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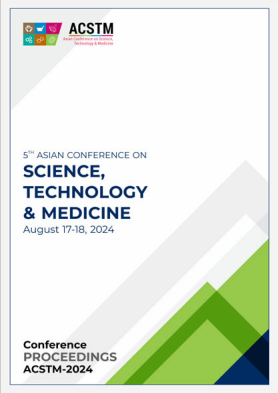
Conference PROCEEDINGS ACSTM-2024



PROCEEDING
ACSTM 2024

Sustainable Higher Education: Role of International Cooperative Education

Abhilasha Singh
Academic Affairs, American University in the Emirates, Dubai, United Arab Emirates

Abstract

International cooperative education is an interpretation or actualization of the dream of creating civically engaged and technically up-skilled citizens to bring change. Through it, futuristic humans will be part of a more connected education system with their ability for civic mobility. This style of education only can solve the complex dilemma of sustainability in the aftermath of the looming climate crisis and other geopolitical tensions that are not fragile enough to destroy this centuries-old social order.

Keywords

Sustainability; Higher education; International Cooperative Education

Presenter

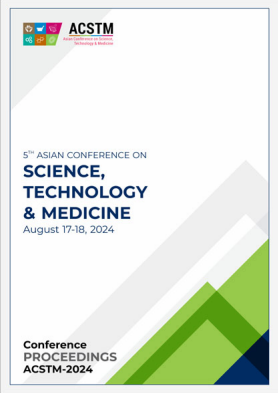
Abhilasha Singh
American University in the Emirates, Dubai

Type

Oral Presentation

Track

Social Sciences and Humanities



PROCEEDING
ACSTM 2024

The Impact of Global Warming on Human Health: A Comprehensive Literature Review

Mona El Husseiny
Cairo University, Giza, Egypt

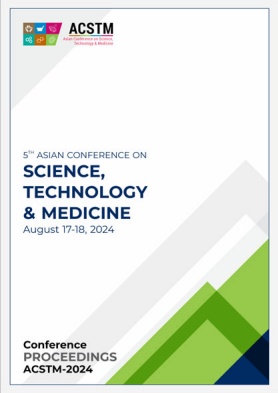
Presenter
Mona El Husseiny
IBN Sina National College for Medical Studies, Jeddah

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract
Global warming is the unifying world issue of our time. Scientists and opinions are at change on its origins and what it presents for the future. Driven primarily by man-made greenhouse gas emissions, global warming has emerged as one of the most pressing challenges of the 21st century. While its environmental and ecological consequences are well-documented, its direct effects on human health are increasingly becoming a focus of scientific curiosity. Various effects of global warming can affect different aspects of human health, which extends to specific endocrine-disrupting chemicals that interfere with normal endocrine function. Rising temperatures may exacerbate heat-related illnesses and can likely increase ground-level ozone concentrations with detrimental effects on lung function. These effects can primarily have an impact on vulnerable populations such as elderly, children, and those with pre-existing cardiovascular conditions. Furthermore, physiological response to elevated temperatures is an increase in metabolic rate, which can have both short-term and long-term consequences on human metabolism. Another indirect effect of global warming on human health is through the effect of high CO_2 concentration on plant physiology causing an elevated carbohydrate content (CO_2 fertilization) and possible reduction in protein and other micro nutrient content, which leads to disruption in nutritional value. This review article provides a comprehensive presentation of the effects of global warming on human health, summarizing findings from diverse fields including physiology, nutrition, and epidemiology. It explores how rising temperatures, altered weather patterns, and associated environmental changes influence metabolic rate, nutrient metabolism, and metabolic diseases. Furthermore, it explores potential adaptive responses and mitigation strategies to safeguard human health in a warming world.

Keywords
Global warming; Greenhouse; Human health; Endocrine; Metabolism



PROCEEDING
ACSTM 2024

Establishment of *in vitro* Propagation Protocol of *Cymbidium bicolor* Lindl., an Ethnomedicinal Orchid and In-Sight of Pharmaceutical Potential Secondary Metabolites and Antioxidant Activity

Chitta Ranjan Deb and Temjennokcha B. Longchar

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Presenter
Chitta Ranjan Deb
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Type
Oral Presentation

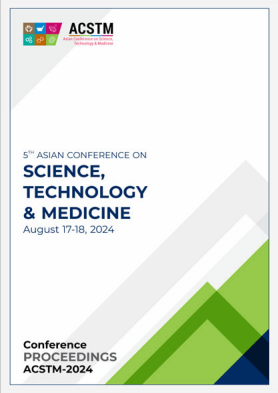
Track
Agricultural & Biological Sciences

Abstract

Cymbidium bicolor Lindl., a rare epiphytic orchid found in the North Eastern region of India is known for its ethnomedicinal values. But due to its over-exploitation for ethnomedicinal and horticulture purpose, the species is under threat in nature. Present investigation was undertaken to authenticate the species using nuclear and plastid DNA sequence based markers, establishment of *in vitro* propagation protocol and genetic fidelity assessment of regenerates and metabolite and antioxidant activity of donor plant *in vitro* regenerates. The matK and ITS markers supported the morphological characterization of the species. Of the different nutrient media, Murashige and Skoog medium was found to be most suitable for *in vitro* asymbiotic seed germination, plant regeneration, and multiplication. It was found that sucrose and fructose (2-3%) in nutrient medium supported better germination of seeds (73%). The MS medium conjunct with IAA (3 µmol/L) supported seed germination in a shorter period of time, though the highest germination (95%) was achieved on nutrient medium supplemented with IAA (9 µmol/L) and sucrose (2%). The optimal growing conditions for plantlet regeneration were found on MS medium supplemented with BAP+NAA, with BAP+NAA (6+3 µm/L) being the most supported combination for protocorm multiplication and simultaneous shoot differentiation. Additionally, the link between seed development stage and germination rate revealed that, seeds from 11 month after pollination was most ideal developmental stage of green pod for culture initiation. Jaccard's coefficient of RAPD, DAMD and SCoT showed 96.57% total monomorphism and 3.43% polymorphism between donor and *in vitro* plantlets. The *C. bicolor in vitro* regenerates showed greater total polyphenol content (TPC), total flavonoids content (TFC), total tannins content (TAC), and higher scavenging activity when compared to the mother plants leaf, pseudobulb, and roots extracts.

Keywords

Asymbiotic seed germination; Embryo developmental age; Ethnomedicinal orchid; Genetic fidelity assessment; *In vitro* propagation; Pharmaceutical potential phytochemicals



PROCEEDING
ACSTM 2024

Bioaccumulation and Distribution of Heavy Metals in the Bay of Bengal and its Toxic Effects on Human Health

Mohammad Lokman Ali and Md. Tanvir Khan
Department of Aquaculture, Patuakhali Science and Technology University, Bangladesh

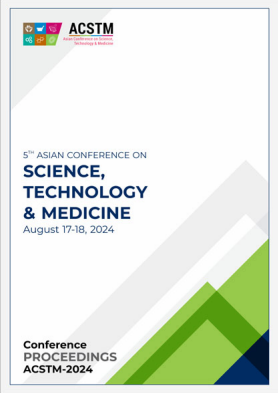
Presenter
Mohammad Lokman Ali
Patuakhali Science and Technology University, Patuakhali

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract
This experiment aims to assess the distribution of Cr, Cd, Pb, Fe, and Hg in water, sediment, invertebrate, and fish samples at the Patuakhali Coast of the Bay of Bengal. Water, sediment, fish (Hilsa and Flatfish), and invertebrates (Prawn) were collected from the studied area during the dry and wet seasons. Heavy metal concentrations were measured in different gills, muscles, and liver using High-Resolution Inductively Coupled Plasma Mass Spectrometry (HR-ICP-MS). The decreasing trend in heavy metal concentrations was observed as Cr>Fe in water and Fe>Cr in sediment during both the dry and wet seasons. The Cd, Pb, and Hg were found below the lowest detection level. Heavy metal concentrations were slightly higher in the wet season. The range of heavy metals was 0.069-0.077 and 0.011?0.018 mg/L in water for Cr and Fe, indicating that the Cr concentrations exceeded the permissible limits set by WHO and USEPA. The range of heavy metal concentrations was 0.014-0.019 and 32.0?37.0 mg/kg for Cr and Fe in sediment, assuming no health risk since the concentrations were within the permissible limits. The Cd and Hg were found below the lowest detection level in all fish and invertebrate samples. Gill was the major site for contaminant uptake with the range of heavy metals as 0.08-2.43, 0.01-0.11, and 25.0- 40.0 mg/kg for Cr, Pb, and Fe. The range for Cr, Pb, and Fe were 0.058 ? 0.33, 0.01-0.08, and 28.0-39.0 mg/kg in muscle samples and 0.036-0.24, 0.01-0.07, and 27.0-37.0 mg/kg in liver samples. Except for the Cr concentration in the gill of flatfish, heavy metal concentrations in fish and invertebrate samples were within the permissible limits. Non-significant seasonal variations ($p>0.05$) in heavy metal concentrations were observed with no specific pattern. Among the studied metals Fe showed bioaccumulation results and among the fish samples flat fish exhibited the highest bioaccumulation result. Estimated daily intake (EDI), target hazard quotient (THQ), hazard index (HI), and carcinogenic risk (CR) were assessed for potential human health risk implications suggesting that the values were within the acceptable threshold for both adults and children.

