PEERS ALLEY MEDIA

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JOINT EVENT

ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY

&

INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY

AMSTERDAM

NETHERLANDS

APRIL 03-04 2025

SCIENTIFIC PROGRAM

DAY 01
THURSDAY

APRIL 03, 2025

08:00-08:30	**Registrations**
08:30-08:40	**Inaugural Ceremony**
Moderator	**Andreas M Papas,** *Antares Health Products Inc., East Tennessee State University, USA*

Sessions: Medicinal Chemistry | Drug Discovery, Design and Development | Novel Drug Delivery Systems | Computer Aided Drug Design | Pharmacogenomics and Personalized Medicine | Orphan Drugs and Rare Diseases | Molecular Docking and Computational Drug Design | Biologics and Biosimilars | Drug Safety and Pharmacovigilance | Personalized Therapies | Pharmacogenomics | Toxicology

Session Chair	**André Mauricio de Oliveira,** *Federal Centre of Technological Education of Minas Gerais (CEFET-MG), Brazil*

Distinguished Speaker Talks

08:40-09:05	Title: Aqueous Two-Phase Partitioning: Science and Applications for Biomarkers Discovery and Early Cancer Detection **Boris Y. Zaslavsky,** *Cleveland Diagnostics, USA*
09:05-09:30	Title: Formulation and Delivery Applications of Vitamin E TPGS for Novel Drug Categories **Andreas M Papas,** *Antares Health Products Inc., East Tennessee State University, USA*
09:30-09:55	Title: Topical Delivery of Drugs in the Treatment of High-Grade Cervical Squamous Intraepithelial Lesions: A Meta-Analysis **Jianlan Zheng,** *Chenggong Hospital of Xiamen University, China*
09:55-10:20	Title: Hydroquinone-Free Skincare Treatment for Hyperpigmented and Photodamaged Facial Skin **Sofia Iglesia,** *Revision Skincare, USA*

10:20-10:45	Title: Environmental Conditions Actively Participate in Protein Folding Process **Irena Roterman,** *Jagiellonian University, Poland*
GROUP PHOTO 10:45-10:55	
REFRESHMENT BREAK 10:55-11:15	
11:15-11:45	Title: Flaxseed: A Novel Approach to Enhanced Wound Healing **Basma Ezzat Mustafa Alahmad,** *International Islamic University Malaysia, Malaysia*
11:45-12:10	Title: NMR-Based Metabolomics and Biochemical Analyses as Tools for Precision Medicine in Fighter Pilots **Grace Barros de Sá,** *University of Rio de Janeiro State (UERJ), IBMR University Center, Brazil*
12:10-12:35	Title: Advanced Surface Plasmon Resonance (SPR) Assay Application for Preclinical Antiviral Drug Testing **Petia Genova-Kalou,** *National Centre of Infectious and Parasitic Diseases (NCIPD), Bulgaria*
12:35-13:00	Title: Development of a First-in-Class AUTOTAC Targeted Protein Degrader for Pathological Tau Aggregates in Tauopathies **Chang Hoon Ji,** *AUTOTAC Bio, Inc., Seoul National University, South Korea*
13:00-13:25	Title: Perfect State Transfer in a Quantum Biological System Based on the Davydov Model **Elham Faraji,** *Jülich Research Center, Germany*
GROUP PHOTO 13:25-13:35	
LUNCH BREAK 13:35-14:15	
14:15-14:40	Title: Artificial Intelligence Enabled Nanosensors for Trace-Level Biomarkers Detection **Ajay Agarwal,** *Indian Institute of Technology Jodhpur (IITJ), India*
14:40-14:55	Title: DFT Investigation of the Antioxidant Capacity of Culinary Herbs Polyphenols **André Mauricio de Oliveira,** *Federal Centre of Technological Education of Minas Gerais (CEFET-MG), Brazil*

14:55-15:10	Title: Evaluation of Multifunctional Hemorphins with Modifications at the N- and C-Terminal Regions for the Improvement of the Anticonvulsant Activity **Jana D. Tchekalarova,** *University of Chemical Technology and Metallurgy, Bulgaria*
15:10-15:30	Title: Cannabis Situation in Germany **Jonas Michael Wilhelm Westphal,** *International Business Jurist and Author, Germany*
15:30-15:55	Title: Mycobacterial ATP-Phosphoribosyl Transferase (HisG) Inhibition by The New Anti-TB Chemotypes Benzo[d]thiazole-2-carboxamides/ carbanilides **Dhameliya Tejas Manjibhai,** *Nirma University, India*
15:55-16:20	Title: Advancing Cancer Treatment: Leveraging Marine Polysaccharides for Enhanced Drug Delivery **Jinu George,** *Sacred Heart College (Autonomous), India*
16:20-16:45	Title: Quinoline-Hydroxamic Acid Inspired Dual Inhibitors of Topoisomerase-Histone Deacetylase: Design, Synthesis, *in vitro* and *in vivo* Anticancer Potential **Raj Kumar,** *Central University of Punjab, India*
REFRESHMENT BREAK 16:45-17:05	
17:05-17:30	Title: Tobacco Plant of Kyrgyzstan: A Valuable Crop for Biotechnology in Medicine **Smailov Eltar Ablametovich,** *International Kyrgyz-Uzbek University named after B. Sydykov, Kyrgyzstan*
17:30-17:55	Title: Innovative Nanotechnological Platforms for Drug Delivery Systems in Biomedical Applications **Pramod K. Avti,** *Post Graduate Institute of Medical Education and Research (PGIMER), India*
17:55-18:20	Title: The Brown Algae *Padina pavonica* Methanol and Hexane Partitions Showed Antidepressant Effects in Mice **Negar Asgari,** *Isfahan University of Medical Sciences, Iran*

18:20-18:45	Title: Antibacterial Activity of Silver Nanoparticles Derived from Extracellular Extract of *Enterococcus aerogenes* Against Dental Disease Bacteria Isolated
	Mohammed A. Abd Ali, *Misan University, Iraq*
18:45-18:55	Title: Discovery of Antibodies that Modulate Macrophage Functions in Boosting Cancer Immunotherapy
	Jianyong Wang, *Genentech, USA*
18:55-19:05	Title: Chitosane - Antibiotic Based Composites and their Application in Medicine
	Dilyana Todorova Zvezdova, *Prof. Dr. Assen Zlatarov University, Bulgaria*
19:05-19:15	Title: Social Determinants for the use of Complementary and Alternative Therapies among Women During Pregnancy, Labor and Postpartum Period in Low Income Countries: A Scoping Review
	Mabel Kefilwe M. Magowe, *University of Botswana, Botswana*
NETWORKING	
END OF DAY 1	

SCIENTIFIC PROGRAM

DAY 02
FRIDAY

APRIL 04, 2025

08:50-09:00	**Introduction**

Sessions: Medicinal Chemistry | Drug Discovery, Design and Development | Novel Drug Delivery Systems | Computer Aided Drug Design | Pharmacogenomics and Personalized Medicine | Orphan Drugs and Rare Diseases | Molecular Docking and Computational Drug Design | Biologics and Biosimilars | Drug Safety and Pharmacovigilance | Personalized Therapies | Pharmacogenomics | Toxicology

