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ABSTRACT BOOK

Organizing Committee Member

The Application and Challenge of Chemosensors in Agriculture

Yong Zhang
Yunnan Normal University, China

Abstract:

Chemosensors, as advanced analytical tools, have gained significant attention in the field of agriculture due to their ability to detect and monitor various chemical compounds in soil, water, and air. These devices play a crucial role in improving crop yield, ensuring food safety, and managing agricultural resources efficiently. In agriculture, chemosensors are employed for tasks such as nutrient monitoring, pesticide detection, soil health assessment, and water quality analysis. By providing real-time data on essential nutrients like nitrogen, phosphorus, and potassium, chemosensors help farmers optimize fertilizer application, reducing both costs and environmental pollution. Similarly, they can detect trace amounts of pesticides, ensuring that produce meets safety standards and protecting consumers' health. However, despite their potential, the application of chemosensors in agriculture faces several challenges. One major hurdle is the complexity and variability of agricultural environments, which can affect the accuracy and reliability of sensor readings. Additionally, the high cost of chemosensors and the lack of specialized training among farmers can limit their widespread adoption. Furthermore, the integration of chemosensor data with existing farm management systems presents a technical challenge that needs to be addressed. To overcome these obstacles, ongoing research focuses on developing more robust and cost-effective chemosensors, as well as improving data integration and interpretation capabilities. Collaboration between researchers, farmers, and industry stakeholders is essential to drive innovation and facilitate the adoption of chemosensor technology in agriculture.

Biography:

***Dr.** Zhang Yong is currently a Professor/Doctor Mentor at the School of Energy and Environmental Science of Yunnan Normal University. He received his B.S. degree in Applied Chemistry from University of Jinan, M.S. degree in Applied Chemistry from Nanjing University of Technology, and Ph.D. degree from the Beijing Institute of Technology. He carried out postdoctoral research at the University of Jinan and at the National Institutes of Health (USA). He has published more than 200 papers in SCI journals. He has many scientific research achievements, including hosting the National Natural Science Foundation Projects, Yunnan Provincial Funds for Applied Basic Research, and Shandong Province Natural Science Foundation Projects. His research interests include low-dimensional optoelectronic functional nanomaterials and metal nanomaterials; electroanalysis and chemical sensing detection, and the preparation and application of agricultural chemosensors.*

Making Sense of Early Pregnancy Ultrasound: High-risk Features in Predicting Early Pregnancy Loss

Arthi Subramanian
Rotunda Hospital, Ireland

Abstract:

Early pregnancy loss (EPL) is one of the most common first-trimester complications and is often associated with significant anxiety and distress for patients. Although ultrasound is central to diagnosing EPL, several first-trimester markers can help identify pregnancies at increased risk even before a loss occurs. However, many clinicians find these markers challenging to interpret consistently, which can result in uncertainty regarding patient management.

This seminar provides a structured, clinically focused overview of ultrasound markers associated with EPL. It highlights how these markers can be applied effectively in routine practice within early pregnancy units and emergency departments, with particular emphasis on their relevance to clinical decision-making.

The seminar explores key ultrasound parameters that may indicate an increased risk of EPL, including gestational sac morphology, yolk sac characteristics, crown–rump length (CRL) growth, fetal heart rate (FHR), sub-chorionic haematoma (SCH), and maternal anatomical factors. It also discusses limitations and common pitfalls in interpretation and emphasizes the importance of clear, empathetic communication with patients in cases of uncertainty.

A comprehensive understanding of early sonographic predictors, combined with detailed clinical history, enhances patient counselling and supports informed decisions regarding follow-up and management. Although ultrasound cannot prevent pregnancy loss, accurate interpretation of early markers improves risk communication and allows a more patient-centred approach to care.

Biography:

Dr. *Arthi Subramanian MB, BCh, BAO (Hons), M.Sc, PGDip is a Junior Registrar in Obstetrics and Gynaecology at the Rotunda Hospital, Dublin, and a third-year Basic Specialist Training (BST) trainee in Ireland. She has a strong clinical interest in early pregnancy care, acute gynaecology, and first-trimester ultrasound. She completed the Early Pregnancy Ultrasound Assessment Module at the University of Derby, UK, where she developed advanced skills in early pregnancy imaging and assessment. Her clinical work focuses on delivering high-quality care in early pregnancy units, interpreting complex ultrasound findings, and providing patient-centred counselling. She is committed to ongoing professional development and excellence in women's health.*

Novel phage vB_CsaM_2375H2 Effectively Controls Cronobacter sakazakii Biofilms and Contamination in Powdered Infant Formula

Yang Wang
Anhui Polytechnic University, China

Abstract:

Cronobacter sakazakii, a significant foodborne pathogen in powdered infant formula (PIF), forms resilient biofilms that confer resistance to disinfectants, antibiotics, and environmental stresses. Bacteriophages represent a promising alternative for controlling bacterial contamination in food. Our study isolated and characterized a novel lytic phage, vB_CsaM_2375H2 (2375H2), from wastewater. Transmission electron microscopy revealed an icosahedral head and a contractile tail structure, including a sheath, baseplate, and tail filaments. Phage 2375H2 exhibited broad host specificity within the Cronobacter genus, lysing 13 out of 28 tested strains, while showing no activity against non-Cronobacter bacteria. Key features include a low multiplicity of infection of 0.01, a short latent period (<20 min), and notable stability across a wide temperature (25-70°C) and pH (3-11) range. Whole-genome analysis classified phage 2375H2 within the Pseudotevenvirus genus and confirmed the absence of virulence or antibiotic resistance genes. Crucially, phage 2375H2 effectively disrupted pre-formed C. sakazakii biofilms, achieving removal rates of 61.11% and 62.55% at concentrations of 10^6 PFU/mL and 10^7 PFU/mL, respectively, after 8 hours. Furthermore, in PIF matrices, phage 2375H2 (10^{10} PFU/mL) demonstrated potent bactericidal activity, achieving a 99% reduction in viable C. sakazakii within 6 hours. These findings highlight phage 2375H2 as a highly specific and effective candidate for controlling C. sakazakii biofilm formation and contamination in food systems.

Biography:

***Mr.** Yang Wang is a Lecturer at the College of Biological and Food Engineering, Anhui Polytechnic University, Wuhu, Anhui, China. He received his Ph.D. in Food Science and Engineering from Hefei University of Technology in 2024. His research expertise lies in food microbiology and molecular pathogenesis, with a particular focus on the biology and control of foodborne pathogens. His work systematically investigates the stress resistance mechanisms and virulence regulatory networks of major foodborne pathogens, contributing to a deeper understanding of pathogen survival and adaptation. His research interests include the isolation, detection, and population biology of foodborne pathogens; molecular mechanisms of stress adaptation and resistance; characterization of virulence factors and pathogenic pathways; and the targeted biocontrol of pathogens using bacteriophages. By integrating molecular biology with microbial ecology approaches, his studies provide valuable insights into pathogen behavior and support the development of innovative phage-based intervention strategies aimed at improving food safety and public health protection.*

Poster Presentation

Structurally Tailored Amide-Functionalized Ring Systems of Carbazoles for Antimicrobial Resistance Combat (STARC)

Shruti Mahendra Vishwakarma
MIT Art, Design & Technology University, India

Abstract:

In response to the growing global threat posed by drug-resistant pathogens and the pressing demand for innovative drug candidates with varied pharmacophoric frameworks, a novel series of amide-functionalized carbazole derivatives (7a-7k) was successfully synthesized and comprehensively characterized. The antimicrobial potential of these compounds was systematically evaluated in vitro against a series of six microbial strains, which included four bacteria; two Gram-positive (Staphylococcus aureus and Streptococcus pyogenes) and two Gram-negative (Escherichia coli and Pseudomonas aeruginosa), as well as two fungal strains, Candida albicans and Aspergillus niger. The biological screening revealed that several of the synthesized derivatives exhibited noteworthy antimicrobial activity. Among them, compound 7c shows remarkable efficacy against E. coli. At a concentration of just 10 µg/mL, it demonstrated antimicrobial potency up to ten times greater than the standard antibiotic Ampicillin, highlighting its strong inhibitory effect. On the antifungal front, compound 7a showed moderate but promising activity, surpassing the efficacy of the conventional antifungal agent Nystatin, particularly against C. albicans, with a minimum inhibitory concentration (MIC) of 50 µg/mL. Notably, some compounds exhibited very low MIC values (ranging from 10 to 15 µg/mL), indicating a high degree of potency and establishing a promising starting point for further chemical optimization. These findings support the potential of this compound series as a foundation for developing new antimicrobial agents with enhanced efficacy and broad-spectrum activity.

To further elucidate the potential of these molecules, a comprehensive set of computational analyses was conducted. These included Density Functional Theory (DFT) calculations, Molecular Docking Studies, ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) profiling, and Molecular dynamics Simulations. The results from these in silico studies revealed favourable molecular geometries and conformations, strong binding affinities to biological targets, and desirable drug-like properties. Particularly, compound 7c emerged as a notable candidate, showing a stable and strong binding interaction with the E. coli target enzyme (PDB ID: 1IXA), as well as excellent pharmacokinetic characteristics that further enhance its suitability for drug development. Collectively, these experimental and computational findings underscore the therapeutic promise of amide-linked carbazole derivatives. The superior biological activity, particularly of compound 7c, coupled with its robust pharmacokinetic profile and target-specific binding, highlights this series as a valuable platform for the design and development of next-generation antimicrobial agents aimed at combating resistant microbial strains. These compounds offer significant potential for further investigation and advancement in the field of antimicrobial drug discovery.

Biography:

Ms. *Shruti Vishwakarma is a Research Scholar in the Department of Applied Science and Humanities, School of Engineering and Sciences, at MIT Art, Design and Technology University, Pune, Maharashtra, India, where she is pursuing her Ph.D. in Chemistry. Her academic expertise focuses on the synthesis of organic compounds and the exploration of their diverse applications, with particular emphasis on molecular design, synthesis, and spectroscopic characterization. She has contributed as a co-author to publications in reputed journals, including the Journal of Molecular Structure (Q1, 2025), demonstrating her active involvement in advancing research in organic and medicinal chemistry. In addition to her publication record, she has presented her research at international conferences, where she has received awards for best oral presentations. Her doctoral research is centered on the development of novel molecules with potential medicinal applications, aiming to provide innovative solutions to current challenges in medicinal chemistry. Through her strong dedication to scientific research and passion for discovery, she aspires to make meaningful contributions to the advancement of medicinal and synthetic chemistry.*

Impact of Silkworm (Bombyx mori) Protein on Physicochemical Properties of High Moisture Plant-based Meat Analogue

Kantapit Mektun
Prince of Songkla University, Thailand

Abstract:

High-moisture extrusion process is a technology for texturizing plant-based meat analogue into a product with a fibrous structure. In this study, the effect of silkworm pupae protein (Bombyx mori, SP) incorporation (0, 7.5, 15, 22.5 and 30%) on physicochemical properties of high-moisture meat analogues (HMMA) from mung bean protein and wheat gluten (70:30) was investigated. The protein mixtures were extruded using a co-rotating twin screw extruder at 140 °C extrusion temperature, a screw speed of 400 rpm, and a feed moisture content of 65%. The results showed that increasing SP contents up to 15% led to disrupt fibrous structure formation in macrostructure. The values of shear force in both parallel and vertical directions of the products increased with increasing SP content up to 15%, after which a decreasing trend was observed. The degree of texturization significantly decreased with increasing proportion of SP, while the highest value was found in the control formulation ($P < 0.05$). Fourier transform infrared (FTIR) spectra indicated that intensity of Amide A, I, II, and III bands decreased, while Amide B increased, implying weaken protein network when incorporation SP at higher levels. Finally, the acceptance test ($n = 50$) showed that HMMA with SP at level of 7.5% could enhance color and flavour scores, without adverse effect on texture attributes. However further increase in SP content led to decrease in all sensory scores. These findings showed that SP was a potential and sustainable alternative protein source for insect-based alternatives.

