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Proceedings of

International E-Conference on

MEDICINAL PLANTS AND NATURAL PRODUCTS

December 15-16, 2021 I Webinar

Address:
United Research Forum,
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NOTE:

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DAY 1

KEYNOTE SPEAKERS

Kai-Wei Chang
Department of Thoracic Surgery, Tung's Taichung MetroHarbor Hospital, Taiwan

Atractylodin attenuates TGF-β1-induced epithelial-mesenchymal transition in alveolar epithelial cells and bleomycin-induced pulmonary fibrosis in mice

Idiopathic pulmonary fibrosis (IPF) is characterized by fibrotic change in alveolar epithelial cells and gradually progresses to irreversible deterioration of pulmonary function. Transforming growth factor-beta 1 (TGF-β1), one of the most studied fibrogenic cytokines, induces epithelial-mesenchymal transition (EMT) in type 2 lung epithelial cells and contributes to excessive collagen deposition in the process of IPF. Atractylodin (ATL) is a kind of herbal medicine that has been proven to protect intestinal inflammation and attenuate acute lung injury. Our study aimed to determine whether EMT played a crucial role in the pathogenesis of pulmonary fibrosis and whether EMT can be utilized as a therapeutic target by ATL treatment to alleviate IPF. To address this topic, two steps were taken to investigate: 1. Utilization of anin vitro EMT model by treating alveolar epithelial cells (A549 cells) with TGF-β1 followed by ATL treatment for elucidating the underlying pathways, including Smad2/3 hyperphosphorylation, mitogen-activated protein kinase (MAPK) pathway overexpression, Snail and Slug upregulation, and loss of E-cadherin. 2. Utilization of an in vivo lung injury model by treating bleomycin on mice followed by ATL treatment to demonstrate the therapeutic effectiveness, such as, less collagen deposition and lower E-cadherin expression. In conclusion, ATL attenuates TGF-β1-induced EMT in A549 cells and bleomycin-induced pulmonary fibrosis in mice.

Keywords: Idiopathic pulmonary fibrosis; Transforming growth factor-beta 1; epithelial-mesenchymal transition; atractylodin; Smad2/3; MAPK

Biography:

My name is Kai-Wei Chang. I was born in Taiwan in 1983. I graduated from medical school in 2008 and received thoracic surgery training in the following years. I became an attending surgeon in a 1000-bed regional hospital since 2015 and as a PhD student in the institute of biomedical sciences in National Chung-Hsing University since 2018.

Petra Bajerová, Tomáš Bajer, Karel Ventura
University of Pardubice, Faculty of Chemical Technology, Studentská 573, 532 10 Pardubice, Czech Republic

Possibilities of isolation and extraction of volatile compounds from plant matrices

Sample preparation step like extraction is a crucial step of an analytical method and very often it is the most time consuming step and also a source of many errors. We can differentiate between conventional techniques for the extraction of plant matrices (such as Soxhlet extraction, hydrodistillation or steam distillation and others). These techniques are time and solvent consuming and the analysis of numerous samples is limited by the extraction step. Among all conventional techniques for isolation and extraction possibilities, other non-conventional techniques like supercritical fluid extraction, pressurised hot water extraction, pressurized liquid extraction and solid-phase microextraction represents a good choice. Optimization of each extraction technique and its parameters affecting the extraction yield is a very important step and saves cost and time. Gas chromatography-mass spectrometry is used for separation, detection, and identification of volatile compounds. Calculation of the retention index is done for each observed peak and volatile compounds are identified by comparison of mass spectral fragmentation patterns stored in MS data libraries and verified by comparison of retention indices of identified compounds to published data and/or RI from MS data libraries.

Keywords: extraction, natural product, optimisation, GC/MS

Biography:

Petra Bajerova completed her doctoral studies at the University of Pardubice at the age of 29. Since 2015 she has been working as an associate professor at the University of Pardubice, Faculty of Chemical Technology, Department of Analytical Chemistry and focuses mainly on the use of classical and green analytical methods for the preparation of samples of natural origin. She has published more than 40 papers in reputed journals.

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DAY 1

SPEAKER PRESENTATIONS

The antimicrobial properties of Mweps must be increasingly studied and made known.