Distinguished Speaker Talks

09:00-09:25	Title: Eliminating Infection Through Nanomedicine: 30,000 Human Cases and Still Counting **Thomas J. Webster,** *Hebei University of Technology, China*
09:25-09:50	Title: A Randomized, Double-Blind, Placeo-Controlled Trial Assessing the Efficacy and Safety of a Fixed-Dose Combination (FDC) of MEtformin Hydrochloride 1000 mg ER, SItagliptin Phosphate 100 mg and DApagliflozin Propanediol 10 mg in Indian Adults with Type 2 Diabetes: The MESIDA Trial **Akhilesh Sharma,** *Alkem Laboratories Mumbai, India*
09:50-10:15	Title: Electroencephalographic Guided Propofol-Remifentanil TCI Anesthesia with and without Dexmedetomidine in a Geriatric Population: Electroencephalographic Signatures and Clinical Evaluation **Fernando Zurita Delgado,** *Hospital Base San José, Chile*
10:15-10:40	Title: Evaluation of the Antimalarial Properties of *Solanum incanum* L. Leaf Extract Fractions and Its Ability to Downregulate Delta Aminolevulinate Dehydratase to Prevent the Establishment of Malaria Infection **Ogochukwu Caroline Chiamah,** *Alex Ekwueme Federal University Ndufu-Alike, Nigeria*
10:40-11:05	Title: *In vitro* Study of Sonodynamic Therapy using Gemcitabine-loaded PEG-Gold Nanoparticles Against MCF-7 Breast Cancer Cells **Ahmad Shanei,** *Isfahan University of Medical Sciences, Iran*
11:05-11:30	Title: ACE-Dependent Alzheimer's Disease (AD) **Sergei M. Danilov,** *University of Illinois at Chicago, USA*

SCIENTIFIC PROGRAM

DAY 02
FRIDAY

APRIL 04, 2025

Exclusively for Virtual Speakers

Virtual Presentations Conducted through CISCO Webex

ADV. MED CHEM 2025
DRUG CONCLAVE 2025

DAY 01

JOINT EVENT

ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY

&

INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY

AMSTERDAM, NETHERLANDS

APRIL 03-04, 2025

SPEAKER TALKS

Aqueous Two-Phase Partitioning: Science and Applications for Biomarkers Discovery and Early Cancer Detection

B. Y. Zaslavsky[1] and **P.P. Madeira**[2]

[1]Cleveland Diagnostics, USA
[2]Instituto de Investigação e Inovação em Saúde, Portugal

This presentation covers the fundamentals of protein partitioning in aqueous two-phase systems (ATPS) and analytical application of solute partitioning in ATPS.

Multiple examples of experimental data providing evidence that phase-forming polymers do not interact with solutes partitioned in ATPS.

The partitioning of solutes is governed by the differences in solute interactions with aqueous media in the two phases. Solvent properties of the aqueous media in these two phases may be characterized and manipulated. The solvent interaction analysis (SIA) method, based on the solute partitioning in ATPS, may be used for characterization and analysis of individual proteins and their interactions with different partners.

The current state of clinical proteomics regarding the discovery and monitoring of new protein biomarkers is discussed, and it is argued that the protein expression level in a biological fluid may be not the optimal focus of clinical proteomic research. Multiple examples of application of the SIA method for discovery of changes in protein structure and protein–partner interactions in biological fluids are described. The SIA method reveals new opportunities for discovery and monitoring structure-based protein biomarkers.

Biography

B.Y. Zaslavsky is an analytical chemist with Dr. Sci. degree obtained in 1984 from USSR Academy of Sciences. Author of over 150 publications and 1 monograph. Cofounder and VP of Analiza in 1996 and cofounder and CSO of Cleveland Diagnostics from 2013.

Pedro P. Madeira is a chemical engineer with a master's degree in protein partitioning in aqueous two-phase systems and a PhD in thermodynamics, which he obtained in 2008 from the University of Porto in Portugal. He has authored over 50 publications and founded BiotecFoz in 2024, a company dedicated to various bioanalytical applications of aqueous two-phase partitioning.

Formulation and Delivery Applications of Vitamin E TPGS for Novel Drug Categories

Andreas M Papas

CEO, Antares Health Products Inc.
Adjunct Professor of the College of Medicine, East Tennessee State University, USA

Vitamin E TPGS (d-α-tocopheryl polyethylene glycol 1000 succinate) combines the functions of solubilizer, emulsifier, and absorption enhancer of lipophilic and poorly soluble drugs. In addition, it enhances drug bioavailability and efficacy through inhibition of the P-glycoprotein mediated drug efflux and other mechanisms which reduce first-pass metabolism and facilitate its transport, cell uptake and function. The safety and efficacy of TPGS expanded research and development in major areas. The presentation will review emerging applications of vitamin E TPGS which include:

- Multi-drug resistance and first-pass metabolism and their effect on drug efficacy, especially in cancer chemotherapy.
- Formation of prodrugs and drug conjugates and their role on drug efficacy and adverse effects.
- Synthesis of TPGS based polymers and their role in drug encapsulation, intracellular uptake, therapeutic effects, and safety.
- Excipient in nanomedicine and targeted drug delivery systems for increased therapeutic effect and reduced toxicity.
- Interactions with active pharmaceutical ingredients through antioxidant function and other mechanisms.
- Function as active pharmaceutical ingredient by selective induction of apoptosis of some cancer cells lines.
- Parenteral administration, a major component of the emerging applications of drug

formulation including mRNA, peptide, and other novel drug categories.

- The applications of vitamin E TPGS in solubility, stability and enhanced absorption and bioavailability of lipophilic nutraceuticals and natural extracts including cannabinoids. The presentation will include applications in pharmaceuticals, veterinary, food, dietary supplements, and personal care.
- Applications in formulations for long-term treatment of special patient categories (infant, children, elderly, etc.)

Biography

Dr. Papas is Adjunct Professor of the College of Medicine, East Tennessee State University and CEO and member of the Board of Directors of Antares Health Products, Inc. A Fulbright Scholar, Dr. Papas is a graduate of the University of Illinois and author of The Vitamin E Factor paperback and editor of the scientific book Antioxidant Status, Diet, Nutrition and Health. Dr Papas developed product concepts and managed formulation, clinical evaluation supported by the National Institutes of Health and the Cystic Fibrosis Foundation, stability and safety testing, pilot, and commercial production.

Topical Delivery of Drugs in the Treatment of High-Grade Cervical Squamous Intraepithelial Lesions: A Meta-Analysis

Jianlan Zheng, Shixuan Liu, Wenlei Zhang and **Wenyan Wang**

Chenggong Hospital of Xiamen University, China

Objective: The present study aims to evaluate the efficacy and effect of localized delivery of drugs in the treatment of high-grade squamous intraepithelial lesion (HSIL) based on a meta-analysis.

Study Design: Databases including Cochrane Library, PubMed, Embase, Scopus, CNKI, and Wanfang were searched from their inception till August 2022. Randomized controlled trials (RCTs) that compared the efficacy of drugs and surgery in the treatment of HSIL were collected. A meta-analysis was performed using the software of Review Manager (version 5.4.1).

Results: Eight RCTs involving 523 patients were included in the meta-analysis. For HSIL, the rate of cervical lesions histological regression was 69.85% in the surgery group and 59.88% in the drug group, there was no significant difference between the two groups [OR=0.45, 95% CI (0.07, 3.03), P=0.41]. The histological regression rate of cervical lesions in the placebo group was 37.76%, and the difference between the drug group and the placebo group was statistically significant [OR=4.94, 95% CI (2.65, 9.20), P<0.00001].

Conclusion: A total of four drugs were involved in the eight RCTS included in this study, which were imiquimod, 5-fluorouracil (5-FU), cidofovir and interferon. The results showed that although drug administration was effective in the histological regression of HSIL, the efficacy was less than about 10% of surgical treatment. Considering the recurrence of the disease after surgery and the problems of abortion, premature delivery and premature rupture of membranes after cervical conization in reproductive women, drug therapy can be used as a supplement to surgery or conservative treatment to promote the histological regression of cervical lesions in patients with HSIL.

Biography

M.D, Professor, Chief Physician, Director of the Department of Obstetrics and Gynecology and Pediatrics, Chenggong Hospital of Xiamen University, Xiamen, Fujian, China.

Jianlan Zheng has worked in this field for 35 years. She was invited to give lectures at domestic and foreign academic conferences for many times; exchange scholar at the University of Cincinnati and British Imperial College Maternal and Infant Research Center.

