silver Nanoparticles are particles whose size is measured in nanometer(nm).The present study was focused on synthesis of silver nanoparticles (AgNPs) from endophytic fungi*Lasiodiplodiatheobromae* isolated from themedicinalplant.The aqueous extract of the endophytic fungi was used for the synthesis of silver nanoparticles and was confirmed by the colour change from white to reddish brown colour visually, followed by characterizing the nanoparticles by UV-Vis, FT-IR spectroscopy, FESEM , Particle size analysis (PSA) and Zeta Potential. The antimicrobial activity of the synthesized silver nanoparticles was tested in ATCC and resistant clinical strain *P.aeruginosa.* and it showed anti-bacterial activity against the strains. Further the antimicrobial assays like MIC, MBC, Biofilm assay was performed with the same strains. Pyocyanin which is a blue redox pigment produced by *P.aeruginosa* was also extracted and the concentration of the pyocyanin was decreased after the treatment with nanoparticles when compared with the control clinical strain. This current result suggest that nanoparticles can be used as an antimicrobial agent for therapeutics.

Keywords: Nanoparticles, Anti-microbial, Anti-bacterial, Pyocyanin, MIC, MBC, Biofilm.

Ref: ICBEE/113

Biogenic Synthesis, Characterization, Anti-Bacterial Activity and Comparison of Silver Nanocolloids Synthesized from Endophytic Fungus and Medicinal Plant

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Biogenic synthesis of AgNcs was done from the endophytic fungi cell filtrate isolated from a medicinal plant nanocolloidal synthesis from the aqueous extract of same medicinal plant. The fungal cell filtrate consist of different phytochemical compounds such as Saponins, Steroids, Tannins and proteins which acts as reducing agent and regenerate metal ions to metal nanocolloids. The synthesized green silver nanocolloids (AgNcs) from fungal cell filtrate and medicinal plant were characterized by using UV-vis spectroscopy, FTIR Spectrum, Zeta Potential and Particle Size Analyzer (PSA). Both green Ncs at a concentration of 1mg/ml were checked for their antibacterial activity. MIC, MBC and Biofilm Assay results revealed that both the silver nanocolloids were able to inhibit the biofilm formation in both the strains of *E.coli*. Green nanocolloids were also found to inhibit the Amp C gene expression as compared to the untreated bacterial strains (control). Both the silver nanocolloids were found to be very efficient growth inhibitors for both the strains of *E.coli*. Both the silver nanoparticles

Keywords: Endophytic fungi, Medicinal plant, Antibacterial, Biofilm

Ref: ICBEE/114

Myco-Nanocolloids manipulate growth, biofilm formation and virulence genes in UTI causing E. coli

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The existing antibiotics are incapable of killing resistant pathogens including *E.coli*. ESBL genes are found to be the main cause of the resistance as it degrades the β- lactam ring of the antibiotics. This study aims at the green synthesis of silver nanocolloids from endophytic fungi *Lasiodiplodiatheobromae* (LtNc's), isolated from traditional medicinal plant which is of ethnomedical importance. The green silver nanocolloids were characterised by using UV-Vis spectroscopy, FTIR, DLS, Zeta potential, FE-SEM and EDX techniques. Antimicrobial assays such as Minimum susceptibility concentration, growth rate, Minimum Bactericidal Concentration and Biofilm inhibition assays were performed to evaluate the efficacy of LtNc's against Biofilm forming urinary tract infection (UTI) causing clinical strains of *E.coli*. The LtNc's was found to be efficient antimicrobial agent which successfully controlled the growth and biofilm formation in ATCC and Multi drug resistant clinical strains of *E.coli*. Further, the detection of ESBL genes including CTXM-15 and Amp C were analysed in control and LtNc's treated strains. Interestingly, it was detected that the both the genes were downregulated in MDR pathogens when treated with LtNc's. From our studies it was observed that LtNc's was very effective in controlling the growth and biofilm formation in UTI causing pathogens by downregulating the ESBL genes. LtNc's can be formulated as vaginal wash to control the growth of UTI causing MDR pathogens.

Keywords: Silver nanocolloids, Endophytic fungi, Ethnomedicine, ESBL, antimicrobial agent, Multi drug resistance, Urinary Tract infection

Ref: ICBEE/115

Antimicrobial effect of Floral extract mediated Nanosuspension

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Aqueous extract of medicinal flowers have been used for the synthesis of Silver Nanosuspension.On treatment of Silver nitrate (AgNO3) with the crude extract a rapid reduction of Ag+ ions at room temperature was observed without the need of any additional reducing agents or stabilizing agents. The floral extract contains certain bioactive compounds like phenols, tannins, saponins, steroids, flavonoids which were detected by phytochemical screening. The synthesized silver nanosuspension were characterized by UV Visible spectroscopy, Field Emission Scanning Electron Microscopy (FESEM), Fourier Transform Infrared Spectroscopy (FT-IR),Zeta potential, Energy Dispersive X-Ray Spectroscopy (EDAX) and Particle Size Distribution (PSD) by Dynamic Light Scattering (DLS).The floral nanosuspension were observed to inhibit American Type Cell Culture (ATCC) strains and strains isolated from tannery effluent (Penicillin Resistant bacteria). Initial screening was performed by Agar well diffusion method followed by Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC) and biofilm.Theresults of these assays suggest that green nanosuspension from floral extract can be used as an alternate for growth inhibitors of microbes and may assure an effective rolein antimicrobial control systems. Isolation of DNA for Penicillin Resistant strains were carried out by heat lysis method. The existence of genomic DNA was confirmed by Agarose gel electrophoresis. Polymerase Chain Reaction (PCR) was performed for the amplification of 16srRNA. The PCR product was sent for sequencing. The sequenced results reveal the species of Penicillin Resistant strains. The dye degradation test was carried out to evaluating the effect of organism on degrading dye. Gene expression analysis for CTXM15 and Amp C genes were carried out on Penicillin Resistant strains to find out the gene expression. It was found that CTXM15 gene was expressed than Amp C gene. Thus, the synthesized floral nanosuspension prove its antimicrobial activity towards Penicillin Resistant strains.

Keywords: Green Nanosuspension, Antimicrobial assays, Green synthesis, Gene expression, Dye degradation, Tannery effluent & bacterial strains.

Ref: ICBEE/116

Green nanocolloids from *Trachyspermumammi* as effective antimicrobial agent

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Nanocolloid research is currently an area of intense scientific research, due to its potential applications in biomedical, optical, and electronic fields. *Trachyspermumammi* which commonly known as 'Ajwain' is growing throughout India and is mostly cultivated in Gujarat and Rajasthan. Ajwain extract was prepared from fresh Ajwain powder was utilized for green synthesis of silver nanoparticles. The synthesis of *Trachyspermumammi* silver nanocolloid (TaAgNcs) was confirmed through various biophysical characterizations, including UV-VIS spectroscopy, FT-TR, FESEM and EDAX. The antimicrobial activity of the TaAgNcs was tested against *E.coli*ATCC (25922) and pathogenic Ampicillin resistant clinical isolate of *E.coli* strain. The expression of genes encoding AmpC and CTXM-15 were analysed using polymerase chain reaction (PCR), to check the effect of TaAgNcson these genes involved in antibiotic resistance in *E.coli*. The current study suggested that TaAgNcs acted as a potential antibiotic resistance breaker by controlling the growth and biofilm formation in pathogenic *E.coli* by modulating the expression of AmpC and CTXM-15 genes.

Keywords: Green Nanocolloid, *Trachyspermumammi*, FTIR, EDAX, FESEM, Antimicrobial Activity, PCR

Ref: ICBEE/117

Myconano suspension against Multi Drug Resistant *E.coli*

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Nanotechnology has greatly developing in medical science which involves synthesis of nanoparticles that has been used in therapeutic application for treating numerous diseases. Endophytic fungus isolated from the healthy leaves and stems of medicinal plant. The genomic DNA of endophytic fungus was isolated using CTAB method which involves CTAB, β-mercaptoethanol, chloroform and isoamyl alcohol extraction method to remove proteins and polysaccharides. The isolated genomic DNA was successfully amplified using ITS primer by PCR. The amplified genomic DNA was sequenced, and endophytic fungus was identified. The CTAB method was rapidly used for obtain good quality of genomic DNA to amplification and sequencing of endophytic fungus. From this, endophytic fungal extractwas used as a reducing agent for synthesis of silver nanocolloids. The synthesized silver nanocolloids were characterized using UV-vis spectroscopy, Fourier transform- infrared spectroscopy (FTIR), Particle size analyzer, Zeta potential and Energy- Dispersive Spectroscopy (EDX). The Antimicrobial activity of synthesized silver nanoparticles was determined using minimum inhibitory concentration assay (MIC) and minimum bactericidal concentration assay (MBC). The MIC and MBC of silver nanoparticles was done against *E.coli* CTXM-15 strain and ATCCstrain. The antimicrobial assay results show thatsilvernanocolloidsshowing strong antimicrobial activity against MDR pathogen and ATCC bacterial strain. This was followed by the expression study of antibiotic resistance gene CTXM-15 and AmpC gene using polymerase chain reaction. Our results suggest that TI6 & TI7 AgNps could be used as an alternative source for the new therapeutic application.

Keywords: Nanotechnology, Myconanocolloid, Genomic DNA extraction, Antimicrobial assay

Ref: ICBEE/118

Green nanocolloidsagainst biofilm causing *E.coli*

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In recent times, nanotechnology has been utilized in all areas of science and technology due to its wide applications. One such part in it is the synthesis of nanoparticles where the particles size ranges from 1-100nm.Nanoparticles are being used because of their unique physical, chemical and biological property. In this study the nanocolloidsare synthesized using the noble metal silver by using herbal extract. Synthesis of silver nanocolloids were confirmed by colour change followed by using UV-Visible Spectroscopy, FTIR (Fourier Transform Infrared Spectroscopy),Zeta potential analysis,Particle Size Analyser, FESEM-EDAX. The synthesised silver nanocolloidswere evaluated for its antimicrobial activity and antibiofilm activity against pathogenic biofilm forming *E.coli*. Furthermore, the synthesized nanocolloids were evaluated for the expression of virulent genes encoding CTXM-15 and AmpC through polymerase chain reaction.

Keywords: Nanocolloids,CTXM-15, AmpC, antibiotic resistance

Ref: ICBEE/119

Nanocolloidalformulationand to screen it's antimicrobial activity against biofilm causing agent *Klebsiella pneumonia*

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Nanotechnology is one of the fascinating field of research and it has many applications in several fields. Silver nanoparticles have attracted many researchers due to its unique properties. Green synthesis of silver nanoparticles has many advantages such as viability, non-toxic, morphology, ease of availability, scaling up and high stability. From ancient times thesecompound has been used in traditional medicines. Silver nanocolloids are synthesized usingherbal extract. Conversion of this extract into silver nanocolloids can cure harmful diseases and can bring remarkable changes in the medicinal field because of the synergistic effect of silver and herbal extract. Biophysical characterization of these nanoparticles was done using UV – visible spectroscopy, FT-IR, FESEM, EDAX, Particle size distribution, zeta potential. Antimicrobial activity of GNC was evaluated against biofilm causing *Klebsiell*a *pneumonia.* MIC, MBC and biofilm inhibition assay was performed to confirm the antibacterial activity of GNCs on pathogenic *Klebsiell*a *pneumonia*. GNCs was found to show better antibacterial activity against *Klebsiell*a *pneumonia.* Further the expression of antibiotic resistant gene CTXM-15 and Amp C were analyzed using polymerase chain reaction on GNCs treated pathogenic *Klebsiell*a *pneumonia.* It was found that the expression of both the genes CTXM15 and Amp C were found to be downregulated in GNCs treated pathogenic *Klebsiell*a *pneumonia.*

Keywords: Nanotechnology, Green nanocolloids, Green synthesis, *Klebsiella pneumonia.*

Ref: ICBEE/120

Novel green nanocolloids from herbal extract and screening their anti-microbial activity against Bovine mastitis pathogen

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Nanotchnology is a field of modern research which deals with manipulation of size, structure and properties. Chemical methods have certain limitations in the form of chemical contaminants during the synthesis or in later applications. Green synthesis is preferred over chemical method due to its eco-friendly, cost-effective and easy scaling up process. In this study, the synthesis of silver nanoparticles was carried out with combination of six herbal extract of medicinal importance. Rapid microwave-irradiation method was used for the synthesis of AgNcs. Visual colour change indicated the formation of nanoparticles and UV-Visible spectroscopy scan was used to confirm the synthesis of nanoparticles. FT-IR spectroscopy was done for both crude extract and nanoparticles to identify the functional groups, which were modified during nanoparticle synthesis. Further, the silver nanoparticles were characterized by Dynamic light scattering (DLS) to analyze the nanoparticle size and zeta potential to identify the surface charges on the nanoparticle. FE-SEM analysis was done to study the morphology and EDAX was carried out to confirm the elemental composition of silver nanocolloids. Organism was isolated and identified from infected Milk samples using 16srRNA. Antibiogram was done for the test organisms such as *Acinetobacter junii, Klebsiella pneumoniae, Pseudomonas stutzeri*and*Acinetobacter baumanii*against Ampicillin (AMP), Streptomycin (S), Ceftriaxone (CIT), Cefoperazone (CFS) and Enroflaxacin(EX). The antibacterial activity of green Nanocolloids were evaluated through MIC, MBC, biofilm inhibition assays. Among all the three silver nanoparticles, NP29 was found to be very effective against all the pathogenic strains. Further, gene expression studies for CTXM-15gene and AmpC gene was done through polymerase chain reaction on nanocolloid treated test organisms. It was found that nanocolloid treatment effectively downregulated the expression of CTXM15 gene in all the pathogenic strain. In future these nanocolloidal formulation can be formulated as nanospray to control the mastitis causing bovine pathogens

Keywords: Green nanocolloidss, Characterization, Antibacterial activity, Bovine Mastitis

Ref: ICBEE/121

Phytocompound loaded green nanocolloid against multidrug resistant bacteria isolated from tannery effluent

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The environmental pollution is caused because of poor disposal of solid and liquid waste from the leather industry. The solid waste is either dumped in the landfill area or incinerated which releases toxic gases in to the atmosphere. The liquid waste is released as such in to the rivers without treatment. The leather industry releases effluent by treating only 20% while the rest 80% is untreated. The tannery effluent houses many antibiotic resistant bacteria and multidrug resistant bacteria and these cause bacterial infections which cannot be treated by antibiotics.This current work focusses to identify the number of bacterial species present in the effluent. After the identification process, if it is not pathogenic it can be utilized for various applications like enzyme production, metabolite production etc. the emergence of antibiotic resistant bacteria has drifted research towards AMR. Among the 12 bacterial isolates, three of the bacteria have shown antibiotic resistance to penicillin while one of the isolate has shown multidrug resistance.The second part of the work focuses on controlling the MDR bacteria isolated from the tannery by using alternative approaches. Green Silver Nanocolloid (GSNc) were synthesized from the traditional medicinal plant. The efficacy of the GSNcs are tested against the MDR bacteria isolated from the tannery. The antibiogram assays including Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC) and Biofilm formation were carried out in control and GSNcs treated bacterial samples.The bacterial species were identified by 16S rRNA sequencing and it was checked if it was able to degrade the azo dye- reactive red 198. The action of these GSNcs against the dye degrading bacteria was also assessed. The degraded products of the dye by bacterial species and the undegraded dye were used to grow the fenugreek seeds. The degraded products are not toxic and enhanced the germination and growth of fenugreek seeds. However, the original undegraded dye inhibited the growth and germination of the seeds.

Keywords: Multi-drug resistant bacteria, Tannery effluent, Nanotechnology, Antimicrobial assays, Green Silver Nanocolloids.

Ref: ICBEE/122

Isolation of Lactic Acid Bacteria from the Midgut of *Chiloscylliumindicum*

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The aim of this study is to isolate and characterize lactic acid bacteria (LAB) from the midgut of *Chiloscylliumindicum* and thus to regulate their potential for use as probiotics against antibiotics. A total of four LAB strains were isolated, namely, strain A, B, C, and D, of which strain A shows hydrolytic activity by producing caseinase and lipase. Thus, strain A was selected for further screening tobiochemical characterization. Partial sequence analysis was performed with 16S ribosomal RNA gene using Sanger dideoxy sequencing, which identified strain A as *Lactobacillus plantarum*. An antibiogram is generated to show the susceptibility of strain A using antibiotic discs of various antibiotics such as ampicillin, penicillin, streptomycin, gentamicin, ceftriaxone, cefoperazone, and enrofloxacin. Thus, the results of the conducted in vitro tests indicate that the fish-associated *Lactobacillus plantarum* strain is an expectant entrant probiotic. Further study needs be carried out to evaluate its appropriateness for use in aquaculture and health care.

Keywords:*Chiloscylliumindicum,* lactic acid bacteria, antibiotic resistance

Ref: ICBEE/123

Molecular Characterization of Ozone-Pretreated Fishes and Microbial Role in Spoilage

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The purpose of the present study was to determine the effect of ozone pretreatment ofcommercially available fishes on their shelf life andstorage characteristics by analyzing and restricting the growth of microbes in it'sstructure. The evaluation included microbialtests at set intervals throughout a storage period of 5 days under different concentrations of ozone were passed for 5 days (10 ppm, 20 ppm, and 30 ppm). The results of themicrobial tests showed that ozone pretreatment of fishes prolonged their shelf life by 12 days and improved their qualitycharacteristics during storage at 0°C for 30days. Theozone-treated fishes stored at 5°C became unacceptable 3 days later than those of control fish. Although the mostimportant factor affecting the fish shelf life is microbial growth and storage temperature, the combination of ozone pretreatment with storage at 0°C appears to be a promising means of prolonging the shelf life. The quorum sensing capacity(QS) of microbes may have led to early spoilage in control fishes and use of luciferase, a bio-luminescence producing enzyme to indicate microbial attack on fishes is yet to be takenfor further research.Ozone is an effective antimicrobial agent that does notleave significant toxic residues in the environment following its use. Initial microbiota of seafood known as specific spoilage organisms (SSOs), which is favored by storage conditions, prevails over the rest of the microbiota, reaching high populations and producing corresponding metabolites.

Ref: ICBEE/124

Ecofriendly bioremediation of crude oil contaminated soil by using earthworm (*Eudriluseugeniae)*

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The present study was performed to degrade the crude oil present in the contaminated soil by using earthworms.It is an ecofriendly and natural process.The earthworm (*Eudriluseuge*niae) used in this study was collected from Vadipatti.The contaminated soil was collected from the mechanical shed. After the collection of samples, physiochemical properties containing the soil were checked and measured the length of the worms. Afterwards the worms are let into the tray which containing a contaminated soil. These worms are uptake the carbon source from hydrocarbon and they are survived. After 22 days, these earthworms are produced a cocoons and castings in each tray. We have done a gravimetric method for analysis the amount of hydrocarbon present in a contaminated soil. Nutritive value test and FTIR analysis is also takes place. The results were observed. Finally to check the fertility of the contaminated soil, we sowed the fenugreek seeds and after five days, plants were grown well in the contaminated soil. From this study, it could be concluded that the earthworms have an ability to degrade the hydrocarbon from the contaminated soil.

Ref: ICBEE/125

Extraction of lipid compound from bacteria of tannery effluent

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A Tannery is a workshop where raw hides and skins are converted into leather by the application of astringent called tannin or tannic acid. It is almost completely a wet process that consumes significant amount of water, and generate about 90% of the used water as effluent. It is estimated that discharged tannery effluent contain 800-400 million tons of heavy metals, solvents, toxic sludge, various microbe which also include some resistant variety and other waste, which are dumped into water bodies each year. Also several bacteria from these industries produce commercially useful value added products such as protein, lipid, which can be used in the discovery of antimicrobial agent, anti-inflammatory agent, etc. The increasing need for new antimicrobial agents is able to control emerging disease or resistant of microorganism inspired a growing number research group to explore new bioactive compounds. The present study deals with isolation, estimation and extraction of lipid from bacteria isolated from tannery effluent collected in and around Chennai. Initially, a total of 12 isolates were screened from tannery effluent. The four isolates were selected based on their high yield. Then the four strains were cultured in laboratory condition and their lipid production was estimated. Based on the estimation result, the best among the four strains was selected for future research in characterization and application.

Keywords: Tannery effluent, bacteria, lipid, yield, value added product

Ref: ICBEE/126

Acidic Pretreatment of Mushroom Spentwash for Biobutanol Production

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Taking effective use and conservation of natural resources into consideration, biorefinary industries aim at the effective conversion of lignocellulosic biomass into compatible and eco-friendly biofuels. Cellulose, hemi-cellulose and lignin form the primary components of lignocellulosic biomass, besides their variation in composition based on the source. Biobutanol is an elite source of fuel when compared with ethanol and biodiesel, due to its high O2 content, higher energy content and less NOx emission. In general biobutanol could be produced over fermentation of sugar moieties. The organic matter left out after cultivation of mushroom is a potent source of cellulosic and hemi-cellulosic content. Pretreatment of these cultivation remains would enhance the conversion rates. This study focuses on the acid pretreatment studies on mushroom spent wash for effective production of biobutanol. Low concentration (1% & 2%) and high concentration (6% & 10%) acidic pretreatment studies are carried out with five different acids namely, nitric acid, hydrochloric acid, sulfuric acid, lactic acid and acetic acid under suitable conditions. Quantitatively cellulose and reducing sugar in the pretreated samples were analyzed. Acidic hydrolysis of lignin by 1% sulphuric acid was found to be effective over other test conditions. Further studies are to be carried out with low concentration of sulphuric acid and further carried on to production of biobutanol.

Keywords: Mushroom spentwash, acidic pretreatment, hydrolysis, biobutanol.

Ref: ICBEE/127

Utilization of *Moringa Oleifera*, *StrychnosPotatorum* and their Oddity as a Characteristic Coagulant in Defiled Water Treatment

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Water purification is a process of removing undesirable chemicals, biological, contaminated and suspended particles from contaminated water. Safe and convenient water supply plays a vital role in the well-being of society. Purification of polluted water from natural reservoirs is a very urgent task. The study aimed to ascertain a comparative study on the efficiency of water purification by using Polysaccharide-based Coagulants (PBC) from *Moringa oleifera* and *Strychnospotatorum* mediated by coagulation-flocculation (CF) process. Methodology: extraction of polysaccharides from seeds, assess the turbidity of treated water samples, Water potability (MPN) test, evaluation of antimicrobial activity against water pathogens- *E. coli* & *Staphylococcus* sp., qualitative screening of phytoconstituents, FTIR analysis, UV Spectroscopy, Atomic Absorption Spectroscopy and evaluation of cytotoxicity by Brine shrimp lethality assay.Significance outcomes of the study are availability of resources, cost-effectiveness, short processing time, less sample requirement, and environment friendly.The study concludes that *Moringa oleifera* coagulant exhibited high water purification activity than *Strychnospotatorum*.