Biography:

Mr. *Kantapit Mektun is a PhD candidate in the Food Science and Technology Program at the Faculty of Agro-Industry, Prince of Songkla University, Songkhla, Thailand. He specializes in product development and sensory evaluation, with a strong focus on innovative and sustainable protein alternatives. His research interests include the development of high-moisture meat analogues derived from plant- and insect-based protein sources using wet extrusion technology.*

Poster Presentation

Anti-envelope Virus Multi Water

Masahiko Morioka
Future Cell Japan, Japan

Abstract:

Quaternary ammonium cations (QACs) are cationic surfactants (reverse soaps) primarily used in the livestock industry for disinfecting animal housing and equipment. They are extremely useful for hygiene management due to their bactericidal and antiviral effects at low concentrations and have a long-lasting effect. We confirmed that a disinfectant solution containing QAC and sulfobetaine (amphoteric soap) inhibited avian influenza virus by 98.85% (<30 min).

Biography:

Mr. *Masahiko Morioka is an accomplished chemical researcher formerly associated with Mitsubishi Chemical Corporation Holdings in Yokohama, Japan, where he contributed significantly to pharmaceutical research and drug discovery. His work includes the discovery of the anti-cancer drug candidate DEA-1496, an Aurora kinase inhibitor developed for targeted cancer therapy, as well as MCC-565, a medication aimed at the prevention of osteoporosis. Through his expertise in chemical and medicinal research, he played an important role in advancing innovative therapeutic compounds with potential clinical applications in oncology and bone health. His research contributions reflect a strong commitment to the development of novel pharmaceuticals designed to address critical medical challenges and improve patient outcomes. With extensive experience in industrial chemical research and drug development, he has demonstrated excellence in translating scientific concepts into promising therapeutic solutions, contributing to the progress of modern pharmaceutical science and the advancement of healthcare innovation.*

Portable Paper-Based ECL/FL Dual-mode Sensor for Detecting Mycotoxin

Di Zhang
Yunnan Normal University, China

Abstract:

Zearalenone (ZEN), a mycotoxin that poses a serious threat to food safety and public health, calls for the development of portable and highly sensitive detection technologies. In this work, we constructed a paper-based three-electrode electrochemiluminescence (ECL)/fluorescence (FL) dual-mode sensing platform, employing MSN-TCBPE/Ru(dcbpy)$_3^{2+}$ as an efficient luminescent probe and integrating a self-assembled portable micro-ECL sensor for detection. The sensor operates on the ECL principle and incorporates a photon counter, counting unit, and a miniaturized electrochemical workstation, while a customized housing enhances device protection and portability. This configuration ensures portable operation while achieving detection performance comparable to that of large-scale laboratory instruments. Furthermore, the MSN-TCBPE/Ru(dcbpy)$_3^{2+}$ material was fabricated by encapsulating aggregation-induced emission (AIE)-active H_4TCBPE and highly ECL-active Ru(dcbpy)$_3^{2+}$ within mesoporous SiO_2. The uniform confinement of mesoporous SiO_2 not only regulates the aggregation state of H_4TCBPE to optimize the AIE effect but also suppresses the self-quenching of Ru(dcbpy)$_3^{2+}$ and shortens the intermolecular distance, thereby facilitating resonance energy transfer. As a result, the cooperative luminescence of fluorescence and ECL was significantly enhanced. Benefiting from these features, the platform achieved dual-signal amplification and maintained precise quantitative capability even at trace concentrations, with a detection limit down to the fg·mL^{-1} level. This study presents a novel portable dual-mode sensing strategy that combines laboratory-level sensitivity with on-site applicability, offering a reliable and efficient approach for rapid detection of mycotoxins.

Biography:

***Ms.** Zhang Di is a doctoral candidate in Agricultural Engineering at the School of Energy and Environmental Sciences, Yunnan Normal University. She is committed to innovative research in the field of agricultural chemical sensors, focusing on the design of novel sensing materials, optimization of detection mechanisms, and the development of portable detection platforms. She has published several academic papers in SCI-indexed journals, including articles in CAS Category 1 Journals. In addition, as a project leader, she is currently presiding over a provincial-level Graduate Innovation Fund project, which explores the performance enhancement and scenario adaptability of agricultural chemical sensors, further promoting the translation of related technologies from laboratory research to on-site applications.*

Exploration of Pyrazole Based Molecules as Antimicrobial Leads: Synthesis, Characterization and In Silico Target Validation by Computational Investigation

Nikhil Satish Jadhav
MIT Art, Design & Technology University, India

Abstract:

Pyrazole scaffolds are widely recognized for their diverse biological activities, particularly their pronounced antibacterial potential. In this study, we report a straightforward and efficient synthetic route for the design and development of novel pyrazole derivatives. The chemical structures of the synthesized compounds were confirmed using mass spectrometry along with spectroscopic techniques such as NMR and IR. The newly obtained compounds were evaluated against two fungal and four bacterial strains to assess their in vitro antimicrobial spectrum and potency.[1,2] Among them, compounds HG2 and HG6 exhibited remarkable antibacterial activity, outperforming standard reference drugs. To gain mechanistic insights, density functional theory (DFT) calculations and molecular docking studies were performed against key microbial protein targets. Notably, HG2 demonstrated an exceptional binding affinity score of –15.1 kcal/mol, highlighting its strong potential as an enzyme inhibitor. ADMET predictions further revealed favorable pharmacokinetic properties, including good oral bioavailability and drug-like characteristics. The outstanding binding interactions and biological activity strongly suggest that these pyrazole derivatives could serve as promising candidates in addressing antimicrobial resistance and advancing future therapeutic development. Furthermore, the molecular docking profiles revealed significant hydrogen bonding, hydrophobic interactions, and π–π stacking with active site residues, providing a clear rationale for the superior inhibitory activity. The minimum inhibitory concentration (MIC) values obtained from biological assays further validated their potency, indicating their effectiveness even at low doses.[3] Comparative studies with existing antibiotics emphasized the enhanced selectivity and reduced resistance liability of the pyrazole analogues. Structure activity relationship (SAR) analysis revealed that electron-withdrawing substituents significantly contributed to the observed biological activity, offering a pathway for further structural optimization. The integration of computational modeling with in vitro evaluation underscores the robustness of this research, bridging the gap between theoretical predictions and experimental findings.[4]

Taken together, these results not only establish pyrazole-based derivatives as potent antimicrobial scaffolds but also pave the way for their further exploration in preclinical models.[5] Their remarkable binding affinity, excellent drug-likeness, and broad-spectrum activity position them as strong contenders in the global fight against multidrug-resistant pathogens.

Biography:

Mr. *Nikhil Jadhav is a doctoral researcher in Medicinal Chemistry at MIT Art, Design and Technology University, Pune, where he also completed his Master's degree in the same discipline. His research focuses on the design, synthesis, and characterization of small molecules as potential therapeutic agents, with the objective of advancing the development of effective drug candidates. Deeply committed to scientific research and professional growth, he aims to bridge academic innovation with societal benefit by addressing pressing healthcare challenges through medicinal chemistry. He possesses expertise in computational and molecular visualization tools, including Olex2, Avogadro, ChimeraX, and ChemDraw, which support his work in molecular modeling, structural analysis, and rational drug design. Throughout his academic journey, he has demonstrated a strong interest in learning advanced research methodologies, collaborating with fellow scientists, and contributing to interdisciplinary research efforts. Driven by determination, dedication, and a commitment to impactful science, he aspires to contribute meaningfully to medicinal chemistry research and the broader advancement of healthcare solutions.*

Decoding The Structure Of Mkp-1 Bacteriophage :Implication For Host Pathogen Interactions

Sandip Kaledhonkar
Indian Institute of Technology Bombay, India

Abstract:

Klebsiella pneumoniae, a Gram-negative ESKAPE pathogen, have become a significant public health concern, due to 15–60% rise in carbapenem resistance[1]. This causes a 29% to 71.09% mortality rate, especially in multi drug-resistant cases[1]. Hence, development of alternative therapeutic strategies are required to combat Klebsiella pneumoniae infection. In this scenario, phage therapy emerges as a promising approach to address antimicrobial resistance. To formulate an effective phage therapy, one of the major criteria is to understand the structural as well as functional aspects of Klebsiella phages. In our lab, we have isolated Klebsiella pneumoniae phage (MKP-1) from natural resources[2] which belongs to the Siphoviridae family. Biochemical and genomic analysis were conducted to characterize phage and identify its protein components. We have performed single-particle cryo-EM studies on MKP-1 phage and achieved overall resolution 3.49 Å of capsid protein. The structural studies of MKP-1 will further help in development of alternative therapies to combat Klebsiella pneumoniae infection.

Biography:

Prof. *Sandip Kaledhonkar is a researcher with expertise in biophysics, structural biology, and computational biology. His work integrates multidisciplinary approaches to investigate complex biological systems and advance understanding at the molecular level. His research group is actively engaged in developing alternative therapeutic strategies to combat antimicrobial resistance (AMR), a growing global health challenge. By combining structural and computational methodologies with biological insights, his team aims to identify novel mechanisms and therapeutic interventions that can address resistant microbial pathogens. His contributions to the field reflect a strong commitment to translational research and the development of innovative solutions for infectious disease management and public health.*

Molecular and Genomic Characterization of Pathogenic Leptospires in Humans Targeting Major Outer Membrane Proteingene (lipL32) to understand the Prevalent Species and Serovars Associated with Disease Severity and Identifying Possible Source Animal Reservoirs Involved in the Outbreak

Sunitha Karunakaran
Department of Animal Husbandry and Dairying, India

Abstract:

Leptospirosis, caused by pathogenic Leptospira spp., is a major public health concern in Kerala, India, with increasing morbidity and mortality and year-round occurrence beyond the traditional monsoon season. Early diagnosis remains challenging due to reliance on antibody-based tests such as IgM/IgG ELISA and MAT, which are limited by delayed seroconversion and the need for specialized laboratory facilities. This study aimed to standardize RT-PCR targeting the lipL32 gene for early detection of Leptospira in febrile phase EDTA blood samples and to identify circulating species and serovars associated with disease severity and mortality.

A total of 627 clinically suspected human samples were analyzed, of which 185 were RT-PCR positive. Samples with Ct/Cq values <35 (n=97) were selected for sequencing, and 70 yielded quality reads after exclusions. Demographic and clinical outcome data were obtained from hospital records. Sequence analysis using NCBI BLAST identified Leptospira interrogans as the predominant species (66/70 samples), with occasional detection of L. noguchii and L. kirschneri. Among confirmed cases, 14 patients died, and L. interrogans was detected in 13 of them. Identified serovars included canicola, hardjo, copenhageni, manilae, bataviae, lai, icterohaemorrhagiae, and ranarum, with canicola, hardjo, copenhageni, manilae, and ranarum associated with fatal cases.