She edited 2 monographs and participated in editing 3, published more than 30 papers, presided 10 projects, include the National Natural Science Foundation and provincial and military scientific research projects, introduced the Bakri postpartum hemostatic balloon, and CRB balloon for cervical maturation and induction of labor, invented the Zheng uterine compression suture and other 4 patents, gained 9 medical achievements or scientific and technological progress awards.

Hydroquinone-Free Skincare Treatment for Hyperpigmented and Photodamaged Facial Skin

Sofia Iglesia, Alisar S. Zahr and **Tatiana Kononov**

Revision Skincare, USA

The FDA decision to pull over-the-counter hydroquinone treatments off shelves as part of the 2020 Coronavirus Aid, Relief, and Economic Security (CARES) Act has left physicians with limited treatment options that can effectively target hyperpigmentation skin concerns.

The objective was to evaluate a hydroquinone-free skincare regimen consisting of a vitamin C serum (VCS) formulated with 30% (w/w) Tetrahexyldecyl (THD) Ascorbate and a 0.5% (w/w) retinol serum (RS) for the treatment of moderate hyperpigmented and photodamaged facial skin.

Design: An institutional review board (IRB)-approved, 12-week, dual-center, open-label, cross-over clinical study recruited thirty healthy female subjects aged 35 - 65 with Fitzpatrick skin types I – VI and moderate global face hyperpigmentation and photodamage. Subjects followed a cross-over skincare regimen that consisted of phase 1: baseline to week 6, VCS twice daily application, phase 2: week 6 to week 8, VCS twice daily and 0.5% RS every other evening application, and phase 3: VCS twice daily and 0.5% RS every evening application. Clinical efficacy, tolerability, and self-assessment questionnaires were performed at baseline and weeks 6, 8, and 12. Investigator Global Aesthetic Improvement Score was completed at week 12.

Results: A significantly progressive improvement in visual radiance, overall photodamage, clarity / brightness, hyperpigmentation (mottled), and skin tone evenness (redness) was observed during each phase ($p < 0.001$).

Conclusion: Due to the ban of over-the-counter hydroquinone treatments by the FDA in the CARES Act of 2020, there is a consumer need for cosmeceuticals that effectively and safely address facial hyperpigmentation and photodamage concerns. An optimized vita-

min C serum formulated with 30% (w/w) THD ascorbate paired with a 0.5% (w/w) retinol serum produced clinical improvements in subjects with moderate global facial hyperpigmentation and photodamage. These findings provide health care providers with a safe and efficacious treatment regimen for patients concerned with facial skin hyperpigmentation and photodamage.

Biography

Sofia Iglesia, MS, is a Research and Clinical Development Senior Scientist at Revision Skincare since March 2021. She leads and supports new product development projects, research new technologies, and assists in clinical study design. Her previous experience has been as a Junior Chemist at Emilia Resources LLC, where she assisted in the development of cosmetic and over-the-counter skincare products and ensured successful scale up in manufacturing. Additionally, she has 7 years of experience and knowledge in clinical research from her time spent as a clinical research associate at the Department of General Internal Medicine and Clinical Research Volunteer at the Department of Dermatology and Cutaneous Surgery, at the University of Miami Miller School of Medicine. This is where she also obtained her Masters of Science in Skin Biology and Dermatological Sciences in May 2020.

Environmental Conditions Actively Participate in Protein Folding Process

Irena Roterman and **Leszek Konieczny**

Medical College, Jagiellonian University, Poland

Protein structure prediction seems to be solved using Artificial Intelligence in form of AlphaFold. This program delivers the protein structures for given amino acid sequence in high accordance with experimentally determined. However the question regarding the mechanism of protein folding process remains unrecognized. The program used for this aim are looking for low energy structure is basing solely on the internal force field to express the energy as the criterion. The active participation of environment in this process is presented introducing the external force field as the second factor influencing the folding process. The basis for the model is the use of 3D Gauss function as the representation of hydrophobicity distribution in protein body. Any discordance versus the Gaussian distribution appears to represent the biological specificity preparing the protein molecule to be able to interact with selected compounds. This is why the protein can be called “intelligent micelle” with the specificity expressed by local discordance in respect to micelle-like hydrophobicity distribution. The mathematical form expressing the influence of environment (membrane, chaperones, chaperonins) is proposed. The application of the presented model to amyloids reveals the mechanism of amyloid transformation. The application of multi-object optimization in form of Front Pareto is presented to simulate the protein folding process as the result of the consensus of internal and external force field.

Biography

Irena Roterman – professor of bioinformatics - protein structure and amyloid transformation. Employed at Jagiellonian University – Medical College Krakow, Poland. Educated in theoretical chemistry, specialized in computer techniques oriented on biological issues.

- Two years postdoc at Cornell University – H. A. Scheraga group.
- Chief Editor of the journal *Bio-Algoriythms* and *Med Systems* (2000-2020 https://bamsjournal.com/).
- Author of 150 publications (according to PubMed) and books: Springer https://link.springer.com/book/10.1007/978-3-031-31557-2), Walter de Gruyter (ISBN (978-3-11-04064403), Elsevier (elsevier.com/books/from-globular-proteins-to-amyloids/roterman-konieczna/978-0-08-102981-7).
- Present on the 2% top scientists list – Stanford University.

Flaxseed: A Novel Approach to Enhanced Wound Healing

Basma Ezzat Mustafa Alahmad

Department of Fundamental Dental and Medical Science, Kulliyyah of Dentistry, International Islamic University Malaysia, Kuantan Campus, Malaysia

Delayed wound healing in diabetic patients remains a critical clinical challenge, driving the need for innovative and effective therapeutic approaches. Medicinal plants, including flaxseed, have gained increasing attention due to their regenerative properties and potential to address wound-healing complications. This study explores the therapeutic effects of flaxseed extract on wound healing in diabetic animal models, emphasizing its anti-inflammatory, antibacterial, antifungal, and antioxidant characteristics.

A total of forty-five male white New Zealand rabbits were included in the study, with four full-thickness, linear wounds created bilaterally on the dorsal skin of each animal. Tissue samples were collected on days 4, 7, and 14 post-wounding for histopathological analysis, evaluating key wound healing parameters such as inflammation, re-epithelialization, neovascularization, and surface closure rates. The results revealed that flaxseed extract significantly accelerates healing by enhancing keratinocyte and dermal fibroblast proliferation, promoting collagen deposition and maturation, facilitating new blood vessel formation, and reducing inflammation throughout the healing intervals.

Additionally, flaxseed extract improved skin elasticity and firmness during healing, providing further benefits beyond wound closure. These findings underscore the therapeutic potential of flaxseed extract as a promising topical agent for diabetic wound management. They suggest its applicability in developing advanced, efficient wound dressings for clinical use.

Biography

Associate Professor Dr. Basma Ezzat Mustafa, a distinguished academic and researcher, holds a Ph.D. in Clinical Pharmacology, a Master's degree in Advanced Clinical Laboratory Sciences, and a Bachelor's in Pharmacy. She currently serves as a lecturer and the Head of the Fundamental Dental Medical Sciences Department at the Kulliyyah of Dentistry, International Islamic University Malaysia. Dr. Basma has been honored for her exceptional contributions with accolades such as the Certificate of Excellence in Research and Publication in 2019 and the prestigious 6-Star MyRA distinction in 2022. Her extensive research portfolio reflects her expertise in Clinical Pharmacology and Advanced Clinical Laboratory Sciences, focusing on Microbiology, Immunology, Endocrinology, and Natural Products. She is particularly passionate about the development of traditional and herbal medicine. Dr. Basma's prolific academic career includes the authorship of six books and 60 publications in indexed journals, showcasing her significant impact in her field.