Keywords
Heavy metal; Bioaccumulation; Fish; Bay of Bengal; Toxic effects



Influence of Neem Bioactive Constituent on Phosphorylation Status of Tyrosine Residues in Hamster Sperm Proteins During Capacitation

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Central Animal Facility, Division of Biological Sciences, Indian Institute of Science, Bengaluru- 560012, Karnataka, India

Presenter

Ravindranath H. Aladakatti
Indian Institute of Science, Bengaluru

Type

Oral Presentation

Track

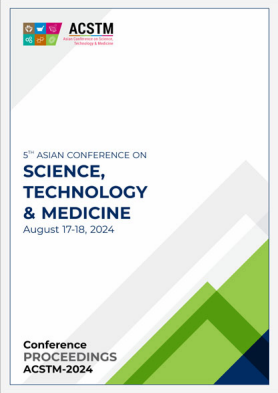
Agricultural & Biological Sciences

Abstract

Though, little evidence has been documented to evaluate the specific effects of neem active ingredients in rodent models. This study specifically focused on *in vitro* effects of nimbolide (tetranortriterpenoids group, one of the main components of neem leaves) on sperm functional events at biochemical and molecular levels that are critical for the process of sperm capacitation and performed an immunoblotting study to evaluate the phosphorylation status of tyrosine residues in sperm proteins incubated for a period of 1 to 5 hrs. The functional consequences of the capacitation process, i.e. motility score, percentage of motile sperm, sperm motility index (SMI) and the levels of molecular events are decreased in a dose- and time-dependent manner in sperm followed by declined spontaneous acrosome reaction (AR), which subsequently lead to lesser binding of cauda epididymal sperm to the zona pellucida (ZP). Furthermore, immunoblot studies showed that inhibition of protein tyrosine phosphorylation (PYP) was associated with proteins of approximately 29-120 kDa during capacitation. Biochemical studies have shown that the activity of antioxidant enzymes such as superoxide dismutase, catalase, glutathione reductase and glutathione peroxidase is significantly reduced, while the production of hydrogen peroxide and levels lipid peroxidation is increased in the treated groups indicating nimbolide-induced oxidative stress in rat epididymal sperm. This study confirmed that nimbolide influentially inhibited sperm motility in hamsters by blocking certain biochemical pathways, such as energy utilization, and showed that sperm capacitation was associated with reduction in AR, with changes in antioxidant enzymes reflecting a decrease in the levels of molecular events (ATP, Ca^{2+} and cAMP) and PYP. This will lead us to produce a special plant-based product as a source of a new male contraceptive. Further studies aim to molecularly and functionally identify sperm associated PYP during sperm capacitation and AR in golden hamster.

Keywords

Spermatozoa; Capacitation; AR; PYP; Nimbolide



Pretreatment of Cellulose-Rich Materials by Potential Microorganism - A Faster and Economic Approach for Bioethanol Production

Namrata Vimalkumar Joshi and Preeti Mahawar
Sardar Patel Institute of Applied Science, Gujarat, India

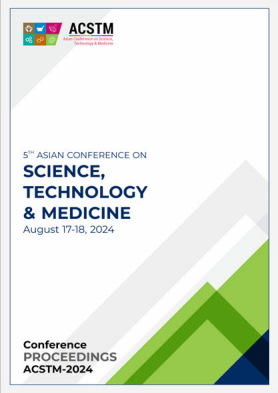
Presenter
Namrata Vimalkumar Joshi
Sardar Patel Institute of Applied Science, Vallabh Vidyanagar

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract
Biofuel is a promising replacement for maintaining a higher quality of both human health and the environment. A renewable fuel, bioethanol is produced by fermenting lignocellulosic biomass used to produce sugar. Now a days, fuels obtained from the conversion of polymers into fuels is a key research area in the field of renewable energy research. To decrease global warming and preserve fossil fuels, bioethanol is playing a vital role. Bioethanol is regularly used as motor fuel or as an additive in fuel. Bioethanol is the fuel produced by the anaerobic digestion of cellulolytic material, especially agriculture-based materials. Group of enzymes play vital role in the digestion of these cellulolytic materials. These enzymes are cellulase, ligninase, chitinase and amylase. The concentration of these digested products significantly affects bioethanol production quantity and quality. It is seen that microorganisms present in the soil with the capability of cellulose degradation degrade them and convert them into non-hazardous and useful compounds. Bioethanol production is done in a two-step process saccharification and fermentation. The conversion of cellulose into single sugars occurs through a process called saccharification. This is a simple hydrolytic reaction performed by the enzyme cellulase. A pre-treatment procedure is used to decrease the sample size, break down the hemicelluloses into sugars, and open up the structure of the cellulose component to make bioethanol from cellulosic biomass. Acids or enzymes hydrolyze the cellulose to create glucose sugar, which is subsequently fermented to create bioethanol. Bioethanol is also produced by fermenting the sugars found in hemicelluloses. The present study has focused on the use of cellulase producers as a source of digestion of cellulose for easy and economical pre-treatment for the saccharification for bioethanol production. Results of the study have shown that use of potential microorganisms for digestion of cellulose rich material is very economic alternate rather than using the purified enzymes. Not only this, but there microorganisms are also more stable than their respective enzymes.

Keywords
Cellulase; Bioethanol; Pretreatment; Sugar; Cellulolytic Material



PROCEEDING
ACSTM 2024

Impacts of Water Pollutants on Public Health

Abdelazim Negm
Faculty of Engineering, Zagazig University, Zagaizg, Egypt

Presenter

Abdelazim Mohamed Abdelhamid Negm
Zagazig University, Zagazig

Type

Oral Presentation

Track

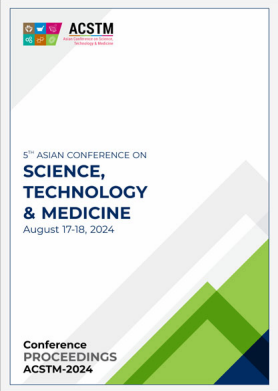
Agricultural & Biological Sciences

Abstract

With the rapid growth of the global population, environmental pollution is increasing rapidly. Environmental pollution includes air pollution, soil pollution, and water pollution. In this presentation, our main focus is water pollution because water constitutes 70% of the earth. Water pollution could be due to domestic sewage, plastic pollution, particularly nano-plastic particles in water, toxic waste, oil pollution, thermal pollution, and sediment pollution. On the other hand, globally, we consume 4.3 trillion cubic meters per year, with India, China, and US the largest consumers, with yearly rates of about 761, 581.29 and 444.29 BCM, respectively. With such a huge amount of consumed water by humans for domestic, agricultural, and other purposes, human health is adversely impacted, particularly in countries with less available water and highly polluted at the same time. Consequently, public health is under severe threat due to the lack of effective and efficient water treatment to meet world/local standards. This poses significant health risks with substantial healthcare costs to treat those affected by pollutants. The data will provide the causes of water pollution, their sources, their impacts on public health, mitigation measures, proper treatment, minimization, elimination, or prevention to avoid severe and harmful impacts on human health. We recommend appropriate strategic measures to reduce their harmful effects or prevent them at the source whenever appropriate. The presented materials are based on the presenter experiences in the field of water engineering and published article in reputable journals within the last 10 years.