The study demonstrates that L. interrogans is the predominant pathogenic species in human infections in Kerala and is strongly associated with mortality. The findings highlight multiple animal reservoirs, including dogs, bovines, rats, and swine, emphasizing the zoonotic transmission potential. Molecular detection using RT-PCR provides a rapid and reliable tool for early diagnosis, supporting timely treatment and improved patient outcomes. The results also underscore the need for expanded animal vaccination strategies and region-specific surveillance for effective leptospirosis control.

Biography:

Dr. *Sunitha Karunakaran serves as District Laboratory Officer under the Animal Disease Control Project, Department of Animal Husbandry, Kerala, India, and brings over 20 years of experience in veterinary microbiology, with a strong focus on laboratory diagnostics and disease control. Her academic training includes a master's thesis on the detection of Pasteurella multocida in domestic ruminants using isolation and polymerase chain reaction techniques, and she has also contributed as a Senior Research Fellow to an ICAR-funded national program on hemorrhagic septicemia. Since joining the department in 2005, she has led and completed key research projects, including studies on poultry mortality and the standardization of real-time PCR for tick-borne pathogens affecting multiple animal species. She has an extensive publication record comprising international and national journal articles, clinical reports, and technical contributions, along with numerous conference presentations. Her work has been recognized with several prestigious honors, including the State Award for Best Laboratory Officer (2020) and multiple awards from the Indian Veterinary Association, reflecting her sustained contributions to animal health and disease surveillance.*

Oral Presentation

CoDaLoMic: An Innovative R Framework for Modeling Compositional Microbiome Time-series Data

Irene Creus Marti
University of Valencia, Spain

Abstract:

The study of the microbiome has become one of the most prominent areas of contemporary science, largely due to its strong association with human health and its potential clinical applications. Microbiome datasets are compositional (Gloor et al, 2017), high-dimensional, underdetermined and zero-inflated. For these reasons, microbiome analysis poses substantial methodological challenges. Creus-Martí et al. (2025) provide a comprehensive overview of the methods used to analyse microbiome data, classifying them according to the specific analytical problem they address and the statistical properties they incorporate, such as whether they account for compositional constraints. This review is intended to serve as a roadmap for laboratories engaged in microbiome research, as it encompasses the full spectrum of methodologies currently employed to address the diverse challenges that may arise when working with microbiome datasets and, in addition, it provides a solid foundation for identifying potential avenues for future research.

Nowadays, there is a growing need for statistical models capable of describing bacterial dynamics and extracting meaningful information about microbiome behaviour. In addition, recent research highlights the importance of analysing longitudinal datasets to better understand microbiome-related health states (Martí et al, 2018). We present CoDaLoMic (Creus-Martí et al. 2026), a new R package that implements a range of models for the analysis of microbiome compositional time series. CoDaLoMic is able to describe and predict microbiome dynamics while accounting for relationships among groups of taxa, rather than being limited to pairwise interactions. This package represents a significant step forward, as it enables laboratories worldwide to analyze longitudinal microbiota data.

Biography:

Ms. *Irene Creus Marti is an Assistant Professor in the Department of Statistics and Operational Research at the Universitat de València, Spain, specializing in Bayesian statistical modelling and compositional data analysis. Her research primarily focuses on microbiome time-series analysis, with an emphasis on developing statistical methodologies that address the compositional structure of longitudinal microbiome data. Through her work, she has contributed to improved characterization and prediction of microbial dynamics over time, supporting advances in biological and medical research. In addition to methodological development, she is actively involved in creating software tools and R packages that facilitate the practical implementation and accessibility of these statistical models for the wider scientific community. Her research interests include modelling the effects of time-varying external covariates on microbiome trajectories, assessing disease probability using gut microbiome time-series data, and integrating advanced statistical approaches into translational biomedical applications. By combining theoretical innovation with practical computational tools, her work contributes significantly to the growing field of microbiome data science and longitudinal statistical analysis.*

Unlocking The Nutritional And Nutraceutical Potential of Indigenous Fruits in the Democratic Republic of Congo: The Case of Afrononum Africanum

Patricia Nyembwe Mujinga
Universite Nouveaux Horizons, Congo

Abstract:

The Democratic Republic of Congo (DRC) is endowed with exceptional biodiversity, including a rich variety of indigenous fruits with notable nutritional and medicinal properties. Among these, Afrononum africanum is traditionally consumed for both dietary and therapeutic purposes, yet it remains largely underutilized and absent from formal food and nutraceutical sectors. This study examines the potential of A. africanum as a functional food ingredient and nutraceutical resource, emphasizing its antioxidant properties and its potential to enhance dietary quality and health outcomes in the DRC.

Framed within a food science and nutrition perspective, the research underscores the urgent need for systematic investigation of the phytochemical composition, antioxidant activity, and bioactive compounds of A. africanum. Preliminary ethnobotanical evidence indicates that the fruit contains phenolic compounds, flavonoids, and other antioxidants, which may contribute to mitigating oxidative stress-related conditions issues increasingly prevalent due to nutrition transitions and lifestyle changes. The study explores potential applications of A. africanum in functional foods, fortified products, and nutraceutical formulations, particularly targeting micronutrient deficiencies and non-communicable diseases.

Key barriers to industrial integration include limited scientific validation, absence of standardized processing methods, weak value chains, and minimal policy and private-sector engagement. Addressing these challenges through applied research, post-harvest technology development, and industry academia collaboration could unlock the fruit's nutritional and economic potential.

Promoting underutilized indigenous fruits such as Afrononum africanum offers a strategic opportunity to enhance nutritional security, stimulate local economies, and conserve biodiversity in the DRC. This study contributes to the growing discourse on sustainable, locally driven food system innovations and positions indigenous fruit research as a critical component of global nutrition agendas.

Biography:

***Dr.** Patricia Nyembwe is a food scientist who earned her doctorate in Food Science from the University of Pretoria, South Africa. She currently serves as a professor at University New Horizons, Lubumbashi, DRC, specializing in food science, chemistry, nutrition, and sensory evaluation. Her research focuses on the nutritional and functional potential of indigenous fruits, exploring their bioactive compounds and antioxidant properties for applications in functional foods and nutraceuticals. Professeur Nyembwe combines scientific expertise with community-relevant research, aiming to promote nutritional security, sustainable food systems, and the valorization of traditional Congolese food biodiversity.*

Sustainable Food Systems: Evaluating Resource Conservation Technologies in Punjab Agriculture

Baljinder Kaur Sidana
Punjab Agricultural University, India

Abstract:

India's agricultural sector has seen significant productivity gains over the past four decades, but intensive resource use, particularly in Punjab, has led to environmental and economic challenges. This study evaluates the impact of Resource Conservation Technologies (RCTs) on crop productivity, costs, and carbon footprint in Punjab's paddy-wheat and cotton-wheat systems. The study was conducted in the districts of Mansa and Shri Muktsar Sahib during 2021-2022, utilizing a sample of 120 farmers employing various RCTs, including Direct Seeded Rice (DSR), Crop Residue Management (CRM), and Integrated Pest Management (IPM). The results reveal that while RCTs involve higher variable costs, they offer higher net returns compared to conventional methods. Specifically, combining DSR with CRM and modern tillage in the paddy-wheat system reduced greenhouse gas emissions by 48.55% compared to traditional practices. In the cotton-wheat system, IPM alongside modern tillage in wheat also led to reduced emissions by 14% and 4% respectively. The study found that $P_{DSR+CRM}+W_{MT}$ and $C_{IPM}+W_{CT}$ came out to be the cost effective and environmental friendly RCTs for paddy-wheat and cotton-wheat crop rotation. The study highlights that RCTs, despite having higher variable costs, are economically viable and environmentally beneficial, reducing carbon footprints significantly. Policy recommendations include enhancing financial support and awareness to further promote RCT adoption, aiming for a more sustainable and resilient agricultural sector in Punjab.

Biography:

Dr. *Baljinder Kaur Sidana is working as a Senior Scientist (Quantitative Methods) in the Department of Economics & Sociology since Jan 2009. She is working in prestigious Centrally Sponsored Scheme "Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in Punjab State" and is involved in validating and submitting a huge data set to Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare, Govt. of India which is used to calculate cost of cultivation and production of major crops grown in Punjab State. This set of data is used for fixing Minimum Support Price(MSP) of concerned crops by CACP for the state. She has worked as a Co-PI in various internationally and nationally funded projects e.g. Columbia Water Centre, USA; International Development Research Centre, Canada; ICAR under Farmer First Programme, ICAR-NIAP and Punjab & Sind Bank since joining. Her research work on water resource assessment and modeling; optimal crop plans; groundwater depletion scenario and impact of climate change on production efficiency of rice and wheat crops in Punjab agriculture have proved beneficial for policy makers. She has published more than 80 Research Papers, 10 Book Chapters, organized more than 100 trainings & farmers camp, attended 50 Conferences/workshops since she joined University. She has been bestowed with N A Mujumdar Prize award, Prof R S Deshpande Award, RT Doshi First Prize, Best Oral and Poster presentations in various academic years.*

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Inversion of Magnetotelluric Data for the Characterization of Geothermal Structures in the Region of Paucarani Zone, Tacna, Peru

Yovana Viviana Alvarez Robles
Geophysical Institute of Peru, Peru

Abstract:

The Paucarani zone, located in the Tacna region of Peru, presents a diverse geological landscape characterized by an interplay of mountains, hills, volcanoes, and wetlands. This area is primarily composed of Holocene dasitic and andesitic rocks, showcasing significant structural features such as fault planes that are oriented in a northwest-southeast (NW–SE) direction. These features align with the Apurimac-Caylloma-Maure fault system, underscoring the tectonic complexity of the region.

This research aims to elucidate the geoelectrical structure of the Paucarani zone through the analysis and interpretation of magnetotelluric (MT) data collected in this geothermal region. The data acquisition process was executed by the Instituto Geológico Minero Metalúrgico of Peru during a campaign in 2017, covering a spatial extent of 120 km². Throughout this campaign, a comprehensive approach was undertaken comprising 43 longband MT soundings aligned along nine northeast-southwest (NE–SW) profiles. The inherent topographic variability necessitated meticulous distribution of these soundings to ensure accurate data representation.

The processing sequence initiated with the calculation of apparent impedances and dimensionality assessments following raw data refinement. A two-dimensional (2D) inversion was subsequently employed to generate a geoelectric model, utilizing iterative inversion processes complemented by smoothness constraints based on an initial resistivity mesh. The outcomes of this analysis present notable resistivity variations across the study area. Particularly, regions exhibiting heightened conductivity, which may indicate potential geothermal energy sources, are predominantly concentrated in the western sector of the Paucarani zone. These findings not only reinforce the viability of these areas for future geothermal exploration but also highlight the importance of continued research and development endeavors in harnessing geothermal resources effectively.