Keywords: Water purification, Polysaccharide-based Coagulants, *Moringa oleifera*, *Strychnospotatorum.*

Ref: ICBEE/128

Azolla as a Liquid Fertilizer and it's Effects on Various Plants

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The aim of the study is to prepare liquid biofertilizer from Azolla. Azolla is an aquatic fern associated with the cyanobacteria which help in fixing the atmospheric nitrogen and entrapped in the host. Azolla liquid fertilizer (ALB) was prepared by extracting the azolla. The different concentrations such as 0%, 30%, 50%, 80%& 100% was prepared to study the effectiveness of the biofertilizer. The invitro study of seed germination was carried out with different seeds. Germination rate of the plants with different concentrations of ALB was observed at various intervals and also in in vivo condition. The result shows ALB as an effective growth promoting agent.

Ref: ICBEE/129

Estimation of Carcinogenic Compounds in Reused Frying Oil in Periyapattinam of Ramanathapuram District

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Cancer is the uncontrolled growth of abnormal cells in the body. Carcinogens are substances that give rise to cell changes that eventually lead to tumor growth and cancer. Diet is one of the lifestyle factors that influence the risk of developing cancer. High-energy and a high-fat diet may lead to obesity, which is a risk factor for several cancers including cancer of the colon, breast, kidney, oesophagus, gallbladder and endometrium.

To select the specific area where incident of cancer is high and to collect the samples (reused frying oil) for estimating the carcinogenic substances. The news published in the daily Hindu dated July 31, 2007, is an evident that there is high prevalence of cancer among the people of Periyapattinam, Ramnathapuram District. Method: 1. Estimating the carcinogenic toxins (Polycyclic aromatic hydrocarbon, Trans fatty acids) 2. Determination of Iodine value, Peroxide value and Acid value in Reused Frying oil from Periyapattinam of Ramanathapuram District. Result: The selected sample was analyzed for Trans fatty acids by IS method and Aflatoxins and Polycyclic aromatic hydrocarbons were analyzed using AOAC method 18th Edi:2005. The reused frying oil was subjected for the quantitative estimation of Iodine value, Peroxide value and Acid value recommended by AOCS practice cd. 1c-85(1998). Aaflatoxin in reused Frying oil shows no strains. In the estimation of Fatty acid composition of Frying oil, the concentration of saturated fat is 48.90g/100g, Mono unsaturated fat is 41.16g/100g, Poly unsaturated fat is 9.89g/100g and Trans fat is 0.31 g/100g were found in the sample. The level of Poly Aromatic Hydrocarbon level is below limit of quantification in the sample and the concentration of Peroxide values is 20.6 meq oxygen/100g, Iodine values is 57.1 g/100g, Acid values is 0.89 mg KOH/g. Conclusion: The study concluded that in the coastal areas the fatty acid composition, Iodine, peroxide and Acid values are higher than the permissible limit. The high intake of the Poly unsaturated fat and presence of Trans fat in frying oil may cause cancer. The Iodine, peroxide and Acid values are also cause cancer for the people who consumed the frying oil. The continuous consumption of these above identified carcinogens may cause cancer in future.

Keywords: Carcinogen, Aflatoxin, Poly aromatic Hydrocarbon, Iodine Value, Peroxide Value and Acid value

Ref: ICBEE/130

Isolation and Identification of Bacterial and Fungal Isolates from the Garden Soil

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The present study was formulated to plant growth promoting microorganisms and theywere isolated from soil sample. The colonies were isolated from soil sample by serial dilution and agar plating method on nutrient agar medium and rose Bengal agar medium. Two different colonies were selected. The pure culture of isolated strains was obtained by quadrant streaking on nutrient agar medium. Gram's staining result showed that the isolated two strains were gram positive. Bio-chemical test were also performed to characterize the isolated strains. They both expressed positive result to the tests performed. From the above experiments that the identified microbial isolates were named strain "A" and strain "B".

Ref: ICBEE/131

Evaluvation of phytochemical and Antioxidant Activity of Grape Seed Incorporated Mouthrefreshner Granules

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Grape is the world's largest fruit crop and a major solid waste its grape pomace.Grape seeds are rich bioactive compound and in this case, the research focus has been on using grape by-products for alternative uses. Developing a new innovative product out of grape pomace products using disposed grape seeds for a new application in the food industry.**Objectives** The aim of this study is to determine the Phytochemical, biochemical composition and consumer acceptability of mouth refreshner granules incorporated with grape seeds.Selected fruit seeds collected as bio-waste products from the Food Processing and Preservation Training centre at Tamilnadu Agricultural University, Coimbatore District, Tamilnadu. The fruit seeds were cleaned and made into powder by using a Pestle and Mortor. A mouth refreshner granule was prepared with and without incorporation of the developed at 5% (GM1), 10% (GM2) and 15 %(GM3) level of the grape seeds incorporated product. The sensory evaluation of standardized recipes was subjected to organoleptic evaluation by the panel of 20 judges using A9 Hedonic Rating Scale. The water extract was used to analyse the Phytochemical and antioxidant activity of grape seeds incorporated mouth refreshner granules.The sensory evaluation results showed a higher overall acceptability to 10% grape seeds incorporated mouthrefreshner granules. Among the three variations, GM2 had the highest overall acceptability.The highest overall acceptability variation was taken further analysis..Qualitative Phytochemical analysis of grape seeds incorporated mouth refreshner granules extract reveals that, except alkaloids, Acidic compounds and Phytosterol and other possible constituents, including Flavoids, Saponins, Tannins, HCN, Anthroquninone, Cardiac glycosides, Phenol were present in Grape seed. Quantitative phytochemical analysis of the developed mouthrefreshner granules had Flavonoids (84.75mg CE/gDW)), Polyphenol (158.3mg GAE/gDW)), Procyanin (3.87mg (mg CE/gDW)) and Tannin (1.32mg) respectively. The DPPH assay was used to detect the antioxidant activity of the developed product. The scavenging activity was 1.56 percent for control and 25.64 percent for grape seed incorporated mouthrefreshner granules. **Conclusion:** It is concluded that grape seeds which has many nutritional and therapeutic attributes if fully utilized by the population may get health benefits.

Keywords: Grape seed phytochemicals, sensory evaluation. Mouth Refreshner granules

Ref: ICBEE/132

CRISPR-Cas9 Technology in Hematology and Oncology

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CRISPR –Cas9 system for genome editing has emerged as wonderful technology in haematology and oncology. CRISPR-Cas9 technology can be used to edit site-specific genes in human cells. CRISPR-Cas9-mediated gene editing can be done in two ways via transient or stable delivery of the CRISPR components. Viral-based transfection of CRISPR components is an efficient way to generate stably edited cells. The delivery technique generates transient holes in the membrane that enable the delivery of biomaterials via the medium. This approach achieves high delivery efficiency in different cell types. Viral transfection is frequently used to deliver CRISPR-Cas9 system into haematological malignant cancer cells. In conclusion, CRISPR-Cas9 technology can be ideally used to treat inherited haematological disorders

Keywords: CRISPR-cas9 system, hematology, oncology.

Ref: ICBEE/133

Bioactive Potentials of Green Synthesized Silver Nanoparticles from *Turbinariaornata*

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Silver nanoparticles (AgNPs) are one of the nanomaterials having biologically active molecules with promising biomedical applications and employed in medicine, therapeutics, engineering etc. Green synthesis of nanoparticles proves to be eco-friendly and efficient utilization of natural resources instead of using harsh, toxic chemicals which are deliberated for human wellbeing. The study was aimed to find out the potential activity of the brown seaweed *Turbinariaornata*– screened the phytochemicals present in the aqueous extract, evaluation of functional groups by FTIR analysis, antioxidant activity; synthesis of silver nanoparticles from the fresh and boiled extracts of *T. ornata*and evaluate antibacterial activity against five bacterial pathogens– *E. coli* (MTTC code 4604), *B. cereus* (MTTC code 1305), *S. aureus* (MTTC code 1144), *K. oxytoca*(MTTC code 3030), *and P. aeruginosa* (MTTC code 8076).The study concludes that the algae mediated AgNPscan be developed as a novel medicine for biomedical applications in the near future.

Keywords: Silver nanoparticles, *Turbinariaornata*, antibacterial activity, phytochemical analysis, antioxidant activity.

Ref: ICBEE/134

Antibacterial activity of *Gomphrena serrata,* leaf extract: a Molecular Docking approach

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The study is designed to evaluate antimicrobial activity of crude extract of *Gomphrena serrata* leaves ingram-positive and gram-negative organismTo identify the compounds using X-ray Diffraction and to determine whether the plant compounds inhibit the growth of microorganisms that lead to pathogenic disease conditions in human beings.

Fresh leaves of *Gomphrena serrata* were collected from the nearby surroundings, washed and the leaves were shade dried under room temperature for 10days.The shaded dried leaves were coarsely powdered, sieved and stored in the dark air tight containers.The powdered leaf was processed for xrd method to identify the compounds. Further the compounds were validating for Toxicity and ADME properties. The suitable compounds from ADMET were taken for molecular docking and dynamics for ftsZ protein.

The docked complex gives the potent novel compound against bacterial diseases. The ADMET shows that the compound from XRD posses drug properties and can be further isolated and synthesised into drugs and can be further taken down for drug manufacturing after animal trials and clinical trials.

Ref: ICBEE/135

Green Synthesis of Silver Nanoparticles Using *Caesalpiniabonducella*, Phytochemical Analysis and its Toxicity Effect in Brine Shrimp

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Silver nanoparticles are interesting nanotechnology materials with borderless applications in medical science, environmental science, material science and also used in various kinds of industrial household products. The present study reports the successful synthesis of silver nanoparticles using rapid, single step and completely green biosynthetic method employing aqueous *Caesalpiniabonducella* seeds and it act as a reducing or capping agent. Silver ions were rapidly reduced by the aqueous *Caesalpiniabonducella* seed leading to the formation of highly crystalline silver nanoparticles. The preparation of stable, uniform silver nanoparticles by the reduction of silver ions is reported in the present paper. It is a simple process of recent interest in obtaining silver nanoparticles. The samples had given to the characterization of Fourier Transform Infrared (FTIR) Spectroscopy, UV-Visible spectroscopy. In the present study, Ag NPs toxicity was determined using brine shrimp Artemia salina as a model. A total of 10-15 adult brine shrimps were incubated in solutions containing various Ag NPs concentrations for 24 hr at room temperature. Percentages of brine shrimp dead were recorded and calculated to determine the lethal concentration. The phytochemical screening was also done by using *Caesalpiniabonducella* seeds.

Keywords:*Caesalpiniabonducella*seeds, silver nanoparticles, silver nitrate, Cytotoxicity assay.

Ref: ICBEE/136

Effect of *Hydrilla Verticillata* on Oral Cancer Cell Lines

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Oral cancer is one of the ten most frequently occurring cancer globally. It is one among top three cancers in India. Though there are treatments, side effects remain to be a constant concern. Hence the natural compounds are highly recommended for treatment. Phytol appears as a useful natural substance and acts as an anticancer agent. Phytol is a natural linear diterpene fatty alcohol, an integral part of the chlorophyll found in copious amounts in the aquatic weed *Hydrilla verticillata.* Several reports have assessed the anticancer activities of plant extracts that contain phytol as a major component. Phytol is known to exhibit antitumor activity. Thus phytol extracted from *Hydrilla verticillata*can be used in the induction of apoptosis in cancer cells. Hence, the main aim of the work is to study the anticancer activity of phytol derived from the medicinal plant *Hydrilla verticillata*and its effect on expression on tumor related gees on oral cancer cell lines. The cell culture system offers the characterisation of phytol isolated from medicinal plants. The molecular expression studies give an additional support to confirm the therapeutic effect of bioactive molecule against cancer. This may then form a basis for the development and formulation of a therapeutic agent from natural sources to possibly treat cancer. This plant is widely spread and thus easily available. This could prove to be an effective treatment for cancer as phytol is a natural compound having decreased or no chances of side effects.

Keywords: Oral cancer, Apotosis induction, Phytol, Anticancer activity

Ref: ICBEE/137

Medical Device for Microbiology

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Microbiology plays a significant role in medical devices, such as fluorescent fusion, which are used for fast and precise detection of pathogens in tissue samples. It is a technology for carrying out immunofluorescence studies that may be applied to find specific cells in complex biological systems.The production and sterilization of a sterile medical device requires the application of validated microbiological testing. The expertise in medical device microbiology are assisting either in-house or a contract laboratory to insure that the testing performed meets and exceeds the AAMI/ISO requirements and in establishment of product families to reduce the overall costs of the testing.Services provided include the management of Biological indicator/BI testing,Test of Sterility,Bacteriostasis/Fungistasis (B/F),Bioburden testing and validation, Establishment of Bioburden Families,Manufacturing Environment Test Programs,Sterile Media production and Growth Promotion.AAMI/ISO standards detail the requirements and guidance used throughout the industry. These standards are consensus voluntary standards which are the minimum requirements for the manufacturing and sterilization of Medical Products.

Ref: ICBEE/138

Promotion of Lactic Acid Bacteria Growth using Target Nutrients for the Industrial Applications

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Lactic acid bacteria act as a probiotics which plays a pivotal role in the health maintenance and also as a prevention of disorders. Lactobacillus are the friendly bacterial species that normally lives in our digestive, urinary and genital tracts without causing any diseases and also helps in the production of fermented foods, traditional food etc. Oligosaccharides are the type of carbohydrates and considered also as the prebiotics. The combinational of prebiotics and probiotics helps in promoting the beneficial bacteria for the food products by providing nutrients for growth and also flourishing the micro organisms by creating the environment. Prebiotic and probiotic were used to produce new functional foods like traditional and novel foods by improving the nutrients and technological features. In this study *Lactobacilli* strain are to be isolated from traditional food and undergoes the characterization of the strains by using biochemical tests analysis. The characterized *Lactobacilli* strains are fermented by using different oligo alginates undergo the formation of end products of mixed acid fermentation. The fermented *Lactobacilli* growth and their metabolites explain the ability to compete with other bacteria in the gastrointestinal tract and antimicrobial assay of lactic acid bacteria identifies the bacteriocins which inhibit pathogenic and food spoilage bacteria.

Ref: ICBEE/139

Study of antimicrobial peptides extracted from a Cyanobacterium, Spirulina sp.

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The upheaval of microbial protection from antibiotics makes the requirement for new wellsprings of dynamic mixes for the treatment of pathogenic microorganisms. Marine microalgae are specifically noteworthy right now they have created resilience and safeguard procedures to oppose the introduction to pathogenic microbes, infections, and growths in the aquatic environment. Microalgae are quite compelling because of their gigantic biodiversity and their generally simple development needs. Acid extraction and solid-phase extraction are the methods to be employed for the extraction of antimicrobial peptides from the cyanobacterium, *Spirulina sp*. *It is* a blue-green microalgae attributable to chlorophyll (green) and phycocyanin (blue) shades in its concoction piece. It is one of multicelluler cyanobacterium microalgae with capacity of photosynthesis that can develop well in either freshwater and seawater. The isolated strains were to be identified through morphological, cultural and biochemical properties. While there are various kinds of AMPs, the linear cationic α-helical are the most prominent. These commonly comprise of short groupings of <30 amino acids with a high level of cationic deposits, essentially lysines and arginines, and with amphipathic character. The antimicrobial activity can be improved by coupling to a linear, biocompatible carbohydrate polymer, chitosan, for multivalent display. The MIC of chitosan conjugated microalgae was to be determined against helicobacter pylori which is a small, winding, Gram-negative bacillus normally found in the stomach assumes a job in the pathogenesis of various diseases running from asymptomatic gastritis to gastric cancer.

Ref: ICBEE/140

Rapid Preparation of Microalgal Liquid Fertilizer for the Enhanced Growth of Crop Plants

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Microalgae are diverse and wide variety of microorganisms and they can carry oxygenic photosynthesis as well as biological nitrogen fixation. The biomass of microalgae has various applications in the field of food, agriculture, energy and also in cosmetic sectors. One of the known facts is the adverse effects of the chemical fertilizer which affects the soil, plant and even the environment. Microalgae are capable of fixing atmospheric nitrogen and convert it into available form of ammonia for the growth of plants. In order to reduce this effect the concept of organic farming has been increasing in recent years. Microalgae play a vital role in the field of agriculture where it is used as biofertilizers and soil stabilizers. In this study liquid fertilizer obtained from microalgae was applied to cucumber, green gram, chilli and tomato plants. Algal liquid fertilizer is applied at various doses to the crop plants. The application of the algal liquid fertilizer for the crop plants was of great importance to substitute the commercially available chemical fertilizers and to reduce the cost of production. Liquid fertilizers derived from the microalgae are found to be superior to the chemical fertilizers because of high level of organic matter, micro and macro elements, vitamins and fatty acids and also rich in growth regulators. The growth parameters and the biochemical studies are carried out after 14 days of paper towel method and followed by hardening. Biofertilizers are eco friendly and it is a great economical alternative for the chemical fertilizer. Finally, liquid fertilizers obtained from microalgae can be reported to have positive effects on plants and therefore environment.

Ref: ICBEE/141

Pectin Based Edible Composites Films as Active Food Packaging Polymer

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The objective of this work is to prepare and characterize pectin based composite films as an active food packaging material to protect fresh meat, vegetables and fruits from deteriorating factors thereby extending it's shelf life. The composite films so prepared will ensure to be safe for consumption by the usage of only food grade components within their daily limits of consumption. Being biodegradable and renewable they serves as potential alternatives to petroleum based food packaging material. Due to pectin's good gelation property, non toxicity, biocompatibility and versatile physiochemical nature it is considered as a suitable polymatrix, while Glycerol confers high efficiency and is colourless, it makes a good choice for a plactisizer. To impart antimicrobial activity and improve mechanical and barrier properties without on structural and functional stability, this study proposes the incorporation of stearic acid, oleic acid and chitosan nanoparticles. As chitosan nanoparticles are expensive, a blend of cinnamaldehyde and carvacrol will be used in addition to enhance microbial inhibition or elimination of the following food borne pathogens. This project aims to experiment with different compositions of the selected components and evaluate the prepared film's efficiency and effectiveness in terms of antimicrobial, mechanical and barrier properties.

Ref: ICBEE/142

Life Cycle Assessment on the Value-added Products of Freshwater Microalgae

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Microalgal value added products (pigments, lipids, protein) and bio-fuels are highly depended on the algal biomass and its growth. For instance, bio-fuel produced by microalgal feedstock and assessment of their lipid productivity during its life cycle. In this study, determination of optimum lipid productivity in microalgal through life cycle assessment (LCA) analysis. Briefly, microalgal strains were obtained from microalgal collection at School of Life Sciences, B.S.A. Crescent Institute of Science and Technology, Chennai. The obtained cultures are BSACIST001, BSACIST002, BSACIST005, BSACIST011 and BSACIST013 were grown in BG11 medium. As per the LCA, microalgal growth was assessed and the purity of the culture was investigated by microscopic examination. The grown cultures were subjected for the chlorophyll estimation to analyze the cell growth spectroscopically. The growth of the cultures was examined periodically under spectroscopic assays. In addition, lipid productively also was done using standard protocol. Thusly, the growth of microalgae, pigment and also their lipid productivity were assessed through LCA. This LCA might helps to analyze the optimum stage of growth and lipid production of microalgae can be interpreted.

Ref: ICBEE/143

An Induction of Lactic Acid Bacterial Growth by Oligo-alginate Prepared by Solution Plasma Process

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In general, lactic acid bacteria (LAB) is a gram-positive, acid-tolerant, micro-aerophilic or facultative anaerobic, non-sporulating, non-respiring bacteria that shares some common metabolic and physiological characteristics and these bacteria produce lactic acid as the major metabolic end product of carbohydrate fermentation. In this study, LAB growth was induced by incubating with oligo-polymer such as oligo-alginate prepared by solution plasma process (SPP). It was applied to degrade biopolymers of macromolecule that are not efficiently hydrolyzed by other methods, but exhibit various biological functions when they are degraded to have low molecular weight (LMW). Alginate is an anionic polysaccharide and its short form of polymer, oligo-alginate with lower molecular mass, are also known as useful biomaterials. Alginate at various concentrations was depolymerised to oligo-alginates using SPP by discharging for various times. It was found that oligo-alginates derived from 0.5% alginate (100 mg mL^{-1}) promoted growth of LAB at the micro-aerophilic condition than the normal growth in the MRS media. Life cycle assessment was investigated for the rapid growth of LAB for the effective industrial application. These preliminary studies pave a way to generate the active LMW molecule for the induction of LAB bacteria.

Ref: ICBEE/144

Effect of equimolar polyol mixtures on the stability of RNase-A

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Compounds that can cause the proteins to fold into their native functional structures are of utmost importance in the production of proteins which are recombinant or of therapeutic importance. For this, osmolytes, the low-molecular weight organic compounds that help organisms to evade hostile environmental conditions, are being used widely. These compounds also play a very important role in osmoregulation mechanisms operating in the living systems. Based on their effect on protein function osmolytes are classified as compatible and counteracting. Compatible osmolytes do not alter protein function while the latter do. Another way of grouping them is on the basis of chemical composition. Under this scheme they are grouped into three major classes: Amino acids and their derivatives, polyols and sugar, and methylamines. Among these chemical classes polyhydric alcohols (*polyols*) are among the most prevalent molecules used by nature to protect organisms against the stresses of high osmotic pressure and freezing. Few examples of polyols are sorbitol, mannitol, myo-inositol, arabitol, etc. Studies have been carried out in the presence of each of these polyols individually. It has been found that all the polyols act as good protein stabilizers. But the living system contains mixture of osmolytes- osmolytes from same group as well as osmolytes from other chemical groups. Therefore, in this study we wish to investigate the effect of mixture of polyol osmolytes in equimolar concentration on the stability of RNase-A.

Keywords: polyols, osmolytes, stress, osmoregulation, protein stability, therapeutic, compatible, counteracting.

Ref: ICBEE/145

Isolation and Characterisation of Antimicrobial Metabolites and Peptides from *Bacillus coagulans*

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Probiotics are bacteria that help the natural balance of organisms (microflora) in the intestines.The commonly found metabolites in probiotic organisms are bacteriocins, lipophilic molecules etc. Antimicrobial peptides (AMPs) are various classes of naturally occurring molecules that are produced by all multicellular organisms. AMPs are naturally produced either by ribosomal peptide synthesis or by non-ribosomal peptide synthesis. Our aims areTo perform antimicrobial activity of *B. coagulans* against different ATCC strains.To isolate and characterize the antimicrobial metabolites and peptides .This experimental study is performed using *Bacillus coagulans*. the antimicrobial activity of *B. coagulans* against gram positive , gram negative bacteria was performed. the antimicrobial compound is analyzed by infrared spectroscopy. The peptide isolated by solvent extraction is characterized by liquid chromatography- mass spectrometry.The antimicrobial assay was performed and the zone of clearance was observed. *Bacillus coagulans*is a spore-forming bacterium which is resistant to high temperatures with its probiotic activity. It exhibited antimicrobial activity against the chosen pathogens as described above. As one of the most important requirements of probiotics, it has broad antimicrobial spectrum. *Bacillus coagulans* fulfilled the beneficial requirements of probiotics.

