SONA COLLEGE OF ARTS AND SCIENCE

Enabling Dreams, Empowering Visions (Affiliated to Periyar University)

DEPARTMENT OF BIOTECHNOLOGY

Organises

NATIONAL CONFERENCE ON BIOTECHNOLOGICAL APPROACHES FOR CURRENT CHALLENGES

BIOTA-2024

02 Feb 2024

SOUVENIR

NATIONAL CONFERENCE ON 'BIOTECHNOLOGICAL APPROACHES FOR CURRENT CHALLENGES

NATIONAL CONFERENCE ON

BIOTECHNOLOGICAL APPROACHES FOR CURRENT CHALLENGES

BIOTA – 2024

ORGANIZED BY

BIORITZ ASSOCIATION

DEPARTMENT OF BIOTECHNOLOGY

SONA COLLEGE OF ARTS AND SCIENCE, SALEM – 5

TAMIL NADU, INDIA.

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FOREWORD

Department of Biotechnology has established in the year 2018. Currently, Our department has ample state-of-the-art facilities and laboratories for students utility. We have scientific Collaboration with many departments in and around the campus. Highly qualified and experienced faculty members are motivating the students on futuristic thinking approaches in Biotechnology. 'Biotechnology' is one of the highly demanded courses in SONACAS with good placement. Biotechnology department students secured three consecutive gold medals in 2021, 2022, 2023 batches and many university ranks. BIOTA 2024 is a National level scientific event, which is being conducted with eminent speakers. I am sure that this will be a platform to nurture young minds in the recent areas of Life Sciences. I wish the organizers for the grand success of the Conference !

- **Dr. G. M. Kadhar Nawaz**
Principal, SCAS

PREFACE

Department of Biotechnology was established in the year 2018. Our department has ample state-of-the-art lab facilities such as PCR, ELISA reader, UV-Vis Spectrophotometer & Transilluminator, Cooling Centrifuge, LAF, Electrophoresis set-up, Incubator, Deep freezer and laboratories for Plant tissue culture, Biochemistry & Microbiology. Our Department of Biotechnology is organizing the National Conference on " Biotechnological Approach on Current Challenges in - BIOTA - 2024" to be held on 2nd February 2024 at Our Sona campus, Salem. Major thrust areas of biotechnological applications are enhanced productivity in agriculture, live stocks, pharmaceuticals, diagnosis, resource management, energy generation and environmental sustainability. This conference provides a platform to upgrade our knowledge among scientific community on exploring the new strategies in biotechnology to meet out the current challenges worldwide. So far, we have received more than 100 participants from different educational Institutions in and around Tamil Nadu. I hope that this conference will deliver fruitful deliberations to the students, faculty and young researchers.

Mrs. M. Bhuvaneswari
Convener – BIOTA 2024

ABOUT CONFERENCE THEME

Biotechnology deals with multifaceted challenges across ethical, regulatory, and scientific domains. Ethical concerns emerging largely, particularly surrounding gene editing and cloning,need a delicate balance between scientific progress and societal values. Creating strong rules that work together worldwide is very important to manage the global use of biotechnology. Making sure we edit genes with great accuracy, like using CRISPR, is crucial to avoid unexpected problems. This precision is like being careful to do things exactly right when working with the instructions of life. These measures help us use biotechnology safely and avoid any unintended issues, ensuring that the benefits of this technology can be enjoyed by everyone around the world.Meanwhile, the accumulation of vast amounts of genomic data necessitates rigorous data security measures and ethical guidelines to ensure privacy. Addressing climate change through biotechnological interventions, developing solutions to drug resistance, and advancing synthetic biology add layers of complexity to the field. Challenges also emerge in improving bioprocessing efficiency, ensuring reasonable access to biotechnological advancements, and promoting sustainable agricultural practices. Balancing the promise of personalized medicine with ethical considerations, resolving intellectual property issues, and cultivating a skilled workforce are integral components of the biotechnological landscape. Moreover, biological security concerns underscore the importance of responsible research and development. Tackling these challenges and demands requires a collaborative effort from the scientists, policymakers, educators, and the public to harness the potential of biotechnology responsibly and for the collective benefit of humanity.

Sustainable Agriculture

Agriculture, being the backbone of our lives, faces significant challenges in meeting the increasing global demand for food while minimizing the impact on the environment. Natural disasters and diseases affecting plants further hinder agricultural developments.One major concern in conventional agriculture is the extensive use of chemical fertilizers and pesticides. In this context, biotechnology, particularly nano-biotechnology, emerges as a promising solution to address these challenges and promote sustainable agriculture.Nanobiotechnology offers an innovative and sustainable alternative by utilizing green-synthesized nanoparticles. These

nanoparticles, derived from plant extracts, not only provide cost-effective solutions but also minimize environmental pollution and enhance agricultural yields.

Metal-based nanoparticles, such as SiO_2 NPs, ZnO NPs, TiO_2 NPs, MgO NPs, and CuO NPs, have demonstrated their significance in agricultural development. For instance, TiO_2 NPs have shown the ability to enhance seed germination in *Agropyrondesertorum* by reducing the mean time for germination. Silver nanoparticles have improved growth and germination in *Trigonellafoenum* during drought conditions. Zinc oxide nanoparticles synthesized from flower extracts have exhibited antimicrobial and antibacterial activities against *Enterobacillus* spp.Furthermore, SiO_2 NPs from plant extracts act as accumulators or intermediates, enhancing growth, germination, and salt/heavy metal tolerance. Nanoparticles made from chamomile flower extracts, such as MnO_2 and MgO have effectively inhibited brown stripe disease caused by *Acidovoraxoryzae* in rice. Gold nanoparticles (Au NPs) have been found to be taken up and translocated by the roots of *Arabidopsis thaliana*, contributing to seed germination and growth.

The application of nanopesticides, nanofertilizers, nanoinsecticides, and nanofungicides directly to plant roots enhances soil fertility, crop growth, and protection against abiotic stress. Research suggests that nanoparticles interact with the electron transport chain (ETC) and reactive oxygen species (ROS) in plants. Ongoing studies are focused on optimizing the efficient use of nanoparticles to ensure sustainable agricultural development, paving the way for a greener and more environmentally friendly approach to feeding the global population.

Bioremediation for Agricultural Soil Contamination

Bioremediation stands out as a promising solution to address current challenges in agriculture and environmental sustainability, particularly concerning soil pollution caused by the accumulation of heavy metals and aromatic contaminants. The application of bioremediation employs the unique abilities of microorganisms, including bacteria, archaea, fungi, and microalgae, to combat soil pollution effectively. Certain bacteria, such as *Agrobacterium* spp., *Bacillus* spp., *Klebsiella, Pseudomonas, Sphingomonas, Sphingobium, Rhodococcus*, and *Phanerochaetechrysosporium*, have demonstrated their capacity to resist and utilize heavy metals. For instance, *Achromobacterdenitrificans*has shown effectiveness in removing mercury,

lead, and cadmium, while *Klebsiellaoxytoca* can utilize lead, mercury, zinc, and cadmium. *Rhizobium radiobacter* has displayed efficacy in dealing with lead, mercury, and nickel.

Microbes employ various mechanisms, including bioaccumulation, biomineralization, biovolatilization, bioabsorption, and biodegradation, to immobilize heavy metals. These microorganisms can produce substances with binding receptors that accumulate heavy metals over the cell wall, effectively removing pollutants from the soil; additionally, microbes release phytohormones. This symbiotic relationship contributes to the overall health and resilience of plants in metal-contaminated soils.Beyond heavy metals, aromatic contaminants from industries and agrochemicals pose another challenge. Fungi, including*Pleurotusostreatus, Phanerochaetechrysosporium, Trametes versicolor, Ganodermalucidum,* and *Irpexlacteus,* secrete lignin modification enzymes that can degrade resistant polycyclic aromatic contaminants in the soil. Moreover green algae and cyanobacteria, play a crucial role in controlling soil pollution and promoting soil fertility. These microorganisms contribute to the overall health of the soil ecosystem, offering a sustainable and environmentally friendly approach to fight against soil contamination. Through the strategic use of microorganisms, emerges as a cutting-edge biotechnological solution to mitigate soil pollution, restore soil health, and ensure sustainable agricultural practices in the face of current environmental challenges.

Healthcare Systems

In recent years, biotechnology has emerged as a transformative and versatile technology with applications spanning various research fields, including medical, healthcare, chemical, electrical, optical, and biological domains. Gene therapy, a method involving the transfer of genes into stem cells, holds huge potential for treating various genetic disorders and diseases. Traditional gene therapy methods depends on viral vectors which possess inherent risks, including the potential for immune responses, inflammation, and unintended consequences in untargeted areas of the host body.To address these challenges, non-viral nanostructures have emerged as a safer alternative for gene therapy in the healthcare system. Non-viral vectors made of nanoparticles exhibit fewer oncogenic properties and rarely induce immune responses, reduce the risks associated with viral vectors. It also reduces the possibility of viral recombination and offer flexibility in loading genes of varying sizes.Moreover, the ability to encapsulate genetic materials like DNA and RNA enhances the efficiency of gene transfer methods. This makes

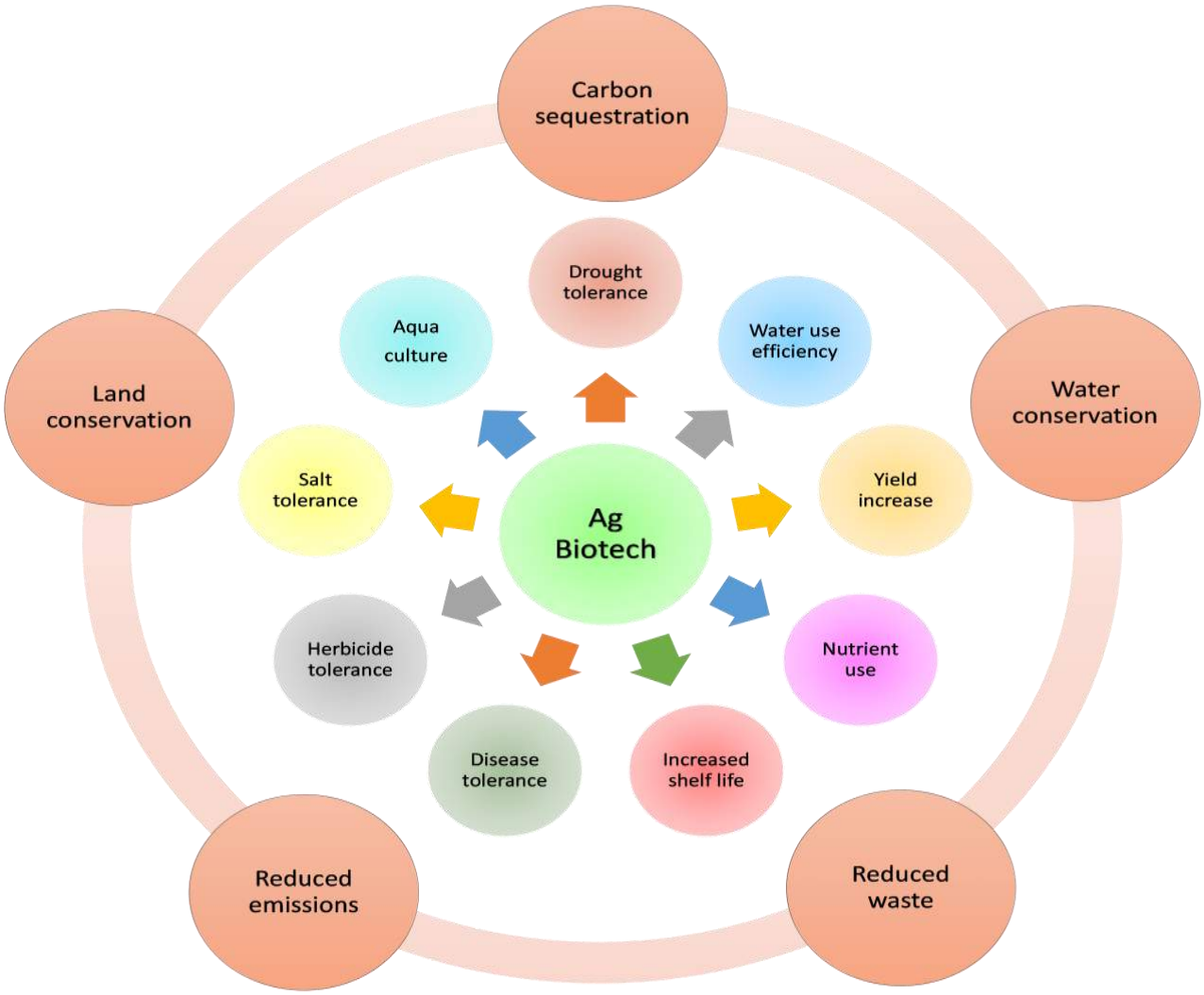
nanoparticles highly beneficial as vectors in gene therapy, promising a safer and more targeted approach to healthcare interventions. The integration of nanotechnology into gene therapy addresses current challenges in biotechnology for the healthcare system by providing a safer, more efficient, and targeted means of delivering genetic materials for therapeutic purposes.

Genetically modified foods

The prospect of delivering vaccines and medicines through the ingestion of genetically modified (GM) foods presents an interesting and convenient method. However, working on this idea involves overcoming various challenges associated with the development and acceptance of GM foods. Environmental concerns also contribute to the challenges surrounding GM foods. Potential impacts, such as the development of resistant pests and crossbreeding with wild plant species, raise ecological worries. Cross-contamination between genetically modified and non-modified crops poses risks, particularly for organic farmers and those aiming to maintain a GM-free supply chain. Critics argue that widespread adoption of genetically modified crops may lead to a reduction in biodiversity by favouring a small number of genetically uniform crops. Ethical questions arise, encompassing issues related to the ownership of genetic material, patents, and the potential exploitation of developing countries by biotechnology companies.Ensuring the absence of health concerns is paramount for GM foods. The long-term health effects of consuming genetically modified foods are still under ongoing research, introducing insecurity that poses a challenge for the industry. As biotechnology advances, navigating these complexities will be vital for the responsible development and acceptance of GM foods in the global market.