Biography:

***Dr.** Yovana Viviana Alvarez Robles is a Geophysical Engineer with more than 10 years of professional experience in applied geophysics. She has strong expertise in the acquisition, processing, and interpretation of geophysical data, particularly in geo-electrical and electromagnetic methods. Her work also includes the application of geophysical techniques in volcanic studies and offshore 2D seismic data acquisition. She has actively participated in geophysical exploration projects across multiple sectors, including mining, geotechnics, oil and gas, environmental studies, and volcanology. In addition, she has contributed to various research projects, supporting the development and application of advanced geophysical methods in earth science investigations.*

A New Perspective on Exercise During Pregnancy

Ozlem Kuculmez
Baskent University, Turkiye

Abstract:

Exercise during pregnancy has been proven safe and beneficial for both the mother and the fetus, yet most pregnant women remain inactive, with only 20% following a recommended exercise program. The main barriers include insufficient information, lack of professional guidance, and misconceptions about fetal safety. Professional guidelines from the American College of Obstetricians and Gynecologists (ACOG), World Health Organization (WHO), and American College of Sports Medicine (ACSM) emphasize that the benefits of prenatal exercise outweigh potential risks.

Physiological and postural changes such as altered center of gravity, lumbar lordosis, increased relaxin secretion, and joint laxity predispose pregnant women to musculoskeletal problems, particularly low back and pelvic girdle pain. Regular exercise alleviates these issues and reduces pregnancy complications by up to 40%, improving cardiovascular capacity, weight control, mood, and delivery outcomes. Maternal exercise at mild-to-moderate intensity is associated with optimal fetal growth and well-being, without evidence of fetal distress or compromised umbilical blood flow.

Before prescribing exercise, both gynecological and physical evaluations are essential to identify contraindications and assess pre-pregnancy activity levels. The ACOG and Canadian guidelines list absolute and relative contraindications (e.g., pre-eclampsia, placental disorders, uncontrolled hypertension) and encourage tailored programs for those without risk.

Safe exercise modalities include walking, stationary cycling, swimming, resistance training, Pilates, yoga, and tai chi. These improve flexibility, balance, and muscle strength while reducing stress and anxiety. High-risk or sedentary patients should begin with low-intensity programs, increasing gradually. The ACOG recommends 30–60-minute sessions, 3–4 times weekly, while the Canadian guideline suggests 150 minutes of moderate activity per week. European and Barakat models further divide sessions into structured phases of aerobic, resistance, stretching, pelvic floor, and relaxation exercises.

Special considerations include adjusting programs for cardiovascular, endocrine, or respiratory conditions. Exercise remains beneficial in obesity and multiple gestations, provided safety modifications are made. Warning signs such as vaginal bleeding, dizziness, or chest pain require immediate cessation and medical evaluation.Postpartum, exercise enhances recovery and cardiovascular endurance without affecting lactation.

Overall, structured, individualized, and supervised exercise programs are fundamental for maternal and fetal health, improving both physical and psychological outcomes throughout pregnancy and beyond.

Biography:

Ms. *Ozlem Kuculmez has completed her medicine education at the age of 24 years from Istanbul University and became specialist in physical medicine and rehabilitation department in Katip Celebi University. She has been still working assist. Prof. Dr. in Baskent University since 2017 and has been serving as a board member of Turkish Physical Medicine and Rehabilitation Society.*

Social Status and Farmer's Perceptions of Ecosystem Services in Two Phytogeographic Zones in Burkina Faso

Alexis Sompougdou
University of Nazi Boni, Burkina Faso

Abstract:

Agroecosystems provide numerous goods and services to millions of people. However, in Burkina Faso, they are continuously degraded, impacting the livelihoods of rural populations. The objective of this study was to understand perceptions of ecosystem services, mechanisms, and approaches to agroecosystem management among producers according to their social status and phytogeographic zone.The Participatory Analysis of Poverty, Livelihood, and Environment Dynamics approach was used to work with producers to define endogenous criteria for prosperity and classify them into prosperity classes in order to understand the specific local issues surrounding the interconnections between poverty, people's livelihood strategies, and the natural environment. A questionnaire on the types of ecosystem services provided for each agroecosystem was administered to 396 producers. An inventory of mature trees was carried out in 249 plots randomly selected from the fields of the producers surveyed. The results revealed that producers were classified into three social categories (wealthy, moderately wealthy, and poor) according to the prosperity criteria they defined. In both areas, three types of agroecosystems were exploited: fields, lowlands, and fallow land. In the southern Sudanian phytogeographic zone, the wealthy exploit significantly more fallow land than the moderately wealthy and the poor (p=0.00). There is a significant difference (p=0.002) in the northern Sudanian phytogeographic zone in terms of the areas of agroecosystems exploited by producers in the three social classes. Eight and ten ecosystem services were cited in the southern and northern Sudanian zones, respectively. There were more regulatory services cited in northern Sudan than in southern Sudan, with a significant difference (p=0.00). Supply services were still the most frequently cited, followed by support services. A significant difference was noted between the poor, the moderately well-off, and the wealthy in terms of regulatory services (p=0.00). Producers cited 60 woody species that varied from one phytogeographic zone to another and from one social status to another. Across all social statuses, Vitellaria paradoxa and Parkia biglobosa were the most frequently cited. Producers claim that there has been a decrease in tree density in their agroecosystems, mainly due to pest attacks, and a decrease in agricultural yields caused by poor soil quality. The inventory of woody diversity in the fields shows that 31 and 29 woody species grouped into 15 and 16 families, 23 and 26 genera were recorded. Producers have a good perception of ecosystem services, which is influenced by the phytogeographic zone. Social status influences producers' perception of ecosystem services in the southern Sudanese zone, unlike in the northern Sudanese zone. This study can contribute to the sustainable management of agroecosystems.

Biography:

Mr. *Alexis Sompougdou is a Forest Engineer and PhD student in Rural Development/Forest Production Systems at the University of Nazi BONI, Bobo-Dioulasso, in collaboration with Tree Aid Burkina Faso. He has over 15 years of professional experience in forest governance, ecosystem services, biodiversity conservation, nature-based solutions, and Non-Timber Forest Products value chains. His expertise also extends to natural resource management, rural development in sub-Saharan Africa—particularly Burkina Faso—technology transfer to rural development stakeholders, international development cooperation, official development assistance, and participatory development approaches. He has significantly contributed to strengthening forest governance systems in Burkina Faso and supporting the establishment of village tree enterprises. His research interests include climate change, agroforestry and forest management, land use and land restoration, resilience of vulnerable communities, and the socio-economic challenges faced by women and youth in West Africa. He is also engaged in studies related to renewable energy impacts, livelihoods, payment for ecosystem services, carbon credits, deforestation, rainfall variability, and drought dynamics.*

Physicochemical Characterization of Cocoa Butterfrom Sao Paulo and its Comparison with Commercial Butters

Valdecir Luccas
ITAL - Institute of Food Technology, Brazil

Abstract:

This study aimed to comparethe physicochemical properties of cocoa butterfrom the CCN51 and PS1319 varieties (blend), obtained from cocoa cultivated in the Planalto Paulista region of Sao Paulo, with two commercial cocoa butters composed of blends from different producing regions.The Sao Paulo cocoa butterwas extracted from fermented and dried beans supplied by a local producer. The beans were roasted at different temperatures and durations in a rotary electricroaster, then dehulledand ground using pilot-scale equipment, and pressed in an expeller press to extract crude butter, which was subsequently centrifuged to remove suspended solids. The butters were characterized in terms of peroxide value, free fatty acids, color, triacylglycerol composition, solid fat content, and crystallization profile, following AOCS methods. The optimal roasting condition was identified as 120°C for 60 minutes. The results revealed that the São Paulo cocoa butter blend exhibited physicochemical properties comparable to or superior to those of the commercial butters. The crystallization profile of the butters showeda predominance of SU_2-type triacylglycerols, with peaks rangingfrom 11.97 to 13.52°C. The findings indicate the potential of Sao Paulo cocoa butter for use in chocolate manufacturing and related products,highlighting the feasibility of regional cocoa cultivation in Sao Paulo as a high-quality, traceable alternative for the chocolate industry.

Biography:

Dr.*Valdecir Luccas Holds a Ph.D. and M.Sc. in Chemical Engineering From UNICAMP and is a Level VI Scientific Researcher at the Institute of Food Technology (ITAL), where he also Serves as a Graduate Professor. He is the Deputy Technical Directorof Cereal Chocotecand a CNPq research fellow in Technological Development. Since 1994, He has Conducted Research in Food Science and Technology, With a Focus on Chocolate and its Derivatives, Working on Innovation Projects, Consulting, Technical Training, and Academic Supervision. He holds Patents, has Published Scientific Articles and Books, and Plays a Key Role in Technology Transfer to the Food Industry. He is a Member of MCTI Echnical Groups and a Mentor in Innovation Programs.*

Organizing Committee Member

Synergistic Exploration of Thiazole Derivatives: Synthesis, Antimicrobial Activity and Computational Insights

Rahul Vilasrao Kadu
MIT Art, Design & Technology University, India

Abstract:

The emergence of antimicrobial resistance (AMR) poses a significant threat to global public health, necessitating the development of novel antimicrobial agents with unique mechanisms of action and improved efficacy. In this context, a new series of thiazole derivatives incorporating biologically relevant functionalities was efficiently synthesized and evaluated for in vitro antimicrobial activity. The compounds were tested against four bacterial strains-two Gram-positive (Staphylococcus aureus, Streptococcus pyogenes) and two Gram-negative (Escherichia coli, Pseudomonas aeruginosa) as well as two fungal strains (Candida albicans and Aspergillus niger), using standard drugs Ampicillin and Nystatin for comparison. Furthermore, density functional theory (DFT) studies were conducted to gain molecular insights into the electronic properties of the synthesized compounds, while molecular docking analyses were performed to evaluate their binding affinities with the respective microbial target proteins. Additionally, drug-likeness and ADME (absorption, distribution, metabolism, and excretion) properties were predicted to assess their pharmacokinetic potential.

Among the synthesized derivatives, compound 7d demonstrated notable antimicrobial activity, with minimum inhibitory concentrations (MICs) of 18 µg/mL against E. coli and 50 µg/mL against A. niger, significantly outperforming the reference drugs (MIC = 100 µg/mL). Likewise, compound 6 exhibited exceptional activity against E. coli and C. albicans, with MICs of 10 µg/mL and 50 µg/mL, respectively. Molecular dynamics (MD) simulations of compound 7d further validated its strong binding affinity and structural stability within the active site of the target protein.

Overall, compounds 6 and 7d emerge as promising lead candidates for the development of next-generation therapeutics targeting drug-resistant bacterial and fungal infections.