Ref: ICBEE/146

Isolation and evaluation of *Bacillus* species from fermented soybean (Bekang) based uponenzyme production and antagonistic effect against opportunistic pathogens

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Background Bekang is a popular traditional fermented soybean food consumed in Mizoram state of India.Very few studies have depicted the isolation of *Bacillus* species from fermented food and their enzymaticactivity but there is limited data available on their antagonistic effect. **Objective** The aim of the study is toisolate *Bacillus* species from fermented food and evaluation of *Bacillus* species based upon enzymeproduction and antagonistic effect against opportunistic pathogens. **Methods** The fermented soybean food(bekang) was collected from Aizawl, Mizoram and serial dilution was performed for the isolation of*Bacillus* species. The *Bacillus* isolate was identified by routine conventional methods and molecularcharacterization by PCR based DNA sequencing targeting 16S and gyrA genes. Subsequently,phylogenetic analysis using MEGA X software was performed. The isolate was further evaluated forenzyme production (protease, phytase, amylase, cellulase and lipase) and antagonistic effect againstopportunistic pathogens (*Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa,Staphylococcus aureus*). **Results** The*Bacillus subtilis* was isolated from fermented soybean and confirmedby PCR based DNA sequencing. The *Bacillus subtilis* produced high enzyme activity and antagonisticeffect against opportunistic pathogens. We conclude that the *Bacillus subtilis* isolated from fermented foodhas potential antimicrobial property.

Keywords: *Bacillus subtilis* ,fermented soybean,enzymatic activity, antagonistic effect

Ref: ICBEE/147

Catalytic Depolymerization of Waste Plastics into Low-Emissive Hydrocarbon Fuels

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Pyrolysis of waste plastic is a prospective way of conversion of waste plastic into low emissive hydrocarbon fuel. The present research is focused on the conversion of waste plastic into low emissive hydrocarbon fuel by two process namely vacuum and catalytic cracking (activated carbon, activated carbon with granulated charcoal and activated carbon with calcium oxide). Waste plastic materials viz., polyethylene, polypropylene, polystyrene and polyethylene terephthalate were collected from local convenience store packing materials. Waste plastic material pyrolysis was conducted as individual plastics and as mixed feed in a new lab scale batch reactor. Hydrocarbon molecules from the basic materials are split under the impact of catalyst inside the reactor in 70 ^{o}C – 240 ^{o}C. The reduction of process takes place from 500^{o}C – 600 ^{o}C to 240^{o}C in the presence of catalyst. The analyses of pyrolysis products suggested that it can be used as a viable alternative to motor fuel. It was observed that the yield was better in the case of individual plastic material as opposed to mixed feed in all cases except polypropylene under non catalysed vacuum process. The comparison of the GC-FID (TPH) report of the obtained oil with that of the commercial petrol clearly proves that the prepared oil is composed of petrol components.

Keywords: Waste plastics; Pyrolysis; Alternative fuel; Catalytic conversion; Hydrocarbon; Petrol.

Ref: ICBEE/148

Effect of drifted seagrass *Cymodoceaserrulata*as potential biofetrtilizer and assessment of its nutritive value

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Drifted seagrass is generally considered to be one of the natural shoreline wastes. The aim of this study is to reuse the settled seagrass and convert it into valuable compost, as seagrass generally contains carbon, nitrogen, potassium and phosphorus. The qualitative phytochemical screening of *cymodeceaserrulata*shows the presence of various phytochemical constituents which is essential for promoting plant growth and enhance soil fertility. The seagrasses are added to empty soil pit containing active earthworms to produce of seagrass vermicompost, simple composting in soil to produce compost and extraction of raw seagrass to produce seagrass extract. All the three forms of seagrass biofertilizers proves that it promotes plant growth and soil fertility. Their nutritive values are analyzed. To achieve sustainable agriculture, seagrass biofertilizer will promote organic farming practices thereby replacing chemical fertilizers.

Ref: ICBEE/149

Detection of Banana Bunchy Top Virus using degenerate primers

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Banana plantations are affected by several viruses, among them Banana bunchy top virus(BBTV) is a major constraint throughout the banana growing regions of the world. It was foundto be an isometric virus having a multi-component genome comprising at least six ssDNA. Theviral genome components are termed DNA-R, DNA-U3, DNA-S, DNA-M, DNA-C andDNA-N. In this study total DNA was isolated from leaves of BBTV infected banana samples andscreened for infection using degenerate primers, BBTVSL1 and BBTVSL2 designed specificallybased on conserved stem loop regions of BBTV to generate a BBTV library. and the PCRproduct was cloned into pTZ57R/T. The transformed bacteria were screened for the presence ofBBTV components using primers E and F. Of the 23 clones obtained, the majority of the cloneswere found to be DNA - U3 as confirmed by primers E and F. Sequence was submitted in GenBank and phylogenetic analysis revealed DNA-U3 belonged to the South Pacific group.

Ref: ICBEE/152

Evaluvation of Dietary Pattern and Food Habit of Adolscent Girls under Sabla Scheme in Ramanathapuram District

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This was a cross sectional research design to gather information from beneficiaries and non beneficiaries regarding dietary intake and food habits of adolescents girls under sable scheme in selected six blocks of Ramanathapuram Districts, Tamilnadu.Two hundred beneficiaries sample were selected from school going and out of school girls and Two hundred non beneficiaries sample were selected from school going girls. A pretested food frequency questionnaire and 24 hour dietary recall method was used to collect information on food intake and dietary pattern. Average daily nutrient intake of adolescent girls were calculated and compared with Indian RDA values. The average daily intake of adolescent girls compared with RDA levels was found to be significantly lower. Cereals has been eaten mainly by subject and are the main energy source. Daily consumption of milk and milk products was low and only 39 percent of beneficiaries and 26.5 percent of non beneficiaries girls take it on regular basis.The finding showed that all the adolescent girls in the Ramanathapuram District had poor n utritional status. Selected studies revealed a very high incidence of undernourishment. A very high incidence of under nutrition has been seen among selected samples nutritional and health profession are needed to educate and encourage these adolescent girls to increase the intake of milk and milk products, fruit and green leafy vegetables. This will help in preventing the disease associated with poor nutrition.

Keywords: Sabla scheme, Food habits, 24 hour recall method, Adolescent girls

Ref: ICBEE/153

Isolation and characterization of *Bacillus spp.* , from soil and its antimicrobial activity

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The increasing levels of antibiotic resistance is a big threat to overcome microbial infection.Thewidespread utilization of antibiotics has caused the pathogenic bacteria to become resistant tomany of the antibiotics used for treatment. *Bacillus subtilis* produces many antibacterialcompounds including lipopeptides which have been proven to have antimicrobial activity againstclinical pathogens.7 strains of *Bacillus Spp*were isolated from 15 soil samples and furtherconfirmed by PCR analysis using Gyrase A and 16S primers and the products were sequenced.The sequences were analysed using MEGA X software. The isolates were evaluated for theirprobiotic characteristics using Bile tolerance, Acid Tolerance tests. The isolate was evaluatedfor secretion of extracellular enzymes including amylase, cellulase, phytase and protease andantimicrobial properties. The phylogenetic analysis of sequences (Gyrase A and 16S) revealedthe isolate A1 belonged to *Bacillus subtilis* . Biochemical analysis of A1 revealed the organism tobe a gram positive bacilli with beta-hemolytic activity and produces amylase, cellulase, phytaseand protease. and found to possess high antimicrobial property against *Pseudomonas aeruginosa.* The antimicrobial property against *Pseudomonas* might be attributed by the lipopeptides likesurfactin which could be targeted against drug resistant pathogens.

Ref: ICBEE/154

Standardization of Method for Extraction of Protein from Marine Seaweeds (*Sargassum spp*and*Turbinariaspp)*

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The present study was aimed to determine the standard method of protein extraction form seaweeds. The two samples of seaweed *Sargassum spp*and*Turbinariaspp*were collected from coastal area. The collected seaweed were washed, dried and grind as a fine powder. The seaweed powder was added with NaOH and centrifuged respectively. Then the crude extract were collected from centrifugation for various analysis. Amount of protein in the seaweed was detected by the Lowry's method. Various concentration of NaoH was added to estimate the amount of protein.Protein values obtained as a protein standard with BSA were closer to the calculated values, suggesting that the BSA usage is more suitable for the Lowry method. The procedure proposed here can contribute a better results , since protein extracted is efficient and potential interference from compounds such as lipids , phenolic , pigments , small peptides and free amino acids is eliminated. The protein isolated protocol increases the concentration of protein and found to be more effective than the different protein extraction procedure for *Sargassum and Turbinaria spp.*

Ref: ICBEE/153

Recombinant DNA Technology: Applications in the Field of Biotechnology and Biometrics

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The advances in recombinant DNA technology have occurred in parallel with the development of genetic processes and biological variations. The development of new technologies have resulted into production of large amount of biochemically defined proteins of medical significance and created an enormous potential for pharmaceutical industries. The biochemically derived therapeutics is large extra cellular proteins for use in either chronic replacement therapies or for the treatment of life threatening indications.There are four important applications of rDNA in the areas of human diseases prophylaxis, therapy, diagnosis and discovery. Areas of prophylaxis include vaccines and coagulation. It is now possible, through rDNA technology, to produce an effective and safer production of both live and killed vaccines with increase response and high specificity. Recombinant DNA technology approach is the identification of that protein component of virus or microbial pathogen which itself can elicit the production of antibodies having capacity to neutralize infectivity, potentially protecting the host against the pathogen. Such proteins are useful for identification of the gene coding the protein.

Ref: ICBEE/154

Effect of *Hydrillaverticillata* extractsenriched with Chitosan Coating on the Meat Products

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Food, an eminent factor without which the survival rate of every living being would be shortened. Nowadays, the health benefits of the food products are masked whereas it unveils only the organoleptic characters. Food preservation aims to prevent and reduce the deterioration of food products thereby extending the shelf-life of food.Various plants contain diversified bioactive compounds with significant antioxidant and antimicrobial properties. These properties are considered asfactors which would extensively contribute to the preserving activity. *Hydrillaverticillata*, a submersed perennial herb found in water bodiesrooted with long stems, forms dense mats having several benefits. Besides many useful functions, this plant provides the preserving property which can be utilized for the food products. The main intent of the study is to treat the meat sample with the ethanolic extract of *Hydrillaverticillata*enriched with chitosan coating which will result in a palatable product. The effectiveness of the extract was resolvedthrough continuous evaluation of the physiochemical and sensory analysis of the treated meat. In conclusion, *Hydrillaverticillata* extract can be suggested as a replacement to synthetic preservative in meat products.

Keywords:*Hydrillaverticillata*, ethanolic extracts, antioxidant and anti-microbial activity, physiochemical and sensory analysis.

Ref: ICBEE/155

A Study on Polyethylene Degrading Potentials of Bacterial and Fungal Isolates from Waste Dumping Site of Velipattinam, Ramanathapuram

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The present studywas formulated that the isolates from the waste dumped area ofVelipattinam, Ramanathapuram soil has the ability to degrade polythene.four different Bacterial Colonies were selected from isolated colonies and two different fungal Colonies were selected from isolated colonies. The pure culture was obtained by quadrant streaking. Gram staining results that the isolated I was gram-negative and isolate II, III, IV was gram-Positive. Biochemical tests expressed both positive and negative results. These organisms were able to degrade polyethylene at different time-interval. Isolatesformed the colonies onthe surface of PE films and these isolates were hydrophobic in nature, because of hydrophobicity the bacterial and fungal isolates adhere to the films and formed colonies.Bacterial isolates I and II and fungal isolates II and III have high efficiency to degrade Polyethylene than other isolates and high amount of protein to measure the biomass. Degradation was monitored by measuringpolyethylene weight (gm) before and after the Treatment.

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Investigation of Antioxidant Effects of Yellow Lac Dye

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Kerria lacca, commonly known as Indian lac insect is a hemipteran insect belonging to the the Family Tachardiidiae (=kerriidae) of Superfamily Coccoidea. This phytosuccivorous insect is economically very important due to production of their economically important products, *viz.*, lac resin, lac dye and lac wax. Lac dye is derived from the body coloration of insect, wild type insects are crimson in color which is a complex of polyhydroxy anthraquinones composed of water-soluble laccaic acid A, B, C, D and E. Lac insect shows qualitative variation with regards to body colour and yellow, cream and white colour morphs have been reported. Among these, the yellow mutants are widely distributed in natural populations of lac insects, especially in Western India. There body colouration is due to the presence of an only pigment molecule i.e. laccaic acid D which is considered as the precursor molecule for the biosynthesis of all other anthraquinoid pigment compound of lac insects. 1, 8 dihydroxylated anthraquinones are known to exhibit many pharmaceutical properties, including antioxidant, antibiotic, antiviral, antifeedant effect etc. A recent study reveals that the laccaic acid D also possess antineoplastic activity. Most of the anticancerous drugs are likely to having an antioxidant activity. Based on the preliminary studies we propose that laccaic acid D may exhibit antioxidant property against reactive oxygen species. DPPH assay and phosphomolybdenum assay were used to study antioxidant activty of the laccaic acid D. Also, *in silico* studies using Autodock 4.2.6 were performed to show interaction between enzymes such as SOD (super oxide dismutase), Gpx (Glutathione peroxidase), CP450 (Cytochrome P450), Catalase, against ligand Laccaic acid D, vitamin E, and vitamin C.

Keywords: Lac dye; Antioxidant; DPPH, phosphomolybdenum; Vitamin E and C.

Ref: ICBEE/157

Cloning, expression and characterization of Rv10169 from *Mycobacterium tuberculosis*

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Mycobacterium tuberculosis is a virulent tuberculosis-causing bacillus, a disease which causes millions of deaths worldwide each year.A one third of the world's population is estimated to be infected with Mycobacterium tuberculosis (Mtb). Tuberculosis is therefore a leading cause of infectious mortality worldwide, responsible for more than 8 million new cases and 2.9 million deaths annually. The success of Mycobacterium tuberculosis (Mtb) as a pathogen rests upon its ability to grow intracellularly within the host macrophages. Mtb cell membrane is having some of the proteins that which helps in the interaction between host and pathogen. Those proteins are called as membrane proteins. Those membrane proteins of Mtb mainly involves in the: Invasion, adsorption, virulence. The functions of various proteins and genes for Mycobacterium tuberculosis are characterized in order to understand its mechanism of pathogenesis in humans and to help control tuberculosis. Now our currentresearch is cloning and characterization of RV0169 from Mycobacterium tuberculosis (H37Rv) strain . So that help to immunomodulate the membrane proteins . mce 1A is the gene product of the Mycobacterium tuberculosis which can be annotated as the RV0169454 amino acids long basic protein. As the function of the mce1A is unknown but thought to be involved in host cell invasion (entry and survival inside macrophages).

Keywords : Mycobacterium tuberculosis , Cloning , Characterization, mce 1A , pathogenesis

Ref: ICBEE/158

Immuno Molecular Markers in Breast Cancer and Exploration of Their Role in Laboratory Diagnosis

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Carcinoma of breast is a unique condition that usually affects tissues involved in milk production (ductal and lobular tissues) often landing in controversy among Pathologist in laboratory workups. Breast cancer is the most frequently diagnosed type of cancer in women and second leading cause of death from cancer for women worldwide. Breast cancer consists of multisystem approach including chemotherapy, radiotherapy, and hormone therapy or biopsy study. The prognosis of breast cancer is determined by age, lymph node involvement, and tumor grade, nuclear expression of ER, PR and HER2. The infiltration of Treg cells in patients with breast cancer has been proposed as an independent unfavorable prognostic factor. In order to analyze the expression of it, we are carrying out Immuno fluorescence by the aid of markers such as Helios and Neuropilin1. The addition behind in it is the secondary antibody which is a Fluorophore. Prophylactic mastectomy being the preemptive mode of surgery and the histopathology evaluation of the gene mutations (for instance BRCA1 or BRCA2) stays the standard evaluation to confirm and categorize. However, for breast cancer, all the standard diagnostic modalities have well known limitations directing to proceed with immune molecular studies. The main purpose of doing IHC is carried out by the preceding methods only, wherein wax melting is very essential in it. The various markers is tested to recognize results and by H&E staining, a procedure to confirm whether or not the tumor is present or absent will be confirmed. In here, we will find out:

- Whether a panel of markers (IHC) will really help in avoiding multiple breast surgeries.
- Is postulating a panel of Immuno markers aid in assessing the behavior of breast cancer and assess the prognosis in Pathology report rather than waiting for yearstogether?
- What is the effect of Cancer microenvironment in the progression of breast cancer?

The markers we will use is ER, HR, PR, HER2, E-Cadherin, ki-67, GCDFP, EGFR, CK5/6, etc. Also with the help of H&E Staining, involving the immune cells into action and dealing with it.

Ref: ICBEE/159

Cloning, expression and characterization of Rv1477 from *Mycobacterium tuberculosis*

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Mycobacterium tuberculosis is an etiological agent of tuberculosis which continuing to be leading cause of top 10 deadly infections. It is estimated that 10 million people fell ill with tuberculosis. one of sustainable development goals includes ending of tuberculosis by 2030. So, there is need for better understanding of *Mtb*. When we look deep into the pathogenicity of *Mtb.*After entering alveolar sac, they invade and replicate with in the endosomes of macrophages. Before entering the endosome, bacteria attach to the surface membrane of macrophage and makes necessary modifications using membrane proteins secreted by *Mtb*. Bacteria has developed large number of mechanisms to enter human macrophages in which caveolae mediated endocytosis is one method. Around 300 membrane genes are found till date in *Mtb*butmanyfunctionsof them are unknown. From them 15 genes are shortlisted based on virulence. Rv1477 (ripA) is a gene which function is unknown. The Present study mainly concentrates on cloning, expression and characterization of Rv1477 related to caveolae mediated endocytosis.pET28a is used as expression vector and plasmid DNA is extracted using alkaline lysis method. Host used for plasmid propagation is Escherichia coli DH5α. Purification and N-terminal sequencing of the protein is carried out. PCR Amplification of Gene following sequencing of the gene and Protein Sequence. Finally, gene expression and protein function are known. At present work is at extraction of plasmid DNA.

Keywords:*Mtb,* Caveolae, pEt28a, RV1477, E.coli DH5α, Macrophages.

Ref: ICBEE/160

Synthesis of graphene-Cu-BiO based microsphere for photocatalytic degradation of phenolic compounds from agricultural wastewater.

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The present study describes the synthesis of graphene incorporated Cu-BiO based composite for photocatalytic degradation of gallic acid (GA) from agricultural wastewater. Initially, graphene was synthesized by using the liquid-phase exfoliation process. The synthesized graphene was incorporated during the formation of Cu-BiO to produce a graphene-Cu-BiO based microsphere. The prepared graphene-Cu-BiO based microsphere was further applied to the photocatalytic degradation of GA with different content of graphene. The maximum photocatalytic degradation (~95 %) was achieved at solution pH using the highest graphene incorporated Cu-BiO based microsphere attributed incorporation of graphene aided advantages in photocatalytic degradation. The approximately 100% photocatalytic degradation was observed at pH 10 within 30 min of exposure, indicated pH-dependent degradation. The synthesis of the graphene-Cu-BiO based microsphere is simple, economically viable, and high photocatalytic degradation of phenolic compounds.

Ref: ICBEE/161

Production, characterization and cytotoxic evaluation of violacein from *Chromobacteriumviolaceum*

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Chromobacteriumviolaceum in a gram negative, facultatively anaerobic, rod-shaped bacterium. It was first isolated from wet rice paste with notable characteristic of having deep violet pigment. The *VioE*gene responsible for pigment production which encodes vioE enzyme that catalyzes the tryptophan molecule and hydroxylation in violacein biosynthesis. In this study violacein was extracted from *C.violaceum* by Ethanol extraction and yield was upto 5g/100ml of violacein extract. The absorbance of the violacein was observed at 520nm using UV/Vis spectrophotometer. The particle size of the pigment was 6.6nm with zeta potential of-14.7 mV. Gene responsible for pigment production was identified using gene specific primer (*VioE* gene) which amplified the Vio E region of the *C.violaceum*ORF region with 203bp amplicon. The cytotoxicity studies (MTT assay) were carried out using human epithelial cells. The CC_{50} values 2.29±0.68 showed that the pigment was below the CC_{50} level.

Keywords*: Violacein, Gene identification, Particle size and zeta potential, Cytoxicity*

Ref: ICBEE/162

An Novel Effort to Increase the Quality and Packaging of Survival Ration in Military

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Food processing is the production of consumables from raw materials using physical or chemical methods. The food processed and packaged for common people is well known where as the food packed for Army/Military/Combat people is a cause of concern since the heroes of every nation consume food that is prepared and packed in plastic bags(Olive green bags in INDIA and Aluminum foils in USA). Since the food is stored and consumed from plastic, it may lead to cancer over the course of their lifetime. The meal ready to eat is officially known as trilaminate retort pouch which is used by US Defense and Combat personals.

Therefore in an novel attempt to improve the quality of food being prepared so as to maintain the freshness of the food to last from breakfast to dinner without causing any harm or damage to the health of army personal,canning which is an alternative process which also contains stored food which has its own demerits, therefore it is necessary for us to improve the packaging of food material from plastic bags to may be capsules such as astronauts consume or it has to be packed in containers which are non carcinogenic in nature.

Ref: ICBEE/163

Structural and Functional Analysis of the Rv2416c Eis Protein

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The Eis gene of mycobacterium tuberculosis plays a major role in the survival within the macrophage. The pathogenesis is complex and manifestations are diverse and reflects the virulence factors on human immune system. It also disturbs the cross regulation of T-cells. The protein contributes to drug resistance by acetylating multiple amines of glycosides. Our current work is to express and purify the recombinant protein Rv 2416cusing Ni-NTA resin column chromatography and look for the 10% SDS PAGE analysis. They are induced by IPTG induction for the purified protein and checked for the mobility of primary , Secondary and tertiary structures. We are also checking the immunomodulatory effects of the Rv2416c Eis on the given PBMC's unit.

Ref: ICBEE/164

Synthesis of magnetic nanoparticles using plant extracts of *Moringa oleifera* and *Solanum nigrum* and its application in microbial capture

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Nanoparticles are nanomaterials which range between 1 nm and 100 nm and find applications in various fields due to large surface volume ratio. Super Paramagnetic Iron Oxide Nanoparticles (SPION) are iron oxide nanoparticles which have unique magnetic properties and can be synthesized by green chemistry method which involves the use of plant extracts. The phytochemicals present in the plant extract reduce the iron oxide into stable nanoparticles and are widely used due to their antimicrobial properties and to replace harmful chemicals in water treatment plants. The main objective of this work is to determine the microbial capture efficiency and antimicrobial properties of the MNPs synthesized from aqueous plant extracts. Aqueous plant extracts of *Moringa oleifera* and *Solanum nigrum* were used for nanoparticle synthesis, the MNPs were then characterized by particle size analyzer and UV- Visible Spectroscopy. Different dilutions of water samples procured from the water treatment plant were treated with the MNPs and it was found that the MNPs were able to capture microorganisms at most of the dilutions. Disc diffusion assay was performed using *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella pneumoniae* to assess the antibacterial properties of the MNPs.