G Kamya, K. Priyadharshini, T M Mothilal

III B.Sc Biotechnology


Carbon sequestration
Water conservation
Reduced waste
Reduced emissions
Land conservation
Ag Biotech
Drought tolerance
Water use efficiency
Yield increase
Nutrient use
Increased shelf life
Disease tolerance
Herbicide tolerance
Salt tolerance
Aqua culture

AGENDA

09.00 am	Registration		
10.00 am	Prayer Song	:	Biotech Students
10.05 am	Lighting The Kuthuvilakku	:	Dignitaries
10.15 am	Welcome Address	:	**Dr. R. Suriyaprabha** Asst. Professor, Biotech, SCAS
10.20 am	Presidential Address	:	**Mrs. M. Bhuvaneswari** Head, Department of Biotechnology, SCAS
10.30 am	Souvenir release, Honoring the Guests & Key note Address	:	**Dr. G. M. Kadhar Nawaz** Principal, SCAS
10.45 am	Introducing the Speaker 1	:	**Dr. M. Srilatha** Asst. Professor, Biotech, SCAS
10.50 am	Invited Talk 1		**Dr. R. Rajeshkumar** Professor and Scientist Pharmaceutical Biotechnology Dept. JSS College of Pharmacy, Ooty
11.30 am	**Tea break**		
11.45 am	Introducing the Speaker 2	:	**Dr. B. Jayanthi** Asst. Professor, Biotech, SCAS
11.50 am	Invited Talk 2		**Dr. R. Subathra** Stem Cell Biologist Dr Rela Institute and Medical Centre National Foundation for Liver Research, Chennai
12.30 – 01.00 pm	Quiz		Round 1

Working Lunch

Display : Poster and Petri Art @ Biotech Lab

02.00 – 03.45 pm	Oral Presentation	: @ PG Auditorium
	Quiz –Final	: @ CV Raman Hall

Tea Break

04.00 pm	Valedictory Function	: Prize & Certificate Distribution Feed Back Session Vote of Thanks **Dr. S. Vasuki** Asst. Professor, Biotech, SCAS
04.20 pm	National Anthem	

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Invited Talk 2	**Dr. R. Subathra** Stem Cell Biologist Dr Rela Institute and Medical Centre National Foundation for Liver Research, Chennai	**Topic** *Revolutionary Potential of Stem cells*

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OP : 01

Revolutionizing Liver Transplants: Expanding the Organ Pool with Non-Antigenic Functional Livers by Regenerating Metabolically Active Parenchymal Cells within Acellular Liver Matrices from Marginal Donors

Catherine Ann Martin[a], Subathra Radhakrishnan,[a]Subbaraya Narayana Kalkura[a,b], Mukul Vij[c], Ashwin Rammohan[c] and Mohamed Rela[a,c*]

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The liver serves as a pivotal metabolic organ, engaging in diverse functions in coordination with other bodily systems. Unfortunately, when it comes to end-stage liver diseases, liver transplantation stands as the sole established treatment option, where the scarcity of available organs poses a significant challenge. We propose a hypothesis wherein non-immunogenic bioengineered livers could serve as an extracorporeal device to carry out metabolic functions in patients experiencing acute liver failure. In this research, a novel 3D matrix has been developed by combining native collagen fibrils and a human-decellularized extracellular matrix derived from liver components, employing the lyophilization technique. Infrapatellar fat pad stem cells (IFPSCs) were utilized and subjected to characterization using state-of –the-art techniques. The stem cells exhibited mesenchymal and pluripotent stem cell markers, with no expression of CD11b and CD45. Examination through H & E staining and SEM revealed that the decellularization process effectively eliminated cells while preserving the microanatomy of the liver extracellular matrix (ECM). Immunocytochemical analysis performed at day 35 following induction demonstrated the expression of endoderm and hepatocyte-specific markers, such as sox17 and cytokeratin 18, further substantiating the efficient transdifferentiation of IFPSCs within the fabricated scaffold. They also displayed functional genes, including Albumin, Tyrosine aminotransferase, tryptophan 2,3-dioxygenase, and HNF4ά. Based on these findings, it can be concluded that metabolically active parenchymal cells reintroduced into an acellular liver matrix (ECM) obtained from marginal livers, results in the generation of a bioengineered liver-like tissue.

Key words: Liver ECM, Collagen, Infra patellar fat pad stem cells, decellularization, tissue engineering.

OP : 02

Elicitation of apigenin in green leafy vegetable plants and its molecular docking evaluation for effective applications

Selvaraj Pushpavathi*.,Thiyagarajan Sankari*- Selvakumar Boobalan [1]- Manohar Aarthi [1] & Mohan Prasanna Rajeshkumar [1]

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Elicitors are generally recognised as safe substances and application to crops is effective for stimulating the biosynthesis of health promoting phytochemicals. The study includes six selected green leafy vegetables (*Coriandumsativum,Trigonellafoenum – graecum, Amaranthusretroflexus, Amaranthus tortuous, Spinaceaoleracea and Amaranthustricolor)* that are appropriate for their growth in Indian fertile soil .The selected linesexhibited their growth enduring elicitors [chitosan (CHT), salicylic acid (SA) and methyl jasmonate (MeJa)] treatments at different concentrations. The best-grown variety denoting maximum shoot and root measurements was further characterized by phytocompounds, and antioxidant ability. Furthermore, phytocompounds screening showed the presence of alkaloids, flavonoids, phenol, terpenoid, protein, and carbohydrates. Besides, flavonoids and phenolic compounds were screened quantitatively for their presence in *A.retroflexus*and *A.tricolor* . This study proved higher antioxidant ability with the AEME- Apigenin compound -enriched methanolic extract from *A.reterofleuxs*with ,MeJa mg/l than the other grown green leafy vegetables. In addition ,this study proved higher antioxidant sufficiency which was attained through the influence of elicitors. The potentiality of the synthesized apigenin compound was evaluated by docking it against colon and breast cancer cell lines. Finally, the toxicity range was tested using zebrafish (*Daniorerio)*. The results state that CHT, SA and MeJa elicitor applications are the most effective strategies for promoting the biosynthesis of phytochemicals in vegetables. As a result, this study provides a sustainable approach that enhances apigenin in green leafy vegetable plants for anticancer applications.

Key words **:** Elicitor, *Amaranthusretroflexus*, HP-LC, Antioxidant compound, Molecular docking, Toxticity.

OP : 03

Synthesis and development of a gold-nano particle based novel dot immunobinding assay for rapid and sensitive detection of Banana bunchy top virus

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Banana bunchy top disease (BBTD) is a devastating disease in banana cultivation. *Banana bunchy topvirus*(BBTV) is the causative agent of the BBTD disease and it is semi-persistently transmitted through the banana aphid *Pentalonianigronervosa*. *There are limited diagnostic tools are available to diagnose the BBTV. So it is much necessary to find an alternative and rapid diagnostic technique based low cost and easily repeatable*. Dot immunobinding assay (DIBA) is much less expensive, simpler to perform, and can be easily used as a field screening test. I would like to develop an gold nanoparticles based DOT immunobinding assay (DIBA) in this project. (DIBA) is generally can be used as for the detection tool of banana bunchy top virus (BBTV), because it is more efficient, sensitive, rapid and simpler than DIBA and ELISA . This research can be done by either commercial gold nanoparticles/biosynthesized gold nanoparticles from *Mimosa tenuiflora* instead of enzyme conjugates, can be used as reports owing to their unique optical properties. These gold nanoparticles can be conjugated to primary detection and the antibody can be raised following immunization with recombinant coat protein, making it highly specific for the virus. Antibody also can be raised against expressed recombinant coat protein of BBTV. In this study I would like to synthesize the gold nanoparticles and also those particle can be conjugated to primary antibody (GCPAB) based DIBA for the development of BBTV detection.

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OP :04

Mycosynthesis and characterization of silver nanoparticles and their activity against some human pathogenic bacteria

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The synthesized silver nanoparticles produced by the fungus *N. sphaerica* is a promising to be used as safe drug in medical therapy due to their broad spectrum against pathogenic bacteria. To examine their activity against three human pathogenic strains of bacteria viz. *Proteus mirabilis, Pseudomonas aeru-ginosa, Salmonella typhi* using disc diffusion method. This study was to biosynthesis silver nanoparticles from the fungus *Nigrospora sphaerica* isolated from soil samples. The synthesized silver nanoparticles from free- cell filtrate were characterized by using UV–Vis spectro- photometer analysis, Fourier transform infrared spectros- copy (FTIR) and scanning electron microscope (SEM). UV–Vis spectrophotometer analysis showed a peak at 420 nm indicating the synthesis of silver nanoparticles, FTIR analysis verified the detection of protein capping of silver nanoparticles while SEM micrographs revealed that the silver nanoparticles are dispersed and aggregated and mostly having spherical shape within the size range between 20 and 70 nm. The synthesized silver nanoparticles exhibited a varied growth inhibition activity (15–26 mm diam inhibition zones) against the tested pathogenic bacteria. A remarkable increase of bacterial growth inhibition (26–34 mm diam) was detected when a combination of silver nanoparticles and Gentamycin was used. A significant increase in fold area of antibacterial activity was observed when AgNPs in combination with Gentamycin was applied.

Keywords: Antibacterial agents, Fungal free-cell filtrate, Mycosynthesis, Pathogenic bacteria. Silver nanoparticles. Synergistic effect.

OP :05

Medicinal Uses of *Euphorbia Hirta*

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Euphorbia hirta Linn., an annual medicinal herb of Kumaun Himalaya Uttarakhand, which is commonly known as 'Dudhy' and is used in conventional medicine to treat various diseases such as gastrointestinal disorders, respiratory system disorders, and asthma. The review compiles information on the plant's medicinal uses, phytochemicals, and biological activities. Qualitative and quantitative phytochemical studies revealed the presence of various chemical compounds in which flavonoids, terpenoids, and phenols are the major constituents. The plant has interesting antimicrobial, antioxidant, antidiabetic, and antitumor properties, and some traditional uses of the plant also indicate its high medicinal potential. The crude hydroalcoholic extract of *E. hirta* has more pharmacological activities and is used as an important medicinal and nutritional source for curing many severe illnesses in different parts of the world. The article emphasizes the need for further research and clinical trials to explore the pharmacological activity and clinical efficacy of this plant, including the isolation and identification of more bioactive constituents and elucidation of their structure and activity.

Key words : E. hirta, Dudhy, flavonoids, terpenoids, phenols.

OP :06

Synergetic and Salubrious Effects of Umbelliferone with Vitamin C on Nitrosodiethylamine Induced Hepatocellular Carcinoma

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Hepatocellular carcinoma (HCC) is the fifth most ubiquitous deadliest cancer in worldwide. The present study aims at elucidating the synergic action of umbelliferone (UMB) with Vitamin C in N-Nitrosodiethylamine (DEN) induced rat liver carcinogenesis. Rats were randomly distributed into five groups of six rats each as follows. Group I rats received standard pellet diet and served as control. Group II rats were induced with HCC by DEN through drinking water for 15 weeks. Group III rats received UMB (30 mg/kg body weight) and Vitamin C (200 mg/kg body weight) for 16 weeks every day. Group IV pretreated rats received UMB with Vitamin C one week prior the administration of DEN and continued till the end of the experiment. Group V post-treated rats received UMB with Vitamin C for five weeks after the administration of DEN and continued till the end of experiment. DEN induction increases the activities of lipid peroxidation, tumour markers and liver marker enzymes with decreased levels of antioxidant enzymes. UMB with Vitamin C treatment restored the elevated activities of above enzymes and markers to near normal with increased activities of antioxidants. Histological observations of liver tissue also confirm the above biochemical findings. UMB with Vitamin C treatment have salubrious effects against DEN induced hepatocellular carcinoma.

Keywords: Hepatocellular carcinoma, N-Nitrosodiethylamine, umbelliferone, VitaminC, lipid peroxidation, Tumour markers.

OP :07

Synthesis, Characterization, Antioxidant, Anti-Bacterial and Anti-Cancer Activity on Copper Nanoparticles of *Andragraphis Paniculata* Aqueous Leaf Extract

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Andragraphis paniculata, commonly knpown as creat or green chiretta, is an annual herbaceous plant in the family Acanthaceae. In our project we have collected *Andragraphis paniculata* and conducted antioxidant, antibacterial and cytotoxicity test. We have conducted the phytochemical analysis on aqueous extract of *Andragaphis paniculata* to observe the phytochemical components present in extract of *Andragraphis paniculata*. Then we synthesized the copper nanoparticle from aqueous extract of *Andragraphis paniculata* by chemical method. Characterization of copper nanoparticles was done by UV visible spectroscopy to determine optical properties and absorption band related to in the nanoparticles. Antioxidant activity of copper nanoparticles was determined using DPPH assay method. Antibacterial activity against *Bacillus subtilis, E.coli, Klebsella pneumoniae, Staphylococcus aureus* was determined using copper nanoparticles. Anticancer activity against HepG-2 cell line was determined using MTT assay method. Results revealed that copper nanoparticles synthesized from aqueous extract of *Andragraphis paniculata* were successful in Antibacterial and Cytotoxicity test.