Biography:

Dr. *Rahul Vilasrao Kadu is an Associate Professor of Chemistry at MIT Art, Design and Technology University, Pune, a role he has held since July 2017. He completed his Ph.D. in Chemistry from The Maharaja Sayajirao University of Baroda in 2015, followed by postdoctoral research at the Indian Institute of Science Education and Research (IISER), Bhopal. His research centers on the design and development of molecular scaffolds with applications in medicinal, supramolecular, and organometallic chemistry. Over the course of his career, he has received several competitive fellowships, including those from the University Grants Commission (UGC) and IISER, reflecting his strong academic contributions. In 2023, he was honored with the Young Researcher Award by the Institute of Scholars (InSc). He has an extensive publication record in leading international journals such as Chemical Science, Dalton Transactions, and the European Journal of Medicinal Chemistry. Additionally, he actively participates in national and international conferences and serves as a peer reviewer for reputed scientific journals.*

Carbon Biodegradability Governs Nitrogen Retention via Microbial Ammonia Assimilation in Composting

Anqi Wang
China Agricultural University, China

Abstract:

Nitrogen loss during composting is fundamentally driven by the temporal decoupling of carbon oxidation and nitrogen assimilation. Although the carbon-to-nitrogen ratio is widely recognized as a regulatory parameter, the role of carbon biodegradability in coordinating microbial energy metabolism and carbon skeleton supply remains insufficiently resolved. Here, we constructed four treatments with graded carbon biodegradability (G, LG2, LG1, L) by modulating lignin-to-glucose ratios to elucidate how carbon quality governs nitrogen fate. The LG2 treatment, characterized by balanced composition of labile and recalcitrant carbon, achieved the highest nitrogen retention efficiency, increasing organic nitrogen by 36.9% and reaching a glutamate content of 2.6 g·kg^{-1} DM. This carbon configuration sustained continuous tricarboxylic acid (TCA) cycle flux, enhanced dissolved organic carbon degradation (53.3%), and promoted α-ketoglutarate production, thereby strengthening ammonia assimilation. Functional prediction analysis revealed indicated enrichment of ammonia assimilation pathways and suppressing of nitrification-related genes in LG2, redirecting nitrogen metabolism toward biosynthetic NH_4^+ incorporation. Partial least squares path modelling further confirmed carbon biodegradability as the primary determinant of ammonia assimilation efficiency, with hemicellulose and cellulose enhanced α-ketoglutarate–mediated carbon skeleton supply, whereas lignin constrained this metabolic routing. These results demonstrate that moderate carbon biodegradability optimizes microbial energy-carbon coupling and ammonia assimilation capacity, providing a mechanistic basis for engineering carbon quality to improve nitrogen conservation in composting systems.

Biography:

Ms. *Anqi Wang is a third-year Ph.D. candidate at the College of Resources and Environmental Sciences, China Agricultural University, and currently a visiting student at the School of Civil and Environmental Engineering, University of Technology Sydney (UTS), under a joint-training program. Her research focuses on aerobic fermentation of organic solid wastes for resource recovery and harmless treatment, with a special interest in efficient nitrogen retention during composting. She has systematically investigated how carbon biodegradability regulates microbial ammonia assimilation, demonstrating that balanced labile and recalcitrant carbon sources sustain the tricarboxylic acid cycle, enhance α-ketoglutarate supply, and thereby improve organic nitrogen formation. Her work offers mechanistic guidance for optimizing carbon quality to mitigate nitrogen loss in composting systems. Anqi has co-authored five peer-reviewed papers in journals such as Bioresource Technology and Environmental Technology & Innovation. She has participated in two National Key R&D Programs of China on agricultural waste valorization. At UTS, she collaborates on projects integrating isotopic tracing and metagenomics to advance composting technologies. Her broader research interests include microbial inoculant development for organic waste treatment.*

Pyrimidine Scaffolds as Promising Antimicrobial Candidates: Synthesis, Characterization and Computational Insights

Bhapkar Prajjwal Vilas
MIT ADT University, India

Abstract:

Antimicrobial resistance (AMR) has emerged as one of the most pressing global health challenges over the past several decades, and the situation has been further aggravated by the COVID-19 pandemic, which has not only highlighted the limitations of existing therapies but also intensified the urgent need for novel antimicrobial agents. The rise in resistance among pathogens underscores the importance of discovering new chemical scaffolds with potent antibacterial and antiviral activities. In this context, pyrimidine derivatives and their fused heterocyclic analogues have drawn considerable attention in medicinal chemistry owing to their wide range of pharmacological properties. These derivatives are reported to exhibit antiviral, antibacterial, antifungal, anti-influenza, antioxidant, anti-inflammatory, antimalarial, antiproliferative, and anticancer activities, thus establishing their versatile therapeutic potential. To address this need, pyrimidine frameworks and their associated fused heterocycles were synthesized through a simple yet efficient synthetic strategy, enabling the rapid construction of structurally diverse molecules. The synthetic protocol demonstrated the effectiveness of cyclocondensation reactions in generating highly functionalized derivatives with significant theoretical and practical value. Furthermore, the method allowed the incorporation of a broad range of substrates, thereby enhancing structural diversity and expanding the scope for biological screening. The synthesized compounds were thoroughly characterized using advanced spectroscopic techniques, which confirmed their molecular structures and purity. Beyond experimental validation, density functional theory (DFT) calculations were employed to gain deeper insights into the structural, electronic, and stability aspects of the synthesized pyrimidines, providing valuable information regarding geometry optimization and reactivity descriptors. Additionally, molecular docking investigations were carried out to predict the binding affinity and optimal conformational orientations of these pyrimidine derivatives when interacting with specific biological targets. The docking results highlighted their potential as active ligands capable of engaging critical binding sites in target proteins, thereby rationalizing their biological activity. Taken together, the combination of efficient synthesis, comprehensive characterization, computational modeling, and docking studies positions pyrimidine-based derivatives as promising candidates in the ongoing search for novel therapeutic agents against resistant microbial strains.

Biography:

Mr. *Bhapkar Prajjwal Vilas is a Ph.D. research scholar in the Department of Applied Science and Humanities, School of Engineering and Sciences, at MIT Art, Design and Technology University, Pune, Maharashtra, India. His academic and research expertise lies in organic chemistry, with a strong focus on the design, synthesis, and spectroscopic characterization of novel organic molecules. His doctoral research centers on the development of bioactive compounds with potential medicinal applications, driven by the need for innovative chemical entities in drug discovery and therapeutic development. By integrating classical synthetic strategies with advanced spectroscopic and analytical techniques, he aims to create structurally diverse molecules with relevance to medicinal chemistry and biological systems. His work also involves investigating physicochemical properties and structure–activity relationships to better understand molecular behavior and therapeutic potential. He actively participates in international conferences, gaining exposure to global scientific developments and collaborative research opportunities. Through his research, he aspires to contribute meaningfully to advancements in organic and medicinal chemistry and support the development of next-generation therapeutic agents.*

Antiviral Drug and Vaccine Development Based on Viral Glycoprotein Fusion Intermediates

Wang Xinling
Fudan University, China

Abstract:

The persistent threat posed by coronaviruses (CoVs) and their evolving variants necessitates pan-protective strategies targeting conserved viral fusion mechanisms. A pivotal advance involves exploiting transient early fusion intermediate conformations (E-FIC) of the spike (S) protein—key mediators of host cell entry and previously untapped targets for antivirals and vaccines. Two complementary approaches have emerged to address this critical need. One is a dual-functional engineered protein targeting the E-FIC of ACE2-utilizing CoVs, which incorporates both a receptor-binding domain (RBD) binder and a heptad repeat 1 (HR1) ligand. This protein inactivates cell-free virions and blocks viral entry by stabilizing the S protein in a non-functional E-FIC, exhibiting exceptional potency across severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants and other ACE2-dependent CoVs. Notably, it demonstrates enhanced activity relative to monofunctional agents, as well as favorable in vivo safety and efficacy via inhalable delivery. Complementing this, a recombinant trimeric protein incorporates conserved S2 domains—including HR1, the central helix (CH), and the stem helix (SH)—which are critical for forming fusion-competent intermediates. This trimeric protein acts as a pan-CoV entry inhibitor by competing with heptad repeat 2 (HR2) to disrupt six-helix bundle (6-HB) formation, while serving as a cross-protective immunogen that elicits robust cross-reactive immune responses. Collectively, these strategies validate viral fusion intermediates as conserved, actionable targets, providing synergistic dual-purpose antivirals and cross-reactive vaccines to combat current and future CoV outbreaks.

Biography:

Ms. *Wang Xinling, M.D., is a Young Investigator (equivalent to Associate Professor) at the Shanghai Medical College of Fudan University, where her research focuses on the molecular mechanisms of viral entry and the development of strategies to prevent and treat infections caused by emerging and re-emerging viruses. Her work lies at the intersection of virology and translational medicine, contributing to a deeper understanding of host–virus interactions and therapeutic interventions. She has authored or co-authored more than 20 peer-reviewed publications in leading international journals, including Cell, Cell Research, Signal Transduction and Targeted Therapy, Trends in Immunology, Emerging Microbes & Infections, Proceedings of the National Academy of Sciences (PNAS), and mBio. Her research has received significant academic recognition, accumulating over 1,000 citations and achieving an h-index of 16. Through her scholarly contributions, she continues to advance the field of infectious disease research, particularly in addressing global health challenges posed by viral pathogens.*

Potential Areas for Global Harmonization of Risk Assessment Protocols for Food Contact Materials

Charlene Lacourt
Danone SA, France

Abstract:

Food Contact Materials (FCMs) are produced and marketed worldwide global. All FCMs have to be safe and guarantee the safety and security of food in contact with them. Specific regulations, which establish the rules for all materials, exist in different regions, which implies that the same material has to comply with different limits depending on the region in which it is distributed and marketed. The objective is to review differences and similarities between the FDA, EU, MERCOSUR, India, China, Japan and Thailand. Various areas essential for a risk assessment are compared. Requirements for testing substances or materials is an area where there are divergencies or commonalities. Harmonization of regulations and procedures is needed, as humans are the same, independently of where they live, and the substances released by the FCMs are the same. The same protocols and procedures are not applied worldwide, but the results are essential for the risk assessment of FCMs. Examining the approaches of different regions showed that there is room for harmonization in many areas, to obtain a more harmonized risk assessment and facilitate subsequent risk management. This review establishes the main areas of risk assessment of FCMs, compares the main regulations in different regions and discusses the essential areas that influence their global risk assessment and provides a guide to help the development of the relevant research field and industry. Some examples and proposals for the main areas for harmonising risk assessment globally, are given.

Biography:

Ms. *Charlene Lacourt is a toxicologist and safety assessor specializing in the safety evaluation of food contact materials at Danone. She holds a Master's degree in Quality and Regulation in Bio-industries as well as a Master's degree in Human Toxicology and Risk Assessment. Prior to joining the food industry, she worked for five years in the cosmetics sector with companies such as L'Oréal and LVMH, where she was responsible for assessing the safety and risk of raw materials and finished cosmetic products. Five years ago, she joined Danone as a toxicologist and risk assessor focused on food contact materials. In this role, she ensures the safety of Danone products by conducting risk assessments of substances that may migrate from packaging materials into food for products distributed globally. In addition, she has been actively involved in the EU ILSI Packaging Materials Task Force for nearly four years and has chaired its working group for the past three years, contributing to the development of scientific guidance and industry frameworks aimed at improving the safety of food contact materials.*

Molecular Approaches of Phytoremediation – A Strategic Regulator for Pollution Management

Hemlata Srivastava
National Institute of Biologicals, India

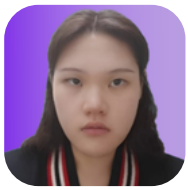
Abstract:

Each year, the Earth loses around 24 billion tons of topsoil, in which HM contribute around 60% of soil pollution, causing crop damage and health issues. This challenge can be effectively an eco-friendly and cost-effective solution. In this process, the plant can destroy the contaminants and pollutants from soil and groundwater that indirectly enrich the beneficial microbes and maintain the fortification of the soil. This review discusses molecular mechanisms, including answered by the process of phytoremediation. Phytoremediation, a plant-based approach, presents gene families(NRAMP, HMA, ZIP) involved in heavy metal (HM) uptake, proteomic pathways (e.g. phytochelatins) and ionomic interactions, alongside advancements in nanotechnology. Additionally, advancements in nanotechnology to enhance phytoremediation efficiency are explored. This review highlights the role of genetic engineering and nanotechnology in improving plant-based remediation strategies. In review, further, the bioinformatics databases were discussed that gradually increasing the phytoremediation exploration. Various candidate genes were elaborated that have capabilities of phytoremediation and different transgenic plants were enlisted in these databases that developed by genetic modification process. One more aspect of Ionomics was discussed, which is still unexplored that can alter the concentration of ions in soil. Future research should focus on optimizing transgenic plant models and integrating nano-assisted phytoremediation for large-scale applications in environmental management.