Ref: ICBEE/165

Antibiotic Resistant Genes in Bacteriophages Isolated from Environmental Waters

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Antibiotic resistance is an increasing global problem resulting from the pressure of antibiotic usage, greater mobility of the population, and industrialization. Many antibiotic resistance genes are believed to have originated in microorganisms in the environment, and to have been transferred to other bacteria through mobile genetic elements. Among others, β-lactam antibiotics show clinical efficacy and low toxicity, and they are thus widely used as antimicrobials. Resistance to β-lactam antibiotics is conferred by β-lactamase genes and penicillin-binding proteins, which are chromosomal- or plasmid-encoded, although there is little information available on the contribution of other mobile genetic elements, such as phages. This study is focused on four genes that confer resistance to β-lactam antibiotics (Oxa-2, AmpC), Imp and one encoding a penicillin-binding protein (mecA) in bacteriophage DNA isolated from environmental water samples. The four genes were quantified in the DNA isolated from bacteriophages collected from 30 urban sewage and lake water samples, using PCR amplification. All four genes were detected in the DNA of phages from all the samples tested, ThemecA gene from phage DNA were transferred by electroporation to sensitive host bacteria, which became resistant to methicillin. MecA gene were detected in the DNA of the resistant clones after transfection. This study indicates that phages are reservoirs of resistance genes in the environment

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Mycotoxin and Food Saftey

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Disease outbreaks due to the consumption of contaminated food and feedstuff are a recurring problem worldwide. The major factor contributing to contamination are microorganisms, especially fungi, which produce low-molecular-weight compounds as secondary metabolites, with confirmed toxic properties referred to as mycotoxins. Several mycotoxins reported to date are cosmopolitan in distribution and incur severe health-associated risks (including cancer and neurological disorders). Hence, creating awareness among consumers, as well as developing new methods for detection and inactivation is of great importance for food safety. In this review, the focus is on the occurrence of various types of mycotoxins in food and feed associated with risks to humans and livestock, as well as legislation put forth by various authorities, and on presently practiced detoxification methods. Brief descriptions on recent developments in mycotoxin detection methodology are also inlcuded. This review is meant to be informative not only for health-conscious consumers but also for experts in the field to pave the way for future research to fill the existing gaps in our knowledge with regard to mycotoxins and food safety.

Ref: ICBEE/167

Improved solubility and Enhanced ROS Scavenging of NanoformulatedNaringenin

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Many promising drugs exhibit poor solubility thereby limiting their application. Nano formulation became a promising technique for improving the solubility of poorly soluble drugs. Naringenin is a flavonoid known for its therapeutic property which is a hydrophobic nutraceutical. In the present study, we have synthesized liposome encapsulated naringenin to increase the solubility and ROS scavenging property. The results showed that the increasing concentration of the cholesterol used in the preparation of liposome plays a vital role in the solubility of naringenin. Spectrophotometric studies proved that there was an increased solubility of naringenin when it is entrapped in the liposomes. The enhanced solubility eventually leads to the increase in the ROS scavenging property which was established with the help of DPPH-assay.

Ref: ICBEE/168

Identification of Novel Tyrosine Phosphatase Inhibitors using Insilico Studies

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BACKGROUND:Protein-tyrosine phosphatase 1B (PTP1B) plays an important role as a negative regulator in insulin signalling pathways that are implicated in metabolic diseases such as obesity and type 2 diabetes. PTP1B is the main enzyme involved in insulin receptor desensitization. Inhibition of PTP1B can improve insulin receptor sensitization and have the ability to cure insulin resistance-related diseases. Computational techniques such as virtual screening is performed to find novel and potential lead compound targeting PTP1B inhibitors.METHOD: The method includes literature survey and the use of protein structure databases such as RCSB PDB, UNIPROT and the tools they provide. The methods used to identify novel inhibitors involves – ASINEX database, virtual screening and molecular docking, ADMET analysis, molecular dynamics (MD) simulations.CONCLUSION: The research for finding PTP1b inhibitors started with the design of molecules mimicking the tyrosine substrate of the enzyme. There are several inhibitors have been already found, interacting with the binding site of some enzyme, surrounding the catalytic amino acid Cys215. However the research continues for finding more potent inhibitors with increased cell permeability and specificity.

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Therapeutic Potential and Health Benefits of Red Algae Refreshing drink (*kappaphycusalvarezii)*

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Seaweeds, otherwise known as marine algae are primitive non-flowering photosynthetic macrophytes occurring in tidal regions of seas and oceans that occupy 71% of the globe and they are natural renewable resources. Green, brown and red seaweeds are generally distributed in the intertidal, tidal and subtidal regions respectively. The red seaweed, *kappaphycusalvarezii*, was evaluated for its potential to prevent signs of many diseases through use as a whole food supplement. Major biochemical components of dried *kappaphycus*are carrageenan *(*soluble fibre ~34.6%) and salt (predominantly potassium(K) 20%) with a low overall energy content for whole seaweed. Seaweed is a multicellular alga containing an immunologically active substance. The use of seaweed so far is still limited to carrageenan and agar products. Marine algae are rich in sulphate polysaccharides (SPs) such as carrageenan found in red algae, and have many beneficial bioactive compounds as anti-coagulants, antiviral, antioxidant, anticancer and immune adulation activators In view of above information my research work focus towards the analyse the nutrient value and therapeutic benefits of red algae (***kappaphycusalvarezii)*** refreshing drink.

Keywords:*Kappaphycusalvarezii*

Ref: ICBEE/170

Nanorobots and their Potential in Drug Delivery

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Nanotechnology deals with the manipulation of matter at the size of 1 to 100 nanometers. Nanorobots are a budding field of nanotechnology. Nanorobots are nanosized machines which are programmed to execute diagnosis and delivery. Conventional cancer treatments fail at delivering drugs to target sites. Also conventional treatments are known to damage healthy cells. This is overcome by the use of nanorobots. Nanorobots are superior to conventional methods of drug delivery. Nanorobots can reliably be applied to cancer treatment, diagnosis of diseases, and dental surgery. They are minimally invasive, small in size, and are mobile and these features enable them to be an excellent mediator for drug delivery and analysis. Nanorobots will become better with time due to advancements in nanoelectronics, wireless communication, proteomics and material engineering.

Keywords: Nanotechnology, nanorobots, drug delivery, Cancer.

Ref: ICBEE/171

In vitro Analysis of Berberis aristata to Combat Paramoxiviridae Infection

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Berberis aristata is associated with the family *Berberidaceae*which is well renowned for its role in various medical applications including treatment for diabetes and cancer. In order to explore its antiviral activity, the phytochemicalswere extracted using acid dye method and it was validated based on the preliminary tests for alkaloids precisely. The GC-MS studies enabledin enumerating the molecules present in the extract responsible for obstructing the viral replication. The antiviral titre of the phytochemical was performed based on the characteristic hemaglutination assay using the *New castle disease*viral vaccine as an antigen and the phytochemical extracted from the barks of *Berberisaristata*as the antiviral agent. These findings open a potential new avenue for the extracts of *Berberisaristata* to be a novel lead compound in striving against the deadly *Paramoxyviridae*infectionsrespectively.

Keywords: Acid dye method, hemagglutination assay, therapeutic efficacy

Ref: ICBEE/172

Vernodalin induces apoptosis through the activation of ROS/JNK pathway in human colon cancer cells

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Colorectal cancer (CRC) is one of the most leading death causing cancers in the world. Plant derived compounds are known to exhibit anticancer property against CRC. Vernodalin, is a cytotoxic sesquiterpene has been reported to possess anticancer properties against human breast cancer cells. This study, was aimed to examine the anticancer mechanism of vernodalin on human colon cancer cells. Vernodalin was treated on human colon cancer cells, HT-29 and HCT116. The cytotoxicity of vernodalin on human colon cancer cells was determined through in-vitro MTT assay. Small interfering RNA (siRNA) was used to analyze the cascade activation of mitogen-activated protein kinase (MAPK) pathway; c-Jun N-terminal kinase (JNK), in HT-29 and HCT116 cells against vernodalin treatment. The protein expressions of caspase 3, Bcl-2 and Bax were examined through western blot analysis. Immunoblot analysis on the JNK, ERK and p38 MAPK pathways showed increased activation due to vernodalin treatment. It was proven from the JNK and p38 inhibition test, that both pathways are significantly activated by vernodalin to induce apoptosis. Our results, collectively showed the apoptosis-induced anticancer mechanism of vernodalin on human colon cancer cells was mediated through the activation of JNK pathway and apoptotic regulator proteins. These results suggest that vernodalin could be developed as a potent chemotherapeutic agent for human colon cancer treatment.

Keywords: Colorectal cancer, vernodalin, c-Jun N-terminal kinase, MAPK, apoptosis

Ref: ICBEE/173

Bisphenol A induced Oxidative injury in Brain Tissues

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Bisphenol A (BPA) has been popularized into the industry andconsidered as environmental toxicant and/or endocrine disrupting chemicals. The distribution of BPA has recently become a critical issue at global level. Nevertheless, studies on the severe toxicity and its associated mechanisms of BPAis still unknown. BPA is ubiquitously used in the production of polycarbonate plastics and epoxy resins. The usage of BPA-encapsulated products in routine daily life cause exposure at universal stage, and the possible health risk of such toxic chemical are a major public healthconcern. Despite its fact that, both *in vitro* and *in vivo* studies have been published reports on the action of BPAon biological systems. Previous published data have suggested the effects of BPA on neurological functions, and the exact mechanisms remain unclear.The oxidative stress has been implicated in pathogenesis of various neurodegenerative conditions including Alzheimer's disease and Parkinson's disease. BPA also caused increased oxidative stress in the brain.It has been investigated that BPA exposure caused neuroinflammation via dysregulation of inflammatory cytokines mRNA and protein expression leads to neurotoxicity through axonal as well as myelin degeneration in the brain tissues. It is suggested that brain homogenate preparations can be used as an excellent model for future investigation of BPA induced neurotoxicity under both *in vivo* and *in vitro* conditions.

Keywords:BPA, Oxidative Stress; Neurodegeneration; Protein Expression; Inflammation

Ref: ICBEE/174

Promising Action of Caspase 8 in Neuroblastoma: *In Silico* and *In vivo* approach

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Neuroblastoma (NB) is frequently most common extracranial solid tumor in childhood, considering for approximately 8-12% of pediatric cancers mortality in patients less than 12 years old. In recent years, several genetic abnormalities have been identified in such disorder. Nevertheless, limited reports have publishedon how such genetic disturbances contribute to tumor formation and metastatic disease. Several neuroscientists, have discovered that NB primary cultures and cell lines frequently showndeprivation of caspase-8 expression at *in vitro* system. It has been implicated that the forfeit of caspase-8 quickens tumor initiation and upgrades metastasis via the regulation of integrin mediated apoptosis and minimize the responses of tumors to cell deathsignals. It has recently been considered that Caspase 8 has an action as both apoptotic and necrotic in neuroblastoma layout modulating of caspase-8 expression confederate with other genetic alterations including N myc over-expression in tumor formation. To investigatesuchqueries. It is planned to establish an *in silico* study with the above discussed proteins and the development of mouse model can be considered reflects the highNmycand low caspase 8 expression as an *in vivo* model.These investigations will explore whether the apoptotic functions of Caspase 8 are modulated in both *in silico* and *in vitro* system, by deviating Caspase 8 levels or by translational modification that minimize enzymatic activity or change subcellular localization in experimental models.

Keywords: Neuroblastoma; Apoptosis; Cell Signaling; Caspase 8; *In Vivo* Studies; *In Silico* Studies

Ref: ICBEE/175

Pharmacological Evidences for immunomodulatory effects of Pregabalin: An *In vitro* and *In vivo* approach

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There is an increasing recognition of a critical link between pain and immune function. In later stages of peripheral nerve damage, the inflammation mediated neuropathic pain develops at the site of injury. It has been implicated that less than 50 percent neuropathic pain patients are satisfactorily treated with drugs. Possibly, this paucity of potency of drugs on neuropathic pain might be due to the drugs prescribed, regardless of the origin of pain. It has been reportedly explored the efficacy of orally administered morphine, pregabalin, gabapentin, and duloxetine on mechanical allodynia with that on pain models.Pregabalin is considered as an antagonist of voltage gated Ca^{2+} channels and specifically binds to alpha-2-delta subunit to produce analgesic or pain-relieving actions. It is more capable to alleviates the symptoms of several kind of neuropathic pain. Such episodes contemplate itself as a primary line therapeutic candidate with unique safety and efficacy. In both Pre-clinical and clinical models, pregabalin has been displayed to be more effective in several models of neuropathic pain, incisional and inflammatory injury.The ion channel modulation, synaptic signaling and inflammation are other probable machinery responsible for its analgesic actions against neuropathic pain. Nevertheless, more investigations are still controversial to enlighten its mechanism in a well specified manner.

Keywords: Inflammation; Ion Channel, Animal Model, Neuropathic Pain, Immunomodulation

Ref: ICBEE/176

Effect of Pesticides on Oxidative Stress and Metabolism in experimental models

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Pesticides (PC) are ubiquitously employed in all over the globe. Pesticideshave been known to act by binding the γ-aminobutyric acid (GABA) receptor and has approvableparticular toxicity towards insects rather than mammals. Nevertheless, due to accidental exposure, mishandlingPC's leading to the contamination of water and soil, there is enhancingproof that PC's could able to show a severe toxic action on rodents and humans. It has considerable progress as neurotoxic, reproductive,nephrotoxic, hepatotoxic, and cytotoxic effects in both *in vitro* and *in vivo* system. For the past two decades, oxidative stress hasbeen put forwarded to be a part in the several kinds of toxicitiestriggered by PC's. It has focused on investigationslinked with oxidative stress as a potent episode for PC's-induced toxicity as well as metabolism. Moreover, PC's metabolismcould be considered with various CYP450 enzymes in rodent models. These enzymesassociated with oxidative stress may be involved. It is suggested that PC's targeted molecules can be used as an excellent model for future investigation via oxidative stress mediated damagein rodent models.

Keywords: Pesticides; ROS; metabolism; oxidative stress; toxicology; CYP450

Ref: ICBEE/177

Fabrication of gold nanoparticles using pectin derived from *Citrus maxima* and its genotoxicity evaluation on Zebrafish embryos.

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Pectin a polymer commonly found on the fruit peels were extracted from the fruit of C. *maxima*. Further, the extracted pectin was characterized by instrumental analyses. Pectin mediated AuNPs were fabricated. The pectin mediated Au-NPs were characterized by spectroscopic and microscopic analysis. The TEM analysis revealed the presence of polymorphic and polydisperse nano particles. Zebrafish (*Danio rerio*) embryos were used to study the effect and distribution of Au NPs in *in vivo*. Various toxicological endpoints like mortality, hatching rate and heart rate were recorded. A concentration dependent increase in mortality was also observed in Au NPs treated embryos. Furthermore, the acridine orange staining was used to evaluate the genotoxicity of pectin mediated AuNPs on the zebrafish embryos. The results indicated that pectin mediated Au NPs and did not hinder the zebrafish embryonic development at lower concentrations.

Keywords: *C.maxima*, Pectin, Gold nanoparticles, *Danio rerio* , genotoxicity

Ref: ICBEE/178

Exploring the Bioactive Potential of Halophilic Bacteria Isolated from East Coast of Tamilnadu, India

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Halophiles are an important group of microbes which require salt for their growthand can be found in all the three domains of life, such as the Archaea, Bacteria and Eukarya. Most of the strains were isolated from various saline habitats such as marine sea water, artificial slatterns, hyper saline lakes, deep salt mines etc,.

Recently, several halophilic microbes have been exploited for their biotechnological potential in various fields, including production of different productssuch as thebiopolymers, biosurfactants, exopolysaccharides etc., and also in process of environmental bioremediation. In the present study, potential halophilic strain was isolated from east coast of Tamil Nadu and exploited for their biotechnological potential. The halophilic strain was tested for their presence of various multienzyme production properties; also for the production of biopolymer, exopolysaccharides and biosurfactants. The bioactive property such as antimicrobial and *invitro*cytotoxicity property of halophilic strains were also tested. The results of the present study revealed that the halophilic strain was able to synthesize protease, gelatinase, amylase, lipase and urease. The strain also found to accumulate polyhydroxybutyrate and also produces significant amount of biosurfactants and exopolysaccharides. Finally the dead biomass of the halophilic strain was also analyzed for their biosorption potential for the removal of hexavalent chromium metal ions form the aqueous solution.

Keywords: Halophilic bacteria, multienzymes,PHB, biosorption

Ref: ICBEE/179

Utilization of non-indigenous ascidians as supplementary feeds for ornamental fish

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Ascidians are marine sedentary organisms, commonly called as Sea squirts or Tunicates belonging to class Ascidiacea of sub-phylum Urochordata. The introduction of this group is escalating in Indian coastal waters as its unique ambience climate and a variety of habitat provides conducing environment for the recruitment, survival and reproduction of ascidians. Control or prevention of their introduction is very difficult as their reproductive potential and polymorphic structure promote mushrooming growth, in turn; pave a way to the consequence problems to the environment. Thus, possible utilization of the exotic tunicates is imperative rather than control or prevention. As ascidians are natural prey for many aquatic animals including flat worms, molluscs, rock crabs, starfishes, sea birds and sea otters, a novel approach is emerged to prepare the pellet feed for fish species. The study revealed the occurrence of 46 species of ascidians belonging to 15 genera and 7 families with two new species. Antibacterial and antioxidant activity of chosen ascidians showed good result as compare to standard. GC-MS chromatogram of the methanolic extract of *Polyclinumglabrum*and*P. saturnium* showed ten and eleven peaks indicating the presence of 10 & 11 chemical constituents.The amount of biochemical constituents present in the supplementary feeds prepared from the chosen ascidians showed higher than in the commercial feed. The growth indicators such as Length, Weight, Specific Growth Rate, Feed Conversion Ratio, Condition factor, Survival rate and Reproductive performancewere calculated and found to be high in the experimental feed.

Keywords: Ascidians, supplementary feed, Antibacterial, Antioxidant activity.

Ref: ICBEE/180

Blood Triggered Generation of Platinum Nanoparticle Functions as an Anti-Cancer Agent

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One main application of nanotechnology in medicine currently being developed involves using nanoparticles to deliver drugs, heat, light or other substances to specific types of cells.Since the discovery of metal nanoparticles (NPs) in the 1960s, there have been several hindrances like unknown toxicity, cost and the ethical hurdles of research in humans which restricts the translation of these NPs to clinical use. This work is a demonstration of Pt NPs generation with protein coronas in vivo in human blood when a patient is treated with cisplatin. These self-assembled Pt NPs are formed rapidly, accumulated in tumors, and remain in the body for an extended period of time. In addition to this, the Pt NPs are generally considered as safe for use in humans and can be used to inhibit chemotherapy-resistant tumor growth by consuming intracellular glutathione and activating apoptosis. The inhibition of tumor is greatly amplified when the Pt NPs are loaded in vitro with the chemotherapeutic drug, daunorubicin and this formulation is effective in daunorubicin-resistant models. These generated metal NPs represent a biocompatible drug delivery platform for chemotherapy resistant tumor treatment.

Ref: ICBEE/181

Energy, Bioenergy and Biofuel

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In recent year biofuel is used as ethanol, methane and hydrogen. They are being produced from cheap raw materials or waste by the action micro-organisms. The advantage of biofuel in monitoring air pollution due to carbon dioxide accumulation. Bioenergy is energy contained in living recently in living biological organism. And organic material it can be converted as a bioenergy by using a biomass. Bioethanol is a colorless, in-flammable liquid. In biotechnology based industries, ethanol is produced from wastes by the fermentative action of microbes. Biobutanol is a colorless liquid with spirituous smell. Butanol fermentation by growing *Clostridium acetobutylicum*on molasses. Biodiesel is a clean burning oil manufactured from fat or vegetables oil. The Prefix butanolA is used before the concentration of biodiesel bends to denote the biodiesel formulation. For example, B20 denotes a fuel with 20% biodiesel and B100 denotes 100% biodiesel. The technique of biodiesel production was actually invented by ***G. Chavanne***of the ***University of*** Brussels ***(Germany)*** in 1937, but commercial production of biodiesel was started in the late 1992s. It is manufactured from ***natural resources*** **.**Biodiesel can be used in ordinary diesel engines with little. Biodiesel blends are used to run buses, autos and bikes. Biodiesel is heating as a fuel and used in biodegradable fuel, non- toxic and reduction of green house gas. Bioenergy is one of the primary sources of fuel in India. In rural areas the dependency on the bioenergy to meet the domestic energy requirements are as high as 80-85%.

Key words: Biofuel, methane, fuel, microorganisms, biodiesel ,bioenergy, biobutanol

Ref: ICBEE/182

Potential uses of nanoparticles in pest control

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Nanotechnology is a wide and promising field of interdisciplinary research. It opens up a wide array of opportunities in various fields including pharmaceuticals and agriculture. The potential uses and benefits of nanotechnology is enormous. This includes management of insect pests through the formulation of nanomaterials based insecticides. An application of chemical pesticides have adverse effects on animals and human being apart from affecting soil fertility .Therefore, bionanotechnology would provide green and efficient alternatives for the management of insect pests in agriculture without harming the nature. Nanoencapsulation is currently the most used technology to protect the plants against insect pests. Thususing green nanoparticles will revolutionize agriculture including pest management in the near future.

Keywords: Nanotechnology,Nanomaterials,Insect pests,Nanoencapsulations.

Ref: ICBEE/183

Nanotechnology for water remediation: A Review

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Nanotechnology is being used in the development of engineered device produced on nanometer scale. Green Nanotechnology involves in developing products that provide benefits to the environment involving novel nanomaterials for the treatment of surface water, groundwater and waste water contaminated by toxic metal ions, inorganic solutes and micro organisms. Nanomaterials such as titanium Dioxide NP, nanoscale iron, nano clay, nanotubes, nano membrane, Magnetic nanoparticles are used as remediation agent. Nanomaterials are more effective compared to traditional precipitation. The aim of the review is to study about the application of Nanotechnology in developing new remediation technology which could provide benefits to the environment.

Keyword: green nanotechnology, nanomaterials, water remediation.

Ref: ICBEE/184

Identification of antimicrobial resistance carried on bacterial metagenomes from environmental samples

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Antimicrobial resistance threatens the effective prevention and treatment of an increasing range of infection by bacteria. Multiple culture based methods are used to assess antibiotic resistance in environmental samples. These methods are labour intensive with time consuming steps for isolation and cultivation of microbes. Novel methods combining culture with molecular methods are enhancing efforts in resistance profiling. “Meta" recognizes the need for computational methods that maximize the understanding of genetic composition. Development of NGS methods made it possible for direct genetic analysis of genome contained within an environmental sample. Metagenomics has become a vital tool for identifying genes that confer resistance to selected antibiotics in environmental sample. This method involves the cloning of total community DNA into an expression vector, followed by transformation of entire library into a host easily grown in laboratory often *E.coli*.