OP :08

Characterization and *in vitro* analysis of biosurfactant producing bacteria from Vellore textile effluent

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Numerous microbial species create biosurfactants, which are low-toxic, biodegradable and have a propensity for neutralizing organic and several synthetic contaminants. Biosurfactants have traits that have been proven to be advantageous over synthetic surfactants. Hazardous compounds found in textile effluent have a terrible impact on the environment and life. This study mainly focuses on isolating different colonies from the textile effluent. The colonies were subjected to several screening assays to test their ability to produce biosurfactants. The assays include drop-collapse assay, microplate assay, oil displacement test, emulsification capacity (E24). As a hydrocarbon source, diesel was used to grow the colonies. The sample showed emulsification (up to 25%) property in Emulsification index (E24) assay. Hence it can be concluded that the bacteria isolated may produce biosurfactant which can be used for degrading toxic hydrocarbons, synthetic dyes and can also be used for crude oil removal from sea pollution. Several biochemical tests like catalase test, oxidase test, substrate utilization test, gram staining and endospore staining were also conducted.

Keywords : Biosurfactants, Textile effluent, Oil displacement and Emulsification index.

OP :09

Isolation, Screening of Enzyme Producing Bacteria from Groundnut Rhizosphere Soil Samples Collected from Kadayampatty Block of Salem District in Tamil Nadu, India

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The use of associated plant-based, native beneficial microbes for sustainable farming is increasing worldwide acceptance as they colonize effectively under stress conditions at specific plant habitat to maximize crop productivity. In the present study, indigenous plant growth promoting bacterial isolates were isolated from the rhizosphere soil of groundnut plants aiming to investigate their enzyme producing capability. Totally, 31 bacterial isolates were isolated from the two rhizosphere soil samples collected from the agricultural field. Out of twenty-four bacterial isolates were 15 isolates were amylase positive, 11 isolates were protease positive, 5 isolates were phosphatase. As a result, this study revealed novel native microbes are potential for the development of groundnut plants.

Key words: Groundnut, Amylase, Protease, Phosphatase, Bacteria.

OP :10

Phytochemical Analysis and *In Vitro* Anti-Inflammatory Activity of Methanol Extract of *Tinospora Cordifolia* Leaves

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This study was undertaken to evaluate the phytochemical analysis and *in vitro* anti-inflammatory activity of methanol extract of *Tinospora cordifolia* leaves. The preliminary phytochemical screening of methanol extract of *Tinospora cordifolia* leaves was carried out using Harbone method. Various concentrations of methanol extract of *Tinospora cordifolia* leaves was taken for *in vitro* anti-inflammatory activity. The methanol extract showed the presence of alkaloids, glycosides, steroids, terpenoids, phenols and tannins. The methanol extract of *Tinospora cordifolia* leaves were investigated for its anti-inflammatory activity by Human RBC membrane stabilization method. Various concentrations (25, 50, 100 and 200µg/ml) of methanol extract of *Tinospora cordifolia* leaves was taken for *in vitro* anti-inflammatory activity. The results showed that the methanol extract of *Tinospora cordifolia* leaves exhibited strong anti-inflammatory activity in a dose dependent manner with IC50 value of 49.5µg/ml. The results showed the use of *Tinospora cordifolia* in traditional medicine for the treatment of inflammation.

Keywords : *Tinospora cordifolia*, Phytochemicals, Inflammation, Membrane stabilization.

OP : 11

Role of Antioxidants, Minerals and Plasma Proteins in Coronary Heart Disease

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Coronary heart disease or ischaemic heart disease (IHD) is synonymous terms for a group syndromes arising from failure of the coronary arteries to supply sufficient blood to the myocardium. The coronary arteries can also get narrow or eventually closed when the athermatous plaques of the artery rupture are covered. Ishemia means that the amount of oxygen supplied to the tissue is inadequate to supply the needs of the tissue. CHD is associated with smoking, obesity, hypertension and a chronic sub-clinical lack of vitamin C. Antioxidant therapy may inhibit atherosclerosis and therapy prevent the clinical complications of the disease such as CHD and in particular MI. In healthy individuals, antioxidants protect components of the body against free-radical damage. The lipid hydroperoxide end-products are also harmful, and may be responsible for some of the overall effect, which can lead to tissue and organ damage. Individuals with high dietary intakes of vitamin C, vit E and β carotene have a lower risk of CHD and may have a greater life expectancy. An interesting inference form the study of minerals, antioxidant activities and plasma protein play a role in heart attack in humans. Hence, Coronary heart disease may have a effect on the antioxidant enzyme activity, mineral and plasma protein levels in aged persons. Dietary sources of readily absorbed haem iron may also contain saturated fat and cholestrol. In this present study, the mechanism by which high calcium-phosphorus product could lead to vascular calcification, arterial stiffening and cardiovascular disease remains to be elucidated. In conclusion, the data on CHD suggest that antioxidant, minerals and plasma proteins variation at middle age people, due to inadequate amount of fat intake and also increased plasma proteins elevations is one of the reason.

Key words : Coronary heart disease (CHD), Ischaemic heart disease (IHD).

OP : 12

Characterization and Evaluation of Oxidative Stress-Induced Liver Disease Model Using Adipose-Derived Stem Cell-Differentiated Hepatocytes: Implications for Drug Discovery and Personalized Treatment

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The liver is a vital organ responsible for a wide range of metabolic functions to maintain homeostasis like detoxification of drugs and xenobiotics, metabolism of macromolecules, enzyme activation, and glycogen storage. The redox imbalance causes oxidative stress leading to acute or chronic liver disorders by modulating liver function and inflammatory pathways leading to the progression of liver disease to fibrosis, cirrhosis, and hepatocellular carcinoma (HCC). The development of disease models for oxidative stress-induced liver diseases was generated using human adipose-derived stem cells (ADSCs) induced hepatocyte differentiation by following a two-step protocol. The ADSCs-derived hepatocytes will be characterized using Immunocytochemistry and RT-PCR. Cisplatin which plays an important role in oxidative stress involved in causing toxicity to various tissues by increasing intracellular ROS levels which was used to induce hepatotoxicity. The present study aims to characterize the hepatocytes differentiated from ADSCs and evaluate the cisplatin-induced oxidative stress in ADSCs-derived hepatocytes. Further, the signal transduction pathways involved in cytoprotective mechanisms in hepatocytes will be studied using the same model, where western blot and qPCR are employed. Developing the disease model for a liver disorder caused by oxidative stress will be a useful tool for drug discovery, investigating biology, and potentially helpful for developing personalized treatment.

Key words: Liver, oxidative stress, ADSCs, hepatocyte, cisplatin, disease model, signal transduction pathways.

OP : 13

Cellular Restoration in Hypoxic Environment Induced by Parkinson's Disease Through Optimized Infrapatellar Fat Pad Stem Cells

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Parkinson's disease (PD) is a neurodegenerative disorder that occurs mainly due to increased loss of Midbrain Dopaminergic neurons (mDA) in Substantianigra pars compacta. mDA is the chief constituent to secretes, the neurotransmitter, dopamine which plays a vital role in regulating multiple brain-related functions. It is very challenging to diagnose PD at early stages due to the exhibited common neurological symptoms. Regeneration of functional mDA neurons through cell-based therapy in PD patients could be an alternative therapeutic intervention. However, the established *in situ* hypoxic condition in the midbrain of PD patients poses a great challenge. Hypoxia is a low-oxygen level (< 21%) condition that induces the Transcription factor called Hypoxia-Inducing Factor (HIF). HIF is the master regulator for embryonic and placental development. The early process of Neurogenesis in utero is induced under a hypoxic environment. Hence, we hypothesize that hypoxia-induced mDA neurons could endow resistance against the pathological condition in PDs. In this study, adipose-tissue-derived stem cells were isolated from infrapatellar fat pad tissue (IFPSCs). IFPSCs get exposed to a hypoxic environment followed by a cocktail of inducing factors that aid in differentiation. Characterization of the differentiated cells was done by RT-PCR, Immunocytochemistry, and Western blotting. The expected outcome of the present study involving the generation of mDA neurons holds great potential for disease modeling and therapeutic modalities.

Key words: Parkinson's disease, Dopamine, Hypoxia, Stem cells, Transcription factor.

OP : 14

A Promising Approach on Mass Cultivation and Production of Therapeutically Active Withanolides through Bioreactor Shoot Culture of *Withaniasomnifera*: A Predominant Medicinal Herb

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Ashwagandha, scientifically known as *Withania somnifera Dunal*, is an important medicinal plant in the Ayurvedic system of medicine. Being a medicinal plant, dried powder, crude extract as well as purified metabolites of the plant has shown promising therapeutic properties. Withanolides are the principal metabolites, responsible for the medicinal properties of the plant. In this study, for mass cultivation of shoots, branches from 15 days old *in vitro* grown shoot clusters were transferred to MS suspension fortified with 4.44 µM BAP in a bubble column bioreactor (Biopia, Korea). Growth index for *in vitro* grown shoot tissues was calculated after 20, 30, 40, 50 and 60 days of cultures. The optimum biomass growth and growth index were observed in 60 days *in vitro* shoots (101.2 g/L FW and 32.73). The higher amount of withaferin A (3872 µg/g DW) and withaferin A (487.02 µg/g DW) content was observed 50 day *in vitro* shoots Successful proliferation of shoots in liquid medium and the synthesis of withanolides in *in vitro* opens new avenues for bioreactor scale-up and the large-scale production of the bioactive phytoconstituents.

Key words : *Withania somnifera*, Withanolide A, Withaferin A, Bioreactors

OP : 15

Phytochemical Investigation of *Adhatoda vasica* Leaf Extract

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Adhatoda vasica leaves are an important medicinal plant from which drug molecules can be developed for heart and coronary diseases and atherosclerosis. *A. vasica* ethanolic and aqueous extract showed that the tannin, saponin, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthroquinone, polyphenol, glycoside and coumarins were present. Quantitative analysis revealed that *A. vasica* leaves has significant amount of flavonoids, phenol and terpenoids. Histochemical analysis of *A. vasica* powder further confirmed the presence of phytochemicals. Fluorescence analysis of *A. vasica* leaves powder was also performed. The result of UV-Visible spectroscopic analysis confirmed the presence of phenolic compounds in the leaves extract. Separation and identification of flavonoids was done using Column chromatography and TLC. Thus the present study concluded *A. vasica* leaves extract contain rich source of phytochemicals. Further the plant extract will be analysed for inhibition of lipase activity which can be further evaluated as novel drug candidate.

Key words : *Adhatoda vasica*, Phytochemicals, Qualtative, Quantitative, Histochemical analysis.

OP : 16

Quantitative Biochemical Analysis of Starch extracted from Corn (*Zea mays*)

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Synthetic Plastics are hazardous to the environment and to the living organisms. Due to the negative impact of synthetic plastics, the development of biodegradable plastics is more important. The natural sources in earth impart compounds that are applicable in biodegradable plastic manufacture. Corn is a starch rice source grown in many countries all over the world, it requires warmer climate to develop into a matured one. The aim of the study is to extract starch from Corn and to make a biodegradable plastic film. The sample was purchased from Avadi, Chennai and washed thoroughly in running water. The cleared Corn was grinded in mortar and pestle using solvent. The extracted starch was identified using iodine test. The biodegradable plastic is prepared with starch, glycerol, vinegar and gelatin. The specimen prepared are cut to pieces and buried in the soil at a depth of 1cm and 3cm for fifteen days. The weight of the specimen is tested before and after the analysis. The study confirms the biodegradable capacity in Corn starch. Further microscopic analysis will elucidate the complete efficacy of the material and henceforth they can be used to prepare polybags.

Key words : Starch, Biodegradable, Plastic, Eco-friendly.

OP : 17

Extraction and Phytochemical screening of *Boerhaavia diffusa* leaves

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Boerhavia diffusa L occurs abundantly as a weed throughout India. It is a spreading perennial and creeping herb. *Boerhaavia diffusa* is the rich source of minerals contains the nutritional and biochemical components (carbohydrates, fats, proteins, vitamins, micro element and macro element).The carbohydrates (10.56 mg/gm) and protein (5.76 mg/gm). The major elements in the plant are Magnesium (142 mg/100g). The nutritive value is helpful for to establish a natural drug for research. The aim of the present work is to evaluate the phytocompounds of *Boerhaavia diffusa* leaves by qualitatively and quantitatively. The preliminary phytochemical screening revealed the presence of alkaloids, tannins and flavonoids which involved in treating various diseases like cancer. The secondary metabolites present in the hydroethanolic extract of *Boerhavia diffusa* possess various pharmacological properties such as anti-tumor, hepatoprotectivity, antioxidant, anti-diabetic, anti-ulcer and anti-microbial. The present study validates the traditional uses of *Boerhavia diffusa* leaves in treating of many diseases and its extract has found to possess many pharmacological activities.

Key words: *Boerhavia diffusa L,* phytocompounds, pharmacological activities, alkaloids, tannins and flavonoids.

OP : 18

Isolation, identification of fungus from soil and their potential larvicidal efficacy against mosquito larvae *Culex quinquefasciatus*

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Mosquitoe vector can transmit pathogens between from animals to human that causes major public health problems as vector of serious human diseases like malaria, dengue, chikungunya, and zika. *Culex quinquefasciatus* are transmitting lymphatic filariasis, Japanese encephalitis. Various chemical pesticides are used to kill the mosquitoes Viz., carbamates, organophosphate and pyrethroids that contaminate soil, water, air and other vegetation. The entomopathogenic fungi are unique, ability to directly infect the host; these are the advantages of fungi as a bio-control agent for mosquito control. Therefore we developed an alternative way to control mosquitoes that is biological control by using fungus (*Aspergillus* species) which is ecofriendly. This study aims to evaluate the larvicidal activity of *Aspergillus flavus, Aspergillus fumigates* and *Aspergillus acluteas* against *Culex quinquefasciatus* larvae. Fungi are isolated from soil and identified by microscopic characteristics technique. More than 20 species of fungi are isolated from soil, among them particularly four *Aspergillus* species are taken for larvicidal bioassay against *C. quinquefasciatus*. *Aspergillus oryzae* showed moderate mortality. *Aspergillus flavus* and *Aspergillus acluteas* showed low mortality rate when compare to *A. fumigatus*. We conclude that *Aspergillus fumigates* with spore concentration at 7.7 $\times 10^7$ showed high mortality rate compared to other *Aspergillus* species and control.