Keywords

Environmental pollution; Water pollution; Health risk; Healthcare; Strategic measures



PROCEEDING
ACSTM 2024

Antiuropathogenic Activity of *Grewia asiatica* Against Uropathogens for Managing Urinary Tract Infections: An *in vitro* and *in silico* Analysis

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[2]The Standard College for Girls, Sialkot, Pakistan

[3]Institute of Biotechnology and Genetic Engineering, Islamabad, Pakistan

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Presenter

Shabina Ishtiaq Ahmed
The Standard College, Sialkot

Type

Oral Presentation

Track

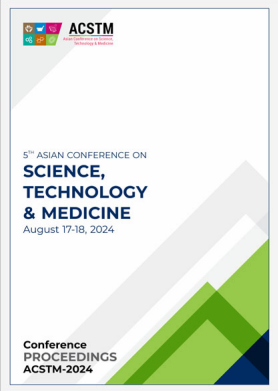
Agricultural & Biological Sciences

Abstract

Urinary Tract Infections (UTIs) are among the most common infections worldwide, affecting 150 million people annually. Despite a low mortality rate, it significantly impact patients quality of life and pose considerable clinical and economic burdens, especially in lower socio-demographic regions. Traditionally, *Grewia asiatica* (Phalsa) is used as a summer fruit for its stimulant and cooling effects. This study investigates the anti-uropathogenic properties of *G. asiatica* and explores the potential of its fruit powder sachets as an alternative treatment for UTIs. The anti-uropathogenic activity of *G. asiatica* aqueous and organic extracts was evaluated against uropathogenic bacterial strains using the disc diffusion method. The extracts were also assessed for antioxidant activity through the DPPH free radical scavenging assay and for cytotoxic potential on normal human corneal epithelial cells (HCEC). Additionally, ten compounds from *G. asiatica* were studied against the bacterial protein glucosamine-6-phosphate synthase, a critical enzyme in cellular membrane synthesis and an antimicrobial target, using molecular docking with Autodock Vina. The *G. asiatica* fruit extracts demonstrated significant anti-uropathogenic activity against uropathogenic strains including *Escherichia coli, Acinetobacter baumannii, Staphylococcus aureus, Proteus mirabilis and Pseudomonas aeruginosa*. The extracts also exhibited strong radical scavenging activity at a concentration of 500 g/mL and showed low cytotoxicity against the HCEC cell line. Molecular docking studies indicated the potential binding modes of the most active compounds to the bacterial protein glucosamine-6-phosphate synthase. *Grewia asiatica* fruit extracts contain secondary metabolites that exhibit anti-uropathogenic activity with low cytotoxicity to normal cells. These findings support the potential formulation of dry powder sachets from Phalsa as an alternative therapy for treating UTIs. Given the widespread prevalence and impact of UTIs, exploring such natural and alternative treatments is of significant importance.

Keywords

Grewia asiatica; Antiuropathogenic; Cytotoxcity; Molecular docking



PROCEEDING
ACSTM 2024

Proximate Composition Characterization of Pullet Meat Produced under Solar Energy and Conventional Poultry Brooding Heating Methods

Wilfred Ifeanyi Okonkwo[1], Emenike Ejiogu[1], Idika Idika[3], Uche A. Onyechi[4] and Cypril Ndamzi[5]

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[5]Department of Agricultural and Environmental Engineering, Rivers State University of Science and Technology, Port Harcourt, Rivers State, Nigeria

Presenter
Wilfred Ifeanyi Okonkwo
University of Nigeria, Nsukka

Type
Oral Presentation

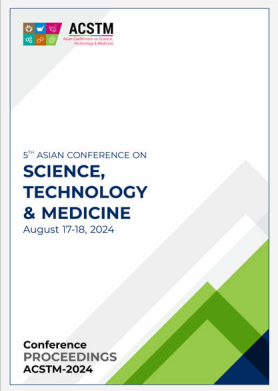
Track
Agricultural & Biological Sciences

Abstract

Solar energy powered chick production systems are unpopular among poultry farm holders in the developing countries. Undocumented concerns and stigmatization expressed by people are that chickens produced under solar energy application may lead to disease and cause some illness on consumption because of solar radiation. These concerns made this study relevant and therefore formed the basis of further investigation of the claims through experimental studies and verification of three energy heating methods for quality assurance. In this paper, experimental studies of three poultry brooding heating methods namely solar, electric and fossil fuel (kerosene) systems were conducted using 300 pullet day-old poultry chicks for three weeks brooding session per batch in three replicates. The aim of the study was to characterize the meat quality of birds brooded under different energy heating sources. Proximate composition of different meat parts of the chickens bred under the various sources of heat were conducted. The meat parts investigated were the liver, heart, kidney, wings, breast, thigh and the gizzard while the proximate parameters examined were protein, fat, ash, fibre, moisture and carbohydrate. Results of the protein content of the livers ranged from 17.94% (solar) to 23.64% (electric), while the ash contents were 1.80% (electricity) and lowest in 1.28% (kerosene), fat content was highest in solar (2.04%) and lowest in kerosene method (0.77%), fibre content ranged between 0.53% (electricity) to 0.72% (solar and kerosene). The mean values of the proximate composition of the various examined parts are presented as detailed in the text. General observation showed that solar has higher comparative advantage over the conventional brooded chickens due to the healthy chickens and meat quality it produced. It was further observed that solar radiation has no negative impact on the meat quality of pullet birds. This study generates new interest in poultry production research. The results of the study could form a useful tool for modern poultry evolution and for policy decision makers towards improved poultry production system and production of high quality meat.

Keywords

Proximate; Characterization; Meat; Solar; Conventional; Brooding; Methods



A Cohort Study on Oxidative Stress Indicators in Children Exposed to Cell Phone and Cell Tower Radiation

Indra Vijay Singh and Abdul Kareem
Moodlakatte Institute of Technology, Kundapura, Karnataka , India

Presenter
Indra Vijay Singh
Moodlakatte Institute of Technology, Kundapura
Karnataka

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract
This study aims to investigate the relationship between radiation exposure from cell phone towers and mobile phone use and various indicators of oxidative stress in children. This preliminary analysis draws from a cohort comprising 241 children enrolled in an ongoing study. We evaluated hematological and oxidative stress markers in these children, comparing parameters between those exposed (within 300 m of a cell phone tower) and unexposed (beyond 300 m), along with their association with specific absorption rates (SAR) from cell phones within their households. The median (interquartile range [IQR]) household radiation level was 52.5 (30.8, 76.2) mW/m2 in the exposed group and 7.7 (95% CI: 3.5, 15.1) mW/m2 in the unexposed group (p<0.001). The SAR value median (IQR) for mobile phones was 1.16 (0.86, 1.60) W/kg. Thrombomodulin median (IQR) values were 5.95 (2.69, 6.88) in the exposed group and 3.91 (2.81, 5.90) ng/mL in the unexposed group (p=0.72). Superoxide dismutase (SDO) median (IQR) values were 2.91 (2.81, 3.03) in the exposed group and 2.84 (2.59, 2.99) U/mL in the unexposed group (p=0.72). Correlations between radiation levels and myeloperoxidase, SDO, thrombomodulin, and glutathione peroxidase were, r= -0.19 (p=0.38), r= 0.16 (p=0.47), r= 0.34 (p=0.10), and r= -0.26 (p=0.39), respectively. Correlations between cell phone SAR and myeloperoxidase, SDO, thrombomodulin, and glutathione peroxidase were r= -0.22 (p=0.30), r= -0.14 (p=0.52), r= -0.05 (p=0.83), and r= 0.24 (p=0.43), respectively. Correlations between distance from the cell phone tower and myeloperoxidase, SDO, thrombomodulin, and glutathione peroxidase were r= 0.01 (p=0.99), r= -0.28 (p=0.19), r= -0.16 (p=0.44), and r= -0.09 (p=0.76), respectively.

Keywords
Oxidative stress; Exposed to cell phone; Cell tower radiation

PROCEEDING
ACSTM 2024

Molecular Insights and Therapeutic Potential: Exploring Some Anti-Diabetic Ethnomedicinal Plants of Nagaland, India

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Presenter
Takhelchangbam Ibeeka Sharma
Nagaland University, Lumami

Type
Oral Presentation

Track
Agricultural & Biological Sciences

Abstract
Diabetes poses a significant health challenge globally, necessitating effective management strategies. Despite advancements in healthcare, existing anti-diabetic medications often entail adverse effects and financial constraints for many. Consequently, exploring alternative treatments, such as plant-based medicines, holds promise. Nagaland, a region rich in biodiversity and indigenous knowledge in North Eastern India, presents a valuable resource in this regard. This study authenticates and investigates the anti-diabetic potential of 15 ethnomedicinal plants from Nagaland. Molecular characterization via DNA sequencing, targeting ITS, rbcL, and matK barcode regions, was conducted to authenticate plant species. Successful amplification and high blast hits were achieved, affirming the potential of DNA barcoding for species identification. Phylogenetic analysis revealed distinct clades, with matK exhibiting hyper variability and rbcL showing consistent matching. Varied genetic distances and GC percentages indicated species divergence and nucleotide composition differences. Phytochemical analysis of plant extracts, prepared using 80% ethanol, 80% methanol, and pure water, revealed diverse compounds, including phenolics, flavonoids, alkaloids, and reducing sugars. Ethanol extracts of *Bauhinia variegata* exhibited significant phenolic content (235.02 mg of GAE/gm) and antioxidant activity (IC50 values in DPPH and ABTS assays were 109.02 mg/mL and 2.19 mg/mL, respectively), with notable α-amylase inhibition (IC50=286.41 µg/mL and 88.65% inhibition). Additionally, *Cajanus cajan* and *Euphorbia hirta* showed potent α-amylase inhibition. *Passiflora edulis*, *Bauhinia variegata*, and *Gynura crepidioides* displayed notable α-glucosidase inhibition, particularly in ethanol and methanol extracts. The study presented the reliability of DNA barcoding in authenticating anti-diabetic plants and highlighted the rich phytochemical composition and antioxidant potential of Nagaland's medicinal flora. Seven plants exhibited promising anti-diabetic properties, particularly in ethanol extracts. Moreover, extracts from *Bauhinia variegata*, *Cajanus cajan*, *Euphorbia hirta*, *Passiflora edulis*, and *Gynura crepidioides* demonstrated significant inhibition of α-amylase and α-glucosidase enzymes. The notable inhibitory effects, high concentrations of phytochemicals and high antioxidants observed in the plants under study demonstrate the ability of these plant extracts to potentially regulate diabetes, thereby recommending further scientific exploration into their bioactive components and *in vivo* assessments.