Francesca Mariani
Institute for Biological Systems, National Research Council, Area RM1-(ISB-CNR), Strada provinciale 35d, 9, Montelibretti (RM), 00010, Italy

Bacterial resistance to antibiotics is estimated to cause the major number of deaths by 2050 if we do not find strategies to slow down the rise of drug resistance. Reviews on Mediterranean Wild Edible Plants (MWEPs) with antimicrobial properties are scarce in the main databases. We recently published a review of the studies on MWEPs. Out of one hundred and ninety-two we had started with, we reviewed thirty-eight studies concerning the antimicrobial properties of seventy-four MWEPs species belonging to twenty-five Families. Fifty-seven species out of seventy-four proved to be antimicrobial with a stringent threshold selection. Overall, out of seventy-four MWEPs species, fifty-one belong to eight out of the twenty-five botanical families analysed in this review. In particular, Asteraceae, Apiaceae, Brassicaceae, Caryophyllaceae and Lamiaceae contain more than eight of the species most studied, and most of them display significant antimicrobial properties.

The reviewed studies did not show antimicrobial assays undertaken with clinically isolated and documented ABR strains. Nevertheless, the MWEPs' property to inhibit the wild type strains of nosocomial bacteria might contribute to lower their replication and the rise of ABR strains. It goes without saying that studies undertaken with MWEPs on documented ABR nosocomial bacterial species are necessary. It is true that studies are still very heterogeneous so far, and that we still know too little about MWEPs properties; however, what we already know strongly recommends carrying on investigation.

Keywords: Mediterranean Wild Edible Plants, Antimicrobial properties, Antibiotic Bacterial Resistance, Natural Products, Plant extracts, Chelating properties.

Biography:

Dr. Mariani studied Biology at the Sapienza Rome University, Italy, and graduated in 1990. She then joined the research group of Prof. Colizzi at Biology Dept. Tor Vergata University, Rome, Italy. She received her PhD degree in 1993 at the same institution. She then moved in 1994 for a two years postdoctoral fellowship supervised by Dr De Libero at the Department of Research, Experimental Immunology Lab. University Hospital, Switzerland. She obtained the position of an Scientist at the Institute of Experimental Medicine, National Research Council, Rome, Italy, in 1996. She has published more than 40 research articles in SCI(E) journals.

An overview of medicinal mushrooms as therapeutics for diseases

Nailoke P Kadhila, Isabella S E Ueitele, Lydia N Horn and Fimanekeni N Shivute
Zero Emission Research Initiative, Multidisciplinary Research Centre, University of Namibia, Windhoek, Namibia

The use of basidiomycetes with potential therapeutic properties raises global interest from the scientific and clinical community based on their efficiency against numerous diseases and metabolic disturbances. Diseases like cancer, malaria and many others are leading cause of death, especially in Sub-Saharan Africa. Mushrooms represent one of the world's greatest untapped resources of nutrition, palatable food and medicinal importance of the future. The chief medicinal uses of mushrooms discovered so far are as anti-oxidant, antidiabetic, hypocholesterolemic, anti-tumor, anti-cancer, anti-viral, immunomodulatory, anti-allergic, nephroprotective, and anti-microbial agents. Some mushrooms are known to complement chemotherapy and radiation therapy by countering the side effects of cancer such as nausea, bone marrow suppression, anemia, and lowered resistance. Antiviral compounds isolated from mushrooms have also shown potential activity against prominent viruses such as human immunodeficiency virus, influenza, herpes simplex virus, hepatitis B and C viruses. The mushroom *Ganoderma lucidum* for example has been used for decades to cure liver problems, heart condition, asthma, cancer, high blood pressure, arthritis and recently associated with boosting immune systems in HIV infected persons. Overall, evidence emanating from research show that mushrooms are of biomedical importance owing to a number of bioactive components found in them. They could therefore be considered as a potential agent for diseases treatment and control. However, intense research is needed to explicate the different roles of multiple active compounds and the pathways involved. Mushrooms have a short crop cycle, thus can be cultivated in big quantities to provide for biomedical importance to combat untreatable and deadly diseases worldwide.

Keywords: medicinal, mushrooms, therapeutics diseases

Biography:

I am a Senior Lecturer, Department of Biochemistry, Microbiology and Biotechnology at the University of Namibia. Coordinator of the New Partnership for Africa's Development/Southern Africa Network for Biosciences Mushroom Node hosted by Zero Emissions Research Initiatives Division at the Multidisciplinary Research. I am an academic with interests in Mycology, Microbiology, Molecular biology, Parasitology and Agronomy. Main interest is in Mycology, especially on the Basidiomycetes where most of my research is based on. Current research is on the Namibian indigenous mushrooms and plants with emphasis on those of medicinal significance, domestication, value addition and promotion of mushroom production and consumption.

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Global environmental changes and the reproductive potential of woody dioecious plants – *Taxus baccata* L. and *Juniperus communis* L.