Key words: *Aspergillus flavus, Aspergillus fumigatus, Culex quinquefasciatus,* Larvicidal, Biological control.

PP : 01

Phytosynthesis and Anti-Cancer Effects of Cinnamon against Heptocellular Carcinoma using sodium selenite nanoparticles

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Liver cancer is also a leading cause of cancer deaths worldwide, accounting for more than 700,000 deaths each year. Cinnamon has an anti-cancer effect due to the interaction of its molecules in different pathways involved in the proliferation, survival, spread and programmed death of cells. Cinnamon is a natural component showing a wide range of pharmacological functions including anti-oxidant, anti-microbial and anti-cancer activities. Impaired apoptosisis plays critical roles in the initiation and progression of cancer.Theanti carcinogenic potential of cinnamon varies with the type of cancer and also depends on the administered active compound individually or in combination with some chemicals or even extract of cinnamon as a whole.Some of its active components exert chemo sensitization of well-known anticancer drugs. Our review describes the potential of cinnamon in the modulation of neo plastic processes through affecting different biochemical signaling pathways, especially apoptosis. In this study, we highlighted anti liver cancer properties of cinnamon, particularly through targeting apoptosis-related mechanisms.

Key words : Chemo sensitization, Anti carcinogenic, Neo plastic, Apoptosis.

PP : 02

Green synthesis of silver nanoparticles using *Azimatetra cantha* plant extract against clinical pathogens

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Nanotechnology has become an emerging success in the field of medicine. The nanoparticles have enhanced pharmacological behavior compared to the larger sized particles. These nanodrugs can be obtained from various sources like plants, seaweed, fungi etc., the green synthesis of nanoparticles is environmental friendly the plant kingdom is a treasure trove of potential drugs. The plant *Azimatetra cantha* has a great medicinal value .the green synthesis of silver nanoparticles by *Azimatetra cantha* leaves extract has potential anti-bacterial effects.it greatly inhibits clinical pathogens such as *Salmonella*, *Staphylococcus aureus, Klebisella pneumoniae* and *Pseudomonas aeruginosa*. Nanoparticle characterization studies like UV spectroscopy, FTIR, SEM and GCMS were also performed and provided effective results. It also has anti-cancer activities, anti-inflammatory activities and anti-fungal activities.

Key words: *Azimatetra cantha*, silver nanoparticle, FTIR, GCMS, SEM, *Staphylococcus aureus*

PP : 03

Phytochemical analysis and green synthesis of silver nanoparticle using *Phyla nodiflora*

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Antimicrobial agents are abundant in medicinal plants and can be used to make a wide range of effective and potentially useful medication. *Phyla nodiflora* is under the family of verbenaceae, small creeping herb and mainly used as traditional medicine for dandruff. The leaf powder was extracted in steps using methanol as the extraction solvent. Leaf extract from the *Phyla nodiflora* were screened for the quantitative phytochemical screening and green synthesis of silver nanoparticles. Preliminary phytochemical analysis for alkaloid, anthraquinone, protein, and amino acid, flavonoids, carbohydrates, tannins, terpenoids, saponins, coumarin, quinone, steroids, starch, phlobatannis, cardiac glycosides which are followed by standard procedure. The green synthesis of AgNPs were characterized by UV-Visible spectrometer and Fourier transform Infrared spectroscopy analysis of phytochemicals screening the presence of alkaloids, flavonoids, amino acid, Carbohydrates, terpenoids, saponins, steroids, tannins are in considerable quantity an aqueous solution of AgNPs was first examined in the 200-800 nm wavelength range using a UV-Visible spectrometer range. This study concluded that the plant is potential source of natural antimicrobial agent.

Key words: AgNPs synthesis, phytochemical analysis, antimicrobial activity, UV, FTIR, *E.coli.*

PP : 04

Applications of CRISPR in Agriculture

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Plant biotechnology and agriculture have some of the most pressing challenges in the realm of crop improvement, food security and environmental sustainability. To overcome this one such potential gene editing tool is CRISPR. Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) / CRISPR-associated system 9 (Cas9) is amendable to edit any gene in any plant species. It is more efficient compared to Zinc Finger Nucleases (ZFNs) and Transcription Activator-like Effectors Nucleases (TALENs), CRISPR has been used over a decade to modify plant genome, study specific genes and biosynthetic pathways as well as accelerated breeding in plant species. It also succeeded in improving crop quality. Despite the significant advantages of using CRISPR to genetically modify crops, there are also considerable challenges. It includes delivering Cas9 to precise cellular location, non - target genes, loss of genetic diversity and also legal regulatory challenges.

Key words: Cas9, CRISPR, Genome, Zinc Finger Nucleases, TALENS.

PP : 05

Stem Cell Engineering and it's Applications

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Stem cell engineering is a multidisciplinary field that involves manipulating and modifying stem cells to generate specific cell types for therapeutic purposes, research or regenerative medicine. The main goal of stem cells becomes differentiated. The ability to repair or replace damaged tissues and organs such as heart, liver or kidney using stem cell-based therapies or tissues engineering techniques. Stem cell engineering continues to be a rapidly evolving field with ongoing research and advancements were prominent in some areas of interest includes clinical translation, immunotherapy, neurological disorders and brain repair, gene editing technologies such as CRISPR-cas9. The focus of stem cell engineering is on controlling the behavior, differentiation and function of stem cells through techniques such as genetic modification tissue engineering and growth factor regulation. Stem cell engineering holds applicability in various fields including drug discovery, transplantation, tissue engineering, and cell therapy. This dynamic field creates artificial tissue and organs by combining stem cells with bio-materials.

Key words: CRISPR, Tissue engineering, cas9, Growth factor.

PP : 06

Fabrication of Textile Fabrics with Plant Extracts for Enhanced Antimicrobial Activity

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One of the major problems with the textiles is the microbial growth in textiles related to hygiene and fabric deterioration. In the present investigation, an attempt was made to make textiles antimicrobial by incorporating the active principles of plant extract with fabric. In this study, three medicinal plants (*Solanum nigrum, Leucus aspera* and *Naringi crenulat*a) were proposed to have antibacterial activity, extracted by hot and cold extraction methods with distilled water as solvent. The phytochemicals present in the plant extracts were screened qualitatively using APHA methods against the bacterial pathogenic strains. The *Leucus aspera* plant extract possessing antibacterial activity was allowed to embed/fabricated on fabrics. The antibacterial activity of the finished fabric samples have been tested against the same bacterial strains by Agar Diffusion method. The wash durability test revealed that the antibacterial activity of the fabrics is durable upto 4 wash cycles. It was proven that the binding of plant phytoconstituents to the fabric by electron microscope analysis. The active phytoconstituents present in the extract of *Leucus aspera* was analyzed using FTIR and GCMS studies. The GCMS analysis revealed 14 active phytoconstituents present in *Leucusaspera* leaf extract. The traditional method exigency in providing durable treatment leads to the development in this area. The further research in this area will contribute to an improved process, which, instead of coating the antimicrobial agent on the fabric, forms a chemical bond with the fabric.

Keywords: Fabrication, Textile fabrics, Plant extracts, antimicrobial activity, *Solanum nigrum, Leucus aspera* and *Naringi crenulata.*

PP : 07

Isolation of Keratinolytic Bacteria from Poultry Soil and Feathers and its Role in Plant Growth

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Microbial keratinase enzymes offer a substantial advantage in degrading keratin waste. In many microorganisms secreted keratinase degrading enzymes used in our study were isolated from poultry waste soil and feathers. M1 and M2 were isolated from poultry farm soil. M3, M4, M5, and M6 bacteria were isolated from chicken feathers which are identified as *Bacillus licheniformis* (M1), *Corynebacterium bernardi* (M2), *Pseudomonas putida* (M3), *Pseudomonas aeruginosa* (M4), *Staphylococcus aureus* (M5), and *Rhodococcus erythropoiesis* (M6). Among six bacterial isolates, (M5 and M6) had the highest keratinolytic activity in a nutrient agar medium. As a preliminary identification, the gram staining was performed and continued with biochemical characterization. The DNA was isolated from the bacterial isolates and PCR amplification proceeded with the 16S rRNA gene the sequences were determined and a phylogenetic tree was analyzed using MEGA. Previously, feather waste was only dropped, discarded, and used for landfilling. It is regarded as a slow-release fertilizer. It was discovered for the first time that after fermentation with appropriate microorganisms, the hydrolysate demonstrated a possible plant growth-stimulating effect. Because a single dose had long-lasting benefits, the hydrolysate can be regarded as a low-cost, long-lasting plant growth promoter. The proposed approach highlighted the volatilization of feather wastes as an alternative step towards the construction of eco-friendly and cost-effective sustainable fertilizer preparation. Individually, the *C. bernardi* (M2) bacterial isolate shows little plant growth. When *C. bernardi* (M2) bacterial isolates are mixed with *S. aureus* (M5) and *R. erythropoiesis* (M6) bacterial isolates, it will exhibit the highest result in nodule formation and soil fertility. When compared to other bacterial isolates, M5 and M6 bacteria considerably improve the seed. As a result, enzymatic feather hydrolysate could one day be used as a type of biological fertilizer.

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PP : 08

Dietary trans fatty acids and cardiovascular disease risk: past and present

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Trans Fatty acids (TFAs) have long been used in food manufacturing due in part to their melting point at room temperature between saturated and unsaturated fats. However, increasing epidemiologic and biochemical evidence suggests that excessive trans fats in the diet are a significant risk factor for cardiovascular events as well as a risk factor for cancer and diabetes. A 2% absolute increase in energy intake from trans-fat has been associated with a 23% increase in cardiovascular risk. They increase the levels of low-density lipoprotein which is bad for health. Moreover, several epidemiological studies have been demonstrated that a high intake of TFAs increases the incidence of cancer and diabetes. On the other hand, total elimination of TFAs is not possible in a balanced diet due to their natural presence in dairy and meat products. Many products with almost 0.5 g trans-fat, if consumed over the course of a day, may approximate or exceed the 2 g maximum as recommended by the American Heart Association. The objective of the review to demonstrate the causal association between trans fatty acid intake and increase the risk of coronary heart disease through their influence on lipoprotein, association with atherosclerosis, stroke, diabetes and cancer.

Keywords : Saturated fat, cancer, diabetes, balanced diet, meat products.

PP : 09

Corneal Tissue Engineering Using Biomaterials

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Corneal endothelial is a layer of cells present on dorsal region of cornea. It act as blockade that separate liquid humor from other layer of Cornea (stroma and epithelium layer). It maintains hydration and transparency of cornea. This can secure clear vision. Surgical procedures involve replacement of diseased endothelial layer by a healthy layer taken from a donor. There is a global need for the corneas from eye banks. Corneal transplant are of two types: synthetic engineering and allogeneic engineering. Synthetic engineering is done to donor's corneal tissue and it is temporary one until donor is available. It has some side effects. Allogeneic tissue engineering is done from donor. Only disadvantage in this is shortage of donors in corneal tissue around world. Bioengineering in tissue by biomaterials is now an effective method because of their physical, chemical and mechanical nature. Biomaterials are sustainable materials which are biocompatible and do not cause any toxicity when it comes in direct contact with the body. Use of biomaterials as cell substrate acts as nature extra cellular matrix that imitates the own natural environment. So, this could be an alternate for sustainable source for treating endothelial layer by bioengineering and use of biomaterials.

PP : 10

Exploring the Therapeutic Potential of Catharanthus roseus Extract – Gummies

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Catharanthus roseus, commonly known as the Madagascar periwinkle, is a medicinal plant renowned for its rich alkaloid content with significant pharmacological properties. The extraction process, phytochemical composition, and bioactive compounds present in the extract are thoroughly examined. The synergistic effects of alkaloids such as vincristine and vinblastine, known for their anti-cancer properties, are highlighted. The review extensively covers the formulation techniques employed to develop *C. roseus* extract gummies, addressing challenges related to taste, stability, and bioavailability. Various studies investigating the physicochemical properties of the gummies, including texture, viscosity, and shelf life, is critically analyzed. Moreover, the review explores different sweetening agents and natural additives that enhance the palatability and nutritional value of these gummies. Insights into the molecular mechanisms underlying these therapeutic effects are presented, shedding light on the extract's impact on cellular pathways and signalling cascades. Furthermore, the review provides a comprehensive analysis of preclinical and clinical studies evaluating the efficacy and safety of *C. roseus* extract gummies. The potential side effects, dosage considerations, and contraindications are thoroughly examined, ensuring a balanced assessment of their use as a dietary supplement. In addition to the therapeutic aspects, the review explores the broader implications of *C. roseus* extract gummies in the context of global health and wellness trends. The sustainable cultivation practices of *C. roseus*, its economic viability, and the socio-cultural significance of integrating such herbal remedies into mainstream healthcare are discussed. In conclusion, this review provides a comprehensive overview of *C. roseus* extract gummies, encompassing their formulation, pharmacological properties, safety considerations, and broader implications in healthcare. The synthesis of scientific evidence and practical insights offers a valuable resource for researchers, healthcare professionals, and policymakers interested in harnessing the therapeutic potential of this remarkable medicinal plant.