Keywords
Diabetes; Ethnomedicinal plants; Nagaland; Molecular characterization; Phytochemical

PROCEEDING
ACSTM 2024

Enhanced Growth of *Phaseolus vulgaris* by Inoculation with Phosphate Solubilizing Plant Growth Promoting Rhizobacteria from *Musa* Rhizosphere

Mum Tatung and Chitta Ranjan Deb
Nagaland University, Lumami, India

Presenter
Mum Tatung
Nagaland University, Lumami

Type
Oral Presentation

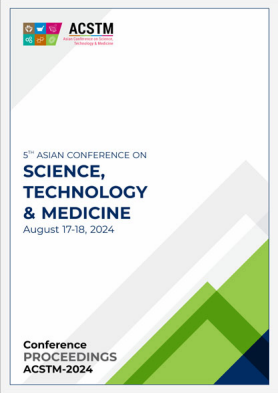
Track
Agricultural & Biological Sciences

Abstract

Plant growth promoting Rhizobacteria (PGPR) are the beneficial rhizobacteria that helps in the plant's growth and development. In the present study, PGPR strains were isolated from the rhizospheric soil of wild *Musa* plants in the jungle of Nagaland. Four isolates were selected for inoculation on *Phaseolus vulgaris* L., after screening for their ability to solubilize phosphate, IAA production, siderophore production, salinity and heavy metal tolerance. Based on 16sRNA sequencing, selected isolates RZ27, RZ23, RZ5, and RZ3 were identified as *Burkholderia cepacia* (OL662932), *Agrobacterium larrymoorei* (OL662933), *Pseudomonas taiwanensis* (OL662931), and *Pseudomonas orientalis* (OL662936) respectively. Phosphate solubilization by the isolates were monitored over 12 days, revealing *Pseudomonas orientalis* as the most efficient solubilizer (222.17?g/mL) on the 10th day, followed by RZ27 (222.80± 0.32), followed by RZ23 (71.57± 0.56) on 12th day, and RZ5 (19.20± 0.33) on 4th day. It was observed that the acidification of the media correlated with increased phosphate solubilization, indicating organic acid production by the bacterial isolates. Salt tolerance assays showed RZ27 as the most tolerant (14%), followed by RZ5 and RZ23 (10%), and RZ3 (6%) under different NaCl concentration. The IAA production was positive for RZ23 only and except RZ27, all the isolates were able to produce siderophore. The highest Siderophore percentage unit (SPU) was observed by RZ23 (33.34± 0.03), followed by RZ3 (29.07± 0.09), and RZ5 (27.20± 0.02). *Agrobacterium larrymoorei* and *Pseudomonas orientalis* showed the highest chromium tolerance (1840 µg/mL), followed by *Burkholderia cepacia* (1810 µg/mL), and *Pseudomonas taiwanensis* (1300 µg/mL). Inoculation of PGPR strains onto *Phaseolus vulgaris* indicated that RZ3 significantly increased shoot length, root length, and fresh biomass of root and shoot compared to control ($p \leq 0.05$). The RZ23 enhanced the shoot fresh weight ($p \leq 0.05$). These findings demonstrate the potential of these PGPR strains as bioinoculants for plant growth and development.

Keywords

PGPR, Phosphate solubilization; Siderophore; IAA; *Musa*; Biofertilizer; *Phaseolus vulgaris*



Tumour Microenvironment (TME) of Cancer as a Target for Future Therapies for Cancer

Kaiser Jamil
Bhagwan Mahavir Medical Research Centre, Hyderabad, Telangana, India

Presenter

Kaiser Jamil
Bhagwan Mahavir Medical Research Centre, Hyderabad

Type

Oral Presentation

Track

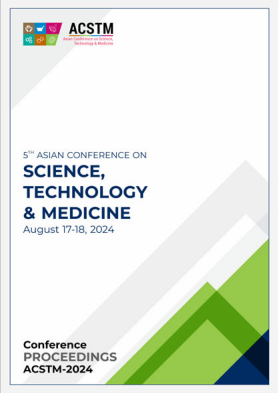
Medical & Health Sciences

Abstract

Cancer biology, an ever-evolving and groundbreaking field, relentlessly uncovers revolutionary insights into the intricate mechanisms driving tumorigenesis and disease progression. This article spotlights the transformative trends that are redefining our understanding of cancer biology. The tumor microenvironment (TME) plays a crucial role in cancer development, progression, and response to treatment. Comprising a complex network of cancer cells, stromal cells, immune cells, extracellular matrix components, and signaling molecules, the TME orchestrates a dynamic interplay that fosters tumor growth and metastasis while often contributing to therapeutic resistance. Emerging research underscores the potential of targeting the TME as a promising strategy for future cancer therapies. By modulating the interactions within the TME, novel therapeutic approaches aim to disrupt the supportive niche that tumors exploit, thereby enhancing treatment efficacy and overcoming resistance. This article delves into the current understanding of the TME, highlighting key components and mechanisms that make it a viable target for intervention. We explore innovative strategies, including immunotherapies, anti-angiogenic agents, and stroma-targeting drugs, that are being developed and tested in preclinical and clinical settings. As we advance our knowledge of the TMEs complexity and its influence on cancer biology, targeting the TME holds immense potential to revolutionize cancer treatment, offering new hope for improved patient outcomes.

Keywords

Cancer biology; Tumour-microenvironment; Targeted therapy; Epigenomics; Omics data, Diagnosis, Micro RNA



PROCEEDING
ACSTM 2024

Direct Evidence Implicating Epstein-Barr Virus in the Pathogenesis of Multiple Sclerosis

Gulfaraz Khan
College of Medicine and Health Sciences, Tawam Hospital Campus, United Arab Emirates University, Al Ain, United Arab Emirates

Abstract

Multiple sclerosis (MS) is a chronic inflammatory disease of the Central Nervous System (CNS), believed to be caused by the autoimmune destruction of the myelin sheaths surrounding the nerve fibers of the brain and spinal cord, leading to inflammation, demyelination and scarring. What causes MS remains unknown? Both genetic and environmental factors have been implicated. Of the environmental risk factors, there growing body of evidence indicating that Epstein-Barr virus (EBV) is involved. However, how EBV induces the pathology seen in MS has been frustratingly difficult to addressed, primarily due to the lack of a naturally susceptible animal model of EBV infection. We recently established a novel rabbit model of EBV infection, which recapitulates EBV infection in humans. We have been using this model to understand the biology of EBV and its associated diseases. Our findings have revealed a number of important insights supporting a role for EBV in the pathogenesis of MS. We show that: (1) Intravenous administration of EBV results in widespread infection with readily detectable virus in the spleen, PBMCs and plasma, (2) Circulating infected cells and not free virus correlate with CNS infection, (3) Peripheral infection induce the formation of distinct inflammatory cellular aggregates in the brain and spinal cord, (4) The aggregates are made up of EBV-infected cells, reactive astrocytes, infiltrating lymphocytes and macrophages, (5) Demyelination is present within the inflammatory aggregates and (6) The expression EBV latent transcripts, EBER1 and EBNA1, correlate with the levels of expression of proinflammatory cytokines such as IL-1β and IL-6. Our study provides, for the first time, direct evidence that primary peripheral EBV infection can lead to the virus crossing the blood-brain barrier and entering the CNS. Importantly, EBV infection in the CNS was associated with the formation of neuroinflammatory cellular aggregates similar to what has been reported in the brain of EBV-positive MS lesions in humans. Moreover, the cellular aggregates in the rabbit brain were also devoid of myelinated nerve fibres, a hallmark of MS pathology. Taken together, our data directly supports a role of EBV in the pathogenesis of MS.