Emilia Pers-Kamczyc[1*], Anna Kowalczyk[2], Jacek Kamczyc[2]

[1]Institute of Dendrology, Polish Academy of Sciences, Department of Genetics and Environmental Interactions, Parkowa 5, 62-035 Kórnik, Poland

[2]Poznan University of Life Sciences, Faculty of Forestry and Wood Technology, Department of Game Management and Forest Protection, Wojska Polskiego 71D, 60-625 Poznań, Poland

Global environmental change increasingly affects plant species worldwide, and declining plant populations is one of the many negative effects of their impact. Recent reports indicate a limited regeneration of the population of dioecious plants, including the common yew and common juniper, which are used in medicine. The resilience of a species depends on the reproductive success of individuals of both sexes and is a function of the quantity and quality of the genetic material produced, pollen grains and seeds, and the impact of the environmental conditions in which the parental specimens grew, as well as the growth conditions of the descendants. The reproductive potential of female specimens is described by the number of female flowers developing and the seeds they produce, while for males it is the number of male flowers and the pollen grains they produce. It results from the appropriate allocation of resources available to the plant between vegetative growth, generative, and defense traits. Until now, most reports have characterized quantitative aspects of the production of pollen grains and seeds, and a few have touched upon the aspect of their quality. This study aimed to understand the effect of long-term resource limitation on the reproductive potential of English yew and common juniper. The plants were kept under the conditions of a pot experiment with differentiated nutrition availability. Long-term fertilization contributed to increased pollen grains and seed production, but at the same time was associated with a reduction in their quality. The research was financed by the National Science Center as part of the scientific activity Miniatura 3 (2019/03/X/NZ8/01887) and the statutory activity of the Institute of Dendrology, Polish Academy of Sciences, Kórnik.

Keywords: dioecy, reproductive efford, nitrogen deposition, pollen grains, English yew, common juniperus

Biography:

I work at the Institute of Dendrology, Polish Academy of Sciences, Kórnik as an assistant professor and currently hold the position of deputy director for the organization and development of the ID PAS. I was awarded scholarships funded by the Swiss Federal Institute of Technology in Zurich (ETH), Switzerland, the CIMO Foundation for MTT Agrifood Research in Jokioinen, Finland, and the Boehringer Ingelheim Foundation, Germany, and the START stipend of the Foundation for Polish Science. I am interested mainly in dioecy and sexual dimorphism in relation to resource allocation and environmental changes (e.g. nitrogen deposition and climate warming).

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Utilizing local environment plants as alternatives to antibiotics

Dr. Bayan Tiba
(Aleppo University), United Arab Emirates

The antibacterial activity of the methanolic extracts of the leaves of three Syrian medicinal plants, namely, *Glycyrrhiza glabra, Ceratonia siliqua*, and *Corylus avellana*, was studied using Agar well diffusion method, and The minimum inhibitory concentration (MIC) was determined by Micro dilution method via Microtetration plates, and the Minimal Bactericidal Concentration (MBC) also was determined by viable cell count method. The results showed that *Glycyrrhiza glabra* leaf extract was the most effective extract on gram-positive bacteria, with zone of inhibition 24.33 mm in diameter on *Staphylococcus aureus*, while *Ceratonia siliqua* leaf extract was most effective on gram-negative bacteria, with zone of inhibition 42 mm in diameter on *Pseudomonas aeruginosa*.

The Minimum Inhibitory Concentration of *Glycyrrhiza glabra* extract was 0.024 mg/ml on *Bacillus pumilus*, and 0.098 mg/ml on *S. aureus*, and for Ceratonia *siliqua* extract was 6.25 mg/ml of on each of *S. epidermidis* and *Klebsiella pneumoniae*, and the Minimum Bactericidal Concentration of *Glycyrrhiza glabra* extract was 3.12 mg. /ml on *S. aureus*, and 25 mg/ml of *Ceratonia siliqua* extract on *P. aeruginosa*.

Glycyrrhiza glabra and *Ceratonia siliqua* extracts were superior in activity to some antibiotics.

Keywords: Antibacterial Activity, MIC, MBC.

Biography:

She is a Member of a Syrian Scientific Society for Medicinal Herbs & Traditional & Complementary & Alternative Medicine & Nutrition. My Skills are Taxonomy, Collect and Uses of Medicinal Plants. Isolation and Identification of Bacteria, and E-Learning.

traditional medicine in Africa : issues and challenges for knowledge and practices in perpetual adaptation

Roch Houngnihin
Laboratory of applied medical anthrpology (LAMA)/ University of Abomey-Calavi, Cotonou, Benin

In Africa, traditional medicine is provided by a varied profile of professionals including phytotherapists, traditional birth attendants, psychotherapists, spiritualists. This medicine, which the majority of the population uses for treatment, refers to practitioners, products, practices and therapeutic knowledge used before the colonial period to promote, maintain and restore health and well-being before the introduction of so-called conventional medicine. In general, professionals acquire their knowledge and skills through observation, spiritual revelation, personal experience, training and direct information from predecessors.