NMR-Based Metabolomics and Biochemical Analyses as Tools for Precision Medicine in Fighter Pilots

Grace Barros de Sá[1,2], Roberta Verissimo França de Oliveira[3], Alanny Cristine dos Santos Pinheiro[3], Paulo Farinatti[1] and **Gilson Costa dos Santos Junior[3]**

[1]Laboratory of Physical Activity and Health Promotion (Labsau), Institute of Physical Education and Sports, University of Rio de Janeiro State (UERJ), Brazil
[2]IBMR University Center, Brazil
[3]IBRAG/Department of Genetics, Laboratory of Metabolomics (LabMet), University of Rio de Janeiro State (UERJ), Brazil

Fighter pilots face a range of physical, psychological, and environmental stressors. NMR-based metabolomics provides a reliable and comprehensive approach to map the metabolic profile analysing associated to acute and chronic effects of aviation of aviation. We evaluated 34 subjects: FP1 (n = 7, fighter pilots with less than 1,100 hours of accumulated flight time), FP2 (n = 6, fighter pilots with 1,100 or more flight hours), and NP (n = 21, military non-pilots). Data collected included total blood count, lipid profile, oxidative stress markers, and serum NMR-based metabolomics. Compared to NP ($p < 0.05$), pilots showed reduced levels of leucocytes (−13%), neutrophils (−15%), lymphocytes (−20%), alpha-glucose (−13%), lactate (−26%), glutamine (−11%), histidine (−20%), and tyrosine (−11%). However, they had higher isobutyrate concentrations (+10%). FP1 exhibited signs of immune-metabolic dysregulation, which appeared to improve in FP2 pilots. A previous study assessed the acute metabolic effects before and after A-29 flights in trainees (n = 12) and instructors (n = 20). Post-flight, trainees showed increased segmented neutrophils (12%) and salivary glucose (49%), alongside a 23% reduction in serum lactate. Instructors displayed a rise in lymphocytes (15%) and decreases in serum lactate (12%) as well as key metabolites, notably choline (−23%) and lactate (−15%). Additionally, urinary L-anserine levels increased by 200% in trainees and by 4.2% in instructors, while trigonelline levels rose by 53% in instructors. These findings highlight the acute metabolic responses to flight stressors in combat pilots, underscoring the importance of personalized monitoring to optimize interventions related to training, diet,

supplements, medications, chronic fatigue management, and personnel selection based on metabolic adaptations.

Biography

PhD in Clinical and Experimental Pathophysiology (UERJ, Brazil). Master in Cardiovascular Sciences (UFF). Specialist in Human and Exercise Physiology. In Post-doctoral Internship in the Postgraduate Program in Exercise and Sports Sciences (UERJ, Brazil), with funding from FAPERJ and CAPES. Member of the Laboratory of Physical Activity and Health Promotion (LABSAU-UERJ). Coordinator of the Physical Education Course at Salgado de Oliveira University (UNIVERSO, Brazil). Professor at IBMR University Center (Brazil). Current research line in Cardiorespiratory Physiology, Aerospace Physiology and Physical Training. Researches the acute and chronic effects of combat flight on the health and performance of pilots.

Advanced Surface Plasmon Resonance (SPR) Assay Application for Preclinical Antiviral Drug Testing

Petia Genova-Kalou[1], George Dyankov[2], Stefka Krumova[1], Evdokiya Hikova[2], Petar Kolev[2] and **Petar Veselinov[2]**

[1]Department of Virology, National Reference Laboratory of Rickettsia and Cell Cultures, National Centre of Infectious and Parasitic Diseases (NCIPD), Bulgaria
[2]Institute of Optical Materials and Technologies (IOMT), Bulgarian Academy of Sciences (BAS), Bulgaria

Viral outbreaks, re-emerging or emerging viral diseases, affecting human population are of particular public health risks. Currently, very few antiviral drugs have been approved for human use, since many of them have associated with high toxicity, low selectivity, and significant resistance. During the preclinical antiviral drug screening various cell culture-based assays are available and can be successfully applied to assess cell viability/cytotoxicity and to determine antiviral activity. Surface Plasmon Resonance (SPR) can be applied in the kinetic analysis of the early stages of viral infection of cells and the antiviral drug activity in the infected cells. The aim of this study was to prove that the cell-based SPR assay can be applied to evaluate the antiviral effectiveness of newly synthesized drugs and natural compounds. For this purpose, cells immobilized on the SPR slides were infected with human coronavirus HCoV-229E and treated with newly chalcones and antiviral drugs remdesivir and hydroxychloroquine. The SPR method was used to evaluate the antiviral effect of chalcones on the early stages of viral replication, and the virus-cell response was followed by the change in the viability of infected and treated cells, assessed by MTT assay. Based on the results obtained, it can be concluded that two of the tested chalcones exhibit promising anti-coronavirus activity in cell cultures. The study conducted is a pilot study and the results obtained will be used to develop and optimize a sophisticated methodology for assessing the “structure – antiviral activity” relationship.

Acknowledgment: This work was supported by the Bulgarian National Science Fund under Grant number KP-06-N 78/9, from 14/12/2023

Biography

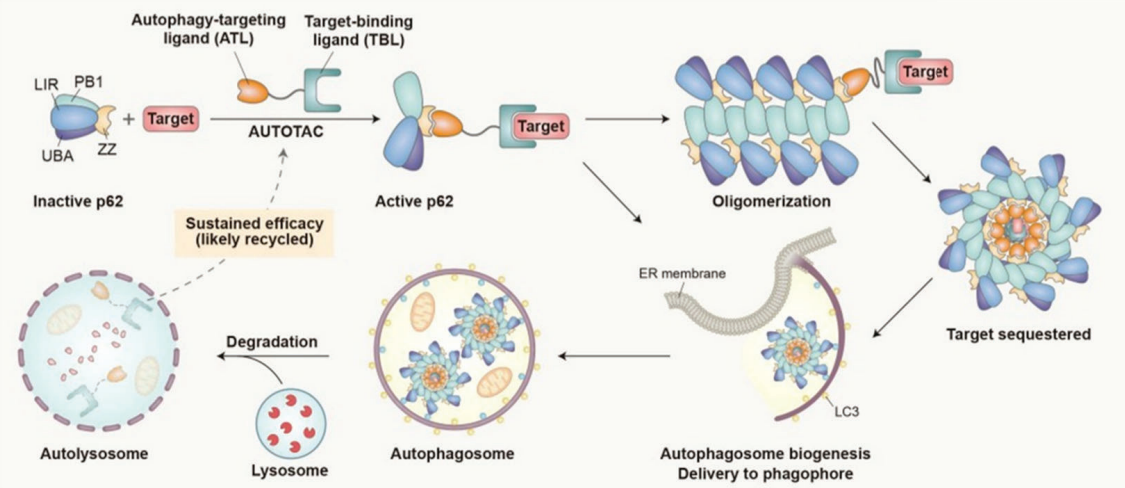
Petia Genova-Kalou received her M.S. degree in Molecular Biology from Sofia University “St. Kliment Ohridki”, Bulgaria and Ph.D. degree on SOCRATES-ERASMUS exchange program from Sofia University and University of Ioannina, Greece in the field of Virology. She has specialization of “Clinical Virology” in Medical University – Sofia. She has worked part-time at Hellenic Pasteur Institute Greece (2006 – 2007), at the National Hellenic Research Foundation, Greece (2007) and National Center of Infectious and Parasitic Diseases, Sofia, Bulgaria (currently). During this period P. Genova-Kalou was involved in study of antiviral effect of different newly synthesized and natural compounds in cell culture, diagnostic of herpes and oncogenic viruses, epidemiology and molecular study and diagnostics of rickettsiae. She is the author and co-author of over 70 scientific articles and over 200 reports.