Biography:

***Dr.** Hemlata Srivastava is a Project Research Scientist II at the National Institute of Biologicals, Ministry of Health & Family Welfare, Government of India, Noida, Uttar Pradesh. With over fifteen years of research experience, her work focuses on genomics, comparative genomics, and molecular studies, particularly in relation to malaria vectors. She has conducted extensive computational and phylogenomic analyses of functional, immune, and insecticide-resistance genes to investigate evolutionary patterns and molecular evolution among Indian malaria vectors. Her research has also involved multilocus phylogenetic studies and the identification of biomarkers and genetic markers for population genetic investigations in malaria vectors and parasites. In addition to her research contributions, she possesses nearly six years of teaching experience in biomedical sciences at reputed undergraduate and postgraduate institutions affiliated with CCS University, Meerut, India. Throughout her academic career, she has actively participated in national and international conferences, seminars, workshops, and distinguished lectures, presenting her research findings widely. She has authored around 15 publications in reputed journals, including several review articles highlighting the multidimensional applications of genomics and molecular biology.*

A Brief Analysis of the Impact of Direct Crop Straw Return to Farmland on the Agricultural Ecological Environment



Ruike Liang
Yunnan Normal University, China

Abstract:

Crop straw is the above - ground residue left after agricultural product harvest, a major agricultural solid waste but a renewable organic resource when properly used. Nearly one - third of the world's crop straw is directly returned to farmland, which is a primary utilization method and of great strategic importance for sustainable agriculture and carbon emission reduction. The direct return of straw to farmland means applying it directly or after crushing before crop sowing. It has four main functions: soil improvement, carbon sequestration and emission reduction, production quality enhancement, and environmental protection. Straw releases nutrients into the soil, promotes microbial activity, and optimizes soil structure. It also directly sequesters carbon and indirectly reduces emissions by replacing fertilizers and preventing straw burning. However, there are challenges. Farmers' acceptance and proficiency in straw return need improvement. Excessive or improper straw return can affect sowing and seedling emergence, cause nitrogen deficiency in crops, and increase the risk of pests and diseases as straw may carry pathogens. To address these issues, current research focuses on improving straw utilization efficiency, developing pest and disease prevention technologies, and formulating region - specific plans. Collaboration among researchers, farmers, and industry stakeholders is essential for realizing the ecological benefits of direct straw return.

Biography:

Ms. *Ruike Liang is currently a master's student at the School of Energy and Environmental Science of Yunnan Normal University. She obtained hers Bachelor of Arts degree in Environmental Design from Fuzhou University of International Studies and Trade. Hers research focus is on the resource utilization of agricultural waste.*

From Bench to Binding: Advancing Oxazolidinone Based Transpeptidase Inhibitors through Synthesis, DFT, Docking, ADME, and MD Simulations toward Next-generation Antibiotics

Khushbu Patil
MIT Art, Design & Technology University, India

Abstract:

The escalating threat of antimicrobial resistance remains one of the most pressing threats to global public health, undermining the effectiveness of existing antibiotics and leading to increasing morbidity, mortality, and healthcare costs. In this context, the continuous development of novel antimicrobial agents with distinct mechanisms of action is imperative. Oxazolidinones, a well-known class of synthetic antibiotics, have shown significant promise due to their potent activity against drug-resistant Gram-positive pathogens and their unique mode of action that inhibits bacterial protein synthesis. Building upon this framework, the present study explores structurally modified oxazolidinone derivatives as potential broad-spectrum antimicrobial agents.

A comprehensive series of novel oxazolidinone based compounds incorporating biologically active functional groups were synthesized via efficient synthetic routes. These derivatives were systematically evaluated for their in vitro antimicrobial activity against a panel of clinically relevant microbial strains, including two Gram-positive bacteria (Staphylococcus aureus and Streptococcus pyogenes), two Gram-negative bacteria (Escherichia coli and Pseudomonas aeruginosa) and two pathogenic fungi (Candida albicans and Aspergillus niger). Standard antibiotics Ampicillin and Nystatin were used as positive controls for bacterial and fungal assays, respectively. Among the tested derivatives, compounds 7g and 7i exhibited particularly noteworthy antimicrobial activity. Compound 7g demonstrated significant inhibitory activity against E. coli (MIC = 12 µg/mL), P. aeruginosa (20 µg/mL) and S. aureus (50 µg/mL), outperforming the reference drug Ampicillin in several cases. Additionally, compound 7a showed potent antifungal activity, displaying MIC values of 50 µg/mL against A. niger and 100 µg/mL against C. albicans, which is comparable or superior to the activity of Nystatin (MIC = 100 µg/mL).

To gain deeper insights into the molecular mechanisms underlying their bioactivity, we conducted Density Functional Theory calculations to analyze the electronic properties and reactivity of the synthesized molecules. Further, molecular docking studies were performed to investigate the binding affinities and interactions of these compounds with relevant microbial target proteins, revealing strong binding conformations and favorable interaction profiles. In addition, ADME (Absorption, Distribution, Metabolism, and Excretion) profiling was conducted in silico to predict the drug likeness and pharmacokinetic behavior of the active compounds. Notably, compounds 7g and 7i displayed acceptable drug-like properties, suggesting good bioavailability potential. Molecular Dynamics (MD) simulations further validated the stability and persistence of the protein-ligand complexes in a simulated biological environment, confirming the robust binding of compound 7g with the target protein over time.

Overall, the integrated approach combining chemical synthesis, biological evaluation, and computational modeling highlights the potential of oxazolidinone derivatives particularly compounds 7g, 7i, and 7k as promising leads for the development of new antibacterial and antifungal therapeutics capable of addressing the growing challenge of drug resistance.

Biography:

Ms. *Khushbu Patil is a Ph.D. candidate in Medicinal Chemistry, specializing in the design, synthesis, and development of biologically active small molecules for drug discovery. Her research is primarily focused on the development of novel therapeutic agents, particularly anticancer compounds, aimed at addressing unmet medical needs. She has contributed to the scientific community through the publication of two research papers and one review article, in addition to presenting her work at three international conferences. Alongside synthetic medicinal chemistry, she possesses expertise in in silico drug design approaches, including molecular docking and molecular dynamics simulations, utilizing advanced platforms such as Schrödinger and AutoDock to investigate compound–target interactions. She is also skilled in evaluating pharmacokinetic and drug-likeness properties using tools such as SwissADME, ADMETlab 3.0, and pkCSM. Her academic training has further strengthened her knowledge in structure–activity relationship studies, chemical biology, and pharmacological assays. Through interdisciplinary research and collaborative scientific engagement, she aims to contribute to innovative advancements in medicinal chemistry and drug discovery.*

Geographic Origin Authenticity of Agricultural Products

Yan Zhao
Chinese Academy of Agricultural Sciences, China

Abstract:

The authenticity of agricultural products includes the authenticity of species, geographical origin and production mode, etc., in which the geographical origin of agricultural products determines the price and quality to a certain extent. Therefore, it is of important research significance to determine whether the nominal origin of agricultural products is true and correct. In this report, the latest technology for identifying the geographical origin of agricultural products is introduced, including stable isotope technology, in situ ionization mass spectrometry technology, spectroscopy technology, etc., and the authenticity identification technology of agricultural products in the future is discussed.

Biography:

Dr. *Yan Zhao is a professor at Institute of Quality Standards and Testing Technology for Agro-products, Chinese Academy of Agricultural Sciences. With expertise in Food authenticity and traceability, they have contributed significantly to geographic origin authenticity of agricultural products. Their research interests include (1) Food geographical origin identification by targeted methods including stable isotopes and mineral elements methods. (2) Spectroscopic (NIR, FTIR) and high resolution mass spectrum (AIMS) based nontargeted fingerprinting for food authenticity. (3) Chemometric modelling, implementation of AI and machine/deep learning in food integrity applications.*

Sustainable Extraction of Lycopene From Tomato By-products: A Systematic Review

Maria Natividad Berradre Ramos
Public University of Navarre, Spain

Abstract:

L*ycopene is a lipophilic carotenoid widely recognized for its antioxidant properties and its potential role in the prevention of chronic diseases. Tomato processing generates large amounts of by-products, particularly tomato peels, which represent an important and underutilized source of this bioactive compound. In recent years, ultrasound-assisted extraction has gained increasing attention as an alternative to conventional solvent-based methods due to its ability to enhance mass transfer, reduce extraction time, and improve extraction efficiency while using milder processing conditions.*

This systematic review aims to analyze and synthesize the available scientific evidence on ultrasound-assisted extraction of lycopene from tomato peels, with particular emphasis on processing parameters and extraction performance. A comprehensive literature search was conducted in major scientific databases, focusing on peer-reviewed studies that evaluated the application of ultrasound technology for lycopene recovery. The selected studies were analyzed according to key operational variables, including ultrasound power and frequency, treatment time, solvent type, solid–liquid ratio, temperature control, and their influence on lycopene yield, stability, and extract quality.

The reviewed literature consistently reports that ultrasound-assisted extraction significantly improves lycopene recovery from tomato peels compared to conventional extraction techniques. The enhancement is mainly attributed to cavitation phenomena, which promote cell wall disruption and facilitate solvent penetration. However, the results also indicate that excessive ultrasound intensity or prolonged treatment times may negatively affect lycopene stability, leading to reduced yields. These findings highlight the importance of optimizing ultrasound conditions to balance extraction efficiency and compound preservation. Variability among reported results is largely associated with differences in raw material characteristics, pretreatment steps, and experimental design.

In conclusion, ultrasound-assisted extraction represents a promising and sustainable approach for the recovery of lycopene from tomato peels. This review provides a structured overview of current methodologies, identifies critical process parameters, and highlights existing research gaps. The findings support the potential application of ultrasound technology for the valorization of tomato by-products and the development of high-value functional ingredients for food and nutraceutical applications.