Keywords

Multiple sclerosis; EBV; Neuroinflammation; Demyelination; Cytokines

Presenter

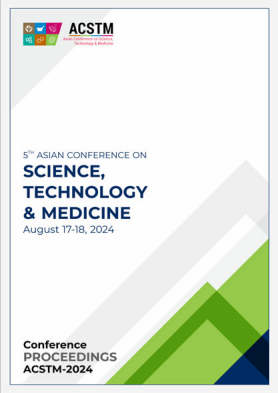
Gulfaraz Khan
United Arab Emirates University, Al Ain

Type

Oral Presentation

Track

Medical & Health Sciences



Epigenetic Signatures of Cervical Cancer: Spotlight on Diagnostics and Therapeutics

Madhumitha Kedhari Sundaram
Strategy and Development Bhaktavatsalam Memorial College University of Madras, Tamil Nadu, India

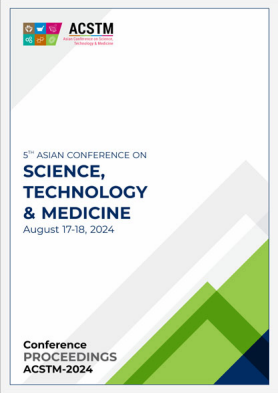
Presenter
Madhumitha Kedhari Sundaram
University of Madras, Madras

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
Cervical cancer remains a significant global health challenge, ranking fourth in both incidence and mortality among cancers affecting women. A striking 94% of cervical cancer related deaths occur in low- and middle-income countries. Extensive research has highlighted the pivotal role of epigenetic alterations in its pathogenesis from early shifts in the epigenetic landscape following Human Papillomavirus (HPV) infection to successive alterations fueling cancer progression. This review comprehensively examines the influence of epigenomic alterations on the hallmarks of cancer and their scope as diagnostic and prognostic indicators. Their reversible nature makes them promising therapeutic targets. Accordingly, numerous agents including phytochemicals have been studied for their ability to modulate the epigenetic machinery and counteract carcinogenesis. Consolidating the current understanding of the molecular mechanisms of these therapeutic moities and their interplay between epigenetic pathways and prognosis could pave the way for actionable insights in therapeutic strategies. The review also identifies gaps and future focus areas to enhance the optimization and clinical utility of these agents. In conclusion, this review underscores the critical role of epigenetic aberrations in cervical carcinogenesis and puts the spotlight on their application in all aspects of cancer management from diagnostics to therapeutic interventions.

Keywords
Health; Prognostic indicators; Critical role; Agents; Cancer



PROCEEDING
ACSTM 2024

Global Health Diplomacy: Fostering Collaborations for Pandemic Preparedness and Response

Jasna Karacic-Zanetti
Health Diplomacy Unit, Bruxelles, Belgium

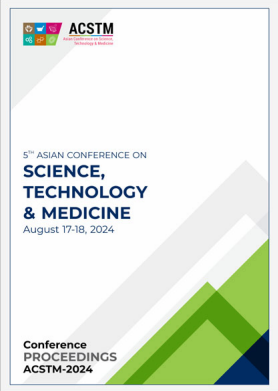
Presenter
Jasna Karacic-Zanetti
Health Diplomacy Unit, Bruxelles

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The emergence and global spread of COVID-19 have underscored the critical role of international cooperation in tackling infectious disease threats. It will also explores the concept of Global Health Diplomacy (GHD) as a framework for fostering collaboration in pandemic preparedness and response. The GHD utilizes diplomatic channels to address global health challenges. By promoting dialogue and joint efforts between nations, GHD aims to strengthen health systems, facilitate knowledge sharing, and ensure equitable access to resources during pandemics. This presentation will delve into the key areas where GHD can foster collaboration. (1) Strengthening surveillance and early warning systems: Effective disease surveillance allows for early detection and rapid response to outbreaks. The GHD can promote collaboration on data sharing, real-time communication, and joint research efforts to improve global disease surveillance. (2) Facilitating research and development: Collaboration is crucial for accelerating Research and Development (R&D) of vaccines, diagnostics, and therapeutics during pandemics. The GHD can encourage partnerships between governments, researchers, and pharmaceutical companies to expedite the development of life-saving interventions. (3) Ensuring equitable access to resources: Pandemics disproportionately impact vulnerable populations. The GHD promotes international cooperation to ensure equitable access to essential medical supplies, diagnostics, and vaccines, fostering a more just and effective global response. By fostering collaboration through GHD, the international community can build stronger pandemic preparedness and response systems, creating a more secure and healthy future for all.

Keywords
Global health diplomacy (GHD); Pandemic preparedness; Pandemic response; International cooperation disease surveillance; Early warning systems



PROCEEDING
ACSTM 2024

Targeting Acid-Sensing Ion Channels: A Novel Strategy for Treating Neurodegeneration in Multiple Sclerosis (MS)

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Presenter
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Khalifa University, Abu Dhabi

Type
Oral Presentation

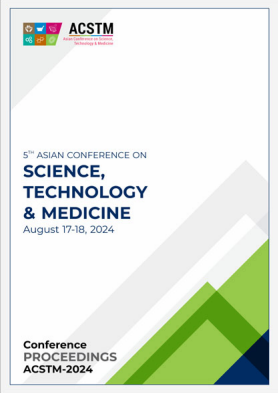
Track
Medical & Health Sciences

Abstract

Despite advancements in immunomodulatory drugs, the search for neuroprotective and remyelinating therapies for multiple sclerosis (MS) continues. Recent studies have linked the activation of acid-sensing ion channels (ASICs), particularly ASIC1a, with demyelination and axonal injury in post-mortem Central Nervous System (CNS) tissues from experimental autoimmune encephalomyelitis (EAE) mouse models and MS patients. This study aims to explore the therapeutic potential of Hi1a, a highly potent inhibitor of ASIC1a (IC50 500 pM), in reducing focal demyelinated plaques in the EAE mouse model of MS. Female C57BL/6 mice induced with EAE were randomized to receive a daily intraperitoneal dose of either Hi1a (50 µg/kg) or PBS under blinded conditions. The EAE disease progression and motor deficits were assessed, and terminal blood and tissues were processed for immunohistochemistry (IHC) and ELISA to examine various neuroinflammatory markers relevant to MS. Additionally, Hi1a conjugated with Alexafluor 700 (Hi1a-AF700) was administered to EAE mice at peak disease to identify the primary site of action of the test item. The EAE mice treated with Hi1a (50 µg/kg) exhibited significant improvement in EAE disease symptoms, particularly motor deficits, compared to the PBS group. The Hi1a-treated mice showed notably reduced demyelination (as indicated by MBP staining loss), activation of microglia/macrophages (Iba1), astrocytes (GFAP), and myeloperoxidase (MPO), a marker of chronic inflammation in spinal cord tissues. The ELISA assays for MPO expression in spinal cord lysates from EAE mice corroborated the IHC findings. The Hi1a-AF700 was predominantly found in neuronal cell bodies in spinal cord tissues, confirmed by imaging with the Odyssey® DLx scanner and confocal microscopy. The Hi1a, mainly interacting with neuronal cell bodies, significantly reduced demyelinating lesions in EAE mice. Future research is needed to elucidate the precise mechanisms underlying its neuroprotective effects.

Keywords

Acid-sensing ion channels (ASICs); Druggable target; Multiple sclerosis; Neurodegeneration; Neuroprotection; Remyelination



PROCEEDING
ACSTM 2024

SARS-CoV-2 Infection and its Association with Hyperglycemia and Inflammatory Biomarkers in COVID-19 Subjects: A Clinical Study

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[2]Department of Biochemistry, JSS Medical College, JSS Academy of Higher Education & Research, Mysuru-570015, Karnataka, India

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Abstract

Diabetes mellitus (DM) is a common comorbidity in COVID-19 patients, with hyperglycemia at hospital admission identified as a major risk factor linked to poor prognosis. Hematological and inflammatory parameters have been recognized as predictive markers of severity in COVID-19. In this clinical study, we aimed to assess the impact of hyperglycemia at hospital admission on hematological and several inflammatory parameters in COVID-19 patients. A total of 550 COVID-19 positive subjects were studied. On the first day of hospitalization, based on random blood sugar levels, subjects were classified into two major groups: Normoglycemic and hyperglycemic. Oxygen saturation, hematological variables, and inflammatory parameters recorded. The hyperglycemic group exhibited higher levels of serum ferritin, total leukocyte count (TLC), Lactate Dehydrogenase (LDH), neutrophil count, and neutrophil-to-lymphocyte ratio (NLR). In contrast, oxygen saturation and lymphocyte count were lower compared to the normoglycemic group. The results of this study provided a clinical association between hyperglycemia and increased severity of COVID-19. Consequently, the identification of these parameters is crucial and valuable for assessing disease severity in hyperglycemic subjects.