Development of a First-in-Class AUTOTAC Targeted Protein Degrader for Pathological Tau Aggregates in Tauopathies

Chang Hoon Ji[1,2] and **Yong Tae Kwon**[1,2,3]

[1]R&D Center, AUTOTAC Bio, Inc., South Korea
[2]Cellular Degradation Biology Center, Seoul National University, South Korea
[3]Department of Biomedical Sciences, College of Medicine, Seoul National University, South Korea

The N-degron pathway dictates the *in vivo* stability of substrate proteins based on the identity of their destabilizing N-terminal amino acid residues, or N-degrons. We elucidated the mechanisms by which the Arg/N-degron pathway mediates autophagic protein quality control *via* conformational and biological activation of the p62/SQSTM1 receptor. Targeted protein degradation allows targeting of undruggable proteins-of-interest for both research purposes and therapeutic applications. Using peptidomimetic approaches to model, design and synthesize a proprietary p62-targeting scaffold using small-molecule ligands, we developed the AUTOphagy-TArgeting Chimera (AUTOTAC) degrader platform that employs bifunctional molecules composed of target-binding ligands linked to autophagy-targeting ligands that bind p62/Sequestosome-1/SQSTM1. AUTOTACs selectively degraded various high-molecular weight aggregates of amyloidogenic hallmark proteins in neurodegeneration at nanomolar DC_{50} values *in vitro* and *in vivo*, along with improvements in cognition, locomotion and behavior. Specifically, the anti-tau aggregate degrader ATB2005A exhibited clear *in vitro/vivo* efficacy, orally druggable ADME/DMPK properties and a large safety window, and was approved for clinical phase 1 single-ascending dose studies in Korea. ATB2005A is a first-in-class AUTOTAC degrader-type drug for tauopathies including progressive supranuclear palsy (PSP) and Alzheimer's disease (AD), and represents to the best of our knowledge the first-ever TPD chimeric degrader to enter clinical trials for tauopathies and neurodegeneration.



Biography

Chang Hoon Ji is a molecular and cellular biologist by training. He works at the Cellular Degradation Biology Center in Seoul National University as a Research Assistant Professor, focusing on the basic and translational science on the autophagic Arg/N-degron pathway. Additionally, he serves as the Executive Director of the Bio R&D Center at AUTOTAC Bio, where he leads drug development efforts for heterobifunctional chimeric targeted protein degraders.

His personal goal is to cover the entire width of the 'basic science - translational science - clinical development' spectrum for a comprehensive understanding and advancement of human health. Specifically, he focuses on elucidating the basic science mechanisms behind the cellular degradation machinery and translating these findings for initial proof-of-concept, then later full-fledged development of first-in-class drug development platform technologies. His key interests are the N-degron pathway, targeted protein degradation, autophagy and protein aggregates.

Perfect State Transfer in a Quantum Biological System Based on the Davydov Model

Elham Faraji[1], Alireza Nourmandipour[2], Stefano Mancini[3], Marco Pettini[4] and **Roberto Franzosi[5]**

[1]Jülich Research Center, Germany
[2]Department of Physics, Sirjan University of Technology, Iran
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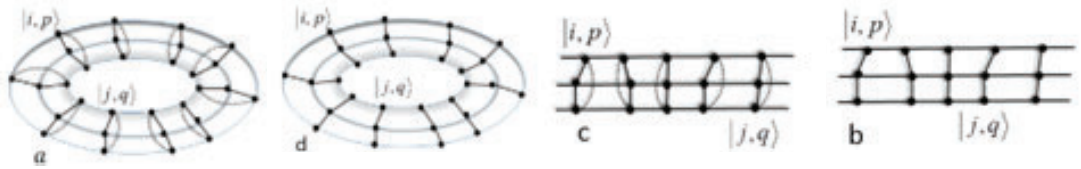
Recent advancements in quantum science have enhanced our understanding of quantum information processing in biological systems. The Davydov model explains energy storage and transport in biomolecules through soliton formation and propagation, particularly focusing on the α-helix structure of proteins that looks like three channels of one-dimensional spring chains of amino acids coupled to each other by chemical bonds.

Building on these principles, we investigate quantum state transitions in a bio-inspired spin network that mimics the α-helix configuration. By treating this as a two-dimensional spin network, we analyze quantum transition probabilities across various configurations under cyclic and non-cyclic boundary conditions.

Our findings indicate that analytical eigenvectors of the exciton Hamiltonian can be derived under specific conditions, allowing us to explore the time scales for quantum perfect state transfer (PST). We assess transmission probabilities and the impact of spin-spin coupling, demonstrating that effective PST requires precise coupling parameters for optimal phase matching.

These insights highlight the potential of bio-inspired networks in advancing quantum communication technologies and their applications in biocomputing, particularly in diagnosing medical conditions like cancer and enhancing photosynthesis processes. This work could pave the way for innovative RNA-targeted therapies and drug design in medicinal chemistry.



Four different cyclic and non-cyclic boundary conditions on the α-helix spin network.

$$p_t([i,p],[j,q]) = \left| \sum_{n=0}^{N-1} \sum_{\alpha=1}^{3} \langle i,p|\prod_n^{\alpha}|j,q\rangle e^{-i\lambda_n^{\alpha} t} \right|^2$$

Quantum transition probability from the input state $|i, p\rangle$ to the output state $|j, p\rangle$.

Biography

Dr. Elham Faraji is a theoretical and computational physicist specializing in molecular quantum dynamics and quantum technologies. She has worked as a postdoctoral research assistant at the Research Center Jülich in Germany and completed a joint Ph.D. in the Quantum Technologies program at the University of Naples Federico II and Aix-Marseille University, focusing on "Quantum Transport Phenomena in Macromolecules." Her research includes charge and energy transfer processes using quantum electron-phonon interaction models and quantum information processing in macromolecules. Additionally, she explored quantum light-matter interactions in her MSc thesis. Dr. Faraji has published several papers in reputable journals and is a distinguished speaker for her work "Routing a Quantum State in a Bio-Inspired Network," which has garnered significant attention in the research community. She is passionate about interdisciplinary research in quantum molecular dynamics, materials science, and open quantum systems, and welcomes collaboration with researchers in these fields.

Artificial Intelligence Enabled Nanosensors for Trace-Level Biomarkers Detection

Ajay Agarwal

Professor, Department of Electrical Engineering, Indian Institute of Technology Jodhpur, India

Detecting biomarkers at trace levels is important for many reasons, including *early detection of disease* which can help in preventing the spread of infectious diseases and reduce the death rate from diseases like cancer; possibilities of *personalized medicine* as biomarkers can provide individualized information about underlying medical conditions, that can guide treatment decisions and improve patient outcomes; it can help in *drugs development* as biomarkers can help in identifying the suitable patients for clinical trials and the approval process can speed up; *etc*. Nanosensors are often used to detect trace-level biomarkers due to their large surface area to volume ratio, which makes them sensitive to chemical compounds, atoms, and single molecules. Nanosensors are categorized by their constituent materials, detection targets, and the signals used to transmit information which include gas-based nanosensors, colorimetric nanosensors, electrochemical sensors, chemo-resistors, piezoelectric sensors, Surface Enhanced Raman Spectroscopy (SERS), etc. The use of nanotechnologies to realize highly sensitive sensors, along with micro-fluidics, are leading to sample-to-answer operations on a chip, suitable for healthcare applications. While detecting trace-level biomarkers, these nano-device encounter a lot of noise from other chemicals in the samples under consideration, which is being taken care by using suitable Artificial Intelligence based algorithms.

Nanotechnologies with micro-fabrication have enabled novel nano-dimensional materials, structures and eventually devices; integrated with AI algorithms-based data analytics are finding several early-diagnostics applications. CNTs, Nano-Gap arrays and Nanowire based bio-chemical sensors are most utilized for such diagnostic applications. Nano-Gap arrays, working on the principle of 'Electro-magnetic enhancement' using micro-Raman spectroscopy is one such technique.

The technology details suitable for the mass realization of the Nano-Gap arrays, for Surface Enhanced Raman Spectroscopy (SERS), along with a few use cases of trace-level early diagnostic applications will be discussed in detail.