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PP : 11

Anti Inflammatory, Anti Arthritic Activity Of Synthesised Nanoparticles Using *Lantana Camara* Roots

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Lantana camara root were collected from the local vicinity, ethanolic extract from roots of *Lantana Camara* was prepared. Silver Nanoparticles was synthesized from the extract of *Lantana camara roots.* .The synthesized Silver Nanoparticles were characterized using UV visible spectroscopy, X-Ray diffraction, Fourier-transform infrared spectroscopy, scanning electron microscopy and Energy Dispersive X-Ray analysis. Synthesized Silver nanoparticles were tested for anti-inflammatory activity using human red cell membrane stabilization method and were tested for anti-arthritic activity using Protein denaturation and Albumin denaturation method. Results were summarized to find out the efficiency of synthesized nanoparticles in Anti inflammatory and Antiarthritic property.

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Keywords: *Lantana camara*, silver nanoparticles, Antiarthritic activity, Anti-inflammatory activity, SEM, XRD

PP : 12

Machine Learning and Deep Learning Applications in Protein Remote Homology Detection and Fold Identification

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The comprehensive investigation delves into the intricate interplay of advanced machine learning and deep learning methodologies in the domains of protein remote homology detection and fold identification. The amalgamation of evolutionary, structural, and functional data has endowed these computational strategies with unparalleled capabilities, enabling them to unravel intricate protein relationships, forecast enigmatic protein folds, and precisely annotate functions. State-of-the-art techniques, such as Siamese networks, attention mechanisms, and transformer architectures, have emerged as formidable instruments for seamlessly integrating information and extracting intricate features. Illustrative case studies, including the groundbreaking success of AlphaFold in protein structure prediction and the heightened functional annotation achieved by DeepGO, serve as compelling instances of the transformative influence of these methodologies. While computational challenges and the imperative of diverse data sources remain at the forefront, the convergence of machine learning and deep learning stands poised to redefine the landscape of protein analysis, propelling breakthroughs in drug discovery and shedding light on the nuanced dimensions of protein biology.

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PP : 13

Green Synthesis and Characterization of Silver Nanoparticle and *in vitro* Anti-Diabetic Activity of Aqueous Extract of *Michelia champaca* Leaves

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Medicinal plants have always played a vital role as sources for drug lead compounds. Diabetes mellitus is one of the most common diseases affecting of millions of people. The present study was aimed for investigating the Green synthesis and characterization of silver nanoparticle and in vitro anti-diabetic activity of aqueous extract of *Michelia champaca* leaves. The synthesis of silver nanoparticles using *Michelia champaca* extract was eco-friendly and cost effective. The color of the solution changes from yellow to brown colour which is the primary confirmation for the formation of silver nanoparticles. Silver nanoparticle characterization was performed by FTIR. The FTIR study concluded that hydroxyl and carboxyl groups act as reducing and stabilizing agent and phenolic group function as capping agent. The aqueous extract of *Michelia champaca* leaves was studied for its anti-diabetic activity using α – amylase inhibition method. The result of our study revealed that aqueous extract of *Michelia champaca* leaves has significant antidiabetic effect due to the presence of phytochemicals in the plant thus justifying the use of the plant by traditional medicine practitioners for the treatment of diabetes.

Keywords: *Michelia champaca*, silver nanoparticle, FTIR, Anti diabetic activity.

PP : 14

An overview of the filtration systems used in IVF (in vitro fertilization) laboratory Incubator

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This review paper examines the filtering techniques employed in incubators in *in vitro* fertilization (IVF) laboratories. The goal is to analyze which filtering systems are most successful at preserving the ideal environmental conditions for embryonic development. The presence of volatile organic compounds and their impact on the quality of the embryos is the primary reason a filtering system was installed in the incubator. The impact of volatile organic compounds (VOCs) on embryo quality inside an incubator can vary. Exposure to certain VOCs may potentially affect embryonic development. It's crucial to maintain a controlled and clean environment in the incubator to minimize any potential negative effects on embryo quality. Regular monitoring, proper ventilation, and adherence to recommended guidelines can help ensure optimal conditions for embryonic growth. Though the precise quantities of volatile organic compounds (VOCs) are still unclear, air quality, particularly their presence and abundance, may have a detrimental effect on preimplantation embryonic development. The four primary components of the embryology laboratory's AQ control principles are air pressure differential, turbulent air, high-efficiency particulate air (HEPA) filtration, and the VOC filtering system in the incubator. To maintain the maximum level of air purity, future advancements in IVF laboratory air filtering systems in incubators may concentrate on sophisticated HEPA (High-Efficiency Particulate Air) and ULPA (Ultra-Low Penetration Air) filters. The real-time regulation of air quality could be improved by the integration of smart sensors and monitoring systems. Furthermore, energy-efficient design advancements might be given priority to create an environment in IVF labs that is both sustainable and user-friendly.

Key words: Air quality, Incubator, Volatile organic compounds, HEPA filters, Embryonic development and IVF laboratory.

PP : 15

Development Of Lanthanum, Cerium Substituted Hydroxyapatite/Carboxy Methyl Cellulose Nanocomposite For Biomedical Applications

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Dual ionic substitutions have been anticipated as a tool to improve the mechanical and biological properties of hydroxyapatite (HA). The present work deals with the synthesis of lanthanum/cerium co-substituted HA (LCH)/carboxy methyl cellulose (CMC) nanocomposite by microwave irradiation method. The properties of pure HA can be tailored to the preferred extent by simultaneous substitution of La^{3+} and Ce^{3+}. To improve the bioactivity of LCH, CMC was incorporated by different concentrations (0.05, 0.075 and 0.1M) of CMC to enhance the bioctivity property. All the as-synthesized samples were investigated by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), energy dispersive X-ray analysis (EDAX), high resolution transmission electron microscopy (HRTEM) and thermo gravimetric analysis (TGA). Moreover the antibacterial activity of the as-synthesized nanoparticles was evaluated against two prokaryotic strains. The *in vitro* bioactivity of the as prepared LCH/CMC nanocomposite at optimum concentration (0.1 M) of CMC was examined by soaking it in Simulated Body Fluid (SBF) for various days. The as prepared LCH/CMC nanocomposite at optimum concentration (0.1 M) of CMC sample can act as a potential candidate for biomedical applications with good antibacterial property and bone bonding ability.

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PP : 16

Fabrication Of Nanocomposites Based On Samarium Substituted Hydroxyapatite/Heparin: Synthesis And Characterization

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ABSTRACT

Hydroxyapatite (HAP, $Ca_{10}(PO_4)_6(OH)_2$) is a bioceramic material, which promotes osteointegration and thus accelerates tissue fixation at the implant surface during the early stages of implantation. Recently, the synthesis and coating of various trivalent minerals (Ce^{3+}, Sm^{3+}, La^{3+}, Y^{3+}, Gd^{3+}, Tb^{3+}, etc.) substituted HAP improve bioactivity, biocompatibility and osteoconductivity of the HAP. Moreover the bacterial adhesions on implant surfaces represent an initial crucial step in infection and direct to the formation of biofilm, which are more resistant to antibacterial agents. In order to improve the antibacterial activity, Sm has been introduced in the HAP lattice. Also, the biopolymer e.g. heparin has the ability to improve the bioactivity of the HAP and can influence in the particle nature. The present work deals with the synthesis of samarium substituted hydroxyapatite/heparin nanocomposite by hydrothermal method and study the effect of gelatin addition. All the as-synthesized samples were investigated by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM) and energy dispersive X-ray analysis (EDAX). The antibacterial activity of the as-synthesized nanoparticles was evaluated against two prokaryotic strains. The as prepared samarium substituted hydroxyapatite/heparin nanocomposite sample can act as a potential candidate for biomedical applications with good antibacterial property and bone bonding ability.

Keywords: Samarium substituted HAP, heparin, antibacterial activity, nanocomposite

PP : 17

Gingerol from *Zingiber officinales* combined with poly (vinyl alcohol) (PVA)/CH films with for antibacterial activity against food poisoning bacterial strains

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Prevention of food spoilage and food poisoning pathogens is usually achieved by use of chemical preservatives which have negative impacts including: human health hazards due to the chemical applications, chemical residues in food & feed chains and acquisition of microbial resistance to the used chemicals. Because of such concerns, the necessity to find potentially effective, safer and natural alternative preservatives is increasing day by day. Within this context, plant extracts have been used to control food poisoning and preserve foodstuffs during processing, storage and transport. Aqueous extracts of *Zingiber officinales* can be added during the reinforcements phases in poly(vinyl alcohol) (PVA) blended with natural chitosan (CH) based films and also combined, for the first time, with gingerol could be as active agent. Morphological and optical characteristics, mechanical response, thermal and migration properties, moisture content and antioxidant and antimicrobial assays will be conducted during the studies. Morphological, optical and colorimetric results will reveal the efficacy and no particular alterations will induced on the transparency and color of PVA and PVA CH blend by the presence of CNC and gingerol, while they will able to modulate the mechanical responses, to induce antimicrobial activities maintaining the migration levels below the permitted limits and suggesting the possible application in industrial sectors. Finally, inhibitions on bacterial development were detected for multifunctional systems, suggesting their protective function against microorganism's contamination.

PP : 18

Combination of Senna auriculata L. flower and Potassium alum as natural biosorbent for fluoride removal from groundwater

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Fluoride contamination in groundwater is a major concern in many parts of India and all over the world. For the removal of fluoride through the application of biosorbents prepared from different parts of plants like *Senn aauriculata.L* and feasible natural based potassium alum could find greater scope and importance. The present research work will focuses on *Senna auriculata L*., flower petal biomass as biosorbent, and evaluated its feasibility for fluoride ion elimination from groundwater samples. Potassium alum is also used as a flocculent in water purification. Factors that may influence the removal of fluoride under different experimental conditions will be optimized for the maximum removal, which includes pH 6, sorbent dosage, time of agitation, and initial concentration of the fluoride ions. Characterization studies of the biosorbent can reveal its favourability towards the sorption of fluoride. In the isothermal modelling studies, Langmuir isotherm model can be evaluated to find the biosorption process with maximum R2 value and from a kinetic perspective, the biosorption of fluoride onto the biosorbent observed the pseudo-second-order reaction with R2 value. The developed biosorbent which includes Senna flowers and alum has been applied to real field fluoride-contaminated water samples and would to be successful.

PP : 19

Formulation of Cost Effective Fertilizer Using Tea Powder Waste and their nutrient evaluation

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Tea plantation is one of the noblest cultivation in North east part of our country. In Hill stations of Nilgris, Assam and Western Ghats, Tea is the major prime crop leading to the economy. Most of the tea factories merely follow the regulations of Tea board of India regarding the disposal of tea waste. The tea waste includes discharge of leaves, buds, and tender stems of tea leaves. Tea leaves consist of nutrients like nitrous, potassium and phosphorus. These tea leaves can be used as a bio fertilizer for plants. In urban area, many restaurants and tea shops simply discard the tea wastes as unproductive without proper utilization. Tea waste contains (caffeine) which is harmful to soil but it can be removed by a simple process by mixing the tea waste with 5.5% urea and cow dung for at least 50 days and place it in soil. Hence, tea wastes are allowed to make compost with wood ash and can be converted into bio fertilizer. As wood ash also rich in potassium and calcium, these nutrients are beneficial for increasing the quality of fruiting and flowering of plants. It is expected that when we allow the tea wastes and wood ashes to compost for one to two months, there is a growth of beneficial bacterial and fungal growth that synthesizes available nitrogen and carbon sources such as humic acid and fulvic acid. Mixing these two wastes results in good source of bio fertilizer. These nutrients not only increase the yields also offers farmers economical natural fertilizers.

PP : 20

Bioremediation In Contamination Of Uranium

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The action or state of making or being make impure by polluting or poisoning. Environmental contaminants can make people sick. Different contaminants can cause a variety of health problems. Common health problems from environmental contaminants include breathing problems (such as asthma), heart disease, and some type of cancer. Dissolved uranium in groundwater at high contaminations is an emerging global threat to human and ecological health due to its radioactivity and chemical toxicity. Uranium can enter groundwater by geochemical reactions, neutral deposition from minerals; mining uranium ore processing. Bioremediation treatment strongly decreased fuel persistence and toxicity and increased microbial activity as compared to contaminated but untreated soil. Filling alone had a favorable but more limited effect. Good correlations were found between residue decline, microbial activity and toxicity reduction.

PP : 21

Nanomaterials for photothermal and photodynamic Breast cancer therapy

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Breast cancer is a lethal disease despite the advancements in tumour biology research and chemotherapy development. Currently, by the extraordinary development of nanomaterials in different fields of medicine, they have found new applications. Phototherapy modalities, such as photothermal therapy (PTT) by toxic heat generation and photodynamic therapy (PDT) by reactive oxygen species, are known as promising phototherapeutic techniques, which can overcome the limitations of conventional protocols. Moreover, nanomaterial-based PDT and PTT match the simultaneous immune therapy and increase the immune system stimulation resulting from the denaturation of cancer cells. Our research focuses on the therapeutic potency of PDT, PTT and also their combined modalities which are known alternative protocols with minimal morbidity integrated into gold standard treatments such as surgery, chemotherapy, and radiation therapy at tumour treatment and cancer-related infectious diseases. In addition for deeper understanding, photoablation effects with emphasis on the nature, morphology, and size of photosensitive nanomaterials and transportation techniques is going to study. This basic knowledge of research is encouraging me to achieve something useful to improve life span and quality of life in Breast cancer patients. The above knowledge of research is encouraging me to achieve and to improve life span of Breast cancer patients.