Biography:

Dr. *Maria Natividad Berradre Ramos is a Doctor in Sciences with a specialization in Food Science and Technology. She holds a degree in Chemical Engineering and a Master's degree in Food Science and Technology, and has extensive academic and research experience in the study of functional compounds in foods. She served for several years as a lecturer and researcher at the University of Zulia, where she was involved in teaching, laboratory coordination, and the supervision of undergraduate and postgraduate research projects. Her research activity has focused on the characterization and recovery of bioactive compounds, particularly antioxidants such as polyphenols and carotenoids, as well as on the application of emerging technologies for food processing and extraction. She has participated in national and international research projects related to food quality, biotechnology, and sustainable processing. Currently, she is involved as a research assistant in the Biogreen Food project at the Public University of Navarra, within the Department of Agronomy, Biotechnology and Food Science. Her scientific interests include non-thermal technologies, ultrasound-assisted extraction, valorization of agro-industrial by-products, and the development of sustainable strategies for obtaining high-value functional ingredients.*

Facile Multicomponent Synthesis of Flavone Derivatives: Antibiotic Activity, Characterization and Computational Study

Devshri Zade
MIT Art, Design & Technology University, India

Abstract:

Herein, we report a novel series of flavone derivatives exhibiting promising biological activities. A broad range of substrates with good functional group compatibility was successfully synthesized through an efficient synthetic methodology. The newly synthesized compounds were characterized using relevant spectroscopic techniques and evaluated for their potential antibiotic activity. The structures of the synthesized derivatives were confirmed through ^1H and ^13C NMR spectroscopy, which revealed characteristic chemical shifts and carbonyl resonances, while mass spectrometry analysis showed molecular ion peaks consistent with the calculated molecular masses, thereby confirming the molecular formulae of the compounds. In addition, thin-layer chromatography (TLC) analysis was employed to assess the purity of the synthesized derivatives. Biological evaluation demonstrated that the synthesized compounds exhibited enhanced antibacterial activity against four bacterial strains and antifungal activity against two fungal strains when compared with the standard drugs ampicillin and nystatin, respectively. Further investigation of the antibiotic potential was carried out using the Muller Hinton Broth dilution method for compounds (6a–6k), among which compound 6b displayed the strongest activity, showing a minimum inhibitory concentration (MIC) as low as 20 µg/mL against E. coli. To gain mechanistic insights into their biological activity, molecular docking, density functional theory (DFT) studies, molecular dynamics (MD) simulations, and ADMET analyses were performed. Docking studies on compounds (6a–6k) revealed that protein 3LGZ (S. aureus) exhibited binding energies ranging from −9.6 to −11.1 kcal/mol for bacterial strains, while protein 1IYL (C. albicans) demonstrated favourable binding interactions ranging from −10.2 to −13.1 kcal/mol for fungal strains. DFT studies were conducted to optimize molecular geometries in agreement with experimental findings and to evaluate the electronic properties of the compounds. Frontier molecular orbital (FMO) analysis indicated that electron-donating substituents reduced the HOMO–LUMO energy gap, thereby enhancing molecular reactivity and potentially improving biological activity across the series. Furthermore, molecular dynamics simulation of the most active compound, 6b, confirmed the formation of a stable complex within the active site of the 4PRV (E. coli) protein. Overall, this study successfully reports the synthesis and characterization of a novel series of flavone derivatives with significant antibacterial and antifungal potential. Spectroscopic and computational investigations collectively confirmed the successful synthesis of the designed molecules and highlighted their favourable interactions with microbial targets, supporting their potential application as promising antimicrobial agents.

Biography:

Ms. *Devshri Zade is a Ph.D. scholar in the Department of Applied Science and Humanities, School of Engineering and Sciences, at MIT Art, Design and Technology University, Pune, Maharashtra, India. Her research focuses on medicinal chemistry, with particular interest in developing innovative approaches to improve therapeutic solutions and address contemporary healthcare challenges. She is actively engaged in exploring novel chemical strategies that contribute to advancements in drug discovery and pharmaceutical research. Throughout her academic journey, she has presented her work at international conferences and contributed as a co-author to scientific publications in peer-reviewed journals. In addition to her research activities, she has participated in certified workshops on molecular docking and intellectual property rights, further strengthening her scientific and professional expertise. Her academic interests reflect a strong commitment to translational research and the advancement of healthcare technologies. Following the completion of her doctoral studies, she aims to pursue a research-oriented career in academia or the pharmaceutical industry, focusing on the development of effective therapeutic solutions for global healthcare needs.*

Reimagining Public Health in India Through Dr. B. R. Ambedkar: Caste, Rights, and Structural Justice

Hemraj P. Jangir
ICMR–National Institute of Health Research, India

Abstract:

Dr. B. R. Ambedkar is widely recognized as the chief architect of the Indian Constitution and a leading theorist of the caste system and democracy, yet his far-reaching engagement with public health remains insufficiently explored. Drawing on Ambedkar's primary writings, speeches, and policy interventions, this review paper reinterprets public health in India not as a technocratic or biomedical domain but as a question of rights, dignity, and structural justice. Ambedkar's analyses of water access, sanitation, labor conditions, spatial segregation, and institutional discrimination anticipate contemporary frameworks such as the social determinants of health, structural violence, and decolonial approaches to well-being. Six interconnected themes emerged based on the literature review: public health as political resistance, sanitation and structural violence, labor rights as health rights, health and the Constitution, caste and the medical system, and Buddhism as collective psychosocial healing. The paper demonstrates how Ambedkar offers a radical normative framework for evaluating present-day health governance in India, including initiatives such as Ayushman Bharat, Swachh Bharat Abhiyan, and the National Health Mission. The paper further situates Ambedkar within broader Indigenous and decolonial health discourses, highlighting his relevance to global debates on health equity. Reimagining public health through Ambedkar's lens exposes the deep entanglements between caste, labor, environment, and state responsibility, while offering an actionable vision for building inclusive, democratic, and justice-oriented health systems.

Biography:

***Dr.** Hemraj P. Jangir is a social science researcher working at the intersection of public health, marginalisation, gender, and rural studies in India. He is currently serving as Research Scientist-II (Non-Medical) at the ICMR–National Institute of Health Research and is placed at the Model Rural Health Research Unit. He holds MA, MPhil and PhD in Social Work. Dr. Jangir has published extensively in national and international journals, including several SCOPUS-indexed journals, on themes related to caste, gender, social exclusion, public health inequities, and denotified communities. His current research interests include public health systems, intersectionality, mixed-methods research, rural transformation, and implementation research. Alongside research, he actively engages in academic mentoring and interdisciplinary dialogue through Social Work Collectives, a platform founded by him to promote discussions on social science research, policy, and methodology.*

Yeast Co-Culture Fermentation and Micro-Oxygenation Enhance Metabolomic Complexity and Quality of Red Wine from Punjab MACS Purple Grapes

Gurvinder Singh Kocher
Punjab Agricultural University, India

Abstract:

Grape cultivation in North India has declined over the years, with most table and wine grapes now sourced from Maharashtra or imported. At the same time, alcohol consumption in the region is dominated by hard spirits, often linked with higher health risks. There is a pressing need to promote health-friendly alternatives such as wine, which can also revive local viticulture and support the establishment of wineries in the state. For wine to be widely accepted, however, its flavour and quality must be enhanced. While genetically engineered yeasts offer one approach, concerns over consumer acceptance and regulatory hurdles limit their use. Defined co-culture fermentation using natural yeast strains provides a promising non-GMO strategy to enrich flavour complexity and sensory appeal.

We investigated the impact of yeast co-culture fermentation and micro-oxygenation on the metabolomic and sensory profile of red wine from Punjab MACS Purple grapes. Two Saccharomyces cerevisiae strains (MK680910 and MK680911) were evaluated individually and in co-culture. Fermentation parameters (°Brix, inoculum size, and oleic acid concentration) were optimized using Response Surface Methodology. Experimental ethanol yields (9.48 % v/v for MK680910; 10.08 % v/v for MK680911) closely matched predicted values. Co-culture fermentation, optimized at 18°Brix, 6.2% inoculum, and 9 mg/L oleic acid, completed in 7 days versus 9 days for monocultures, achieving the highest fermentation efficiency (90%). Post-fermentation micro-oxygenation (0.025 LPM, monthly for three months) significantly improved colour stability, phenolic enrichment, and sensory complexity, with co-culture wines showing superior acidity, antioxidant capacity, anthocyanin levels, and reduced residual sugars. GC–MS analysis revealed greater volatile diversity in co-culture wines, dominated by esters, alcohols, phenolics, furfurals, ketones, and terpenoids, as confirmed by PCA. Overall, the integrated strategy of yeast co-culture, oleic acid supplementation, and controlled micro-oxygenation enhanced red wine quality by increasing metabolomic richness and refining sensory attributes. The developed technology is also submitted for patenting at Indian patent office with application number 202411076960.

Biography:

Dr. *Gurvinder Singh Kocher is researcher with more than 32 years of experience in biotech research and development. Presently he is working as Principal Microbiologist at Punjab Agricultural University Ludhiana, Punjab having served earlier as Principal Microbiologist-cum-Head from 2019-2023. Dr Kocher has carried out research projects and consultancy work in the areas of Value addition of agricultural produce into wines and vinegars, Fermentation of agricultural wastes into ethanol, Bioconversion of industrial wastes and by products into enzymes. He has been principal investigator/ co-investigator of 17 adhoc research projects funded by DST, DBT, ICAR, BARC etc. Dr Kocher has been granted 3 Indian patents and four are in pipeline, published 115 original research papers, contributed 21 book chapters, 5 practical manuals, 40 extension articles and three extension compendiums. He has also guided 34 students as major advisor. He has received various awards like "Applied Fermentation Excellence award-2022" Microbiologist Society of India, Pune, Maharashtra, India, "Distinguished Professor Award-2021", Institute of Researchers, Wayanand, Kerala, India, "High Tech Horticultural Society's Gold medal 2020 for outstanding contributions in the field of Microbiology", "University Merit and Plaque for outstanding scientist for 2018", Punjab Agricultural University,Ludhiana,2019, "Achievement Award" for outstanding work, Punjab Agricultural University, Ludhiana, 2017 and "Young Scientist award in Environment Microbiology" in 1997 by Assoc. of Microbiologists of India. He has won "International Training in Fermentation Technology", University of California, Davis, California, USA (2010), "Normon E Borlaug Fellowship", OARDC Wooster, Ohio, USA. (2007)" and "International Training program in Biotechnology-13th course" at GBF, Braunschweig, Germany (1999). Presently, he has been serving as expert member of 'Scientific panel on alcoholic beverages' by FSSAI, Govt. of India since 2023.*

Graves' Disease Presenting with Pychosis Crisis

Joseph George Minja
Muhimbili National Hospital, Tanzania

Abstract:

P*sychotic symptoms in Graves' disease are relatively uncommon and may mimic primary psychiatric disorders, which can result in delayed diagnosis and management, particularly in resource-limited settings. Graves' disease is the most common cause of hyperthyroidism and is characterized by thyrotoxicosis, goiter, and ophthalmopathy. Classic clinical features include palpitations, heat intolerance, tremors, anxiety, insomnia, and proptosis. Psychiatric manifestations are rare, with psychosis occurring as an initial presentation in approximately 1% of patients. Most cases of Graves' disease presenting with psychotic symptoms respond to antithyroid medications and beta-blockers, while antipsychotics are generally reserved for persistent symptoms. Surgery or radioactive iodine therapy is indicated in refractory cases.*

We report the case of a 22-year-old male who presented with a gradual onset of psychotic symptoms, including auditory hallucinations, visual hallucinations, and psychomotor agitation. Medical therapy with maximum doses of carbimazole, propranolol, and antipsychotic medications (Haloperidol, Risperidone, Zuclopenthixol decanoate) administered over 18 weeks resulted in only a mild reduction in thyroid hormone levels with no improvement in psychotic symptoms. The patient had no history of head trauma, no reported history of drug abuse or alcohol intake, no previous history of mental illness, and no family history of psychiatric disorders.

This case highlights a young patient with psychosis secondary to Graves' disease, whose symptoms resolved completely only after thyroidectomy, underscoring the importance of considering thyroid dysfunction in patients presenting with unexplained psychosis and the diagnostic challenges in resource-limited settings. Following multidisciplinary evaluation, the patient underwent total thyroidectomy. Psychotic symptoms resolved completely within 2 weeks post-thyroidectomy. Follow-up thyroid hormone monitoring demonstrated normalization of free T3, free T4, and Thyroid Stimulating Hormone levels.