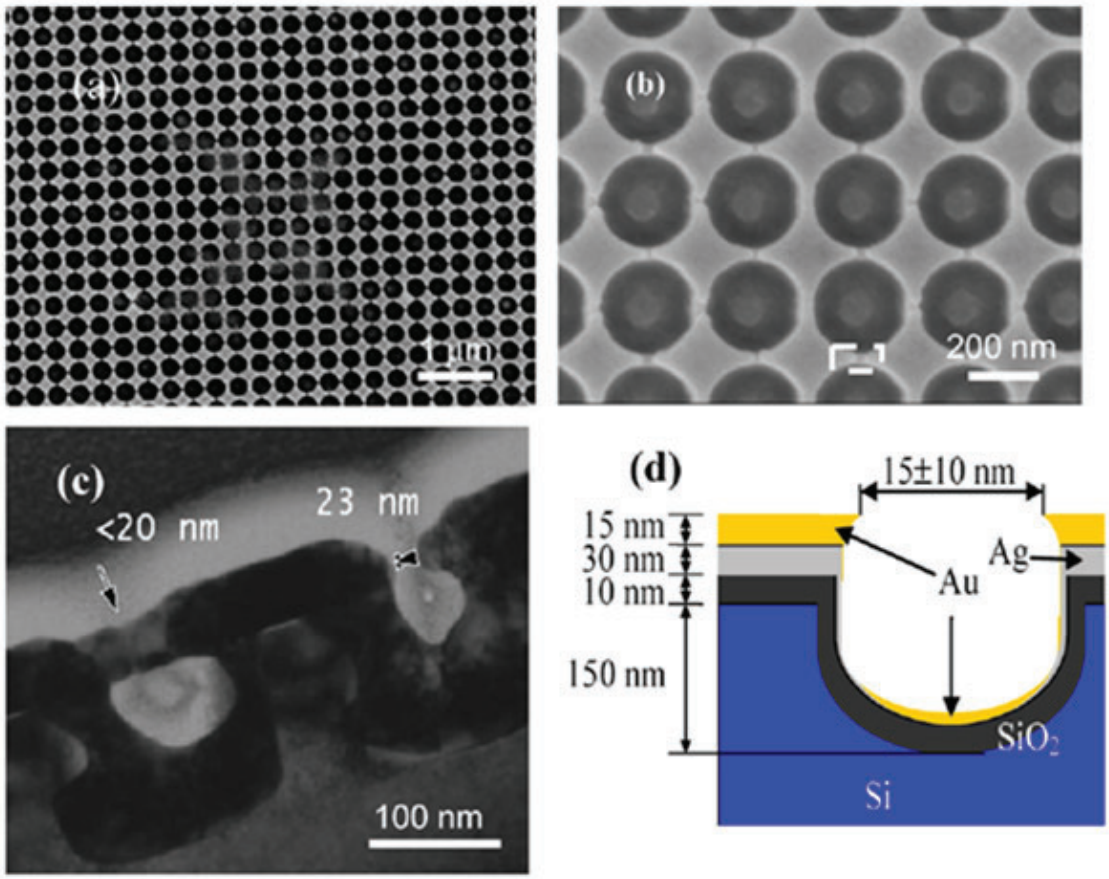


Figure: Nano-gaps in array format, representing SERS nano chip suitable for trace-level molecular/ bio-marker detection.

Biography

Ajay Agarwal is Professor at Department of Electrical Engineering, Indian Institute of Technology Jodhpur, India; an adjunct faculty at Division of Interdisciplinary Research Program (IDRP); Core committee member of Medical Technologies. He is Joint-PI for CoE in "AYURTECH for Integrative Precision Health and Medicine". Prof. Ajay is also Director, Electronics Sector Skills Council of India (ESSCI), New Delhi, founding Director of a startup – 'Sarbit Innovations' & mentor of another startup – 'Caldor Health Technologies'. Earlier, he worked at CSIR-CEERI, Pilani as Coordinator-Smart Sensors Area and Associate Dean, at AcSIR, New Delhi. He also served at A*Star - Institute of Microelectronics, Singapore, Semiconductor Complex Ltd., Chandigarh & USHA India, Faridabad.

He has ~300 research publications, >100 invited/ plenary/ keynote talks and 40 patents. He has supervised or guided 29 Ph.D. students. He is a member / fellow of various professional societies and is bestowed with various awards.

DFT Investigation of the Antioxidant Capacity of Culinary Herbs Polyphenols

André M. Oliveira[1], Heitor A. Abreu[2] and **Mithun Rudrapal[3]**

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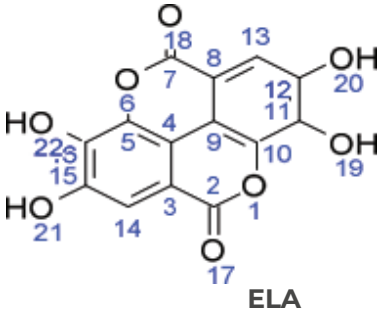
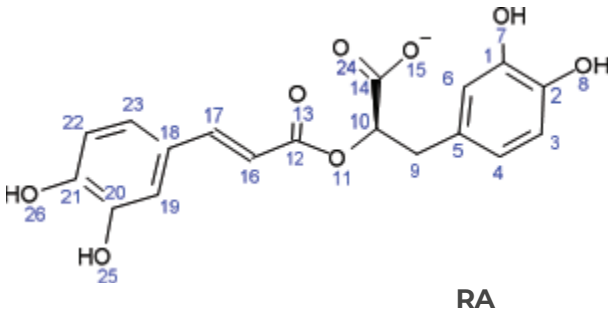
[2]Department of Chemistry, Institute of Exact Sciences, Federal University of Minas Gerais (UFMG), Brazil
[3]Vignan's Foundation for Science, Technology and Research, India

This work investigates the antioxidant potential of two culinary herbs polyphenols, rosmarinic acid (**RA**) and ellagic acid (**ELA**), key inflammatory pathways enzymes inhibitors. **RA** can be found on sage, thyme, oregano, peppermint, rosemary, and **EA** has been detected in beverages, berries and nuts. The antioxidant capacity of **ELA** and **RA** was analysed using DFT (M06-2X/6-311G(2d,2p) and (B3LYP/6-311G(2d,2p)). Enthalpies were determined for non-ionized (ArOH), ionized (ArO^-), radical ($ArO^{\cdot}$), and cation radical ($ArOH^{+\cdot}$) forms. The scavenging activity was correlated with O-H bond dissociation enthalpy (BDE), adiabatic ionization potential (IP), proton dissociation enthalpy (PDE), proton affinity (PA), and electron transfer enthalpy (ETE)[1] (Table 1). M06-2X showed overestimated values when compared to B3LYP. BDE favours **RA** over **ELA**. In **RA**, the 7-OH group, closer to the negative carboxylate group, is less reactive. Electron-donating groups such as OH diminishes the BDE, increasing antioxidant activity[2]. Lower IP suggests stronger electron-donating ability. Discrepancies arise when different functionals are used with cation radicals, affecting the IP calculation of the 20-OH group in **ELA**, and M06-2X exhibiting better reproducibility.

Table 1. Parameters for estimating the scavenging activity of phenolic antioxidants.