Keywords

SARS-CoV-2; Hyperglycemia; Inflammation

Presenter

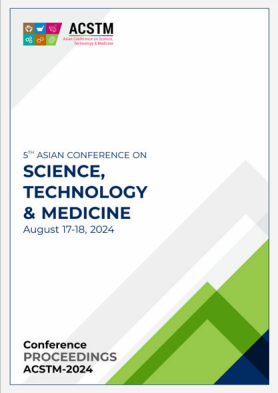
Ravindra P. Veeranna
Xavier University School of Medicine and Xavier University School of Veterinary Medicine, Oranjestad

Type

Oral Presentation

Track

Medical & Health Sciences



Fisetin Reduces Methylation of 5 CpG of Promoters and Modifies Histone Marks and to Restore the Expression of Various Tumor Suppressor Genes in Human Cancer Cells

Nazia Afroze, Madhumitha K. Sundaram and Arif Hussain
Manipal Academy of Higher Education, Dubai Campus, United Arab Emirates

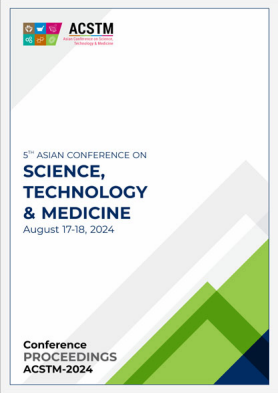
Presenter
Nazia Afroze
Manipal Academy of Higher Education, Dubai

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
Polyphenols have emerged as promising candidates for modulating cancer cell behaviour as they can chromatin modification and DNA methylation pattern in cancer cells. This study aimed to elucidate the epigenetic effects of fisetin, a polyphenolic compound, on HeLa cells. To perform methylome sequencing the DNA was isolated from fisetin treated and untreated Hela cells. The isolated RNA from fisetin treated and untreated Hela cells were subjected to qPCR to study the transcript expression of various TSGs and oncogenes. Various chromatin-modifying enzymes such as DNA Methyltransferases (DNMTs), histone acetyl-transferase (HATs), Histone Deacetylases (HDACs), and histone methyltransferases (HMTs) were tested for their biochemical activities along with their transcript level expression through qPCR. Also, H3 and H4 histone modification marks along with Global DNA methylation-LINE 1 were quantitated by ELISA-based assay. Additionally, expression of migration-related genes at transcript and protein levels, were examined by qPCR and protein profiler array respectively which were corroborated with cellular level through colony formation, invasion, and scratch wound assays. Fisetin treatment reduced the methylation of various TSGs, leading to their corresponding reactivation at transcript level. Fisetin mediated hypermethylation of DNMTs and HDACs were presumably reduced their expression and biochemical activity. Concordant to the reduced expression of HMTs, HATs and other epienzymes various histone H3 and H4 marks were also observed to be modulated. Fisetin treatment cells did not alter the global DNA methylation-LINE 1 compared to untreated control. The molecular studies were well backed by the cell-based studies which consistently proved the cytostatic and anti-migratory behaviour of fisetin in HeLa cells. This study gives mechanistic insight into the action of fisetin, as a potential epigenetic modifier that may open the avenue for better cancer treatment and management.

Keywords
Fisetin; Epigenetic modification; Tumor suppressor gene; DNA methylation; Epigenome; Methyl sequencing



PROCEEDING
ACSTM 2024

Beyond the Smile: Unveiling the Impact of Dental Disease on Skin Health

Shohreh Ghasemi[1] and Mahmood Dashti[2]

[1]Queen Mary University of London, Atlanta, United State
[2]Rochester Institute of Technology, New York, United States

Presenter
Shohreh Ghasemi
Queen Mary University of London , Atlanta

Type
Oral Presentation

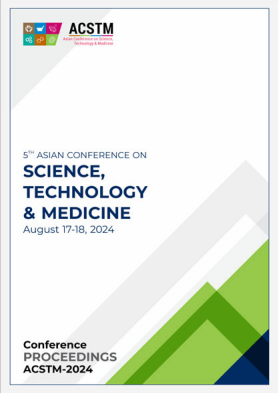
Track
Medical & Health Sciences

Abstract

Dental and skin health are often perceived as separate aspects of overall well-being. However, emerging research suggests a significant interrelationship between these two seemingly unrelated systems. This abstract aims to explore the intricate connection between dental disease and skin health, shedding light on the impact that oral health conditions can have on the skin. Traditionally, oral health has been associated with the well-being of the teeth and gums. However, recent studies have revealed that oral diseases, such as periodontitis and dental caries, can have far-reaching effects beyond the oral cavity. The mouth serves as a gateway for bacteria and inflammation to enter the bloodstream, potentially triggering systemic inflammation and immune responses throughout the body, including the skin. Evidence suggests that chronic oral inflammation can contribute to the development or exacerbation of various skin conditions, such as acne, psoriasis, eczema and rosacea. Furthermore, the oral microbiome and its dysbiosis may play a crucial role in the pathogenesis of these skin disorders. Imbalances in the oral microbiota can lead to an altered immune response, promoting inflammation and skin barrier dysfunction. Understanding the connection between dental disease and skin health is of paramount importance for healthcare professionals and patients alike. By recognizing and addressing oral health issues, individuals may be able to improve not only their dental well-being but also their skin health. Integrated approaches that combine dental and dermatological care could potentially lead to more effective treatment strategies and improved patient outcomes. In conclusion, this abstract highlights the need to expand our understanding of the relationship between dental disease and skin health. By recognizing the impact of oral health on the skin, we can foster interdisciplinary collaboration and develop innovative approaches to promote overall well-being. Further research in this area is warranted to unravel the intricacies of this connection and unlock new avenues for preventive and therapeutic interventions.

Keywords

Dental disease; Oral health; Skin health; Periodontitis; Skin barrier dysfunction; Oral microbiome



PROCEEDING
ACSTM 2024

3D Bioprinting: A New Arena for Studying Cancer Stem Cells Niche

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[3]Department of Biotechnology, Era University, Lucknow, India

Presenter
Zainab Siddiqui
Era University, Lucknow

Type
Oral Presentation

Track
Medical & Health Sciences

Abstract

Cancer Stem Cells (CSCs) are a small subpopulation of cells within a tumor that possess self-renewal and differentiation capabilities, which contribute significantly to tumor growth, metastasis, and resistance to therapy. These cells are often protected within specialized microenvironments known as CSCs niches, which play a crucial role in their survival and function. The CSC niches are complex microenvironments comprising various cellular and non-cellular components such as cancer associated fibroblasts, endothelial cells, tumor associated macrophages, mesenchymal stem cells, and immune cells. To investigate CSCs and their niches, various 3D *in vitro* cancer models are used i.e. spheroid cultures, biopolymer scaffolds, and cancer on chip devices. The 3D bioprinting represents a significant advancement in cancer research by providing a more accurate and dynamic representation of the tumor microenvironment (TME) and CSC niches. It is an advanced technology that allows for the precise and reproducible creation of complex tissue models by layer-by-layer deposition of bioinks (mixture of biomaterials and cells). They must support cell viability and mimic the natural extracellular matrix (ECM). Commonly used bioinks include hydrogels e.g., alginate, collagen, and fibrin. Therefore, 3D bioprinted tumor models can be used to investigate CSC properties such as proliferation, migration, and differentiation. Researchers can also explore how CSCs interact with different elements of the TME, such as hypoxic regions or ECM stiffness through this technology.

Keywords

Cancer stem cell; 3D culture; 3D bioprinting; Tumor microenvironment

PROCEEDING
ACSTM 2024

Bioactive Constituents, Antioxidant and Anti-Inflammatory Effects of *Uvaria chamae* Stem Extracts on Carbon Tetrachloride-Induced Toxicity in Rats