Keywords: Breast cancer, Chemotherapy, Photothermal, photodynamic, Nanomaterial.

PP : 22

Stem Cell Therapy in Treating Arrhythmogenic Cardiomyopathy

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Nowadays, Arrhythmogenic cardiomyopathy remains a major clinical problem and the leading causes of mortality in the world. About 40 million adults are affected due to heart related diseases and it is found to be inherited disease (Nair and Gongora2020). A new treatment using stem cells, which have the potential of self renewal and differentiate into variety of heart cells types could potentially repair and regenerate damaged heart tissue. Globally, researchers have been developing strategies to "remuscularize" the damaged heart wall to improve its function by reprogramming the somatic cells (iPSCs) in to specialized cell types. Treatment of arrhythmogenic cardiomyopathy with stem cells also holds promise but needs more definition with regards to isolation, culturing methods, route of cell delivery and type of cell used to achieve reproducible results. The INSA summer research fellowship opportunity will enhance my research career and I believe that, working with the scientist will definitely inculcate me the best research ideas.

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PP : 23

A New Bioformulin will be Developed from Divergent Combinations of Azospirillin, Glucano Azotobacter & Methylobacterin to Analyze the Vigor Index and Disease Resistance in *Oryza Sativa*

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Many bacteria reported generally having many anti-microbial effects and immunity induction on *Oryza sativa*. Azospirillin, Glucano, and Methylobacterin are new bio-bac compounds that will be formulated from respective consortia. Their vigor index will be measured with these bio-bacs, and their disease resistance will also be studied with various rice- infecting pathogens such as *Magnaporthe oryzae*, *oryzae (Xoo), and Xanthomonas oryzae pv. oryzicola (Xoc).* This bio-bac will be a promising product that is eco-friendly and cost-effective for agricultural management.

Keywords: *Oryza sativa,* Azospirillin, Glucano, Methylobacterin, Rice- infecting pathogens.

PP : 24

CRISPR-Cas 9 Genome Editing Technology for Lung Cancer Treatment

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Cancer is one of the main causes of death worldwide and it is a disease in which some of the body's cell growth is uncontrollable and spread to various part of the body. Among which is lung cancer (LC) is most deadly cancer for both men and women. There are two main subtypes of lung cancer that is small cell lung carcinoma and non small cell lung carcinoma. Considering the role of genetic and epigenetic changes in oncogens and tumor – suppressor genes in cancer progession, gene therapy provides a hot spot in cancer treatment research. Gene therapy offers less side effect compared to conventional methods such as chemotherapy. CRISPR-Cas9 system is a kind of acquired immunity possessed by most bacteria and archaea to act against their enemies. It is ribonucleic acid (RNA) guided convenient and versatile endonuclease platform for site specific genome editing which can play a tremendous role in the application of cancer therapy. To accomplish it task, it requires cas9 DNA endonuclease protein and single guided RNA (sgRNA). That can produce precise gene matching for editing and correction techniques. The sgRNA contains (crRNA), which scans and identifies the target DNA sequences that must be cleaved and corrected. The cas9 protein DNA endonuclease which can sense, identify the site -specific double- strand DNA breaks (DSB). This system works in two ways. The first is by designing sgRNA that looks for the mutated EGFR sequence in LC. Second one is to knockout of PD1 gene in autologous T lymphocytes in patients with metastatic NSCLC. In LC, the CRISPR-Cas 9 system has widely been applied to suppress EGFR expression, bypass TKIS resistance repress ALK-activated cells at early stages, inhibit k-RAS oncogene and finally induce desirable epigenetic alternation. It has advantages such as low cost, feasibility, and high efficiency compared to traditional gene therapy methods such as ZFN and TALENS along with conventional surgery, radiation therapy and chemotherapy. This technology provides a great opportunity to improve therapeutic outcomes in LC.

PP : 25

A Novel Anticancer Therapy: CRISPR/Cas9 Gene Editing

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Cancer becomes one of the main causes of human deaths in the world due to the high incidence and mortality rate and produces serious economic burdens. With more and more attention is paid on cancer, its therapies are getting more of a concern. Previous research has shown that the occurrence, progression, and treatment prognosis of malignant tumors are closely related to genetic and gene mutation. CRISPR/Cas9 has emerged as a powerful method for making changes to the genome, which has extensively been applied in various cell lines. Establishing the cell and animal models by CRISPR/Cas9 laid the foundation for the clinical trials which possibly treated the tumor. CRISPR-Cas9-mediated genome editing technology brings a great promise for inhibiting migration, invasion, and even treatment of tumor. However, the potential off-target effect limits its clinical application, and the effective ethical review is necessary. My Idea brings the molecular mechanisms of CRISPR/Cas9 and discusses the research and the limitation related to cancer clinical trials.

Keywords: Cancer, CRISPR/Cas9, Genome, Mutation, Invasion.

PP : 26

Identification of a New Effective Aphrodisiac and Rejuvenative Biochemical Compounds Based on Methyl Jasmonate and Salicylic Acid-Induced In Hairy Root Cultures of *Withania somnifera*

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The withanolide alkaloids found in the *Withania somnifera* plant, also known as Ashwagandha, are well-known for their anti-cancer properties, ability to treat low back pain, and potential to strengthen muscles. *W. somnifera* is abundant in various important secondary substances like steroids, alkaloids, flavonoids, phenolics, saponins, and glycosides. Since there is a dearth of knowledge about the structures and properties of these compounds, it is necessary to ascertain whether they have any antiviral and antibacterial effects on animal research. This research will provide real data on the bio-potential of metabolites against a range of viral and bacterial illnesses in aquatic animals. The drug design portion will be carried out using docking software, and aquatic animals will be the subject of wet lab work.

Keywords: Withanolide, Ashwagandha, Alkaloids, Phenolics, Glycosides, Saponins

PP : 27

Ameliorative effect of CRISPR/Cas9 mediated gene knockout of immunoglobulin superfamily DCC subclass 4 responsible for viral internalization

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A group of infectious influenza virus A,B,C,D, Isavirus and throat virus are classified under orthomyxo virus category, they possess membrane-enclosed, fragmented negative-sense RNA virus. This influenza virus finds its way into the host cell via hemagglutinin that binds to sialic acid located on glycolipid receptor to target host cell, which is then internalized further by host cell. The nucleocapsid then enters into host nucleus cell & transcription is initiated as 'cap snatching'. In the cytoplasm the hemagglutinin along with nuraminidase encounters glycosylation and polymerization. The neuraminidase at the end demolishes the sialic acid receptor permitting virus to exit the cell. Recent studies show that CRISPR/Cas 9 gene knockout of transmembrane immunoglobulin superfamiliy DCC subclass-4 consequently reducing the viral replication in A549 cells. The subsequent reduction of viral population is due to the lack of isoform signal peptide release by IGDCC4. In future relevant studies on this unexplored area aids in sorting key factor to inhibit viral internalization. If we focus on the receptor that helps virus in binding with host cell and demolish them at the earlier infectious stage mortality rate due to influenza virus could be controlled as well as these kinds of studies helps in designing anti-viral therapeutics against influenza. CRISPR/Cas 9 gene editing system also have potential advantage over other classic editing system such as ZFNs and TALENs, in effective customized and multiplexed genome editing techniques.

Key words : CRISPR/Cas9,Immunoglobulin superfamily DCC subclass 4,Receptor

PP : 28

Nanomolar inhibition of SARS-CoV-2 by extracts of *Houttuynia cordata*

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Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has caused a global pandemic and is posing a serious challenge to the mankind. As per the current scenario, there is an urgent need for antiviral that could act as a protective and therapeutic against SARS-CoV-2. My aim is to provide a drug specifically from the extracts of *Houttuynia cordata* belongs to saururaceae family. *Houttuynia cordata* is a traditional medicinal plant used for the treatment for several infections. The few of the extracts from *Houttuynia cordata* such as 7-oxodehydroasimilobine, 1,2,3,4,5-pentamethoxy-dibenzo-quinolin-7-one and 1,2-dimethoxy-3-hydroxy-5-oxonoraporphine shows inhibition properties against the entry and replication of SARS-CoV-2. These compounds successfully inhibited the SARS-CoV-2 receptors such as protease(3CLpro) and RNA-dependent RNA polymerase (RdRp).As my idea is to isolate these bioactive molecules from the plant *Houttuynia cordata* and impose it as a drug or injection in the nanomolar level which is more effective than Remdesivir. These compounds such as 7-oxodehydroasimilobine, 1,2,3,4,5-pentamethoxy-dibenzo-quinolin-7-one and 1,2-dimethoxy-3-hydroxy-5-oxonoraporphine are added in the ratio of 1.2 : 1.1 : 1 respectively. Furthermore, *Houttuynia cordata* extracts was non-toxic to animals at an oral administration dose and it significantly increases the $CD4^+$ and $CD8^+$ T cells.

PP : 29

Prediction of plant diseases using Deep Learning Models

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Plant diseases pose a significant threat to global food security, impacting crop yields and agricultural productivity. However, in many parts of the world, the rapid identification of these diseases remains a challenging task due to the lack of necessary infrastructure. The intersection of increasing Artificial intelligence model and recent strides in computer vision, facilitated by deep learning, has opened up new avenues for addressing this issue. Leveraging a public dataset comprising 53,200 images of both diseased and healthy plant leaves obtained under controlled conditions, we embarked on training a deep convolutional neural network (CNN) capable of identifying 13 crop species and detecting 25 different types of diseases. The results of model are promising, with the trained model achieving an impressive accuracy of 99.02% on a held-out test set. This remarkable accuracy demonstrates the feasibility of employing deep learning techniques for plant disease identification, even under real-world conditions. By harnessing the power of publicly available image datasets and training increasingly sophisticated models, our approach highlights a clear pathway toward implementing smartphone-assisted crop disease diagnosis on a massive global scale. The key to the success of our method lies in the combination of extensive image datasets and advancements in deep learning technology. The CNN's ability to recognize subtle patterns and variations in plant leaves enables it to accurately distinguish between healthy and diseased specimens.

Keywords: plant disease, CNN, image. Data set.

PP : 30

A Block-Chain Based Approach to Securing data in Smart Agriculture Cloud Using AI Based Techniques

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The existing Agriculture system is having several components such as Supply Chain Management, crop insurance, the shipment of goods, and it involves numerous untrusted stakeholders such as users (farmers, retailers, customers, wholesalers, etc.), agencies (bank, insurance company) and regulators (assessor, surveyors). Due to the active engrossment of the middle man (mostly human beings or agencies operated by human beings) some key issues are raised such as transparency, timeliness, traceability, security, and immutability resulting in financial loss, crop contamination, and spoilage. Secure distributed public ledger technology and decentralized computing paradigm make Block-chain an appropriate alternative to resolve these issues and to achieve profitability & trust for all its stakeholders. The real-time and stored data are analyzed by specialists and farmers. The cloud acts as a central digital data store where information is collected from diverse sources in huge volumes and variety, such as audio, video, image, text, and digital maps. Artificial Intelligence based machine learning models such as Support Vector Machine, which is one of many classification types, are used to accurately classify the data. The classified data are assigned to the virtual machines where these data are processed and finally available to the end-users via underlying datacenters. In this research, we intend to propose a Blockchain-based mechanism which would address the issues mentioned in the agriculture sector by connecting various stakeholders through the usage of IoT devices and smart contracts in Ethereum. This processed form of digital information is then used by the farmers to improve their farming skills and to update them as pre-disaster recovery for smart agri-food.

Keywords: Smart Farming, Cloud Based IoTs, Agriculture, Block-chain technology, Security, Smart Contract; Supply Chain Management.

PP : 31

Electricity from Waste Vegetables and Fruits

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In this idea, we can generate electricity from waste fruits and vegetables. By using this fruits and vegetables electricity can be created in two cycles. For each cycles we use two different methods to generate electricity. In this method, waste raw fruits and vegetables emit incident light from this light source we can generate electricity. This type of light source is absorbed by ultraviolet light. This UV light is converted into electricity by using type of solar panels. Solar panels are comprised of photovoltaic cells that react to UV rays and transform them into electricity. Each cell is made up of conduction material from silicon, which is highly reactive to solar energy. This method works by using the same waste raw fruit and vegetables used in first cycle can be used. It is nothing but small "**biogas power plant**". This power plant converts methane gas from the decomposed waste products into electricity.

PP : 32

Brachytherapy Assisted Radiation Therapy- A Boon To Cure Prostrate Cancer

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Brachytherapy, a spealized form of delivering therapeutic radiation, directly near or into the tumour cells. It serves as optimized tool for remitting very high shot of radiation at targeted site thereby reducing probability of damaging normal tissues. When brachythearpy is used alone or with the combinations of classical therapies its proven to exhibit highly improved efficiency simultaneously helps in expanding patient lifespan. Various augmented technologies such as 3D image incorporation, Bio-3D printing, radioisotopes and advanced delivery methods helps more in optimizing brachytherapy in achieving high dose target irradiation. In this proposal we focus on usage of brachytherapy over prostate cancer. The major benefit of brachytherpy, is that it shows minimal risk in urinary inconsistency, erectile dysfunction is reduced and reducing risks of proctitis, compared to surgery and ERT therapy. Brachytherapy might implant permanently as vLDR Iodine seeds, thereby reducing the risk of patient follow up. In vivo dosimetry (IVD) is an emerging technique by which errors in target accuracy might be reduced to greater extent. The optimization of this new form of source radiation coupled with IVD assisted applicators, thermoresponsive polymer aids us in overcoming challenges in clinical radiation cancer therapy.

Key words: Brachytherapy, *In vivo* dosimetry, radiation.