ELA



RA

Compound	Substitution	BDE		IP		PDE		PA		ETE	
		M06X	B3LYP	M06X	B3LYP	M06X	B3LYP	M06X	B3LYP	M06X	B3LYP
ELA	19-OH	0.1499	0.1183	0.2844	0.2698	0.3679	0.3508	0.5091	0.5046	0.1431	0.1159
	20-OH	0.1193	0.1167	0.2902	0.0012	0.3314	0.6178	0.5128	0.5104	0.1088	0.1086
RA	7-OH	0.1620	0.1139	0.8505	0.9593	-0.1863	-0.3431	0.6513	0.6290	0.0130	-0.0128
	8-OH	0.1250	0.0948	0.8284	0.9470	-0.2012	-0.3499	0.6763	0.6505	-0.0490	-0.0534
	25-OH	0.1331	0.1100	0.8461	0.6725	-0.2108	-0.0602	0.6531	0.6505	-0.0178	-0.0383
	26-OH	0.1636	0.1098	0.8489	0.7376	-0.1830	-0.1256	0.6183	0.5852	0.0476	0.0269

HOMO/LUMO orbitals (M06X-6-311G(2d,2p); Figure 1) for **RA** in their ArO- and ArOH+· forms presents higher values of anion HOMO, which implies in higher PA. The carboxylate group in **RA** takes part in the LUMO electron delocalisation profile, due to the proximity of the electron loss centre.

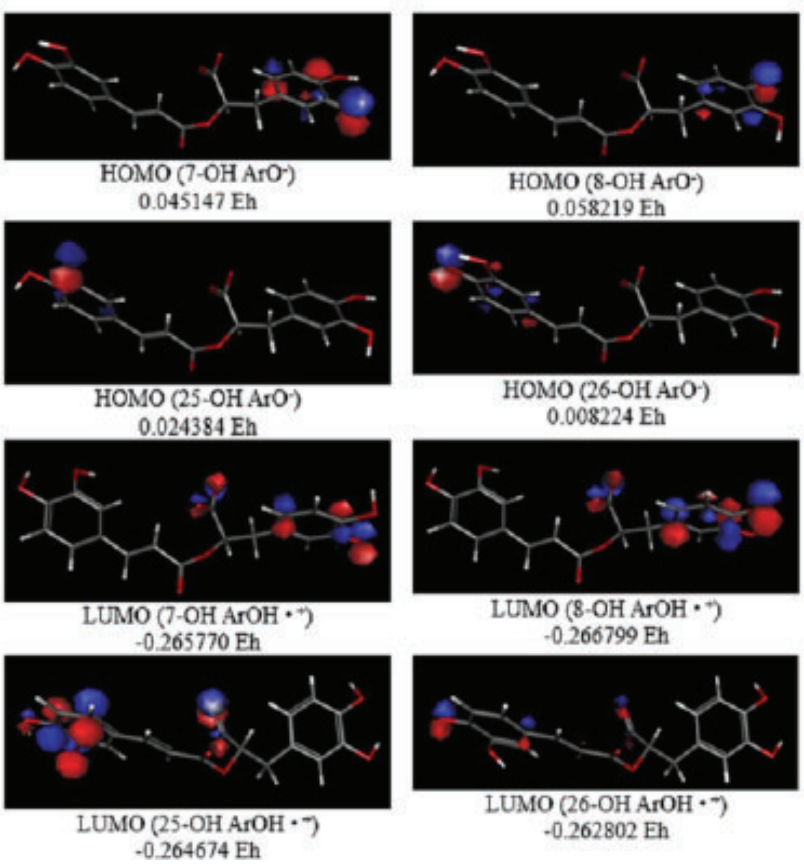


Figure 1. HOMO/LUMO surfaces for **RA**.

ELA's OH groups exhibit a higher tendency to act as electron donors than **RA**, due to their planar, fused rings, more effective at dispersing the positive charge of the cation radical. BDE is influenced by the local environment induced by substituents, while the IP value is affected by extended delocalization and conjugation of π-electrons. **ELA**'s higher PDE result in slower acidity due to smaller OH dissociation *via* proton liberation. Both show lower PA and an easier formation of ArO-. **RA** exhibits higher electron-transfer capabilities.

Biography

Dr. Oliveira holds a bachelor's degree in Chemistry and a doctorate in Organic Chemistry from the Federal University of Minas Gerais. He has experience in Medicinal Chemistry, working mainly in the following areas: QSAR, molecular modeling and scientific divulgation. He is currently a professor at the Federal Center for Technological Education of Minas Gerais (CEFET/MG - Brazil), founder and coordinator of the Center for Studies in Computational Physics and Chemistry (NEFIQC, since 2009), and professor of the Department of Environment and Chemistry. He is the author of the book "Introduction to Molecular Modeling for Chemistry, Engineering and Biomedical Sciences: Fundamentals and Exercises" (published in Portuguese), and also owns book chapters related to polyphenol, fragment- based drug design and QSAR. Dr. Oliveira conducts research with various categories of bioactive compounds (herbicides, antitumoral drugs, bactericides, among others). He is a full member of the Brazilian Chemical Society (SBQ) and holds scientific collaborations worldwide. ORCID: https://orcid.org/0000-0001-6574-7015.

Evaluation of Multifunctional Hemorphins with Modifications at the N- and C-Terminal Regions for the Improvement of the Anticonvulsant Activity

Jana Tchekalarov, Temenujka Radoykova, Petia Peneva and **Petar Todorov**

University of Chemical Technology and Metallurgy, Bulgaria

Hemorphins are endogenous peptides that have opioid receptor affinity and exhibit morphinomimetic properties. These peptides are derived through enzymatic cleavage of hemoglobin, particularly from the beta-globin chain. The two main types of hemorphins identified are hemorphin-4 and hemorphin-7, with their sequences being: Hemorphin-4: Tyr-Pro-Pro-Phe and Hemorphin-7: Tyr-Pro-Pro-Phe-Val. Their opioid activity is due to their ability to bind to opioid receptors in the brain and other tissues, particularly the mu-opioid receptor, which is the same receptor that is activated by morphine and other opioids. Hemorphins are part of a larger family of biologically active peptides that contribute to regulating various physiological functions. They might play a role in processes such modulation of pain, immune response, blood pressure and behavioral responses. However, the exact physiological and pathophysiological roles of hemorphins are still an area of ongoing research. Our research team have synthesized and characterized a series of new analogs of hemorphin peptides modified at the N- and C-terminal regions for potential anticonvulsant activity. Our results suggest that the smallest change in the hemorphin molecule has a great influence on the biological activity, such as the introduction of the unnatural amino acid Dap, and the replacement of Pro with the conformationally constrained amino acids (Ac5c, Ac6c, and adamantane moieties). Structure–activity analysis revealed that the incorporation of an adamantane residue at the N-terminus is necessary for protection against the spread of seizures. The modification of hemorphin peptide analogs at both the N-terminal and C-terminal regions has shown promise in enhancing their anticonvulsant properties. This modification increases their ability to bind effectively to opioid receptors, including the kappa-opioid receptor (KOR), which plays a significant role in various neurological functions, including pain modulation and seizure regulation. Incorporating specific modifications to the hemorphin peptide structure has

the potential to enhance its anticonvulsant properties, offering a new therapeutic pathway for treating seizure disorders. The combination of opioid receptor binding (especially to KORs) and tailored peptide modifications creates a promising strategy that could lead to more effective, selective, and safer treatment options for managing seizure susceptibility.

Acknowledgement: This study is funded by the European Union-NextGenerationEU, through the National Recovery and Resilience Plan of the Republic of Bulgaria, project № BG-RRP-2.004-0002, "BiOrgaMCT"

Biography

Professor Tchekalarova is the leader of the Behavioral Neurobiology Department at the Institute of Neurobiology and a head of “Study of biological activity of biomolecules “research group in the University of Chemical Technology and Metallurgy, Project: BG-RRP-2.004-0002, "BiOrgaMCT*. Since her PhD in pharmacology (2005), she has published over 150 papers on topics related to biological activity and modulatory role of neuropeptides in seizure susceptibility; neuropsychopharmacology, models of neurodegenerative disease; signaling molecules of neuroplasticity. The research group in the lab conducts cutting-edge research in the field of characterization of newly synthetized analogs of biologically active endogenous peptides containing unnatural amino acids and derivatives. The role of opioid receptors underlying their mechanism of action is assessed in silico by docking analysis and pharmacological tools.