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Presenter

David Chukwu Obasi
David Umahi Federal University of Health Sciences, Abakaliki

Type

Oral Presentation

Track

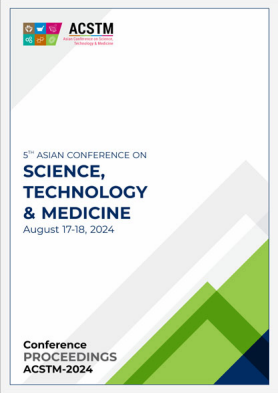
Medical & Health Sciences

Abstract

Despite the developments in contemporary orthodox medicine, kidney diseases remain a serious public health challenge to both genders. The various chemotherapeutic drugs used for the treatment of kidney diseases sometimes possess some side effects, with high costs. Thus, there is a need for systematic research on medicinal plants with potential nephroprotective activities, with less or no side effects and cost. This study investigated the effects of deionized water extract (DWE) and ethylacetate extract (EAE) of *Uvaria chamae* stem on antioxidant and anti-inflammatory parameters of Carbon Tetrachloride (CCl_4)-induced toxicity in albino rats. The LD_{50}, was performed according to the Lorke method. Afterward, 54 male albino rats were separated into 9 groups of 6 rats each. Group 1 (normal control) received normal saline and olive oil. Organ damage was induced by administration of 2.5 mL/kg body weight (b.wt.) of CCl_4 intraperitoneally to the rats in groups 2 - 9. Group 2 (untreated) received normal saline, and Group 3 (standard control) received 20 mg/kg b.wt.,of vitamin C. Groups 4 - 6 and 7 - 9 were given 200, 400, and 600 mg/kg b.wt., of DWE and EAE, respectively for 21 days via oral intubation. Blood samples and kidneys of the rats were collected 24 hrs after the last treatment for various biochemical studies. There were significant ($p<0.05$) lower activities of SOD, catalase and GPx, with significant ($p<0.05$) higher concentrations of ROS, MDA, TNF-α, NF-κB, IL-1α, and IL-1β in the untreated group 2 compared to the normal control, in a dose-dependent manner. Upon treatment, the extract prevented further tissue damage, leading to the recovery of the animals; with higher effects observed in the EAE than in the DWE. The GC-MS results of the crude stem showed the presence of 11-octadecenoic acid, methyl ester; tetradecanoic acid and decanoic acid having antioxidant and anti-inflammatory activities. The findings indicate that *U. chamae* stem possesses various bioactive compounds with antioxidant and anti-inflammatory effects. Hence, the stem of *U. chamae* is suggested to be harnessed for the treatment/management of antioxidant and anti-inflammatory-related diseases, such as renal diseases.

Keywords

Uvaria chamae stem; GC-MS; Antioxidant; Anti-inflammatory; Carbon tetrachloride; Kidney diseases



Analyzing the Reported Prevalence of Heart Disease Among United States Adults: Trends from the NCHS Database

Blessing Itua
Internal medicine department, Annotto Bay Hospital, Annotto Bay, Jamaica

Abstract

This study aims to comprehensively analyze and elucidate the reported prevalence of heart disease among United States adults, utilizing data extracted from the National Center for Health Statistics (NCHS) Database from 1999 to 2019. We conducted a thorough analysis of the NCHS database to examine demographic and socioeconomic variables, such as age, gender, race, education, poverty level, geographic region, and metropolitan status, influencing heart disease prevalence among U.S. adults. The outcomes were concisely summarized using aggregate data from 1999-2019, delineating prevalence trends across all participants throughout these years. One-way Analysis of Variance (ANOVA) was utilized for statistical analyses, assessing variations in heart disease prevalence across diverse demographic and socioeconomic categories. The study reported notable trends in age-specific prevalence, revealing distinct patterns across different age groups. The age-adjusted average reported heart disease prevalence for individuals aged 18 and over from 1999 to 2019 was 5.9%, fluctuating. Within the 18-44 age group, prevalence started at 1.0% and increased notably across subsequent age brackets: 45-54 (4.3%), 55-64 (9.9%), 65-74 (16.8%), and 75 and older (24.4%). Adult men consistently had a higher prevalence (7.6%) than women (4.5%). Prevalence varied among racial groups, with the highest in American Indian or Alaska Native-only individuals (12.4%). Socioeconomic variables illustrated a robust association between lower educational attainment, poverty, and increased heart disease prevalence. Geographic and metropolitan status analyses unveiled significant regional and residential disparities in reported heart disease prevalence. Education-level analysis revealed a higher prevalence for lower education (9.1%) and a lower prevalence for higher education (6.1%). Significant differences were observed in each category ($p < 0.001$). This study highlights epidemiological patterns and reported heart disease prevalence, stressing the urgency for targeted interventions and preventative measures. Results underscore the importance of addressing temporal patterns, demographic inequalities, and geographic disparities through strategic public health efforts.

Keywords

Heart disease; NCHS; Reported prevalence; United States; Adults

Presenter

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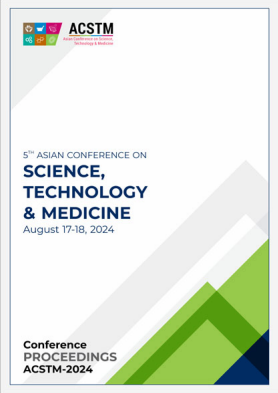
Annotto Bay Hospital,
Annotto Bay

Type

Poster Presentation

Track

Medical & Health Sciences



PROCEEDING
ACSTM 2024

Antimicrobial Advancements using Nanocomposite for Enhanced Personal Hygiene and Comfort

Suneeta Panicker, Sana Anjum, Saba Anjum and Abhishek Nair
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Presenter
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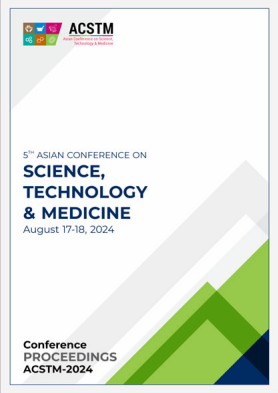
Type
Poster Presentation

Track
Medical & Health Sciences

Abstract
The prevalence of bacterial and fungal infections associated with sanitary napkins and diapers underscores the critical need for innovative antimicrobial solutions. In this study, we synthesized a novel nanocomposite comprising green synthesized selenium, silver, and copper nanoparticles utilizing the plant *Cassia fistula* leaf extract for its medicinal properties and investigated its application onto a cellulose matrix commonly utilized in sanitary napkins and diapers. The aim was to evaluate its antimicrobial efficacy against a diverse range of pathogens commonly implicated in infections. Antimicrobial assays were conducted to assess the efficacy of the nanocomposite against various pathogenic microorganisms, including *E. coli*, *Staphylococcus spp.*, *Proteus spp.*, *Bacillus spp.*, *Candida spp.*, and two strains of multidrug-resistant bacteria. The experiments involved well diffusion assays, broth microdilution assays to comprehensively evaluate the antimicrobial potency of the nanocomposite. Specifically, we utilized green-synthesized Se/Ag/Cu nanocomposites to impregnate them into the cellulose matrix used in sanitary napkins and diapers. The nanocomposite discs were effective not only against the test bacteria, but also significantly inhibited the growth of multidrug-resistant bacteria (*pseudomonas*, *Enterobacter*, and *Klebsiella*). Furthermore, these discs had the potential to inhibit *Candida*, the major causative agent in UT infections. The purpose of this study was to mitigate the risk of urinary tract infections, skin irritations, inflammation, toxic shock syndrome, and candidiasis associated with prolonged use of sanitary pads and diapers.

Keywords
Bacterial infections; Fungal infections; Sanitary napkins; Diapers; *Cassia fistula*; Green Synthesis; Se/Ag/Cu Nanocomposite; Antimicrobial assay



Human Peptidyl-prolyl cis/trans Isomerases Par14 and Par17 Independently Bind to Hepatitis B Virus Core Particles from both Inside and Outside, X Protein, Core protein and Covalently Closed Circular DNA

Umar Saeed
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Presenter
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Foundation University, Islamabad

Type
Oral Presentation

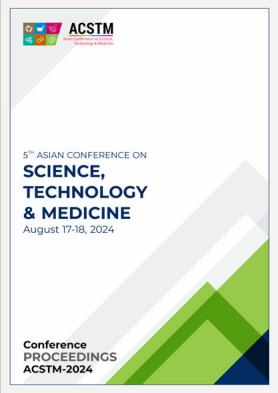
Track
Medical & Health Sciences

Abstract

Peptidyl-prolyl cis+/trans isomerases Par14 and Par17 in humans plays crucial roles in diverse cellular processes, including protein folding, chromatin remodeling, DNA binding, ribosome biogenesis and cell cycle progression. However, the effects of Par14 and Par17 on viral replication have been explored to a limited extent. We first time discovered their influential roles in promoting Hepatitis B Virus replication. In this study, we observed that in the presence of HBx, either Par14 or Par17 could upregulate HBV replication. However, in the absence of HBx, neither Par14 nor Par17 had any effect on replication. Their mechanism of action involves binding to specific motifs within HBc and HBx proteins. Notably, they target the conserved 133Arg-Pro134 (RP) motif of HBc and the 19RP20-28RP29 motifs of HBx. This interaction is fundamental for the stability of HBx, core particles, and HBc. The Par14 and Par17 exhibit versatility by binding both outside and inside core particles, thereby facilitating core particle assembly through their participation in HBc dimer-dimer interactions. The NAGE and immunoblotting analyses unveiled the binding of Par14/Par17 to core particles. The co-immunoprecipitation experiments further demonstrated the interaction of Par14/Par17 with core particle assembly-defective and dimer-positive HBc-Y132A. It's essential to emphasize that R133 is the key residue in the HBc RP motif that governs their interaction with Par14/Par17. Chromatin immunoprecipitation conducted on HBV-infected cells elucidated the participation of residues S19 and E46/D74 in Par14 and S44 and E71/D99 in Par17, in the recruitment of 133RP134 motif-containing HBc into cccDNA. Depleting PIN4 in liver cell lines results in a significant reduction in cccDNA levels, pgRNA, sgRNAs, HBc, core particle assembly and HBV DNA synthesis. Notably, parvulin inhibitors like juglone and PiB have proven to be effective in substantially reducing HBV replication. These inhibitors weaken the interaction between HBV core particles and Par14/Par17, underscoring the dynamic nature of this interaction. It's also worth noting that specific Par14/Par17 inhibitors hold promise as potential therapeutic options for chronic hepatitis B.