This case emphasizes the importance of routine thyroid function screening in patients presenting with psychotic symptoms, particularly in resource-limited settings. It also highlights the need for timely escalation to surgical management when medical therapy fails.

Biography:

Dr. *Joseph George Minja is a Clinical Endocrinologist and Specialist in Internal Medicine. He holds a Bachelor of Medicine degree from Kursk State Medical University, Russia, followed by postgraduate training in Internal Medicine at Fujian Medical University, and a fellowship in Endocrinology, Diabetes, and Metabolism. He is a member of the Tanzania Diabetes Association, the Association of Physicians of Tanzania, and the Medical Association of Tanzania. He has over nine years of clinical experience in managing conditions such as diabetes mellitus, thyroid disorders, electrolyte imbalances, and other metabolic diseases. He is part of a six-member adult endocrinology team at Muhimbili National Hospital, where he contributes to delivering individualized treatment plans for endocrine patients and supports multidisciplinary training and workshops aimed at improving clinical care at both institutional and national levels. His patient-centered approach has strengthened patient–doctor relationships and contributed to improved clinical outcomes and reduced referral rates. His professional achievements include working with the Ministry of Health to update knowledge on non-communicable diseases and their management across the country, training junior doctors and medical students at his hospital, and participating in biannual community outreach programs in collaboration with local government and NGOs to provide healthcare services to underserved populations.*

Application and Prospect of Flexible Agricultural Sensors Utilizing ECL Technology

Chenchen Li
Yunnan Normal University, China

Abstract:

Electrochemiluminescence (ECL) sensors, as an advanced analytical tool, are highly suitable for addressing the pressing need in agriculture for rapid, accurate, and on-site detection of trace substances in complex matrices. Their characteristics, including extremely high sensitivity, very low detection limits, excellent selectivity, fast analysis speed, potential for real-time monitoring, and ease of miniaturization and integration, make ECL sensors a highly promising analytical technology for promoting smart agriculture and ensuring food safety. In the agricultural field, ECL sensors have been used for the detection of contaminants such as pesticide residues and heavy metals. Compared to traditional laboratory chromatography-mass spectrometry methods, ECL sensors can significantly shorten detection time, making them highly suitable for rapid preliminary screening at agricultural product collection sites and in field settings. They can also be used for real-time or online monitoring of key indicators during agricultural processing, enabling process quality control. Although ECL sensors hold great potential in agricultural detection, their application in agriculture still faces many challenges. One of the main obstacles is that the traditional three-electrode system lacks portability, making it difficult to use for immediate on-site detection. Flexible printed electrodes, made using flexible substrates and conductive inks, allow the sensors to bend, fold, and twist without breaking or experiencing significant performance degradation. By modifying design drawings, the shape, size, and pattern of the electrodes can be easily changed without the need to remanufacture expensive molds. Additionally, they support multilayer printing, enabling the integration of working, counter, and reference electrodes, along with insulating layers, onto the same flexible substrate in a single step. Moreover, printing different biological recognition elements in the form of "bio-inks" onto specific electrode areas enables multifunctional detection. Combining flexible printed electrodes with ECL sensors transforms ECL sensors from "precision instruments" in the laboratory into "smart stickers" that can be used in fields and production lines. The manufacturing method of disposable batch printing greatly reduces costs and gives the sensors a new physical form, unlocking their vast potential in areas such as precision agriculture and intelligent food packaging.

Biography:

***Mr.** Chenchen Li is currently a Doctoral Candidate at the School of Energy and Environmental Sciences, Yunnan Normal University. He holds a Bachelor's Degree in Applied Chemistry and a Master's degree in Chemistry from Jinan University. He has published over 10 papers in SCI journals. His research interests include electrochemiluminescence nanomaterials; electroanalytical chemical sensing and detection; and the preparation and application of Agricultural Chemical Sensors.*

Fungal Infectious Diseases

Nora Arvilla
Hospital General ISSSTE San Luis Potosi, Mexico

Abstract:

Fungal infections are increasingly recognized as important causes of morbidity and mortality, yet their diagnosis remains challenging due to non-specific clinical features and overlap with bacterial infections. Invasive fungal disease should be suspected in patients who fail to respond to appropriate antibiotic therapy. This review summarizes key diagnostic and therapeutic aspects of three clinically significant systemic mycoses: cryptococcosis, histoplasmosis, and coccidioidomycosis.

Cryptococcosis, caused by Cryptococcus neoformans and Cryptococcus gattii, is a major opportunistic infection, particularly in immunocompromised individuals, and is a leading cause of meningitis worldwide. It primarily affects the lungs and central nervous system, with high mortality rates in cryptococcal meningoencephalitis. Management depends on disease severity, with fluconazole-based regimens used in selected cases and aggressive antifungal therapy required for CNS involvement.

Histoplasma capsulatum, a thermally dimorphic fungus, causes histoplasmosis with variable pulmonary and disseminated manifestations. Diagnosis relies on culture, antigen detection, and histopathological evaluation. Treatment depends on disease severity and duration, ranging from observation in mild acute cases to prolonged itraconazole or amphotericin B-based therapy in chronic or disseminated disease.
Coccidioides spp., endemic to arid regions, cause coccidioidomycosis following inhalation of arthroconidia. Clinical presentation ranges from self-limited respiratory illness to severe disseminated disease, including meningitis. Diagnosis is confirmed by culture or tissue examination, and treatment includes azole antifungals, with amphotericin B reserved for severe cases and pregnancy.

Early recognition, appropriate laboratory evaluation, and timely antifungal therapy are essential to improve outcomes in systemic fungal infections. Increased clinical suspicion, especially in non-responsive pneumonia cases, is critical for early diagnosis and effective management.

Biography:

Ms. *Nora Arvilla is affiliated with the Department of Internal Medicine at the ISSSTE San Luis Potosí General Hospital in Mexico and has developed a strong clinical and research profile in infectious diseases. She earned her medical degree from the Autonomous University of Zacatecas (2006–2011), followed by internships at Zacatecas General Hospital and the Extended Services Health Centre in Pinos. She later worked in the emergency department at ISSSTE Aguascalientes General Hospital (2014–2021) before completing her residency in Internal Medicine at ISSSTE San Luis Potosí General Hospital (2021–2025). She subsequently served as Coordinator of the Internal Medicine Service and is currently attached to Internal Medicine at the Matehuala Hospital Clinic. Her academic contributions include multiple poster presentations at national and international conferences, addressing topics such as cytomegalovirus infection, invasive pulmonary aspergillosis, coccidioidomycosis, HIV cohorts, and infectious causes of bone marrow aplasia. She has also participated in the Rapid Reviews in Infectious Diseases project (Berkeley, USA) and published in Medical Mycology Case Reports. Her research interests focus on fungal infections.*

Recipe Formulation Food- based Diet Premises for the Socket in Charge of People type 2 Diabetics

Kana Sop Marie Modestine
University of Douala, Cameroon

Abstract:

P*lease type your abstract here. (300-1000 words) The prevalence of type 2 diabetes has increased significantly increased over the last two decades , linked to obesity , aging , lifestyle changes , and sedentary behavior . In Cameroon, the Westernization of eating habits accentuates This phenomenon , making the capture in charge of nutrition essential . This study aimed to formulate recipes dietary food premises for the socket in charge of people type 2 diabetics in order to contribute to the improvement of their socket nutritional intake . To do this , an experimental study prospective analysis has been conducted from May to December 2021 at the Hospital Laquintinie in Douala and at the Viv'ass Impact Clinic in Makepe . Sixty patients have summer of those surveyed , 20 have benefited from monitoring nutritional and 5 are remains until the end (3 months) have The tracking was completed . The parameters measures included fasting blood glucose , hemoglobin Glycated hemoglobin (HbA1c), total cholesterol , triglycerides , HDL-c, LDL-c, weight , height, waist and hip circumference , with BMI calculation . Patients have followed a personalized diet based on local recipes , including White bean salad , eggplant sauce with Yagoua rice , and fruit and vegetable juice . Data have summer analyzed using the R software . Age AVERAGE The mean age was 54.8 ± 11.2 years , with 65% being female. Overweight and obesity were prevalent. affected 38.3% and 33.3% of participants, or 75% in total. Before intervention, 60% had LDL <1 g/L and 100% HDL <0.4 g/L. After three months , blood glucose average decreased from 1.75 ± 0.23 g/L to 1.13 ± 0.18 g/L and HbA1c from 11.26 ± 1.90% to 9.06 ± 2.55%, indicating a significant improvement in control metabolic . The patients presented with diabetes initially unbalanced .The intervention nutritional based on local food has improved profiles glycemic and lipid , highlighting the importance of strategies food adapted culturally in the taking managing type 2 diabetes in resource - limited settings limited .*

Biography:

Prof. *Marie Modestine KANA SOP is a Professor of Biochemistry, Food Science, and Nutrition at the University of Douala, Faculty of Science, Department of Biochemistry, Cameroon. She serves as the coordinator of the Professional Master's program in Biotechnology, Dietetics, and Nutrition at the University of Douala. She has extensive academic and professional experience in biochemistry and nutrition, contributing to teaching, research, and advanced training in her field, with a focus on biotechnology, dietetics, and nutrition development.*

Implementation of Next Generation Sequencing (NGS) as a Diagnostic Tool in Infectious Diseases

Hamsa T. Tayeb
King Faisal Specialist Hospital & Research Centre (KFSHRC), Saudi Arabia

Abstract:

The diagnostic space in infectious diseases has seen many developments in the molecular era. However, all these molecular tools are inherently limited by their targeted approach. The capacity to do untargeted identification of any microbial nucleic acid by massively parallel sequencing (next generation sequencing or NGS) has ushered in an exciting new era although its application in infectious diseases remains largely experimental. Many infectious diseases remain undiagnosed using traditional approaches, which highlights the potential of NGS to close this gap and the need for more research to establish NGS as a trusted diagnostic tool for infectious diseases. Importantly, the local capacity for NGS implementation in infectious disease diagnostics is very limited currently and should be expanded to meet the expected rising demand for this approach clinically. Thus, the main goal of our proposal is to build local capacity in NGS-based diagnostics for infectious diseases by establishing an efficient research protocol that allows NGS to be run in parallel with the current state-of-the-art assays in the clinical microbiology lab in the setting of infectious diseases. The data generated will be the basis for future validation of NGS-based assays as a clinical test. The possible clinical applications are tremendous, including diagnosis of infectious diseases, outbreak tracking, infection control surveillance, and mutation and pathogen discovery, among many others.

Biography:

Prof. *Hamsa T. Tayeb is a leading Saudi clinical scientist specializing in genomics, infectious diseases, and microbiome research at the King Faisal Specialist Hospital & Research Centre. She earned her PhD in Molecular Epidemiology from University of Surrey and has played a significant role in advancing next-generation sequencing technologies and supporting the Saudi Human Genome Program.She currently serves as Head of the Functional Genomics and Metagenomics Section within the Genomic Medicine Centre of Excellence and is the Chairman of the Board of the Metagenomics and Microbiome Association. With an extensive research portfolio and numerous international publications, her work focuses on improving diagnostic approaches, understanding host–microbe interactions, and advancing personalized medicine through genomic technologies.Beyond her research contributions, Prof. Tayeb is actively involved in teaching, mentoring young scientists, and promoting community health awareness. Her efforts continue to contribute to scientific innovation and healthcare advancement in alignment with Saudi Arabia's Vision 2030.*

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