Ref: ICBEE/185

Carbon Nanotubes Used as an Adsorbent for the Treatment of Wastewater: A Review

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The treatment of waste water is more essential for a sustainable environment. The conventional treatment is becoming less effective because the waste water from growing population overloads the available facilities. Therefore there is a need for finding novel methods for the treatment of waste water. One of the methods is the use of nano absorbents. Recently, much attention is given to carbon nanotubes due to its attractive features in water purification. The carbon nanotubes have an excellent adsorbing capacity. There are different methods for the synthesis of carbon nanotubes which are cost effective and less time consuming. These carbon nanotubes can remove the heavy metals, pharmaceutical substanceswhich are toxic and other hazardous substances in waste water being discharged from various sources. Thus the carbon nanotubes can be used as an efeective adsorbent in eliminating these harmful substances in water.

Keywords: waste water, nanoadsorbants, carbon nanotubes, heavy metals.

Ref: ICBEE/186

Prospects of Nanotechnology for Food Processing Technology

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The rapid development in the field of nanotechnology has changed many areas of food science such as processing, packaging, storage, transportation and some other safety aspects of food as well. A range of metal oxides, nanocomposites, inorganic metals, nano-organic materials has been incorporated in the form of nanostructured materials (NSM's) which has various applications especially in food industry. Though nanotechnology has several advantages simultaneously there are some concerns that is emerging in this field. Consumption of food products that has nanostructured materials incorporated in it will leave toxic effect in our body. So this can create certain imbalances in normal functioning of human body in future. Hence, during manufacturing, processing and packaging and consuming these nano-processed food products, several safety and health concerns along with some regulatory policies must be considered. The aim of the review is to provide an understanding of nanotechnology applications especially in the food processing and packaging industries. So that the potential risks and future prospects that is associated with the (NSM's) can be identified.

Ref: ICBEE/187

Facile synthesis of collagen stabilized Agnps and its biomedical applications

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Nanoparticles are substances that are being synthesized using various methods such as physical, chemical, biological etc.,and that act as a promising technology which has applications in various fields. Collagen is an extracellular protein, found in human. Biocompatability, low toxicity, weak antigenicity, bioavailability are the special features of collagen. Collagen is used to stabilize silver nanoparticles (AgNPcol) which are synthesized from various sources and used in biomedical applications including protein based drug delivery, anti microbial activity and cell viability assay. The idea of AgNPcol is to achieve biocompartability for drug delivery at specific size and site for which collagen hydrogel are used. Silver nanoparticles combines cashew gum hydrolyzed collagen, kappa carrageenan hydrolyzed collagen shows antibacterial, antifungal and cytotoxicity activity.Hence the collagen incorporated AgNPs have high biocompatibility and can be used for target specific drug delivery for various biomedical applications.

Keywords: AgNPcol, Biocompartability, antimicrobial, drug delivery.

Ref: ICBEE/188

Isolation and Identification of pathogenic Bacteria and Fungi from coffee plant and treating it with green nano formulation

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The coffee plants (*C. arabica and C. robusta)* are usually affected by common pathogens which are of bacterial and fungal origin causing Bacterial Blight (Bacterial) and Berry blotch (fungal) diseases which develops spots on the foliage and gives a burned appearance. There are various Bacterial and Fungal pathogens which affect the plant and our aim is to isolate and identify them. The disease is usually spread by wind, water and movement of infected seedlings. This leads to significant yield loss and spread of diseases and the condition is controlled by using copper sprays and fertilizers which makes it more toxic for human consumption. Green nano formulation sprays will be synthesized using Green Technology to check the efficacy of the anti - bacterial and anti - fungal activity on the plant and to reduce the toxicity of the plant and to improve the yield. These nano formulations are environment friendly so there is no potential harm to the environment as well as humans. It is easy to scale up, requires less energy and is more efficient.Infected *C. arabica* leaves are used to isolate pathogens and and the DNA is isolated from pathogens and will be sequenced using 16s rRNA primer for Bacteria and ITS primer for fungi to find the potential pathogens. The efficacy of the nano formulations will be checked using agar well assay, MIC assay, MBC assay and antifungal activity. The identified pathogens will be treated with green nano formulation to check the anti bacterial and anti fungal activity to improve the plant yield, quality and to reduce the toxicity.

Keywords : Coffee ; Bacterial Pathogen ; Fungal Pathogen ; Green nano formulation ; Toxicity ; Gene sequencing ; In silico analysis

Ref: ICBEE/189

Environment - Sensitive Gold Nanostructures Encapsulated with Natural Product Chemicals for Targeted Drug Delivery

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Selective accumulation of drug molecules and elimination of diseased cells in a sustained manner can be achieved by understanding the chemical and molecular state of the target site. Gold nanostructures not only are used as carriers of drugs or multifunctional groups but also can be used as photothermal agents. Tailoring of suitable agents to the nanostructures can enable them sense the environment and release drug. Anisotropic gold nanostructures were synthesized using traditional methods and encapsulated with natural product chemicals. These nanostructures were tagged with targeting and environment sensing peptides. UV-Vis Spectrum of synthesized, encapsulated and functionalized nanostructures was recorded. DLS was used to measure hydrodynamic diameter and TEM was used to understand the size of the synthesized and designed nanoparticles. MTT assay was carried out to understand the toxicity of designed nanoparticles and cellular uptake studies was carried out.UV-Vis spectrum confirmed the synthesis of anisotropic nanostructures and the changes due to the encapsulation and tailoring of ligands. TEM pictures revealed the exact size of the nanoparticles and DLS measurements indicated the changes to the hydrodynamic diameter due to functionalities. Functionalized nanostructures had better cellular uptake capabilities when compared to the conventional unfunctionalized nanostructures.Tailoring of nanostructures with ligand that can interact with cells can improve bioavailability to the target site and thus reduce the toxicity to other cells.

Ref: ICBEE/190

Role of Gut Inhabitants on Vectorial Capacity of Mosquitoes

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Mosquito-borne diseases are spreading at an alarming rate. Globally millions of deaths occur due to the diseases transmitted by mosquitoes. Earlier studies have shown the potential role of mosquito gut inhabitants on disease transmission. Their findings can be used as an innovative approach for devising strategies to modify the survival of mosquitoes by reducing their lifespan, reproduction and disease transmission abilities. In this study, microbiome of the three genera of mosquitoes, namely *Aedes, Anopheles,* and *Culex* along with their vectorial capacity have been reviewed for assessing their role in mosquito control and transmission. Relevant articles were accessed using different databases, including LILACS, Embase, Science Direct and PubMed from inception to June 2017. The review indicates that paratransgenesis may be considered as a versatile and effective strategy to eradicate the spurt of mosquito transmitting diseases. *Enterobacter* species is the most common type of gram-negative bacteria associated with the gut of all the three genera of mosquitoes. It was found to have a beneficial effect on humans as it helps in destroying dreadful disease-transmitting vectors. These symbiotic qualities of the microbes need to be thoroughly investigated further to reveal their antipathogenic effect on the vector.

Ref: ICBEE/191

Corticosteroid Encapsulated Metal-Polymer Nanostructures for Dental Regenerative Applications

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One of the major challenges faced due to the use of dental materials for restoration is the development of dental caries. This disease is mainly caused by the formation of biofilm by cariogenic bacteria and destruction of tooth due to acidic attack. Therefore for dental material it is important to have components with multifunctional approach like antibacterial, restoration and regeneration. Polymer nanostructures were used to encapsulated with metal nanoparticles and corticosteroid. The fabricated nanoparticles are coated with cell adhesion biomolecule. Hydrodynamic diameter of fabricated nanoparticles was recorded and the zeta potential measurements were recorded before and after coating of nanoparticles with cell adhesion agents. To understand the changes to the nanoparticles after encapsulation and coating, FT IR spectrum was recorded. TEM was carried to understand the size of nanostructures. Antibacterial, antibiofim and bacterial inhibition studies were carried out. Changes to thehydrodynamic diameter and zeta potential measurements indicated the encapsulation and coating of metal and corticosteroid to polymer nanostructures. FT IR spectra indicated the crosslinking of cell adhesion molecule to the nanostructures. TEM observation indicated change in size of nanostructures due to coating with cell adhesion molecules.There was a better antibacterial activity of the composite nanostructures when compared to the convention treatment strategy adopted. The developed composite nanostructure provides an ideal platform for future bioengineered dental restorative materials

Ref: ICBEE/192

Role of Nanobiotechnology in Waste Water Treatment

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Water being one of the most abundant and important life living source for living organisms,is being insufficient for the overgrown population. Hence it is mandatory to treat the quality of the water from the wastewater which is being depicted from tanneries, industries etc., for day to day life. Silver and gold nanoparticles with their application have become a major research area on water treatment. They are being mainly used to remove the major contaminants namely, pesticides, heavy metals and microorganisms. Low cost, reuse and recovering the pollutants are the some advantages using nanotechnology. Nanoabsorbants are used as powder, beads or porous granules loaded with it. Membranes with nanofibres remove micro-size particles from aqueous phase with a high elimination rate . These are used as permanent method compared to ultrafiltration or reverse osmosis. Nanocatalyst enhance the reactivity and degradation of environmental contaminants such as organochlorine pesticides, Halozenated herbicides azodyes, polchlorinated biphenyls and nitroaromatics. Nanostructurated catalytic membranes have more than a few advantages and are easily scaled up for commercial purpose. All three categories viz. Nanoabsorbants, nanotechnology enabled membranes, and nanophotocatalysts have commercial products although they have not applied in large scale in this field but possibly occur in future hopefully.

Keywords: Wastewater,Nanoparticles,Nanotechnology

Ref: ICBEE/193

Phytonutrients in Common Fruits and Vegetables for Managing Chronic Diseases.

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Fruits and vegetables belong to an important class of natural products with capacity that exert therapeutic effects because of the presence of phytonutrients. Phytonutrients are natural chemical compounds produced by plants. They have antioxidant and anti-inflammatory properties that can help support a healthy human body. While their antioxidant qualities lead the pack in healthful benefits, phytonutrients are also known for other characteristics, such as Carotenoid for eyes, flavonoids for detoxification and so on.Common phytonutrients include Carotenoid such as lutein, flavonoids, isoflavones, lignin and plant sterols. Phytonutrients, also known as phytochemicalsare the potentially helpful compounds found in plant foods such as fruits and vegetables.A number of phytonutrients have been shown to reduce the risk of cancer, heartdisease,stroke, Alzheimer's disease and Parkinson's disease. Hundreds of phytonutrients have been found to have anti inflammatory and antioxidant activity. As I elucidate in this article, phytonutrients consumed in natural fruits and vegetables can serve as lasting treatment for chronic diseases.

Keywords:Phytonutrients, antioxidant, carotenoid, flavonoids, lutein, isoflavones, plant sterols, Alzheimer's disease, Parkinson's disease.

Ref: ICBEE/194

Role of nanotechnology in agriculture and food sectors

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Nanotechnology having the capability of synthesizing materials that are emerged in the size range of nanometers has attracted the researchers globally due to its distinctive properties .This field is becoming one of the most promising field in scientific research. Nanotechnology has the potential to create revolution in agriculture and a clean environment which can have numerous benefits in human health .One of the technique which has been developed by nanotechnology is that the nanomaterial based sensor including certain metal nanoparticles (Gold,silver,silica) that can be able to detect certain pathogen that are carcinogenic and that can create contamination in food and agriculture products. There is an increase in number of patents and IPR filed in the field of nano agro food research and recent trend in food processing , packing, quality control and functionality thus it is an evident to prove that nano agri food sector is an emerging field . The aim of the article is to review the applications of nanotecnology in agriculture and food technology so that the different future prospects can be brought into this emerging field of agro food nanotechnology.

Keywords: Nanomaterials, sensor, nanoparticles, agriculture.

Ref: ICBEE/195

Nanoparticles mediated Mesenchymal Stem Cells(MSCs) labelling and its applications in cell therapy

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Mesenchymal Stem Cells (MSCs) are rare multipotent stem cells of mesenchymal origin that can differentiate into osteoblasts, adipocytes and fibroblasts and also possess the ability to differentiate into cells of other lineages. The multi-lineage differentiation potential and easy availability along with its extensive capacity for in vitro expansion, MSCs widely used in treating variety of congenital and acquired diseases. The most commonly used route of MSCs administration includes Systemic delivery (intravenous injection), site directed delivery(interventional therapy) and Local delivery. The efficient migration and reaching the sites of injury is the major step to exert the therapeutic action of MSCs. Traditional labelling methods are not ideal due the adverse effect on cell's functionality and viability, and also problems caused in imaging. To overcome this problem nanoparticle labelled MSC s are designed. Magnetic nanoparticles like SPIO(Superparamagnetic iron oxide particles) shows most promising results in safety of stem cells tracking methods in vivo. SPIO labelling have been extensively used in tracking of MSCs in numerous animal studies and further clinical applications. SPIO nanoparticles with different sizes, shapes, composition and coating may have different biological and toxic activities. Most often used SPIO nanoparticles includes Magnetodendrimers (MD), Feridex, Resovist, Fluid MAG iron nanoparticles, silica coated magnetic nanoparticles. Currently clinical trials using MSCs to treat acute myocardial ischemia, stroke, ALS, kidney diseases, fire burn and organ transplantation have been reported.

Keywords: Mesenchymal Stem Cells, SPIO, Magnetic nanoparticles

Ref: ICBEE/196

Bioelectricity production from dairy effluent and microbes from its biofilm

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Microbial Fuel Cell (MFC) performance has been enlarged during the last decades towards its dual application process of electricity recovery and treatment of wastewater from the wastewater using microorganisms. The present study focuses on the bioelectricity production from dairy effluent and performance of the bacteria isolated from the biofilm. The anodic chamber of the MFC was filled with dairy effluent and the cathodic chamber with distilled water. The voltage and current readings were taken using digital multimeter. The MFC gave the maximum voltage of 0.42 V and maximum current of 0.13µA on the 14^{th} day. The biofilm from this MFC was taken and bacteria were isolated by serial dilution method. Among the five isolates, Strain 1 produced a maximum of 0.47 V and 15 mA. Strain 1 was then exposed to different electrodes in three MFC's. Strain 1 showed maximum bioelectricity production with carbon paper and Copper and Brass. However, Carbon paper showed a consistent and stable power production throughout the experiment. Hence, Strain 1 with carbon paper was taken for further studies such as Cyclic Voltammetry and Scanning Electron Microscopy.

Keywords: Power,Voltage, Dairy effluent, Carbon paper, Microbial Fuel Cell

Ref: ICBEE/197

Isolation of Bacteria from Mobile Phones

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Pathogenic bacteria can be spread through contaminated inanimate objects and surface. Hence, this study focuses on the bacterial population from mobile phones that might play a role in the spread of infectious disease. A questionnaire containing many details regarding mobile phones were collected from 50 individuals ranging from age groups 18-24, 25-30, 31-35, 36-40 and 41-50. Their mobile phones were collected and using sterile cotton swab the samples were inoculated onto Luria Agar medium. Based on the morphology of the colonies, the bacteria were maintained as a quadrant streak in petriplates. The biochemical tests like IMViC, Urease, gram staining and motility test were performed for all the pure cultures. Based on the results obtained, a Gram positive rod and Gram negative cocci were tested for antibiotic sensitivity by Kirby-Bauer method. Both the bacterial strains showed inhibition for Cefotaxime at a minimum inhibitory concentration of 62.5 mg/mL. Both the strains showed sensitivity for Kanamycin (5 mcg, 30 mcg) and resistance towards Ampiciilin (10 mcg). These cultures will further be identified by 16S rRNA sequencing method.

Keywords: Mobile phone, Antibiotic, Resistant, Biochemical, Morphology

Ref: ICBEE/198

Green synthesis of Nanoparticles and their Application in Waste Water treatment

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Nanotechnology has become a trend in the research arena due to its unique characteristics and applications in the field of medicine,healthcare,agriculture,waste water treatment etc.In this study we focus on the Green synthesis of Nanoparticles[NPs] as this method is eco-friendly, efficient, nontoxic or less toxic and cost effective as compared to physical & chemical methods. Green synthesis of NPs using various biological agents such as plants,bacteria,,fungi and has antimicrobial and antifungal activities.Cholera, typhoid, and viral hepatitis are caused by contaminated water which we consume unknowingly. It is usually separated or purified by sedimentation, boiling, distillation and using UV light to kill the pathogen. But Green synthesized NPs are highly skilled for recycling and removal of heavymetals during filtration and Nano stuctrured materials are adsorbents or catalysts to remove toxic and harmful substances from wastewaterand hence can be used as an alternative approach for the treatment of contaminated water.

Keywords:Nanoparticles,Wastewater,Green synthesis.

Ref: ICBEE/199

Development of Nanotechnology Based Treatment for Lung Cancer

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The expanding field on nanotechnology in cancer therapy extends beyond drug delivery into the launch of new therapeutics by using nanomaterials. Ligands such as small molecules, DNA or RNA strands, peptides, aptamers or antibodies can be used for therapeutics. Recent studies and clinical applications in cancer nanotechnology which can serve as drug carriers for diagnosis, imaging. Research experiments have confirmed that nanotechnology based inhalation chemotherapy is viable and it is more effective than chemotherapy with lesser side effects. Nanocarriers such as liposomes, polymeric micelles, polymeric nanoparticles, solid lipid nanoparticles are utilized for the treatment of lung cancer. Yet, the toxicity level of these nanomaterials to lung tissues and other organs due to inhalation is still a debatable concern. To get rid of this problem, micron sized powdered carriers of nanoparticles are considered for inhalation to treat lung cancer.

Keywords: Nanoparticles, Lung cancer, Inhalational Chemotherapy, Drug targeting, Nano toxicity.

Ref: ICBEE/200

Green Synthesis of Zinc Oxide Nanoparticles using Calendula *Officinalis;* Antimicrobial Assessment and Formulation and Evaluation of Sunscreen

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Zinc Oxide nanoparticles have shown advancements in various biomedical applications. They have become the most popular metal oxide nanoparticles in biotechnology due to their low toxicity, excellent biocompatibility and economic value. Green synthesis is an alternative method to conventional physical and chemical methods of nanoparticle production. The current study involves the production of Zinc Oxide nanoparticles (ZnOPs) from the flower extract of *Calendula officinalis (marigold).*The synthesized Zinc oxide nanoparticles are characterized by UV-Visible spectroscopy, Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), transmission electron microscopy (TEM) and scanning electron microscopy (SEM). Phytochemical analysis of the marigold flower extract is done. The antimicrobial assessment is concluded against four types of bacteria. Formulation and evaluation of the sunscreen is done and results are obtained.

Keywords: Zinc oxide nanoparticles, green synthesis, *Calendula officinalis*, FTIR, XRD

Ref: ICBEE/201

Optimization of solid-state fermentation(SSF) using alternative substrates through response surface methodology(RSM)

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Solid-state fermentation (SSF) holds tremendous potentials for the production of industrially significant enzymes. The present study described by a bacterium, Bacillus subtilis strain on agro-industrial residues. Agro-industrial wastes are rich in nutrients such as sugars, minerals and proteins therefore act as suitable conditions for the prolific growth of microorganisms. Initially, four different oil cakes (obtained after extracting oil from coconut, groundnut, gingelly or soybean) were screened to find out the most suitable substrate-cum-inducer. Then the pretreatment of substrates is carried out either by mechanical, chemical or biochemical processing methods. Followed by fermentation process and then downstream processing for purification and quantification of end product. Then response surface methodology (RSM) was employed to optimize the culture parameters for maximizing the production.

Response surface methodology (RSM) is such a kind of statistical tool being applied widely for the optimization, modeling and analysis of problems related to the production of biomolecules . However, the use of different substrates as well as cultivation strategies for the production of bio-products still remains an emerging area of research. Using the software four different parameters like temperature, pH, moisture content and incubation time were selected for the statistical optimization. Thus, this study signifies the importance of SSF for the production of industrially-significant bioproduct using agro-industrial residues as solid support

Ref: ICBEE/202

In silico analysis of urea – Ice Nucleating Protein from *Nanorana*to explore the cryoprotectant activity of urea

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*Nanorana*is an indigenous frog variety found in the Qinghai Tibetan Plateau. During cold acclimated conditions, these amphibians undergo a period of hibernation and survive through the hard conditions. It does this activity by decreasing the overall water content and accumulation of urea.

Urea is a well-known organic cellular osmolyte that acts as a balancing osmolyte in diverse animal taxa. In addition, there are several Ice Nucleating Proteins (INPs) that confers freeze tolerance to the inhabitants of cold climatic zones. INPs contain large repeating domains that are believed to arrange water molecules in an ice lattice.

Incidentally, in all the freeze tolerant organisms the functioning of the INPs is introduced by accumulation of urea. It is highly likely that urea despite being a denaturant provides cryoprotectant activity to INPs by stabilizing their protein structure. The present study is aimed to explore the interaction between INPs and urea by *in silico* techniques.

Keywords: Ice Nucleating Protein, Urea, Cryoprotectant, Freeze tolerance, Molecular dynamic simulation.

Ref: ICBEE/203

Shelf Life Extension of Tomatoes using Nanoemulsuions

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Food spoilage is the major reason to use chemical preservatives for increasing the shelf life of fruits and vegetables. In tomatoes (*Lycopersiconesculentum*) due to post harvest life they are only edible for few weeks so preservatives such as Sodium benzoate, Sodium propionate, potassium permanganate is used to increase the shelf life. Increased consumption of the chemical-preservatives may increase the risk of inflammation, oxidative stress, obesity, allergies, anxiety, pancreatitis. The synthesis of Nano emulsion using oils can be used to prevent the food spoilage caused by microorganisms. Oils have natural antimicrobial properties that has the ability to serve as natural preservative. The oils due to its hydrophobic properties will affect the quality of food so nano emulsion can be preferred. The nano emulsions have high solubilization effect which does not affect the quality of food and its antimicrobial efficacy. The nano emulsion can be prepared by using different oils such as sunflower, clove, castor and olive oils, Tween60 and water by micro fluidization technique. Tween60(Polysorbate-60) is used as non-ionic surfactant in oil in water nano emulsion. The antimicrobial activity of nanoemulsions in tomato can be observed. Fungi such as *Alternaria alternata, Aspergillus Niger* are dominantly causing spoilage in tomato so they are used to test the antifungal activity. The droplet sizes of the nano emulsion are measured by DLS. The Minimal Fungal Concentration is determined. To observe the antimicrobial activity of nanoemulsion well diffusion method, Time kill analysis curve can be used . The aim of the study is to prove that use of nano emulsion could be more effective to control the spoilage causing microorganisms in tomato.

Keywords:Oils, nano emulsion, tomato, microorganisms, fungi, spoilage

Ref: ICBEE/204

Effect of Antimicrobial Plant Synthesized Silver Nanoparticles on Leather Microorganisms

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The Leather industry in India accounts for around 12.9% of the world's leather production that gives a financial record around $5.5 billion dollars (2018-2019). During the manufacturing and distribution of leather there are mainly two types of bio deterioration might take place that can be bacterial (pre-tanning) and fungal (post-tanning) as hides and leather can be damaged by either bacteria or fungi. This makes the leather industry suffer from huge economic loss. Traditionally proper pre and post-tanning operation using biocides (TCMTB, BMT, CMC, OPP) prevent the microbial growth, which might deteriorates the quality of leather materials [2].AgNPs are potent antimicrobial agents against fungi and bacteria which can act as capping agent on the surface of leather hence preventing the material from degradation.