Keywords

Par14; Par17; HBV; Inhibitors; Cellular processes



PROCEEDING
ACSTM 2024

Apigenin Reinstates Apoptosis in Cervical Cancer Cells

Deepika Bhagavatula, Tarique Noorul Hasan, Huzefa Vohra, Sherareh Khorami and Arif Hussain

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Type

Oral Presentation

Track

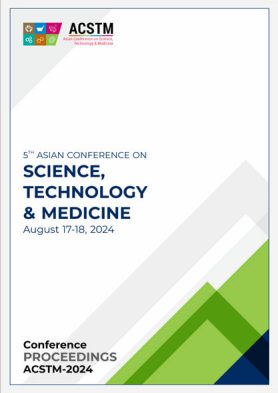
Medical & Health Sciences

Abstract

One of the primary active components of flavonoids, apigenin, is well known for showing protective properties against several cancers, among them cervical cancer. The purpose of this study was to ascertain whether apigenin induced apoptosis and had antiproliferative effects on human cervical cancer cells. In this study, an apigenin-based anticancer effect on HeLa cells has been investigated through various assays suh as MTT, propidium iodide/annexin V tests, DNA fragmentation, PI staining and cell cycle analysis. Apigenin has shown a significant effect on the proliferative, clonogenic and anti-apoptotic capability of HeLa cells both *in silico* and *in vitro* by specifically targeting the anti-apoptotic proteins which are known to be over expressed in cancers. Apigenin has notably reduced the proliferative and clonogenic capability through reinstating apoptotic capability in HeLa cells. Thus, apigenin can be considered a potential anti-cancer agent.

Keywords

Apigenin; Anti-cancer; Apoptosis; Chemoprevention



PROCEEDING
ACSTM 2024

The Impact of EBV Transmission in the Rabbit Model: Oral vs IV Route

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Type

Poster Presentation

Track

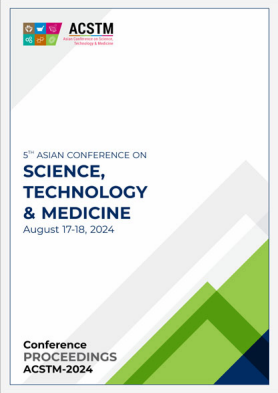
Medical & Health Sciences

Abstract

The isolation of Epstein-Barr Virus (EBV) in 1964 from a case of Burkitt lymphoma prompt a surge in research on the biology of this oncogenic virus and its role in the pathogenesis of associated malignancies. Over half a century later, a number of pertinent questions on the dynamics of EBV and the cellular targets of primary infection, remain poorly defined. One major obstacle in EBV research has been the lack of a suitable small animal model. The EBV is highly human tropic virus. We have recently established a novel rabbit model of EBV infection which appears to mimic the natural infection seen in humans. In this study, we explored the impact of oral EBV infection versus intravenous (IV) transmission. Specifically, the study explored whether oral transmission of EBV is as effective as blood-borne transmission. We investigated the connection between the mode of transmission and the extent of viral dissemination in the peripheral organs and the blood. We also examined if the mode of transmission influences long-term viral latency and reactivation following immunosuppression. A sample of 34 rabbits, randomly divided into two groups were used to address these research questions. Animals in both, oral (n=15) and IV (n=15) groups received the same quantity of fresh cell culture derived EBV, either via oral or intravenous route. From our previous studies, non-infected animals always remain EBV negative. Hence, in this study we only included 4 animals in the control group. Using histology, PCR/qPCR, EBER-*in situ* hybridization and immunohistochemistry, our investigations indicated that rabbits can be infected with EBV via both oral and IV route of transmission. However, the oral mode of transmission is less efficient than the intravenous route. Moreover, immunosuppression of latently EBV infected rabbits resulted in the reactivation of the virus. The viral load was lower in oral group compared with IV. This was also reflected in the degree of viral dissemination in other organs, most notably, the spleen. The rabbit model of EBV infection holds great potential for unraveling the biology of EBV and its associated diseases. In this study, we show that long-term latency and reactivation of EBV is impacted by the mode of transmission.

Keywords

Primary EBV infection; Rabbit model; Oral vs IV infection; Viral latency and reactivation; Cellular targets of EBV



Biosynthesis of Silver Nanoparticles Using Housefly extract as a Bio-Resource and Evaluation of their Biomedical Properties

Mariyam Shafiq and Saiqa Tabassum
Shaheed Zulfikar Ali Bhutto Institute of Science and Technology, Karachi, Pakistan

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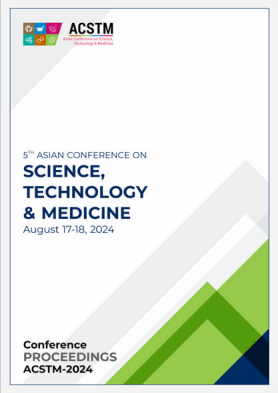
Type
Oral Presentation

Track
Medical & Health Sciences

Abstract
The present study evaluated the efficiency of *Musca domestica* (housefly) extract as a biological source to produce valuable Silver nanoparticles (Ag-NPs). The Ag-NPs have been biosynthesized by various methods using different sources across the globe. However, this study is the first to utilize the extract of *M. domestica* for Ag-NPs green synthesis. The characterization of synthesized nanoparticles was carried out using a UV-Vis spectrophotometer, with particle size and structure identified by Scanning Electron Microscopy (SEM). Elemental analysis was achieved using energy-dispersive X-ray spectroscopy (EDS or EDX), while Fourier-Transform Infrared Spectroscopy (FTIR) identified the biomolecules in the housefly extract responsible for acting as reducing and capping agents to biosynthesize and stabilize silver nanoparticles, respectively. Biomedical evaluation of the biogenic silver nanoparticles was conducted, including assessments of thrombolytic, antibacterial, antioxidant, anti-inflammatory, and anti-diabetic activities. The results demonstrated positive outcomes, particularly highlighting the significant biomedical potential of these biogenic silver nanoparticles. This comprehensive study verifies that housefly extract can be an efficient and eco-friendly source for synthesizing silver nanoparticles via a green synthetic approach. The positive biomedical properties of the biogenic silver nanoparticles underscore their potential application in various therapeutic areas, contributing to the advancement of nanotechnology in medicine. This innovative use of *M. domestica* extract not only offers a sustainable method for nanoparticle synthesis but also opens new avenues for biomedical research and applications.

Keywords
Housefly extract; Silver nanoparticles; Biosynthesis; Green synthesis; Biomedical evaluation; Thrombolytic activity; Antibacterial properties; Antioxidant properties; Nanotechnology; Sustainable development



PROCEEDING
ACSTM 2024

Delineating the Antiapoptotic Property of Apigenin as an Antitumor Agent: A Computational and *in vitro* Study on HeLa Cells

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Type

Poster Presentation

Track

Medical & Health Sciences

Abstract

Apigenin, a flavonoid, is reported to have multiple health benefits including cancer prevention; this study evaluates the drug likeliness and Swiss ADME properties of apigenin. Apoptosis, which is a key hallmark of cancer, is associated with the deregulation of the balance between proapoptotic proteins and antiapoptotic proteins such as BCL-2,BCL-xl, BFL-1, BCL-w, BRAG-16, and MCL-1. The docking studies of apigenin with the mentioned proteins was performed to identify the interactions between the ligand and proteins, which suggested that apigenin was able to bind to most of the proteins similar to the inhibitory molecules of its native structure. A remarkable reduction in the total energy after energy minimization of apigenin-antiapoptotic protein complexes suggested increased stability of the docked complexes. The same complexes were found to be stable over a 10 ns period of molecular simulation at 300 K. These findings advocated the study to evaluate apigenins potential to inhibit the HeLa cells at 5, 10, and 15 ?M concentrations in the clonogenic assay. Apigenin inhibited the colony-forming ability of HeLa cells in a dose-dependent manner over a fortnight. Light microscopy of the treated cells displayed the morphological evidence characteristic of apoptosis in HeLa cells such as blebbing, spike formation, cytoplasmic oozing, and nuclear fragmentation. Thus, these results clearly indicate that apigenin may be used as a potential chemo-preventive agent in cervical cancer management.

Keywords

Apigenin; Apoptosis; Drug likeliness; Docking; Energy minimization; Molecular simulation; Clonogenic assay; Chemopreventive agent

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