PP : 33

Cocktail Monoclonal Antibodies Therapeutics For Ebola Viral Disease

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Ebola Viral Disease (EVD) is known as hemorrhagic fever caused by Ebola virus belongs to the family of fibviridae. It is transmitted through fruit bitten by pteropodidae family of bat is considered as Ebola virus host. EVD first occurred in village near Ebola River in 1976 and its first outbreak occurs in the year.2014-2016 at West Africa guinea. Ebola will spread through close contact with blood, body fluid secretions. It causes deadly illness. symptoms are onset is from 2 to 21days, fever, vomiting, headache, muscle pain, impaired kidney and liver function and bleeding will occur. In 2019 U.S food and drug administration (FDA) approved single dose vaccine. rVSV-ZEBOV for ebola virus. As of now two vaccines (rVSV-ZEBOV and MVA-BN-FILO) require two doses at 56 days interval. Both the vaccines develop active immunity produces antibodies in immunized persons. Monoclonal antibodies isolated from such immunized person who receive vaccines is utilized for treating Ebola viral patients. Monoclonal antibody therapy is less toxicity and versatility range of biological effects. Inmazeb is a mixture of three monoclonal antibodies c.atoltivimab, maftivimab, odesivimab. Ansuvimab-zybl is monoclonal antibody given as injection. ZMapp is drug cocktail of antibodies developed from tobacco plant first drug to be used experimental basis against EBV. This kind of cocktail antibody theraphy is more specific and effective to treat Ebola viral patient.

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PP : 34

Exploration of low quantity ketaconazole loaded polymeric nanoparticles with improved efficacy for the treatment of post COVID mycoses

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Skin infections in humans are majorly caused by superficial fungal infection which is commonly known as mycoses. Dermatophytic fungal species and certain opportunistic fungal pathogens like *Candida* sp. cause such skin infections especially after the steroid treatment upon COVID infection. Despite these mycoses are not dreadful, they are still being a long term communicable diseases and also not be able to control by any preventive measures. Ketoconazole is the first and well known potential antifungal agent used to control mycoses by topical application as cream, soap, etc. However, it has several side effects such as liver dysfunction and hormonal deregulation. Numerous researches proved the efficacy of nanoparticles due to their exotic features like nanoscale size, high reactive surface, charge, ability to deliver any substances, and shape put together them a supreme tool for drug delivery. Especially, biomimetic and biocompatible polymers such as chitosan, sodium alginate and poly lactic acid delivers drug in a controlled manner at target site with better water solubility. Hence, it is proposed that nanopolymers mediated ketaconazole treatment will improve the therapeutic efficacy at low concentration of application. Biodegradable polymers are chosen and synthesized via precipitation method and then, it will be comprehensively characterized to identify the size, shape and morphology employing XRD, SEM and TEM. This study will be useful to increase the bioavailability thereby reduce the usage of toxic antibiotics without any side effect.

PP : 35

Anti-Influenza virus activity and phenolic content of Pomegranate peel extract and fractions

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Influenza virus is a negative – sense single – stranded RNA virus in the orthomyxoviridae family. Influenza virus causes respiratory illness called "flu". Influenza viruses have an outer lipid envelope with spikes composed of glycoproteins termed Hemagglutinin (HA) and Neuraminidase (NA). The present study aims to evaluate activity of Pomegranate peel extract and its fractions against influenza A viruses *in vitro.* Ethyl alcohol extract of Pomegranate peel was prepared and subjected to fractionation with different polarities. The peel powder was dissolved in 80% ethanol and kept at room temperature for 96hrs.Then the mixture was filtered and concentrated under vacuum pressure at 40°C in the rotary evaporator. Four fractions of crude extract with different polarities were isolated by using the difference in various secondary metabolites polarities. The total phenolic content of Pomegranate peel extract and its fractions was determined using Folin-lio-calteu method.
Thus,these obtained extract can act as a drug against influenza virus.

Keywords : Antiviral agent, Pomegranate, *Punica granatum* L.

PP : 36

Biopesticides to Reduce the Ear Rot Disease Caused by Aflatoxins Produced from Aspergillus Species in Maize Kernals

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Food safety and Security are the most Threads in the recent years of raising Population. Aflatoxins secreted by the *Aspergillus* species are the hazardous, toxic and main reason for contamination in food sources, which causes severe health conditions such as Acute intoxication with a high dose of aflatoxin may result in fulminant hepatic failure and rhabdomyolysis. Chronic exposure to aflatoxin may result in liver cirrhosis and ultimately lead to hepatocellular carcinoma. Also, gall bladder carcinoma is associated with chronic toxicity. Aflatoxins are the chemically Difuranocoumarin derivatives with bifuran group. Four main AFs are AFB1, AFB2, AFG1 and AFG2. Aflatoxins contamination have been seen in feed and food, such as groundnuts, wheat, maize, sesame seed, millet and cocoa during pre and post harvesting period by fungal infection. And also some other food products such as peanut butter, cooking oil and cosmetics are contaminated by Aflatoxins. The methods of Identification and quantification of Aflatoxins in food and feed is main challenge to analyse food safety. There are various method available for the testing of presence of Aflatoxins in food products. In this study, biopesticides /BioStimulants are used to reduce *A. Flavus*. There are six biopesticides/bioStimulants (Botector®, mycostop®, seranade max®, Trianum®, vacciplant®, and zeolite®) used in maize feild bioassay to control contamination. The occurance of ear rots in maize by A. flavus which is associated with the secretion of Aflatoxins. Mycostop®, seranade®. Vacciplant®, zeolite control A.flavus secretion and also decrease Aflatoxins B1(AFB1) Secretion in vitro. Mycostop®, Trianum®, and botector®, were mostly reduced AFB1 content in maize kernals . By using the commercial non chemical biopesticides (Botector® and mycostop®) to decrease the ear rot disease and AFB1 amount maize feild which leads to decrease in the health risk.

Key words: Aflatoxins, *Aspergillus*, hepatocellular carcinoma, biopesticides, maize.

PP : 37

CRISPR/Cas 9 Genome Editing Technology For Duchenne Muscular Dystrophy

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Duchenne muscular dystrophy (DMD) is an X-linked recessive neuromuscular disorder with a prevalence of approximately 1 in 3500–5000 males. DMD manifests as childhood-onset muscle degeneration, followed by loss of ambulation, cardiomyopathy, pneumonia, pseudohypertrophy and death in early adulthood due to a lack of functional dystrophin protein. Gene editing via the clustered regularly interspaced short palindromic repeats (CRISPR-Cas9) system is a promising therapeutic for DMD, as it can permanently correct DMD mutations and thus restore the reading frame, allowing for the production of functional dystrophin. CRISPR-mediated gene editing for DMD has been tested both in vitro and in vivo. To initiate the CRISPR Cas9 process, muscle tissues from patient carrying duplications of dystrophin were obtained, and tissue-derived primary cells were cultured. Myoblasts were purified with an immunomagnetic sorting system using CD56 microbeads. After transduction by lentivirus with a designed single guide RNA (sgRNA) targeting a duplicated region, myoblasts were allowed to differentiate for 7 days. Copy number variations in the exons of the patient's myotubes were quantified by real-time PCR before and after genetic editing. Western blot analysis was performed to detect the full-length dystrophin protein before and after genetic editing. After editing, the patient's myotubes expressed the full-length dystrophin protein. The excision of multiple duplications by the CRISPR/Cas9 system restored the expression of full-length dystrophin. It has advantages such as it can modify DNA with greater precision than traditional gene therapy methods like NHEJ, TALEN and ZFNs, low cost and feasibility. CRISPR Cas9 genome editing technology opens the door for permanently correcting DMD and other monogenic disorders.

PP : 38

Targeted Aducanumab (Biib037) Drug for Amyloid-Beta (Alzheimer's Disease)

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Alzheimer's disease (AD) is the most common type of dementia and is among the sixth leading cause of death in United States. Its worldwide prevalence is around 50 million and is projected to double by 2050. It is a progressive disease that destroys memory and other important mental function. Deposition of beta amyloid (also known as amyloid - beta) peptides (beta 40 and 42) in the brain continues to be the most widely accepted disease mechanism. Until recently, only two food and drug Administration FDA)- approved groups of medications, namely, cholinesterase inhibitors and N-methyl - D - asparate receptor antagonist ,were available for symptomatic treatment with limited efficacy. Disease modifying therapeutics, keenly desired by clinicians and patients alike, has long been elusive until recently. FDA's Accelerated Approval program for the approval of a new agent, Aducanumab,is being considered a step in this direction by some, but not without controversy. Aducanumab, marked as Aduhelm by biogen, has been show to lower beta - amyloid plaques in the brain.Biogen believers this will lead to improvement in cognition and functioning in patients with AD. However, within a month of this approval, the FDA has called for investigation into interaction between representatives of Biogen and the FDA preceding the approval of Aduhelm. This report provides an overview of the controversy surrounding the FDA's Accelerated Approval program it pertains to the approval of Aduhelm, and the potential impact of these issues on researchers, clinicians, patients, and families in the ongoing battle against this devastating, debilitating, and ultimately fatal illness.

Keywords: Alzheimer's dementia, amyloid plaques, Aducanumab, cholinesterase inhibitors.

PP : 39

Breast Cancer Treatment Using Gene Editing Technique

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CRISPR/dCAS9 system has the capacity of dual role in gene knocking out and or inserting a new sequence in the genome. In a scientific literature, I read that, loss of bromodomain PHD-finger containing transcription factor (BPTF) gene subjected to decline in ductile structure. Further, mammary gland stem cell self renewing capacity has been lost due to the inactivation of the gene. My ideology is to activate the tumour suppressor gene and to reactivate the BPTF gene using gene editing technology. Mammary gland stem cell therapy might be an alternative strategy to treat the breast cancer. This fellowship will definitely help me to gather scientific information about breast cancer and it will inculcate the research ideas in the field of cancer biology. I wish, this fellowship will be a best platform to learn the techniques in isolation of stem cells and its culture system as well as the gene editing technique.

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PP : 40

Recent Research in Biotechnology

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DNA origami is a technique that allows the creation of precise, modular, and programmable nanostructures using DNA. These nanostructures have found use in several fields like biophysics, molecular biology, nanoelectronics, and nanophotonic due to their programmable nature as well as ability to organize other nanomaterials with high accuracy. However, they are fragile and unstable when removed from their optimal aqueous conditions. In contrast, other commonly used bottom-up methods for creating inorganic nanoparticles do not have these issues, but it is difficult to control the shape or spatial organization of ligands on these nanoparticles. In this study, we present a simple, highly controlled method for templated growth of silica on top of DNA origami while preserving all the salient features of DNA origami. Using the polyplex micellization (PM) strategy, we create DNA nanostructures that can withstand salt-free, buffer-free, alcohol-water mixtures, enabling us to control the material growth conditions while maintaining the monodispersity and organization of nanoelements. We demonstrate the growth of silica shells of different thicknesses on brick and ring-shaped DNA origami structures using the standard Stöber process. We also demonstrate the thermostability of the silica-coated nanostructures as well as accessibility of surface sites programmed into the DNA origami after the silica growth in the final inorganic nanostructure.

Key Words: Nanostructures, silica, polyplex micellization, stober process.

PP : 41

Human DNA character into Digital media

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DNA contains the instructions needed for an organism to develop, survive and reproduce. To carry out these functions, DNA sequences must be converted into messages that can be produce proteins, which are the complex molecules that do most of the work in our bodies. DNA has three distinct functions - Genetics, Immunological and structural that are widely disparate and variously dependent on the sugar phosphate backbone and the bases. DNA contains all the information needed to build your body. Early genetic studies focused on the identification and chromosomal localization of genes that control rapidly observable characteristics, such as the eye color of Drosophila. Like these many undesirable characters found in DNA from our ancestors. Selecting a DNA there it was converted into DNA code. Then those DNA codes were converted into binary code for computer language. By this process we can see the different characters of DNA in digital format. In this work we provide instructions for archieving DNA information and converted in digital information. It encodes the DNA codes and decodes the information from DNA to a digital file. This protocol relies a commercial DNA synthesis and DNA sequencing for data analysis.

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PP : 42

Urease-Powered Nanobots for Radionuclide Bladder Cancer Therapy

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Self-propelled nanoparticles have emerged as delivery systems of therapeutic agents. nanobots can navigate complex fluids and overcome biological matrices. They could be used to treat bladder cancer and other types of cancer. The field of medical micro- and nanomotors is rapidly advancing. RNT (Reactive neuromuscular training) relies on the targeted delivery of cytotoxic radiation from within the body.The recent approval of Lutathera39 and Pluvicto40 for the treatment of neuroendocrine tumours and metastatic castration-resistant prostate cancer, respectively, have boosted clinical interest in RNT..For bladder cancer, the limited efficacy of standard therapeutic approaches and the possibility of utilizing carriers to maximize accumulation, penetration and retention within the tumour, thereby minimizing off-target accumulation and side effects, highlights the potential of RNT as a promising therapeutic alternative. Here, we use an orthotopic mouse model of bladder cancer to comprehensively characterize the successful accumulation of urease-powered nanobots using in vivo and ex vivo imaging techniques after intravesical injection to mimic clinical practice. Moreover, the enhanced accumulation enables 131I-labelled urease-powered nanobots to have a therapeutic effect at doses substantially below those required for passive particles to be efficient. These results take us one step closer toward translational applications and highlight the underexplored potential of nanobots for innovative bladder cancer treatment options.