Accordingly our aim of the work is to avert the development of the microorganism growing on leather material by applying silver nano particle synthesized using potent anti microbial plants and their activity was screened against both gram positive and gram negative organisms. Various fungal organisms were also taken during the study like *Aspergillus niger*, *A. flavus, A. fumigates* etc Consequently in order to prevent that, ten plants having anti microbial activity has been selected (*Amaranthus spinosus, Aloe vera, Azadirachtaindica, Ocimum sanctum* etc.) for the study [4]. As the green synthesized AgNps have the anti microbial activities, they were tested to arrest the microbial growth Among all plants four plants were able to synthesize silver nano particles effectively at lower concentration (1mM). The green synthesized AgNps have been further characterized by UV- Visible spectroscopy, FTIR, EDX and XRD analysis to confirm the presence of nano particle.

Keywords: Silver nano particles, bactericidal assay, fungicidal, Optical devices.

Ref: ICBEE/205

The Essential Phyto molecules for health fromTraditional Siddha Medicine

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Background: In Traditional Siddha Medicine (TSM) wide number of pharmaceutical products are available in different dosage formsthat are selective to the expert hand of practicing. The art of extracting the vital essence of an herbal drug through aqueous distillation is a unique technique followed in Siddha medicine. Theeneer (herbal distillates) are simple and effective formulations that are found to be an exquisite source of essential phyto molecules benefical for health and wellbeing. To validate the auxiliary scientific data lacking in this field an attempt was made to analyze the common herbal distillates used in Siddha medicine through Gas Chromatography Mass Spectrometry (GCMS) studies. **Materials and Methods**: Seven single herbal distillates and one compound distillate was prepared as per the standards of traditional textual references, and the samples were screened with GC-MS.**Results**: GC-MS studies of the distillate samples revealed the presence of mostly aromatic compounds belonging to hetero aromatic group, alkyl aldehyde group, higher alkane group and phenolic group. Organic fatty acids including fatty acid esters, monoterpenes and phenols are the key essential phyto molecules spotted form the samples.**Discussion& Conclusion**: Through the analytical part performed through GC-MS, we may consider the vast medical applications of herbal distillates used in Siddha medicine for its leading role in health promotion, prevention of lifestyle diseases and as a supportive care in chronic metabolic diseases.

Keywords: Traditional Siddha medicine, Herbal distillates, Theeneer, GCMS, Essential phyto molecules.

Ref: ICBEE/206

Effect of Carboxymethyl Cellulose- Polyvinyl Alcohol Film Incorporated with Nem Extracts and Oregano (*Origanum Vulgare)* Essential Oil on the Control of Post Harvest Diseases in Different Lettuce Cultivars

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The aims of the present study were to evaluate the effects newly designed biocomposite film consists of carboxymethyl cellulose (CMC)(0.5-2%), polyvinyl alcohol (PVOH) (1-5%) incorporated with neem leaf extract(0.2,0.4,0.6%) , Oregano eseential oil (0.2,0.4,0.6%) in different ratios. The composition of the film was optimized using central composite design of response surface methodology for responses such as thickness, elongation at break, tensile strength. The optimized film reported with 0.15 mm thickness, 49 Mpa tensile strength and 81% elongation at break compared to PVA film due to incorporation of citric acid, glycerol and CMC.Quality of the optimized film was further confirmed by evaluating morphological features, surface characteristics and thermal properties.The efficacy of these films was also demonstrated by antimicrobial activity against various lettuce postharvest pathogens and shellife study (maximum 12 days) .The results suggest that the newly designed EO and Neem extract incorporated CMC-PVA biocomposite film as a better alternative for traditional food packaging materials .

Keywords: Biocomposite , Response Surface Methodology, Antimicrobial activity, Shelf-life.

Ref: ICBEE/207

Identification of Novel Alpha 1 Antitrypsin Inhibitors by Docking, ADMET Prediction, and Molecular Dynamics Simulation

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Alpha 1 antitrypsin is a protein belonging to “SERPIN super family it is encoded by the SERPINA GENE”. A1AT is 52KDa single chain glycoprotein composed of 394 amino acid residues and 3 asparagine linked complex carbohydrate side chain.it play a key role in inflammatory pathway. It include A1AT deficiency an “autosomal codominant hereditary disorder” this causes the degradation of lung tissue and pulmonary emphysema(COPD), liver cirrhosis. A1AT is a both exogenous and endogenous inhibitor. A1AT plays a key role in modulating immunity, inflammation, proteostasis, apoptosis, cellular senescence program. In this the A1AT cannot go to the blood stream so it accumulates in the liver and causes liver damage like jaundice, cirrhosis, and increased risk of cancer. Virtual screening technique have been used to discover new molecule for development of novel alpha 1 antitrypsin inhibitor. The lead compound is found by using virtual screening and with different databases. molecular docking to find the lead compound targeting A1AT.Drug likeness were studied and finding out the toxicity prediction by using ADMET prediction and to validate the stability inside the active site of protein molecular dynamic simulation is performed. Hence identifying the lead compound that binds to protein A1AT with improved binding affinities, high drug likeness, and low toxicity to human for the treatment of disease.

Ref: ICBEE/208

Investigating the Potential Therapeutic Effects of Naturally Occurring Small Molecules to Prevent Acrolein-Protein Adduct Formation

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Acrolein is a highly toxic unsaturated aldehyde biosynthesized both endogenously and exogenously and a reactive product of lipid peroxidation. Endogenously they are produced via four pathways - degradation of Threonine by myeloperoxidase, lipid peroxidation of unsaturated fatty acids, metabolism of anti-cancerous drug and from catabolism of few polyamines such as spermine and spermidine. The concentration of Acrolein produced can increase at certain cellular metabolism. However, higher levels of oxidative stress greatly amplifies the levels of acrolein in blood. Elevated acrolein levels have been associated with number of pathological conditions including hyperglycemia, vascular complications and neurodegenerative diseases. The major cause of acrolein induced toxicity has been attributed to its ability to form adduct with cysteine, lysine and histidine residues of protein and guanine base of the DNA. The adduct formation with proteins might cause alterations in the structural and functional integrity of the protein. The present studies aims at understanding the structural integrity of protein upon acrolein treatment and also identifying the therapeutic effect of natural occurring small molecules like osmolytes to prevent formation of Acrolein-protein adduct.

Keywords: Acrolein, protein adducts, osmolytes, blood proteins

Ref: ICBEE/209

Nanoemulsion as a bioprotection to control food spoiling microorganisms

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Recent days, there is an increasing demand for fruits and vegetables for its high nutritional value. Fruits and vegetables are easily get spoiled and have a shorter shelf life. Preservation of fruits and vegetables for a longer period is a big challenge faced by the world .Nano edible coating comes with the solution for this problem and it benefits both consumers and the environment. Use of essential oil from aromatic plants as antifungal, anti bacterial has increased due to its popularity among organic farmers and environmentally conscious consumers. In general essential oils have an easier degradation and cause less extension of environmental contamination. Several scientific research have reported the use of nano emulsion are the suitable carriers of active essential oils . The use of essential oils as the support matrix for Nano emulsion for preservation of fruits and vegetables for an extended shelf life.

Keywords: Shelf life, essential oils, Nano emulsion

Ref: ICBEE/210

Nanoemulsion of Essential Oil as a Meat Preservative

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A nanoemulsion is a colloidal system consisting of mainly oil, surfactant, and water, with high kinetic stability, low viscosity, and is optically transparent, which is very beneficial in various industries. Essential oil extracted from aromatic plants is one of the major ingredients with potential in the food industry; for its effectiveness in slowing down the deterioration of food and by its natural origin. Their capacity as a preservative and antioxidant agent has been authorized for its application in meat. This way, they become a natural alternative to synthetic additives. A combination of essential oil and nanoemulsion is a promising approach to counter food spoilage especially meat.

Keywords: nanoemulsion, essential oil, meat.

Ref: ICBEE/211

Synthesis and Characterization of Zinc Oxide Nanoparticles using *Cissus quadrangularis* Extract

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Biosynthesized nanoparticles have an incredible application in biomedicine owing to its simplicity, eco-friendly properties and low cost. The present study aims to determine the green synthesized zinc oxide nanoparticles from ethanol and aqueous leaf extract of cissusquadrangularis. The synthesized nanoparticles were characterized using UV-VIS Spectroscopy, XRD, FESEM with EDAX and HRTEM. The confirmations of synthesized nanoparticles were characterized by UV-VIS spectrum and photoluminescence spectrum respectively. The XRD data showed the crystalline nature of the nanoparticles and EDAX measurements indicated highly pure zinc oxide metal. The morphological characterization of synthesized zinc oxide nanoparticles was analyzed by FESEM and HRTEM and size of the particles were ranging from 32 to 36nm. The synthesized zinc oxide nanoparticles exhibited interesting antimicrobial activity against pathogenic organisms. In addition, this is the first report on leaf mediated synthesis of zinc oxide (ZnO) nanoparticles from *Cissusquadrangularis.*

Keywords: *cissusquadrangularis,* green synthesize, Antimicrobial activity, FESEM, EDAX, HRTEM.

Ref: ICBEE/212

Isolation and Performance Evaluation of Yeast (Saccharomyces cerevisiae) from Palm Wine During Proofing Bread

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Yeast is a unicellular micro organism and helps bakers to produce new products. This is because various types of breads and certain other bakery products are leavened by yeast. Palm wine is a whitish and effervescent liquid obtained from palm trees by the process of palm wine tapping. The unfermentaed sap is clean, sweet, colourless syrup containing about 10-12% sugar which is mainly sucrose. As there is rise in the prices of commodities made internationally, there is in need for the development of less expensive locally made substitutes. Yeast is man's oldest and most industrious micro organism because of it various applications in biotechnology industry. Its fermentation abilities used in different industries especially Food industry.

Keywords: Yeast,Palm wine, Fermentation

Ref: ICBEE/213

Biofilm Inhibition of *Pseudomonas aeruginosa* by GSH

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P.aeruginosa is a gram negative, rod shaped bacterium that causes diseases in plants and as well as in humans. This bacteria is unipolar in nature. It is a harmful bacteria which can cause many critical diseases in plants as well as in animals. It is a frequent cause of nosocomal infections such as pneumonia, bacteremia and urinary tract infections, etc. These infections can be life threatening. This bacteria produces a toxic substance which indeed forms a biofilm, this biofilm forms a layer and allows the toxicity to spread.

We are now using GSH (Glutathione). GSH is an antioxidant in plants, fungi, and bacteria. For that, first we have to know about the growth cure. For the growth curve, overnight culture (broth+ bacterium) is been prepared . keep the culture for overnight in the shaking incubator at 37 degree Celsius. Take the absorbance value in time points (0^{th} – 8^{th} or 9^{th} hour) in spectrophotometer at 600nm. Plot the graph and observe the growth. GSH prevents the bacterium from affectimg the other cells and inhibits the biofilm formation.

Ref: ICBEE/214

Applications of Nanomaterials Against White Feces Syndrome in Shrimps (*Penaeus vannamei)*

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Shrimps are an important commercial species cultivated in India and many other countries worldwide. Bacteriosis is a major economic problem that affects the profit of farming of this species. White feces syndrome (WFS) is one of the diseases that attack shrimps *Penaeus vannamei*, *Penaeus monodon* and *Penaeus chinensis*. The scientists recently found that WFS could be initiated by a *Vibrio*. spp such as *V. parahaemolyticus, V. mimicus,V. vulnificus*, and *V. alginolyticus*are transferred through oral and then localizes the shrimp gastrointestinal tract and create a poison that causes tissue devastation and invalidism of the shrimp digestive system known as the hepatopancreas. As nanotechnology provides "a new dimension" accompanied with new or modified properties conferred to many current materials, it is widely used for the production of a new generation of drug formulations, and it is also used in the food industry and even in various types of nutritional supplements. Nanomaterials are emerging as new candidates to combats against multi-drug resistant (MDR) pathogens. The cause of WFS is currently unknown, but formation by loss of microvilli and subsequent cell lysis indicate that their formation is a pathological process.

Keywords*:* Nanomaterials; MDR; Shrimps; *Vibrio*.spp; White Feces Syndrome

Ref: ICBEE/215

Formulation and use of skin friendly antimicrobial dish wash

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The dish washing liquid which we are using in our day to day life contains plethora of chemicals lurking in it. The two main traditional ingredients that are present in the formulated dish wash includes, *Acacia concinna*(commonly referred as shikakai or soap pod) and *Sapindussaponaria*(commonly known as soapberry or soapnut seeds).The other ingredients that were included in this formulation are neem leaves, fenugreek, Bengalgram, tamarind, ash activated charcoal, coconutoil, colouring agent and essential oil of lemongrass. The procedures employed in the formulation of this skin friendly dish wash give rise to different resulting solutions. The procedure is specified as follows: appropriate amount of neem leaves, *Trigonellafoenum-graecum*,Bengalgram,ash,tamarindandactivatedcharcoal.Neemleaveshaveantimicrobialproperties anditdestroythebacteria.Bengalgramhascertainpropertiesthatmakefoam.Tamarind,ashandactivate dcharcoalareusedinoldendays.The procedures employed in the formulation of this skin friendly dish wash give rise to different resulting solutions. The procedure is specified as follows: Appropriate amount of dried and powdered ingredients were soaked in appropriate amount of distilled water and left overnight at room temperature away from the direct sunlight, the next day the mixture is filtered with the help of fresh muslin cloth, now the appropriate amount of filtrate is mixed with significant amount of coconut oil and distilled water; this mixture is homogenized with the help of magnetic beads; further addition of significant drops of essential oil of lemongrass leads to the formulation of another form of soap, appropriate amount of caustic soda, baking soda, washing soda and sodiyum lauryl sulphate were added. The susceptibility test from agar plate method, well diffusion method, MIC, MBC, Sterility test, Time kill test, Agar patch method of these three resulting powder, liquid, soap will be tested and pH is analysed.

Keywords: Organic; dishwashing; toxic; homogenized; natural ingredients.

Ref: ICBEE/216

Preparation and Use of Herbal Antimicrobialbathsoap

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An antimicrobial soap is a cleansing product made to kill germs on the hands or body. These soaps are made either in liquid or bar form by using some ingredients with microbial properties. The skin has diverse communities of microorganisms and alterations to these communities can impact the effectiveness of the skin as a barrier to infectious organisms or injury. Certain criteria should be followed to make soap. Time required for the product to work and the type of organisms should be effective against the product should be formulated. The soap should contain some factors like foam quality, speed of foaming, rinsability, odour, shape. A variety of ingredients are added to modify different aspects of the formula. This includes thickeners, fragrances, colorants; pearlizing;agents; preservatives; various botanical extracts, proteins, natural oils can be used. Antimicrobial cleansing products are effective in healthcare settings. Cleanliness is the key to good health and when it come to cleanliness soaps has the most important role to play. Washing hands and body with only water certainly does not give the best hygiene. Antimicrobial soaps add to the ability of water to provide better cleanliness by binding with the dirt and oil molecules on the skin surface. These soaps are usually formulated with special chemical or natural ;anti-bacterial; ingredients that help in killing the bacteria on the skin surface ensuring maximum personel hygiene.

Keywords: Antimicrobial; microorganisms; infectious; pearlizing; preservatives.

Ref: ICBEE/217

Anti-adherence efficacy of castor oil based nanoemulsions against multi drug resistant ESKAPE pathogens

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Nanoemulsions (NEs) are a unique class of disinfectants produced under high pressure and are emerging antibiofilm agents. The ESKAPE pathogens are the key agents in nosocomial infections in hospital settings, having a tendency to form biofilms on various. In present study the efficacy of synthesized NEs were determined by MIC, MBC, adherence assay and biofilm studies. The droplet sizes were measured by DLS technique. Castor oil nanoemulsion (CNEs) was formulated with the ratios as castor oil (25%), surfactants (2.5%), CPC (1%) and water. The results of our study showed that the synthesized CNEs, Betadine solution and cefotaxime were effective in resulting in reduced bacterial load. The CNEs were found more statistically significant ($P< 0.05$) and effective than the used positive controls. The DLS characterization showed monodispersed droplet size distribution (PDI < 0.24). *In vitro* anti-adherence of pathogenic bacteria, even at higher dilutions (1:1000 and 1:10000) of CNEs was found effective against multidrug resistant ESKAPE pathogens. It is possible that the positively-charged emulsion remains attached to the biofilm for a longer time than does Betadine solution and Cefotaxime and therefore able to prevent the formation of further biofilm formation. Consequently we can conclude with the observations that the castor oil based nanoemulsions could be precious for the improvement of promising antimicrobial agents to rid off the biofilm formed by multi drug resistant ESKAPE pathogens.

Keywords*:* ESKAPE pathogens; CNEs; Anti-adherence; Biofilm inhibition; Multi-drug resistant

Ref: ICBEE/218

Detoxification of Synthetic Textile Dyes by Bacteria

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Textile dye effluent is a major environmental threat to the flora and fauna. Most of them are azo dyes which are recalcitrant and are toxic to environment and humans. In this study, a strain of bacteria which is harmless and capable of degrading textile dye reactive dyes was identified. This bacterium is referred to as ‘remediator’. The capability of the bacteria to degrade various reactive dyes was assessed with decolorization studies. The optimum pH, temperature, dye concentration, inoculum volume and static/agitated condition were determined using One Factor At a Time (OFAT) approach. To further enhance the degradation efficiency, Box Behnken Design, a type of Response Surface Methodology was applied. At 37°C using an inoculum of 100 µL, 100% decolorization was observed in 500 mg/L of dye mixture at 24 hours. UV- visible spectroscopy and FTIR studies of the dye and degraded metabolites showed different peaks and hence proved that dye degradation had occurred.Phytotoxicity studies using *Vigna radiata* proved that the toxicity of the dye was reduced after degradation.Molecular docking studies between azoreductase enzyme and dyes shows favorable binding energies. This bacterium creates a promising hope for bioremediation of the environment which is polluted by hazardous dyes.

Keywords: One Factor at a Time (OFAT) approach, Box Behnken Design, Response Surface Methodology, phytotoxicity, bioremediation

Ref: ICBEE/219

The antimicrobial efficacies of natural flower extracts based hand wash to fabricate a biocompatible disinfectant

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Hand wash is the primary barrier to prevent transmission of enteric pathogens to avoid getting sick and spreading infection to others. Here, *Hibiscus rosa-sinenis*, jasmine, marigold plants were used for antimicrobial hand wash production. The flower extracts of *Hibiscus rosa-sinensis* have stronger antibacterial effects than the leaves and raises the possibility of using the extracts as antibacterial agents and treating pathological conditions caused by *Staphylococcus aureus* and *Salmonella typhimurium* infection. The natural acids present in Hibiscus help to purify the skin by breaking down dead skin and promoting healthy cell growth. Marigold has antibacterial properties and also acts as an antiseptic agent. It also gives gentle effect on the skin. Marigold has significant inhibitory effect on *S. aureus* and *E. coli*. Jasmine has an antibacterial and antifungal activity. It maintains natural moisture and softness in the skin. This hand wash is to detect the efficiency of flowers and the hand wash should be in organic form and anti-microbial form. The antibacterial activity against different pathogens was evaluated *in vitro* settings. For testing anti-microbial activity, anti-microbial susceptibility test, MIC, MBC test were conducted to ensure the reduction of pathogenic microbes. The goal is to detect possible drug resistance in common pathogens and assure susceptibility to drugs of choice for particular infections.

Keywords*:* Hand wash; *Hibiscus rosa-sinensis*; Marigold; Jasmine; MIC; MBC; drug resistance

Ref: ICBEE/220

Shelf Life Extension of Tomatoes using Nanoemulsuions

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Food spoilage is the major reason to use chemical preservatives for increasing the shelf life of fruits and vegetables. The Tomatoes (*Lycopersiconesculentum)* is one of the major cultivating and consuming horticultural crop worldwide. The post-harvest shelf life of tomato is only few weeks and is difficult to transport and export. Increased consumption of the chemical-preservatives causes the risk of inflammation, oxidative stress, obesity, allergies, anxiety, and pancreatitis in humans. The Nanoemulsions (NEs) containing edible oils can be used to prevent the food spoilage caused by microorganisms. Direct use of oils may affect the quality of food due to its hydrophobic properties. The oils (sunflower, clove, castor and olive oils) in water as NEs can be preferred. Microfluidizer LM10 was used to synthesize the nanoemulsions; the mixture was repeatedly circulated to obtain uniform droplet sizes. The particle size distribution of the nanoemulsion was measured through DLS and the Zeta potential is measured by (Malvern Zetasizer) instrument. The Minimum Fungal Concentration (MFC) was determined by well diffusion method. Time kill analysis growth curve is used to identify the fungal growth at different time standards. The antifungal activities of NEs were observed against *Alternaria alternata, Aspergillus Niger* which are dominantly causing spoilage in tomato. Therefore the use of edible oil containing NEs could be more effective to control the spoilage causing pathogens in tomato and extent their shelf life for transportation.

Keywords: Nanoemulsions; MFC; Edible Oils; Tomato; Pathogens; Spoilage

Ref: ICBEE/221

Isolation and Screening of Plastic Degradation Bacteria

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Plastic is the one of the major pollutant in the today's environment, due to the lack of degradability and land pollution problems has many hazardous effects on human and animals. The need for biodegradable plastics and biodegradation of plastic wastes has assumed increasing importance in the last few years. Plastic with desirable properties such as durability, plasticity have been industrially produced over the past century and widely incorporated into the consumer products. Many of the products are remarkably persistent in the environment because of the absence or lower activity of catabolic enzymes that can breakdown their plastic constituents. In particular BPA (Bisphenol A) is an industrial chemical that has been used to make certain plastics and resins. It is found in polycarbonate plastics and epoxy resins. They are often used in containers that store food and beverages such as water bottles. PVP (Polyvinylpyrrolidone) also called polyvidone, is a water-soluble thermoplastic made from N-vinylpyrrolidone. It is soluble in water, methanol and ethanol as well as many other polar solvents. It is a biodegradable water-soluble polymer. PVP is a miscible into PVA matrix due to strong H-bonding interactions between OH groups of PVA and C O groups of PVP. The aim of this study is to degrade the plastic by using microbes which are isolated from waste products and degraded in environmentally benign

Keywords: Plastic, Biodegradable, Microbes

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Shelf Life Extension of Perishable Fruit-Strawberry through Nanoemulsions

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Monocrotophos is an organophosphate insecticide that acts on a broad spectrum of insects and is highly toxic to birds and humans. It has been banned in various countries because of its high toxicity, but is still available in developing countries like India. The alternative, as nanoemulsions (NEs) formulation can be used instead of the toxic insecticide. A nanoemulsion is a colloidal system consisting of mainly oil, surfactant, and water and in this experiment it has been prepared using castor oil. It is characterised by using DLS and zeta potential techniques. The efficacies of NEs were compared with the commercial insecticide available in market. Plants (*Spinaciaolaracea*) were exposed to the both, nanoemulsion and insecticide in equal concentrations (3 ml in 500ml and 3 ml in 1000ml sterile ultra pure water) and are later were used to prepare feeds for the fish. The feed also includes proteins, carbohydrates and other nutritional requirements. Then the fishes that are already acclimatised to the laboratory conditions were exposed to the prepared feed and continuous exposure is given for 7-14 days. The defects in the physiological factors and neurological behaviour of the fishes were studied and acute toxicity studies were conducted. This experiment is conducted to demonstrate the ill toxic effects of the insecticide and a possible alternate for it is prepared using nanoemulsion without the harmful effects. The conclusion of the study indicated that the nanoemulsions can be used as an alternative of toxic insecticides which are available in market.