Today, traditional medicine faces a growing number of chronic diseases (sickle cell disease, diabetes, hypertension, cancers, etc.), concomitantly with persistent and emerging infectious diseases (malaria, AIDS, etc.) and neglected tropical diseases. (Buruli ulcer, leishmaniasis, etc.). In this context, almost everywhere, pharmacopoeia products have experienced a major improvement in terms of presentation and care. The specialties offered and the ailments treated differ depending on whether it is urban or rural, with a concern for adapting the offer to diseases affecting individuals.

Finally, people do not see modern medicine as a competitor or a replacement for what they had always practiced until then in terms of care; they do not reject their nosological categories or their explanations for the disease as soon as they meet the doctor, clinic or hospital. While doctors see an absolute opposition between traditional medicine and modern medicine, populations see a complementarity. They understand very well the coexistence of several ways of diagnosing and treating and combine remedies, attributing one action to the other and another.

Keywords: traditional medicine, perceptions, modern medicine, disease, Africa

Biography:

He is the current Director of the Laboratory of Applied Medical Anthropology (LAMA). During twenty years, he worked in the field of research on health systems and public policies in Africa (access to care, logic of caregivers, patient practices, therapeutic routes, etc.). Within the Beninese public administration, he held positions including National Coordinator of the Pharmacopoeia and Traditional Medicine Program (from 2007 to 2019).

Study of the concentration of elements in medicinal plants used in traditional medicine in Congo

Pawel Konieczynski, Adrianna Chrubczynska, Edem Mpandzo, Marek Wesolowski
Medical University of Gdansk/Department of Analytical Chemistry, Gdansk, Poland

Folk medicine in Africa uses known botanical plant species in the given region, and it joins the knowledge about herbal medicine with abilities of diagnosing and spiritual attitude to the disease. The knowledge on compounds occurring in the herbs used medicinally is relatively low, and at the same time the growing interest in alternative medicine causes that the scientists search for justification of the use of various plants, as well seek the information about their chemical composition. Due to these, the aim of the study was to analyze 10 botanicals species of medicinal plants originating from Congo, to determine in them microelements - Cu, Zn, Fe, Mn, also macroelements - P, Ca, Mg, Na, K, and toxic elements – Cd and Pb. To prepare the plant samples to quantitative element analysis the microwave digestion was applied, and the elements were determined by the flame atomic absorption spectrometry. The results of the studies showed that the analyzed medicinal plants from Congo differed in a high degree. Principal Component Analysis has demonstrated that the highest impact on sample's differentiation had the concentrations of Cu, Zn and P. It was also possible to notice the relationship between the type of plant material (bark, root or leaf) and its content of elements.

Keywords: medicinal plants, Congo, essential and toxic elements, statistics

Biography:

Pawel Konieczynski studied Pharmacy at the Medical University of Gdansk (MUG), Poland and graduated from Faculty of Pharmacy at MUG in 1992. He started his scientific and didactic work at the Department of Analytical Chemistry of MUG. In 1997 he obtained PhD at MUG and in years 1997-1999 dr P. Konieczynski was a fellow of EU scientific scholarship (PostDoc) at the University of Padua (Italy). His research interest is focused on analysis of metallic and non-metallic elements in medicinal plants. In 2018 he became an Assistant Professor at the Medical University of Gdansk. He has published about 50 research articles.

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Combating Bacterial 'Superbugs' by an Innovative Platform for Target site Penetration and Receptor Binding

Jürgen B. Bulitta
PhD, Department of Pharmacotherapy and Translational Research, College of Pharmacy, University of Florida, Orlando, FL, USA