PP : 43

Modification of *Saccharomyces cereviciae* cell and turning it into a cannabis tracker for point-of-use in forensic science

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Abstract

Eukaryotic cells like *Saccharomyces cerevisiae* utilize the seven-pass transmembrane domain receptor to recognize various signals, including chemical admixtures and light. Cannabinoids, in minimal quantities, have widespread actions on the brain, but frequent uptake results in antinociception, euphoria, distraction, and dementia. This study aimed to establish a cannabinoid type 1-based biological sensor working at three ranges. Step 1 involved screening a compound library to determine a molecule with the ability to bind and activate a target functionally, as well as a compound that interferes or ceases other physiological activity. Step 2 involved the analysis of 25 plants to identify a contemporary plant cannabinoid. Step 3 involved the development of a point-of-use device that analyzeshumoral fluids and particularly senses drugs classified under the naphthoylindole family, especially JWH-018. Modification of yeast cells was found to sense active compounds in cannabis, turning the yeast cells red to indicate the presence of cannabis. The three steps outlined above demonstrate the potential application of *Saccharomyces*-based biosensors in various applications that can be utilized by medical investigators. This research exploited the extensive sensing capacity of GPCR (G-protein coupled receptor) of eukaryotic cells, suggesting it as a good portable device for detecting numerous compounds associated with forensic science, including cannabis, even with smart phones.

Keywords: Biosensor, Cannabis, GPCR, JWH-018, Naphthoylindole.

PP : 44

Artemisia annuaL. Polyphenols Enhance the Anticancer Effect of β-Lapachone in Oxaliplatin-Resistant HCT116 Colorectal Cancer Cells

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Recent studies suggest that the anticancer activity of β-lapachone (β-Lap) could be improved by different types of bioactive phytochemicals. The aim of this study was to elucidate how the anticancer effect of β-Lap is regulated by polyphenols extracted from Korean Artemisia annua L. (pKAL) in parental HCT116 and oxaliplatin-resistant (OxPt-R) HCT116 colorectal cancer cells. Here, we show that the anticancer effect of β-Lap is more enhanced by pKAL in HCT116-OxPt-R cells than in HCT116 cells via a CCK-8 assay, Western blot, and phase-contrast microscopy analysis of hematoxylin-stained cells. This phenomenon was associated with the suppression of OxPt-R-related upregulated proteins including p53 and β-catenin, the downregulation of the bioinformatics analysis of 21 proteins regulated by combined treatment of pKAL and β-Lap in HCT116-OxPt-R cells showed that the enhanced anticancer effect of β-Lap by pKAL was related to the inhibition of negative regulation of apoptotic process and the induction of DNA damage through TERT, CD44, and EGFR-mediated multiple signaling networks. Our results suggest that the combination of pKAL and β-Lap could be used as a new therapy with low toxicity to overcome the OxPt-R that occurred in various OxPt-containing cancer treatments.

Keywords: *Artemisia annua* L. Polyphenols; β-lapachone; phytochemical; anticancer effect; oxaliplatin-resistant; colorectal cancer; chemotherapy

PP : 45

Detection of Breast Cancer Causing Oncogenes CRISPR Cas9 System

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Increased incidence of cancer in recent years and its impact on different physical, mental, and social dimensions of human life have turned it to a major problem of the century. According to estimates, more than 7 million people globally die from cancer (Sabit et al. 2021). Meanwhile, breast cancer is the most prevalent type of malignant neoplasms among women with more than one million new cases per year. The risk of an individual dying from breast cancer is 1-in-35 (Waks et al. 2019). Bromodomain PHD-finger containing transcription factor, the largest subunit of the NURF chromatin remodeling complex, is essential for MaSC self-renewal and differentiation of mammary epithelial cells. BPTF depletion arrests cells at a previously undefined stage of epithelial differentiation that is associated with incapacity to achieve the luminal cell fate. BPTF must be present in order for mammary stem cells to perform their normal functions. Clustered regularly interspaced short palindromic repeats (CRISPR)-associated protein 9 (Cas9) is one of the most efficient gene editing technology and it has versatile therapeutic applications compared to ZFN's and TALEN. Although CRISPR-Cas9 tool has experienced development rapidly in recent years, there are still several issues related to its efficiency, immunogenicity and especially off-target effect. Hence, I wish to elucidate the possible mechanism to reactivate BPTF gene and tumor suppressor genes using CRISPR tool. The main objective of this proposal is to learn the CRISPR-Cas9 technique and the acquired knowledge will encourage me to do future research and achieve great heights in breast cancer research.

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PP : 46

Exploring Nanocomposites into the Development for Processing and Utilization as Sensing Materials

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The term nanocomposites has greatly widened to include a wide range of systems, including one-dimensional, two-dimensional, three-dimensional, and amorphous materials, made of clearly different components and combined at the nanoscale scale. This study provides thorough definition of nanocomposites, along with information about their history, types, characteristics, uses, and prospects. The nanometer-sized clay platelets interact with polymers in distinctive ways when the right compatibilizing chemicals are used. The study demonstrates that rigid containers and films for both food and non-food applications are available for packaging. Numerous automotive and industrial components that make use of lightweight, impact-resistant, scratch-resistant, and increased heat distortion performance qualities can be thought of in the context of engineering plastics. The advantages of nanocomposites over traditional ones in plastics go beyond strength. The conservation of stone, metals, wood, bone, paintings, archival documents, and other heritage materials are just few of the materials we review in this paper along with their diverse applications.

Keywords: Nanocomposites, Nanoscale, Scratch-resistant, Polymer.

PP : 47

Nano robots in Biotechnology

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Nano robots in biotechnology represent a transformative frontier, merging nanotechnology and biology to revolutionize medical and therapeutic applications. These miniature robots, operating at the nanoscale, hold immense potential for precise and targeted interventions within the human body. Nano robots, often constructed with materials like carbon nanotubes or magnetic nanoparticles, exhibit remarkable maneuverability and responsiveness when navigating biological environments. Their integration with biological systems allows for unprecedented levels of precision in drug delivery, diagnosis, and treatment. The study emphasizes the diverse applications of Nano robots, including targeted drug delivery to specific cells or tissues, non-invasive diagnostics, and therapeutic interventions at the molecular level. Additionally, it discusses challenges and ethical considerations associated with the deployment of Nano robots in biotechnology. In conclusion, the integration of nanotechnology and biomedicine opens new frontiers in healthcare, promising revolutionary advancements in personalized medicine and disease treatment.

Keywords: Nano robots, drug delivery, molecular level.

PP : 48

Augmenting the Biophysical Characteristics of Green Fluorescence Protein via Genetic Code Expansion

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Recent advancements in protein engineering have facilitated the integration of non-canonical amino acids to enhance protein biochemical functions. It allows the manipulation of overall physical and chemical behaviors at a macroscopic level, while also enabling detailed mechanistic investigations at an atomic scale. This study employs a residue-specific approach to introduce amino tyrosine, DOPA, fluoro tyrosine, and chloro tyrosine into recombinant Green Fluorescent Protein (GFPhs). Global incorporation of these unnatural amino acids maintains structural integrity and thermal stability in the modified proteins. Mass spectroscopy (MALDI-TOF) analysis shows the significant increase in the molecular weight of the protein conform the incorporation of unnatural amino acid. Secondary structure analysis using CD spectroscopy and fluorescence spectroscopy indicates altered folding naature in the modified proteins. Amino, DOPA, and fluoro tyrosine incorporation leads to a red shift in the emission spectrum due to electron transfer between chromophores. However, chloro tyrosine incorporation does not alterthe emission due to the absence of electron sharing. These modified proteins show great potential as probes for in vivo applications such as cell labeling, protein translocation, and targeted drug delivery. Ongoing research aims to unravel the molecular mechanisms behind the observed intense fluorescence stability and thermostability. Future studies will focus on site-specific incorporation of target unnatural amino acids to elucidate the role of adjacent amino acids near the chromophore region in influencing fluorescent nature and thermo stability. These findings contribute valuable insights to the development of novel biomolecules with applications in diverse biotechnological fields.

PP : 49

Optimization of direct organogenesis protocol in *Stevia rebaudiana* using synthetic plant growth regulators and seaweed extracts

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In the present study, an simple and efficient direct organogenesis system was developed from leaf explants of Stevia rebaudiana. The protocol has been developed by using plant growth regulators and seaweed extracts a natural biostimulant. The leaf sections were initially cultured on to the LDOM medium fortified with various concentration and combinations of (0.2-1.0 mg L^{-1}) TDZ , (0.2-1.0 mg L^{-1}) IBA and (0.1-0.5 mg L^{-1}) Kin. The best responding concentration in induction of organogenesis was tested for the proliferation. The cultures were sub-cultured in the 3 different medium (MSPM, MSCS and MSGC) supplemented with PGR'S, 0-25% *Caulerpa scalpelliformis* and *Gracilaria corticata* for proliferation The two fold increase in shoot proliferations were observed in the medium containing seaweed extracts (MSCS and MSGC) than the control (MS). The plantlets transferred from plant growth chamber to green house conditions exhibited high survival rate (90%) than the directly shifted plantlets.

Key words: *Stevia rebaudiana, Caulerpa scalpelliformis, Gracilaria corticata*, Seaweeds, Organogenesis.

PP : 50

FDA Approved Chimeric Antigen Receptor (CAR)-T Cell Therapy for Different Cancers - A Recent Perspective

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Cancer is one of the most prevalent diseases in the world, and its incidence has been on the rise in recent decades. Current review article, summarizes the novel treatment options Chimeric Antigen Receptor –T (CAR-T) cell therapy for various cancers constitute a major health and development challenge, impacting every aspect of sustainable development quoted by goal 3 good health and well-being of UN sustainable goals. WHO estimates that 70% of cancer deaths occur in low- and middle- income countries (LMICs) by 2030, LMICs are expected to bear thebrunt of the expected 24.1 million new cancer cases per year. This current review article focuses and discussed about CAR-T cell therapy for various cancers against most prevalent non communicable disease cancer disease stipulated by WHO and UN sustainable goals. Three literature databases Google scholar, Science Direct, PubMed was utilized to search and collect CAR-T cell treatment options for different cancers published articles sources in between January 2000 to December 2023. There were a total of 18700 papers found, with 48 of them being found to be eligible focusing various cancer treatment by CAR-T cells utilized for the study. Based on the information gathered, CAR-T cell therapy treating different cancers and their merit and its advantages in heal and improve certain cancers was also discussed in this review article with their detailed molecular mechanisms. This article also gives an insight to utilize CAR-T cell treatment protocols for rejuvenating cancer patient from such ruthless cancer disease condition thereby improving life span of cancer patients and eradication of disease in some cases.

Keywords: Cancer, Chimeric Antigen Receptor-T Cell (CAR-T), Novel, Therapeutics.

PP : 51

Apoptosis induction capability of Titanium oxide nanoparticles capped with Acorus calamus L. against lung carcinoma cells

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Titanium oxide nanoparticles (TiONPs) were prepared using a one-step reduction of titanium with sodium borohydride (NaBH4) in the presence of polyvinylpyrrolidone (PVP) as a capping agent. Plant extracts from A. calamus L. (AC) leaves were incorporated during the synthesis process. The crystalline nature of the TiONPs was confirmed through X-ray diffraction (XRD), confirming the face-centered cubic structure, with a lattice constant of 4.08 Å and a crystallite size of 18 nm. Field Emission Gun Transmission Electron Microscopy (FEG-TEM) revealed spherical TiONPs (10-20 nm) with evident PVP adsorption, leading to size changes and gglomeration. UV-Vis spectra showed a surface plasmon resonance (SPR) band at 417 nm for TiONPs and a redshift to 420 nm for PVP-coated TiONPs, indicating successful synthesis. Fourier Transform Infrared Spectroscopy (FTIR) identified functional groups and drug-loaded samples exhibited characteristic peaks, confirming effective drug loading. The anti-cancer potential of synthesized NPs was assessed by MTT assay in human adenocarcinoma lung cancer (A549) and lung normal cells (WI-38) cells. IC 50 values for AC PVP NPs is 420.69 ± 2.87, Furthermore, the NPs generated Reactive Oxygen Species (ROS) and altered the mitochondrial membrane potential (MMP). Differential staining techniques were used to investigate the apoptosis-inducing properties of the three synthesized NPs. The colony formation assay indicated that nanoparticle therapy prevented cancer cell invasion. Finally, Real-Time PCR (RT- PCR) analysis predicted the expression pattern of many apoptosis-related genes (Caspase 3, 9, and 8).

Keywords: Titanium Oxide Nanoparticles, FTIR, RT-PCR, Lung cancer cell line.

PP : 52

Biofilm formation from *Prunus dulcis* leaves

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Synthetic materials like nylon, polyethylene, and other organic polymers are combined to create plastic. It can be shaped while still flexible and then solidified into a slightly elastic or stiff form. In Malaysia, it is typically utilized for toys, furniture, food packaging, and other purposes. Although it is incredibly practical, petroleum-based polymers are not biodegradable. Every year, about 80 million tonnes of plastic debris enter the world 's oceans. Bioplastic, on the other hand, is a kind of biodegradable plastic made from biological materials as opposed to petroleum. The growing concern about the environmental issues brought on by petroleum-based plastic is driving up demand for bioplastic. From 2003 to 2007, the world's ability to produce bioplastic expanded by 68% annually, with projections indicating that it will reach 3.4 million tonnes by 2020. This project aimed to create bioplastic from the leaves of Prunus dulcis. Then, the extracted cellulose was employed in bioplastic production by using solution casting. The results showed that the lignocellulose content of our *Prunus dulcis* leaves was 19.6 % lignin, 35.9 % cellulose, and 38.5 % hemicellulose. The bioplastic from Prunus dulcis leaves cellulose has shown good flexibility and strength as well as good opacity. In conclusion, bioplastic from *Prunus dulcis* leaves research was successfully prepared and can be developed as plastic bags or food packaging.

Keywords: Bioplastic, *Prunus dulcis* leaves, Cellulose, Biodegradable.

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