Keywords: Monocrotophos; Nanoemulsion; Insecticide; DLS; Fish feed; Acute toxicity

Ref: ICBEE/223

The efficacy of organic textile dye against multi drug resistant ESKAPE pathogens, extracted from ten herbal plants

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The use of and search for drugs derived from plants have accelerated in recent years. The aim of the present study to evaluate the antimicrobial potential of ethanolic and water extracts of Adhatoda (*Justicia Adhatoda*), neem (*Azadirachta Indica*), Holy Basil (Ocimumtenuiflorum), Nilavembu (Andrographis paniculate), Keelanelli (*Phyllanthusniruri)*, Nochi (Vitex negundo), Karpooravalli (*Plectranthusamboinicus),*Thumbai (Leucas aspera),Amman Pacharasi (*Euphorbia hirta*) and Kuppaimeni (*Acalyphaindica)* on ESKAPE pathogens. The emergence of resistance in ESKAPE pathogens (*Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa*, and *Enterobacter* species) a strong demand of new alternative to overcome the problem of drug resistance. The efficacy of herbal plants extract against multi-drug resistant pathogens is a novel search for the welfare of human being. In the present study the combination of ten medicinally important plants extract were used. The efficiency of resulted dyes and their constituents was determined by MIC, MBC and disc diffusion studies. The results of antimicrobial activities of herbal plants extract against the strains of ESKAPE pathogens were recorded which shows the inhibition of pathogens in an increasing manner of the concentrations. In conclusion, the mixtures of plants extracts are of great value as natural antimicrobials and can use safely to treat the drug resistant ESKAPE pathogens.

Keywords*:* Dyes; Herbal Plants; ESKAPE pathogens; MIC; MBC; Disc diffusion

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Shelf Life Extension of Perishable Fruit-Strawberry through Nanoemulsions

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The demand for fresh fruits like Strawberries occupy a major role in the food industry sector in the form of fresh fruits, thick shakes, juices, processed jams, jellies, ice cream, chocolates, sauces, etc. Several chemical preservatives have been emphasized to maintain the quality, appearance, taste and shelf life of strawberries which might have adverse effects on health. The present study focuses on introducing edible coating preservation through the application of nanoemulsions (NEs) using essential oils. Nanoemulsions are considered as one of the important vehicles for the sustained release of food bioactive compounds due to their smaller size (nm), increased surface area and unique morphological characteristics. In the preparation of the NEs, Tween60, CPC, Oils (olive, castor and sunflower) and Microfluidizer equipment were used. The mixtures of the ingradients were passed through this equipment three times in order to obtain nanoemulsions of required size. The physio-chemical characterizations of the nanoemulsions were analyzed through DLS, zeta potential, pH measurement and stability check methods. Real time analysis would be done by spraying these nanoemulsions on fresh strawberry fruits along with a positive control. Assays with different dilutions were performed with the fungal strains- *Rhizopus stolonifier* and *Aspergillus niger* which causes spoilage in strawberries. Thus these NEs are expected to increase the food stability, thereby building a promising and safe preservation technology in the food industry. The futuristic aspect of this methodology is aimed at obtaining extended shelf life of these perishable fruits which would favor transportation and storage resulting in reduced wastage of fruits during post-harvest.

Keywords: Nanoemulsions; spoilage; strawberries; DLS, preservation; *Rhizopus stolonifier*, *Aspergillus niger*

Ref: ICBEE/225

Incorpoartion of nanoemulsion as an edible coating for increasing the shelf life of apple fruits

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The increasing consumer demand for “healthy diet” has promoted variousresearches towards novel approaches for preserving minimally processed fruits, such as apples in reducing the use of synthetic additives. Apple has been one of the top three fruits globally consumed with the added chemicals as enhancer of shelf life of fruits. The edible coatings of nanoemulsions (NEs) has been promising and considered as an alternative in increasing the quality and shelf life of apple during transportation. The NEs, because of its unique characteristics such as small size (5-100nm), increased surface area and less sensitivity to physical and chemical changes, making them ideal formulas in enhancing the storage life for transportation. The emulsifiers such as tween60, CPC, oil in water (castor oil, sunflower oil, and olive oil) were used for the synthesis of NEs. The sizes of the droplets were determined by using DLS and the zeta potential techniques. The antimicrobial activities of NEs were evaluated by Real time analysis and Minimum fungicidal concentration (MFC). *Penicillium* and *Aspergillus* species which causes spoilage in apples were used to determine the antifungal activity. In conclusion, the NEs may serve in reducing the post-harvest losses of apples and increasing the shelf life of apples during transportation as an alternative to synthetic additives and thereby reducing its cost in contrast to conventional method making it edible and disease free.

Keywords*:*Nanoemulsions; MFC; Edible oils; Shelf life; Apple fruit; Spoilage

Ref: ICBEE/226

Combinational Therapy Using Lectins and Taxol On Cancer Cell Line

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Cancer was the most prevailing disease worldwide and it was expected that more than 1million men were affected in a year and 900,000 women were affected by cancer. Among them, Prostate, kidney, liver and bladder cancers are common in men and lung, breast, uterine, thyroid cancers are common in women. Though various drugs are available, the side effects of the drugs make researchers and patients to seek for a natural alternative for treating cancer. Cancer cells undergo various mechanisms which leads to their proliferation. Glycosylation, a post translational modification was one among them, which leads to alterations in biochemical and biophysical alterations of normal cells. These leads to cancer cells proliferation. Lectins are proteins which have high affinity towards glucose moieties. Cancer cells have proteins which are glycosylated and having glucosamine, galactosamine, sialic acid residues on their surfaces. Lectins have been reported to reduce cancer cell viability upon performing mtt assay. It was reported that combinational therapy for cancer by amalgamating conventional anti-cancer drugs with naturally developed lectins might help in reducing tumor growth, reducing cancer cell populations, inducing apoptosis and reducing metastatic potential of the cells. The idea is to use combination of lectins and conventional anti-cancer drugs by targetting glycosylated cancer cells and check for their viability rate which might be a potential treatment for cancer.

Keywords: Cancer therapy, lectins, glycosylation, anti-cancer drug

Ref: ICBEE/227

In Silico Structural and Funtional Analysis of Mycobacterium Gene Rv1085c from H37 Strain

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Tuberculosis has its very own distinct way of existing just like other diseases. Numerous therapeutic ideas have been implemented over the years and clinical trials are being undertaken simultaneously in order to achieve a terminal cure for this infectious bacterial disease. Due the various advancements in this area of research, the TB incidence in the world is falling at a rate of 2% per year. *Mycobacterium tuberculosis* is the pathogenic bacteria responsible for the development of this disease, extensively affecting the lungs with a hallmark of remaining confided within the alveolar macrophages. The bacterium eludes the immune mechanism of the host by evading phagocytosis in the macrophages. The complex peptidoglycan wall of the pathogen restrains the phagosome from integrating with the lysosome thus obstructing lysis and degradation of the bacterial cells. Among the various host-macrophage interactions in TB, Rv1085c is considered to play a cardinal role. It stands out to be one among the virulent genes responsible for adaptation and infection and is also poorly characterized. In addition to consisting a caveolin 1 binding motif, it being an integral membrane protein with enhanced probabilities of having interactions with host macrophages is what has drawn our attention towards this specific gene. Caveolin 1 is a promising protein possessing a mechanism of its own that can be exploited for achieving possible curing strategies in tuberculosis. Various researches have been performed with the aim of controlling the disease progression by the use of different drugs. In our work we have carried out the *in silico* structural and functional analysis as well as the characterization of Rv1085c protein which includes prediction of threedimensional structure of the gene and caveolin 1, molecular docking studies of Rv1085c with several drugs and elucidating interactions between Rv1085c and Caveolin 1 with the application of diverse number of bioinformatics tools.

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In Silico Structural and Functional Analysis of Mycobacterium Gene Rv1477 from H37 Strain

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Tuberculosis stands out be one of the top ten causes of deaths taking the lives of nearly 1 million people at an average every year. It is characterized as an infectious disease usually caused by *Mycobacteriumtuberculosis* that majorly affects the lungs. The alveolar macrophages phagocytose M. tuberculosis when in the lungs but however are unable to lyse and digest the bacterium. The cell wall of the bacterium refrains the phagosome from fusing with the lysosome, which contains host antibacterial factors in abundance. M. tuberculosis cells reside within the macrophages and eventually rapidly multiply within them thereby increasing in number. Rv1477 being one among the virulent genes accountable for infection, adaptation, being less well categorized, consisting of a Caveolin-1 binding motif and considered an integral membrane protein has increased possibilities of playing a key role in the host-macrophage interactions. We have aimed to perform the In Silico Structural analysis, functional analysis and characterization of the Mycobacterium gene Rv1477 from the Strain H37. The docking studies of the gene with various drugs has been performed. Various bioinformatics tools have been used for this purpose and for the prediction of Caveolin 1 three-dimensional protein structure as well. The interactive sites between Rv1477 and Caveolin 1 have also been predicted.

Ref: ICBEE/229

Elucidation and interaction studies of algal peptides on helicobacter pylori

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Although most *Helicobacter pylori* infections are asymptomatic, some may develop serious disease such as gastric and peptic cancer. *H. pylori* infects about 80% of Asian population. Epidemiological and basic studies have provided evidence that infection with *H. pylori* carrying specific virulence factors that can lead to more severe complications. And this virulence factors could be a potential target for which drugs could be designed and targeted to inhibit their growth and pathogenicity. Chronic infection with *H. pylori*CagA positive strains (virulence gene marker) is the important risk factor of gastric cancer. It is an exogenous cancer promoting gene and can induce cell proliferation and cell elongation. Algae are a diverse group of aquatic organisms that have the ability to produce variety of peptides which has varied physiological functions importantly antibacterial and anti-inflammatory characteristics in addition to acting as source of nitrogen and amino acids. The project aims to analyse the interaction between the potential algal peptides against the CagA virulence factors of *H. pylori* in inhibiting the progression of the infection through Insilico analysis.

Keywords: *H. pylori*, CagA, antibacterial algal peptides, cancer

Ref: ICBEE/230

An epitope based immunoinformatics approach to study the antigenicity of Dengue Virus strains in India

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Dengue fever is a mosquito borne disease caused by Dengue virus which is a single-stranded RNA virus of the *Flaviviridae* family. Mosquitoes of the Aedes aegypti species are the primary transmitters of the Dengue virus. This fever affects a significant population of subtropical and tropical countries in Asia and Latin America with incidences steadily increasing in recent decades. With nearly half of the world's population at risk of being infected, this virus has become one of the worst mosquito borne human pathogens. All the 4 major serotypes of Dengue Virus (DENV) are prevalent in India. Being a RNA virus, it is highly mutated and therefore each year we see new symptoms of Dengue fever.This study attempts to understand the different antigenic/immunogenic events onset by different strains of Dengue Virus reported in India using various immunoinformatics tools to identify variation in B cell and T cell epitopes across the DENV Indian Strains and to further study the immune response induced by these epitopes.

Keywords: Dengue virus, Immunoinformatics, Indian Strains, Epitopes.

Ref: ICBEE/231

In-Silico Screening of Natural Components as Potent Inhibitor of Glucose Specific Symporter and Uniporter in the Kidney

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Diabetes is characterized by chronic glucose levels resulting in damage to several tissues. Eg. (retina, kidney, nerves) due to higher protein glycation, retardation of wound healing, impaired insulin secretion, enhanced insulin resistance, cell apoptosis, and increased oxidative stress. Type 2 Diabetes Mellitus (T2DM), representing 90-95 % of all diabetic cases, is a multifactorial disease. Six isoforms of Sodium-Glucose Cotransporter (SGLT1 to SGLT6) have been identified. Among these only two isoforms SGLT1 and SGLT2 are well investigated. SGLT2 is especially expressed in renal uriniferous tubules, a low-affinity, high capacity transporter. It plays a critical role in renal glucose absorption while SGLT1 helps in the absorption of dietary glucose in the small intestine. Similarly, GLUT (Glucose transporter) functions by transporting the glucose from extracellular into the cells. Inhibition of SGLT and GLUT leads to decreased glucose reabsorption, resulting in the urinary sugar excretion and normalize the blood glucose level without severe side effects. This study aims at screening and identification of potent natural compounds to inhibit the reabsorption of glucose by SGLT, GLUT and thereby comparing it with the market available drugs.

Keywords: SGLT, GLUT, Diabetes Mellitus, Natural Compounds

Ref: ICBEE/232

Molecular Comorbidity Analysis of T2DM, TNBC, Obesity and PCOS using Integrated Bioinformatics Approach

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Type 2 Diabetes Mellitus (T2DM) is one of the most prevalent and serious metabolic disorders caused due to factors including genetic, environmental and lifestyle of the people. It is widely characterized by hyperinsulinemia and insulin resistance rather than low level of insulin as seen in Type 1 diabetes. Clinical implications in T2DM patients include altered metabolic rate in metabolism related cells, dyslipidemia and dysregulated release of adipokines and adipocytokines causing inflammation. These lead to various other complications in patients like metabolic dysregulation, renal failure, cardiovascular diseases, neuropathy and also some major forms of cancers. Some of the commonly occurring comorbidities of T2DM include Triple Negative Breast Cancer (TNBC), Obesity and Poly Cystic Ovary Syndrome (PCOS). There are lots of clinical studies implicating the prevalence of increased risk in T2DM patients especially females to develop these associated complications. A commonly used T2DM drug Metformin has been identified to play a role in the therapeutic pathways of the above mentioned diseases. However there are very few studies showing their molecular interlink and mechanisms of these diseases. In our study, we propose to elucidate the molecular crosstalk between these T2DM comorbidities using publicly available microarray gene expression datasets to identify the differentially expressed genes and its associated functional and pathway enrichment analysis. Bioinformatics tools including BioConductor packages, STRING, Cytoscape and KEGG are used to carry out this integrated analysis.

Keywords: T2DM, TNBC, Obesity, PCOS, Comorbidity, Gene expression, Bioinformatics.

Ref: ICBEE/233

Optimization of Media for Cordyceps Militaris Growth

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Cordycepin is one of the most important bioactive compounds produced by species of Cordyceps sensulato, but it is hard to produce large amounts of this substance in industrial production. In this work, single factor design, Plackett-Burman design, and central composite design were employed to establish the key factors and identify optimal culture conditions which improved cordycepin production. Cordycepin (3'-deoxyadenosine) is one of the most versatile metabolites of Cordyceps militaris due to its broad spectrum of biological activity. In this study, response surface methodology (RSM) was applied to optimize the medium components for the cordycepin production by submerged liquid culture.

Ref: ICBEE/234

Metalloproteinase a Potential Target for Anti-Venom Treatment – Identification of Metalloproteinase Inhibitors in Ancient Medicinal Plant, *Andrographis paniculata*

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Snake venom metalloproteinase (SVMP) enzyme a major constituent of Crotalid and Viperid venom plays a crucial role in the toxicity. Besides the hemorrhagic activity it's also involved in various other activities viz., fibrin (ogen)olytic, platelet aggregation inhibition, act as prothrombin activation, apoptotic, blood coagulation factor-X activation, inactivation of blood serine proteinase inhibitors. Metalloproteinase also known as zinc-protease a multidomain protein involved proliferation of cancerous cell and in cell-ECM adhesion. Structural similarity between the mammalian matrix metalloproteinase and SVMP would trigger the interest in developing the potential molecules for venomous snake bite. Our present study focusses on finding the novel phytochemical against metalloproteinase of Russell viper using *insilico* analysis, Autodock. Molecular interaction of twenty two*Andrographis paniculata* phytochemicals with target metalloproteinase was analyzed. 14-acetylandrographolide (-9.32kCal) showed highest binding affinity followed by 14-deoxy 11,12didehydroandrographolide (-8.66kCal) compared to standard batimastat (-7.96kCal). Phytochemicals was mainly found to interact with ASN203, ARG293, PHE203, LEU206, LYS199 and ALA122 of target metalloproteinase. Furthur studies on its pharmacological and biological activity would shed light on anti-venom treatment.

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Phytochemistry of the Wild Fruit- Cili (*Rosa roxbhurghii*)

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Cili fruit (Rosa roxbhurghii), which is referred as the "King fruit of vitamin C" is broadly used in health supplement and medicine. This fruit is underutilised and found only in some of high mountain ranges of China. This fruit is said to have an astringent yet a smooth, sweet and sour taste. It is a perennial shrub in Rosaceae family. The concent of Vitamin C and Vitamin P is found to be higher than other fruits. Its properties includes strong antioxidation, cancer prevention, anti-aging, antifatigue and immunity enhancement, effect of whitening, dispelling the spots. The application field includes food additives, beverages, pharmaceutical field, cosmetic field. Nearly thirty phytochemical compounds were identified and Linoleic acid was found to be the most predominantly found essential oil compounds. The process of determination of total phenolic content, total flavonoid content, essenential oil profile, phytochemical profile, ascorbic acid content were done using Folin-Ciocalteu, AlCl 3 based colorimetric method, GC-MS, UPLC-QTOF-MS, HPLC methods respectively. The application of Cili fruit in health benefits is not promoted due to lack of scientific research and their limited yield as well.

Keywords: Vitamin C, essential oil compounds, antioxidant.

Ref: ICBEE/236

Ointment made from Natural Sources for Effective Wound Healing

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Skin is the protective barrier for human. When there is an injury, it may results in loss of skin layer and bleeding. The time of wound healing depends on the extent of wound. Delayed wound healing increases the chance of infection. Also, deep wound like laceration may cause excessive hemorrhage and sometimes becomes life threatening. In household injury, abrasion, puncture and laceration is most common and laceration causes major complications and requires immediate medical attention. In the current work, an ointment is being synthesized for quick blood clotting and accentuates wound healing. For this purpose, we used natural compounds like hibiscus leaves which have both blood clotting wound healing effect, turmeric which has anti-inflammatory effect and bitter cumin seed extract consisting of antimicrobial and wound healing activities. The synthesized solution was characterized to assess phytochemical components and tested for blood clot assay and wound healing activity of fibroblast cells. This ointment may be a useful product for household injuries.

Keywords: Laceration, wound healing, hibiscus leaf extract, turmeric, bitter cumin, scratch test

Ref: ICBEE/237

Synthesis of Natural Product Based Anti – Pimple Gel

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Pimples are caused by excess sebum, dead skin cells that clog the pores of skin. Bacterial infection is very common in this situation and aggravates the situation when the pimples matures or popped up. *Propionibacterium acne* and *Staphyllococcus aureus* are predominantly found in the affected areas. If untreated, in long term, pimples cause a much serious condiftion called acne. The common medications include antibiotic creams, benzoyl peroxide etc. But due to growing antibiotic resistance among bacteria, especially *Staphylococcus*sp., doctors are looking for alternatives. Majority of the market available anti-pimple creams are constituted of antibiotics, which, due to overuse, not only becomes ineffective, but also confers antibiotic resistance among skin residing bacterial population. In this work, neem leaves extract, which is known to have broad spectrum antimicrobial role used as a key component. Besides, aloe vera extract is used as an anti-inflammatory agent. Shea butter, which is commonly used in face pack and other beauty products, is used as a base for the mixture of these two extracts. The antimicrobial effect of the gel was studied on the skin model made by agar. Also, gel was tested on mammalian cells to check whether the gel has any cytotoxic effect. Hence, the natural product based gel can be used to treat pimples.

Keywords: pimple, neem leaves extract, aloe vera, shea butter, anti pimple gel, agar based skin model

Ref: ICBEE/238

Andrographis paniculate Extract Inhibit Growth, Biofilm Formation in Multidrug Resistant Clinical Strains of *Klebsiella pneumoniae*

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Andrographispaniculata (Kalmegh), a valuable ancient Ayurvedic medicinal herb is used in the treatment of several diseases in most Asian countries including India. *K. pneumoniae* is anopportunistic pathogen causing nosocomial infections in human. We have investigated the antimicrobial susceptibility and the presence of AmpC gene of *K. pneumoniae* strain isolated from the patient's sputum. Antibiotic susceptibility test and phenotypic detection of AmpC/ESBL beta-lactamase were performed by combined disc diffusion test. The crude ethyl acetate (CEA) of *A. paniculata* was analyzed for its antibacterial potential against susceptible and resistant strains of *K. pneumoniae* through the broth microdilution method. Molecular detection of AmpC gene was carried by polymerase chain reaction. Antibiotic susceptibility test displayed that the clinical isolate of *K. pneumoniae* were resistant towards cephalosporins, quinolone and monobactambut susceptible to carbapenems. Combined disk diffusion demonstrated AmpCpositive/ESBL negative beta-lactamase. 250 µg/ml of CEA extract confirmed the inhibition of bacterial growth and biofilm formation, compared to the antibiotic. CEA treated *K. pneumoniae* displayed a reduction of AmpCby polymerase chain reaction. The present study illustrates that CEA extract of *A. paniculata* demonstratedpotentiality to control *K. pneumoniae* growth and biofilm formation. CEA was able to down regulate the amplification of gene encoding AmpC.

Keywords: *Klebsiella pneumoniae*, Multidrug-resistance, Polymerase chain reaction

Ref: ICBEE/239

Recovery of heavy metal induced vascular endothelium damage by nanorods

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Industrial heavy metal pollution is one of the major reasons for humans to become susceptible to various health hazards. Among all, cadmium (Cd) is a potent heavy metal that predominantly targets the vascular endothelium leading to various cardiovascular diseases. To this end, there is a critical need for the development of alternative treatment strategies to address the Cd intoxication. One such novel approach is therapeutic angiogenesis which could be an ideal option to recover from the toxicity. Our group already demonstrated the biocompatible europium hydroxide nanorods (EHN) which exhibited excellent pro-angiogenic properties. In the present study, we have evaluated the effect of EHN on Cd induced toxicity in EA.hy926 using various in vitro and in vivo assays. EHN improved the viability of EA.hy926 cells pretreated with Cd, reduced apoptosis, increased NO production and promoted blood vasculature development in chick embryo model. The reduced p53 and increased Bcl-XL expression as well as enhancement of NO was found to be the plausible molecular mechanisms underlying the retrieval of Cd induced vascular toxicity by EHN. Henceforth, we strongly hope that the EHN could be developed as potential alternative therapeutic candidate for overcoming heavy metal induced vascular toxicity and related diseases.