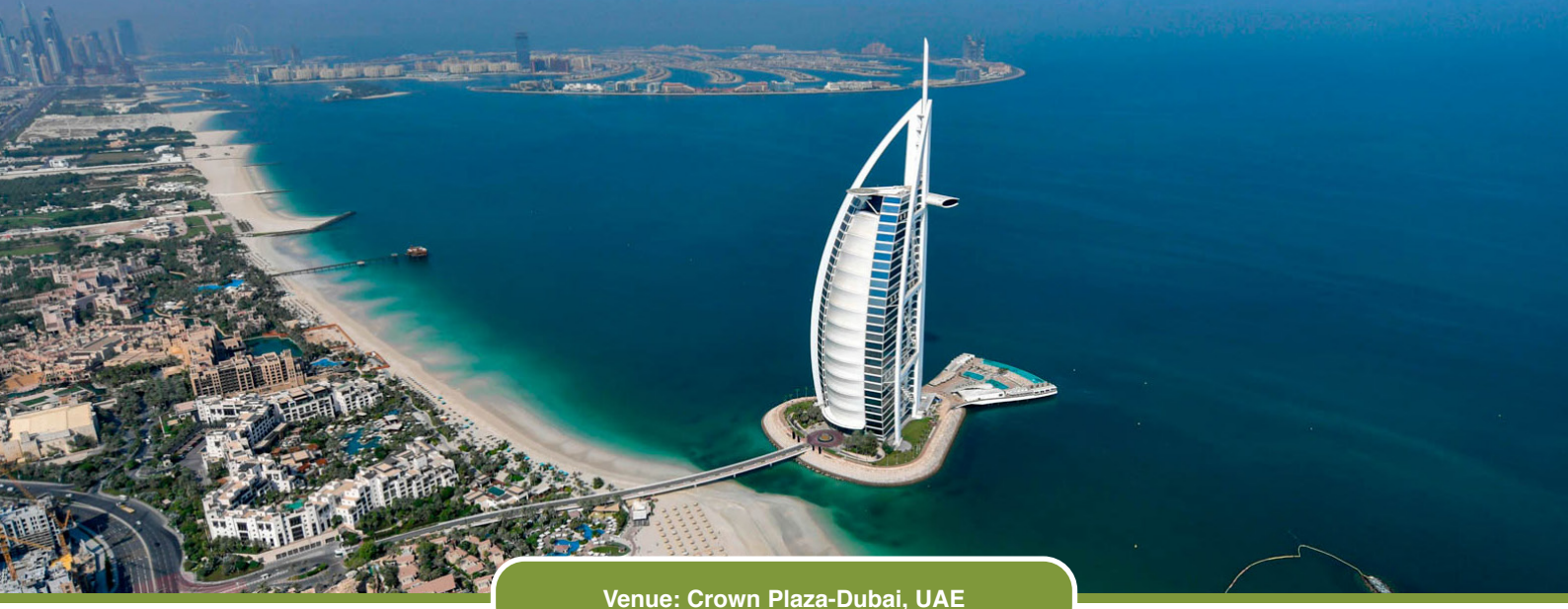
Multidrug-resistant Gram-negative bacteria (i.e. 'superbugs') are causing a serious global health crisis. Investments into antibiotic discovery and development by pharmaceutical industry have declined dramatically. This has led to a slow adoption of new technologies for antimicrobial drug development. However, it is imperative that we create new mechanistic insights and leverage latest technologies in our armamentarium of translational approaches to optimize patient therapy. Standard MIC testing and established in vitro and mouse infection models have served as a cornerstone of antibiotic development. However, major gaps in our understanding of outer membrane permeability in Gram-negative bacteria continue to present substantial challenges. Our team has developed a novel platform to characterize target site penetration and receptor binding in intact bacteria. These latest technologies can inform translational modeling and guide new discovery. A series of assays to quantify the outer membrane permeability of β-lactam antibiotics and β-lactamase inhibitors using multiplex LC-MS/MS has been developed and refined. β-Lactam antibiotics are known to bind to multiple different penicillin-binding proteins (PBP), but their binding profiles are almost always studied in lysed bacteria. Novel assays for the time-course of PBP binding in the periplasm of intact bacteria were developed. Bacterial morphology changes in response to PBP binding were efficiently characterized by high-throughput flow cytometry and time-lapse confocal microscopy with fluorescent probes. These assays provide unprecedented mechanistic insights. Finally, quantitative and systems pharmacology modeling is used to integrate these mechanistic data. This approach allows one to maximize bacterial killing and minimize resistance in in vitro and mouse infection models. This translational strategy holds great promise to optimize monotherapies and identify antibiotic combination dosing strategies for patients with serious infections.

Keywords: pharmacology, infectious diseases, Gram-negative bacteria, penicillin-binding protein receptors, target site penetration, novel assays

Biography:

Dr. Bulitta's research focuses on combating multidrug-resistant bacterial 'superbugs' which present one of the three most serious threats to human health. His mission is to optimize patient therapies and innovative drug development by providing a focal point for translational research in infectious diseases and related areas, and to serve as an internationally-leading, interdisciplinary, collaborative program for translational research.

NOTE:



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Email: louisanthony@urforum.org I Phone/WhatsApp: +44 7424914137