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Bio- Engineered Genome Editing in Agriculture

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Genome editing with engineered nucleases will represent a specific and efficient tool to generate useful novel phenotypes in crops with an economic interest in agriculture by base additions, deletions, gene replacement or transgene insertion. These techniques generate phenotypic variation in plants that can be indistinguishable from those obtained through natural means or conventional mutagenesis. The intense development of these new techniques of plant breeding leads to several issues concerning the regulatory status of plants edited by engineered nucleases. This chapter aims at providing some keys to answer these issues. The intellectual property and legislation of genetically modified organisms (GMOs) in several countries including European Union and major countries such as the USA, China, Brazil, Argentina and India are discussed. A scientific description of these new editing techniques and of recently edited plants is included. From a technical point of view, edited plants should only be considered as GMOs in the current EU legislation of GMO in the case of transgene insertion, while the best regulatory issue might be a product-based approach.

Ref: ICBEE/241

Ecofriendly green synthesis and characterization of silver nanoparticles using aqueous extracts of Imperata cylindrica and its biological activities

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The present study deals with the synthesis and characterization of silver nanoparticles using stem and leaf aqueous extract of Imperata cylindrica and its antioxidant and antimicrobial activities. Silver nanoparticle (AgNP) was synthesized using 5% extract (inherent pH) pH 7 and 1 mM silver nitrate (AgNO 3) at room temperature. The color change to reddish brown indicated the reduction of silver ions to AgNP. Effect of varying concentration of the extract with silver nitrate and time was observed. AgNPs were characterized by using UV visible spectrophotometry, Xray diffractometer, scanning electron microscopy and fourier infrared spectroscopy. Stability of the nanoparticle was determined using zeta potential analyzer. The spectrum revealed surface Plasmon resonance (SPR) band for AgNP for aqueous extract at 450nm. The shape of the silver nanoparticle was spherical, polydisperseed with the size of 70nm and the zeta potential value was -15.6 mV. The synthesized AgNP exhibited potent hydroxyl radical scavenging and reducing power activities than aqueous extract. The synthesized AgNP exhibited antibacterial activities against pathogenic bacteria Salmonella typhi and Bacillus cereus. AgNP of I.cylindrica exhibited antifungal activity against fungi Aspergillus niger with MIC of 500µg/ml. Keywords: Imperata cylindrica L . XRD, FTIR, SEM, Zeta potential, Antioxidant activity and antimicrobial activities.

Ref: ICBEE/242

Smart plants - A solution to curb global warming

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The greenhouse effect and global warming are some of the leading causes of depletion of ozone, an increase in atmospheric carbon dioxide, which in turn results in climate change. Researchers and scientists of Salk Institute have come up with an idea to control climate change using plants as the bait. Genetically modified plants have been developed to absorb more amount of CO_2 into the roots. Elongation of the root size helps store more CO_2, but those roots soon decompose and release the CO_2 back into the environment. This problem is tackled using the compound 'Suberin.' This compound is found in some quantity in most plants. Researchers have successfully identified some genes in Arabidopsis, which can increase the root depth and mass as well as develop cork in the roots. The Suberin (cork) prevents natural decomposition of the roots in the soil, and the increase in depth and mass of roots helps store more CO_2 in them. Scientists are working on inculcating these characteristics in other plants as well. Field tests are in progress, and if an ideal prototype plant could be produced within the next few years, global warming can be drastically controlled.

Ref: ICBEE/243

A brief report on the modifying role of polyphenols on bacterial respiration

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Oxidative metabolism is an essential component of bacterial energy network, especially in aerobic bacteria like Pseudomonas, Escherichia coli, Staphylococcus etc. Inhibiting the oxygen consumption mechanisms with antibiotics or any antimicrobials can be a promising approach to manage the growth of the pathogenic bacteria under aerobic condition. In this brief report, an attempt has been made to compare the effect of various naturally occurring plant phenolics like gallic acid, propyl gallate and tannic acid in altering the oxygen consumption rate of both Gram negative and Gram positive bacteria. Among the three compounds gallic acid and propyl gallate has shown prominent inhibition of oxygen consumptions when used at physiologically relevant dosages. The use of glucose, ascorbic acid and protonophore CCCP has clearly indicated the effects are on the oxidative metabolism of the bacterial cells. Further analysis of the molecular mechanisms may reveal clinically significant bacterial treatment modules using the plant polyphenols.

Ref: ICBEE/244

Effect of equimolar amino acid osmolyte mixtures on the stability of RNase-A

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Organisms have evolved mechanisms to adapt to environmental assaults. But the most intriguing adaptation strategy is the use of organic osmolytes. The distinctive role of these low molecular weight organic molecules is to manage cell volume regulation under water-stress conditions that may include extremes of temperatures, extremes of pressure, changes in extracellular osmotic conditions, desiccation, or even the intracellular presence of the protein denaturing osmolyte, urea. These compounds stabilize the proteins. Chemically, they belong to three different classes, amino acids and their derivatives, polyols and sugar, and methylamines. Among these chemical classes amino acid proline and alanine are the major osmolytes hold a special importance for cell volume preservation in Theodoxus fluviatilis under hyperosmotic stress. Studies have been carried out in the presence of each of these amino acids individually. It has been found that both these amino acids stabilize proteins. But the osmoticum of Theodoxus fluviatilis contain mixture of both of these osmolytes. Therefore, in this study we wish to investigate the effect of mixture of both these osmolytes in equimolar concentration on the stability of RNase-A.

Keywords: amino acids, osmolytes, stress, osmoregulation, protein stability, Theodoxus fluviatilis.

Ref: ICBEE/245

Synthesis and characterization of zinc oxide nanoparticles by using catharanthus roseus and to study the antibacterial activity against pathogenic bacteria.

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In the present study, zinc oxide nanoparticles (ZnO NPs) were synthesized using leaf extract of Catharanthus roseus (C. roseus) under different physical parameters. Biosynthesis of ZnO NPs was confirmed by UV-Visible spectrophotometer and further, characterized by X-Ray Diffraction (XRD), Fourier Transform Infrared spectroscopy (FTIR), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Energy-Dispersive X-ray spectroscopy (EDX).We have also confirmed that several physical parameters such as pH, temperature, concentration of metal ions and reaction time were able to regulate shape and size of synthesized ZnO NPs. XRD and TEM analysis provided the information about the average size and hexagonal morphology of ZnO NPs. FTIR spectra analysis suggested that phenolic compounds played crucial role in the biosynthesis of ZnO NPs. The significant antibacterial activity of ZnO NPs was observed against pathogenic bacteria. The synthesized ZnO NPs have shown antibacterial efficacy against pathogenic bacteria. Overall, the results elucidated a rapid, cost-effective, environmentally friendly and convenient method for ZnO NPs synthesis, which could be used as a potential antibacterial agent against pathogenic microbes.

Keywords: Zinc Oxide Nanoparticles, Catharanthus roseus, Antibacterial activity, Transmission Electron Microscopy

Ref: ICBEE/246

Ocimum sanctum Leaf Extract Incorporated Chitosan Antioxidant Film For Bioactive Food Packaging

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To develop, Characterize and application studies of Chitosan films enhanced for their antioxidant activity by Ocimum sanctum incorporation. Chitosan is a naturally occurring linear polysaccharide that comes from the deacetylation of chitin. Its chemical characteristics provide chitosan with a unique set of functional properties. The main characteristics of chitosan are its degree of acetylation and molecular weight. During this study we have a tendency to see the development, characterization and application studies of chitosan film increased for their antioxidant activity by Ocimum sanctum leaf extract incorporation. Phytochemical screening was carried out for the Ocimum sanctum leaf extract. Further, synthesis of chitosan film and its characterization should be studied to determine moisture content, solubility, thickness, and its strength. The result of this study will focus on the potential and promising nature of Ocimum sanctum leaf extract with chitosan film as active packaging for food preservation.

Keyword: Thulasi ; Chitosan; Antioxidant; Bio-film; Active packaging

Ref: ICBEE/246

Purification of Grey water to clean drinking water

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Purification of grey water to drinking water is a tedious process which has issues related to cost and the chemicals used for its treatment. This study is based on creating a prototype for purification of grey water to clean drinking water using biological/natural substances at low cost. This method involves natural coagulants instead of synthetic coagulants in order to avoid problems related to chemical remains in treated water. In this, watermelon seeds are taken as an alternate for synthetic coagulants. An extract from strychnos potatorum, commonly known as cleaning nut is prepared in two batches as extract using cold water and hot water, to check its effectiveness. This extract from strchynos potatorum is used in major purification step. The water from a series of purification is allowed to go through activated carbon purification by passing it through carbon membrane. Thus the water purified through this method will be free from chemicals and will be a major solution for cost related issues in water purification.

Keywords: Grey water, Green water, strchynos potatorum

Ref: ICBEE/247

Green sysnthesis and Chanracterization of Zinc oxide nanoparticles using Solanum trilobatium extract and it antibacterial activity

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Biosynthesized nanoparticles have an incredible application in biomedicine owing to its simplicity, eco-friendly properties, and low cast. This study aims to determine the green synthesis of zinc oxide nanoparticles from ethanol and aqueous leaf extract of Solanum trilobatum. Solanum trilobatum was extracted and the phytochemical analysis were performed. The synthesized nanoparticles will be characterized using UV-VIS Spectroscopy, Fluorescence spectrometer, FT-IR, XRD, SEM with EDAX and TEM. The conformations of synthesized nanoparticles were characterized by a peak at 351 to 410 nm in the UV-VIS spectrum and photoluminescence spectrum respectively. The synthesized zinc oxide nanoparticleswill be tested for the antibacterial activity against pathogenic organisms.

Keywords: Zinc Oxide Nanoparticles, Solanum trilobatum, Antibacterial activity, Transmission Electron Microscopy

Ref: ICBEE/248

Effect of Room Temperature Storage on The Physicochemical and Antioxidant Properties of Oven Dried Thuthuvalai (Solanum trilobatum)

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Objectives: To study the effect of room temperature storage on the antioxidant and physicochemical properties of oven dried thuthuvalai (Solanum trilobatum) chutney powder. Methods: Instant thuthuvalai (Solanum trilobatum) chutney powder was developed with oven dried thuthuvalai leaves along with mixture of spices at various ratios for their storage stabilities and antioxidant activities for 12 d at room temperature (27 oC) storage. Phytochemical analysis, pH, volume and bulk density, color, solubility, swelling powder and angle repose, WHC and OHC capacity were studied. Findings: The addition of oven dried thuthuvalai leaves significantly increases the moisture, ash, protein, fat and fiber content at 0- 12 days.

Keywords: Chutney Powder, Oven Dried thuthuvalai Leaves, antioxidant properties, physicochemical analysis.

Ref: ICBEE/249

A novel bio-based tertiary disinfection process for the destruction of MDRO's and pathogens in secondary biological treated domestic wastewater

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At present, the conventional tertiary disinfection (ultraviolet (UV) radiation, chlorination and sodium hypochlorite) methods of domestic wastewater causes mutation in the microbes that result in the development of MultiDrug-Resistant Organisms (MDROs). In addition to this, it leads to biofilim formation on the surface of membrane during Reverse Osmosis (RO) results in membrane fouling. Hence this elucidates the lack of potency in the current tertiary treatment of domestic wastewater. The gain of resistance among non-resistant strains via conventional disinfection process are primary reasons for the immediate need for alternative methods to be designed, that can effectively destruct the pathogens and non- pathogens present in the secondary biological treated domestic wastewater. Leather tannery Industry is main cause of a huge amount of solid and liquid wastes. Solid wastes primarily include raw trimmings, fleshing, skin hides, chrome shavings, etc. Amongst the solid wastes, animal fleshing (AF) is considered as one of the major solid wastes that are generated huge amounts and causing disposal problems. Currently, these wastes are dumped in the landfill sites and emitting toxic gases such as ammonia, methane, etc. As an alternative, we proposed to utilize the AF as an economical substrate (contains around 83% protein and 17% lipid content) for the production of useful products such as bioactive molecules such as proteins and peptides under anaerobic fermentation process. Such bioactive molecules combat the several multi-drug resistant organisms and pathogens present in domestic wastewater (SBTDW) whose prevention and control is essential as they are life threatening. Also, reusability was enhanced by immobilizing onto the mesoporous activated carbon (MAC) which is prepared from rice husk. The immobilization was confirmed using SEM and FT-IR. Immobilized activated carbon was used for the disinfection of microbes present in SBTDW using column mode of treatment process. The effective destruction of microbes present in SBTDW was confirmed by SEM analysis. Therefore, our study provides a process for the utilization of leather industry solid waste (AF) for the production of antibacterial agent (protein and peptide) for environmental applications using immobilized system an alternate solution to the existing disadvantages in the conventional disinfection method.

Keywords: Leather industry solid waste; Anaerobic fermentation; Antibacterial proteins and peptides; Multidrug resistant organisms (MDROs), Secondary biological treated domestic waste water (SBTDW), Mesoporous activated carbon (MAC).

Ref: ICBEE/250

Synthesis of Chitosan Nanoparticles Loaded with Cowdung Manure and Evaluation of its Effect on Economically Important Plant

S Manonmani, S Shankar, N Dhivya

Bannari Amman Institute of Technology, Sathyamangalam.

Fertilizers have disadvantages like getting washed away by water easily and cause pollution, providing only short term benefits, altering the pH of the soil and many. The use of chitosan as a carrier for slow fertilizer release is a novel trend. The chitosan nanoparticle will be synthesized using Methacrylic acid and to be studied by particle size analyzer, zeta potential, FT-IR, TGA. The obtained CS-PMAA nano solution will be loaded with the cow-dung manure since it is a good source of NPK. The impact of that complex will be evaluated on a particular plant (Cicer arietinum) by performing root elongation assay, starch accumulation test and calculating mitotic index and cell division rate.

Keywords: CS-PMAA nanoparticle, cow-dung, Cicer arietinum

B. S. Abdur RahmanCrescent Institute of Sceince and Technology

B.S. Abdur Rahman University, Vandalur, Chennai-600 048, (formerly B.S. Abdur Rahman Crescent Engineering College) has been established under section 3 of the UGC Act 1956. The University is located in the outskirts of Chennai city on the G.S.T. Road, (Chennai-Trichy National Highway) 7 km from Tambaram and 2 km from Vandalur Railway Station and 17 km from the International Airport. Being adjacent to the Arignar Anna Zoological Park, it is easily accessible by city buses.

B.S. Abdur Rahman Crescent Engineering College, which has now been upgraded as B.S Abdur Rahman University, was an institution acclaimed throughout India for its quality in teaching and research. Being one of the largest engineering institutions in India, it lays emphasis on innovative research, investment in high-quality facilities and first-rate infrastructure. By making use of the latest technologies and quality teaching, the college is able to offer a wide choice of interdisciplinary degrees in engineering which has enabled students to gain accolades in the global level. It is one of the few institutions with all the UG and PG programmes approved by AICTE and accredited by the National Board of Accreditation. This has been upgraded to university status with a view to keep academic in pace with development in industry. Modern hostel facilities are available for men and women students separately within the University campus.

Students are imparted knowledge and provided ample opportunities to test their knowledge in real-time industrial situations and during this pursuit, their character traits are shaped and fine-tuned to enable them to initiate, compete, lead and share and become a good human being.

The placement record of the institution has been remarkable and most students chart their careers well before their graduation. All the graduates from its portals either occupy prestigious positions in multinational companies or join institutions of higher learning in India and abroad. Some of the graduates turn entrepreneurs with the guidance of Entrepreneurship Development Cell and Industry-Institute Partnership Cell.

School of Life Sciences

Among deemed Universities, B.S. Abdur Rahman University (formerly known as Crescent Engineering College), Vandalur, Chennai hosts one of the few broad "Life Sciences School" in the country, providing students, faculty, and staff with the opportunity to learn and perform research in a highly integrative and interactive setting. Our newly established Crescent School of Life Sciences & Technology hosts over 12 active faculty research laboratories studying areas spanning biotechnology, biochemistry, microbiology, molecular biology, and genetics etc.

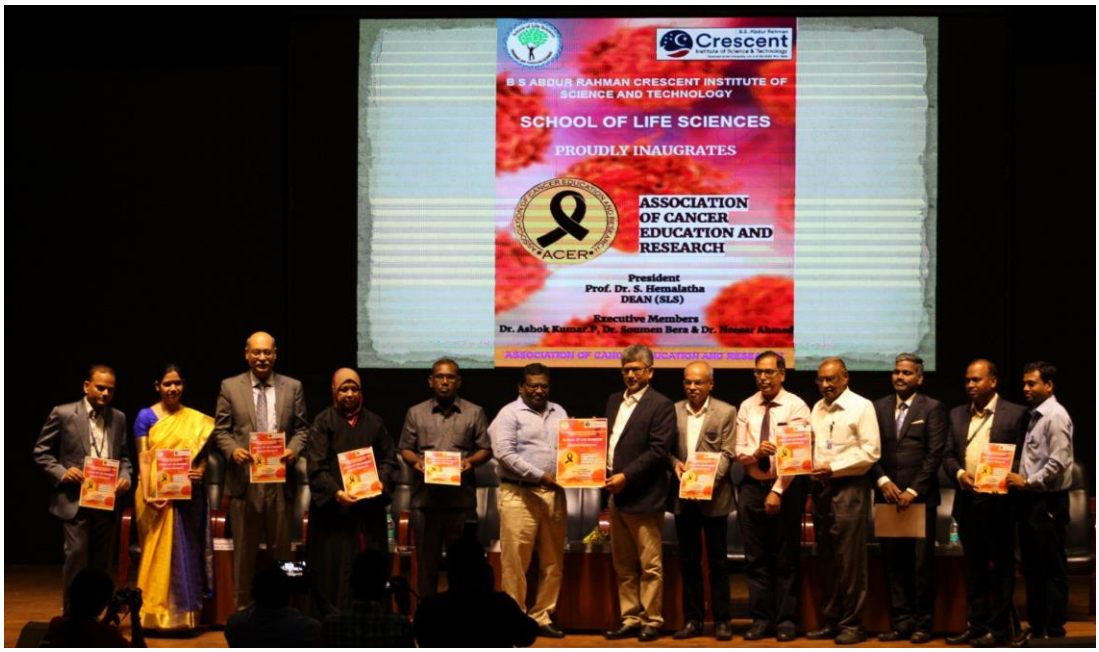
SLS is dedicated to achieving excellence in graduate training and undergraduate learning. Undergraduates benefit from having these world experts present the topics of their research passions in the classroom, exposing them to both the fundamental principles and the latest advancements or breakthroughs in biotechnology. Our undergraduate curriculum provides a rigorous introduction to biotechnology and other allied biosciences for students from many programs.

Graduate students pursue both M.Sc. and Ph.D. degrees enrolled either by individually or by our integrated program. Our upper level curriculum offers advanced training and specialization through course work and formative research experiences. Ph.D students join research teams either through our own extremely flexible graduate program in Biosciences or through a diverse array of interdisciplinary programs, such as those spanning the B.S. Abdur Rahman University (BSAU) like Polymer Technology. The school interacts heavily among the diverse disciplines represented within it, with other BSAU schools, and with programs at the many other partnership universities having MoU with BSAU. Besides the above, we are also offering many short term diploma courses pertaining to life sciences, corporate hospitals and industry. Our prospective students admitted in the school will have an opportunity to interact with our overseas trained faculty members on cutting-edge research to further our understanding of the natural world and seek answers in fields across all of biology, from molecular and cell to animal, plant and other allied areas.

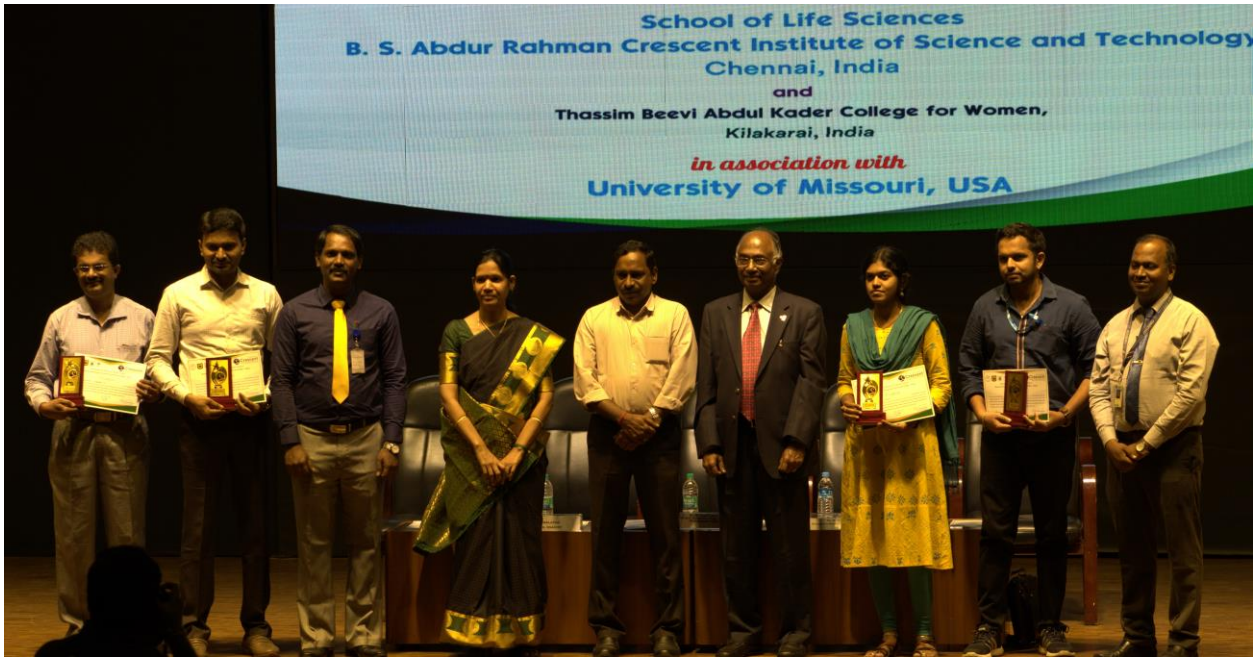
Programs currently offered by the School of Life Sciences

Name of the Degree	Name of the Programmes
B.Tech	**Full Time** Biotechnology
B.Sc	**Full Time** Biotechnology
M. Tech	**Full Time** Biotechnology
M.Sc	**Full Time** Biochemistry and Molecular Biology Biotechnology Microbiology
M.Sc - Ph.D Integrated	**Full time** Biochemistry and Molecular Biology Biotechnology Microbiology
Ph.D	**Full time / Part time**

The ICBEE 2020 conference proceedings was released by the Chief Guest Dr. S. P. Subramaniam, Deputy Controller of Patents and Designs, Chennai and the first copy was received by Dr. A. Peer Mohamed, Pro-Vice Chancellor, BSACIST.



A new association, 'Association of Cancer Education and Research' was also inaugurated in the School of Life Sciences by the joint effort of Dr. P. Ashok Kumar, Dr. Neesar Ahmed and Dr. Soumen Bera, Teaching faculties of the School of Life Sciences.



Four Young Researchers were awarded with Young Scientist Award during ICBEE 2020

Dr. Sumaiya, Principal of Thassim Beevi Abdul Kader College for Women, Keelakarai released her product, seaweed chocolate during the ICBEE 2020 conference

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