Cannabis Situation in Germany

Jonas Michael Wilhelm Westphal

International Business Jurist and Author, Germany

Following the partial legalization of cannabis in Germany, significant shifts have occurred in both medical and recreational markets. The legal framework now permits possession and private cultivation of recreational cannabis, while the concept of “cannabis clubs” and regional pilot projects remain in early planning stages. Additionally, medical prescriptions can be issued more easily, though a change in government may reverse these advancements.

The medical cannabis sector has seen a notable increase in demand. Imports continue to rise, and since 2022, domestic cultivation has contributed to market stability. Pharmaceutical and online sales channels have expanded, while private- sector investments in cannabis production and distribution are growing. Despite this progress, thethe discussion surrounding CBD and THC variants remains ongoing, with regulatory uncertainty affecting market confidence.

Several challenges persist. The overlap between medical and recreational use creates legal ambiguities, such as individuals obtaining prescriptions for non-medical purposes or private cultivation blurring regulatory boundaries. Furthermore, bureaucratic hurdles, safety regulations, and restrictive THC limits (e.g., 0.3%) hinder industry growth.

A major barrier to cannabis normalization remains deeply rooted societal attitudes. Public discourse continues to focus on perceived dangers such as misuse and addiction, while punitive approaches dominate legal perspectives. This creates a self- reinforcing cycle that impedes scientific research and policy innovation.

To break this cycle, a shift in legal and economic narratives is required. Evidence- based regulation, greater public education, and balanced policy approaches could foster a more

sustainable framework for both recreational and medical cannabis use.

Addressing these challenges will determine the long-term success of Germany's evolving cannabis legislation.

Biography

J.M.W. Westphal is an international business jurist and author specializing in the regulation of the industrial hemp and Cannabis market. His research deals with the five central sectors: CBD, recreational cannabis, medical cannabis, fiber hemp and seed hemp.

He analyzes the economic, substainability and legal framework of these industries and examines market potentials and regulatory challenges. He is particularly interested in the interactions between legislation, the economy and the social acceptance of hemp products.

Westphal regularly publishes on business law issues and speaks at international conferences on the development of the hemp sector. His focus is on promoting a fact- based regulatory approach that enables innovation and market growth without neglecting health or legal risks.

Through his interdisciplinary perspective, he combines legal expertise with economic understanding and advocates for evidence-based regulation of the hemp market.

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Mycobacterial ATP-Phosphoribosyl Transferase (HisG) Inhibition by The New Anti-TB Chemotypes Benzo[d]thiazole-2-carboxamides/carbanilides

Tejas M. Dhameliya[1,2], Rishu Tiwari[3], Arkaprabha Banerjee[3], Sahaj Pancholia[1], Dharmarajan Sriram[4], Dulal Panda[4] and **Asit K. Chakraborti[1,5]**

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[2]Department of Pharmaceutical Chemistry, Institute of Pharmacy, Nirma University, India
[3]Department of Biosciences & Bioengineering, Indian Institute of Technology Bombay, India
[4]Department of Pharmacy, Birla Institute of Technology & Science-Pilani, India
[5]School of Chemical Sciences, Indian Association for the Cultivation of Science, India

Targeting metabolic enzyme, unique to *Mycobacterium tuberculosis*, provides a novel approach to develop new drugs to eradicate *Mtb* via inhibition of the mycobacterial ATP-phosphoribosyl transferase (ATP-PRTase). Benzo[*d*]thiazole-2-carboxamides and benzo[d] thiazole-2-carbanilides with activity against *Mtb* having MIC of 0.78-25 µg/mL were identified as potential inhibitors of ATP-PRTase (HisG). The effect of benzo[*d*]thiazole-2-carboxamide and benzo[*d*]thiazole-2-carbanalide derivatives on the enzymatic inhibitory activity against ATP-PRTase was studied. The compounds **1n** and **2a** were found to be most potent which inhibited the activity of ATP-PRTase with EC50 of 20 ± 2.2 and 14 ± 1.8 µM, respectively. The compounds **1n** and **2a** bound to ATP-PRTase with a dissociation constant (K_d) of 11 ± 1.5 µM and 6.6 ± 1.2 µM, respectively, and perturbed the secondary structure of ATP-PRTase. The compound **1n** exhibited a stronger competitive inhibition towards ATP (K_i = 19 ± 3 µM) as compared to **2a** (K_i = 35 ± 2 µM). There was a recovery in the growth of *M. smegmatis* when the growth medium was complimented with histidine in the presence of **1n** and **2a** indicating that these compounds inhibit the growth of *Mtb* by targeting histidine biosynthesis pathway. The molecular modelling studies revealed the binding interactions of **1n** and **2a** in the active site of ATP-PRTase supporting the activity of these compounds through inhibition of ATP-PRTase. The time dependent molecular dynamics simulation studies further supported the stability of **1n** and **2a** bound to the active site of the enzyme.

Thus, benzo[*d*]thiazole-2-carboxamides and carbanilides can be exploited for identification of anti-TB agents by targeting the mycobacterial ATP-phosphoribosyl transferase enzyme, to develop new and effective anti-TB drugs.

Biography

Dr. Tejas M. Dhameliya has completed B. Pharm. From L. M. College of Pharmacy (LMCP), Ahmedabad in 2012 and M.S. (Pharm.) from Department of Medicinal Chemistry in June 2014 from National Institute of Pharmaceutical Education and Research (NIPER), S.A.S. Nagar, India. During his M.S. (Pharm.). He carried out his project work under the direct supervision of Prof. Asit K. Chakraborti on 'Design and Synthesis of Novel Benzothiazoles as Potential Anti-tubercular Agents'. Later, he joined as a Ph.D. research scholar under the guidance of Prof. Asit K. Chakraborti in July 2014 in NIPER, S.A.S. Nagar to pursue his career in research and drug discovery. He has worked as Asst. Prof. at LMCP, Ahmedabad during Aug 2017 to Jan 2023 and moved to Institute of Pharmacy, Nirma University, Ahmedabad in Jan 2023. He has published a total of 23 research and 22 review articles in international peer reviewed journals.

Advancing Cancer Treatment: Leveraging Marine Polysaccharides for Enhanced Drug Delivery

Jinu George

Associate Professor and Head, Department of Chemistry, Bio-Organic Laboratory, Sacred Heart College (Autonomous), India

In contemporary medical practices, a shift towards targeted drug delivery systems is evident, aiming for controlled and localized therapies over conventional systemic approaches. This paradigm aligns with the growing interest in harnessing marine biocompatible resources to develop innovative biomedical applications. Marine algae represent a vast reservoir of polysaccharides with promising applications in drug delivery. Alginates, extracted from brown seaweeds, exhibit biocompatibility and low toxicity, making them ideal for drug encapsulation. Carrageenans, derived from red algae, have been utilized to create hydrogels and other materials suitable for cell encapsulation. Fucoidans, found in brown algae, demonstrate potential in drug delivery, especially when combined with chitosan to form novel nanoparticles. Ulvans, extracted from green algae, offer unique variations in charge density and molecular weight, presenting versatile applications in membrane construction and bone cements.

Chitosan, derived from the deacetylation of chitin found in crustaceans, stands out as a widely studied marine polysaccharide. Its positively charged nature in acidic environments makes it suitable for various biomedical applications, including controlled drug delivery systems and tissue engineering. Hyaluronans, belonging to glycosaminoglycans, contribute to tissue regeneration and find applications in diverse biomedical fields. Chondroitin sulfates, obtained from marine animals like whales and sharks, exhibit retention capacity for proteins and polypeptides. The biodegradability, non-toxicity, and stimulus-responsive properties of marine polysaccharides make them valuable for constructing drug delivery systems. The interaction between polymers, drugs, and native biological tissues, coupled with the intelligent response and targeting capability of polysaccharides, underscores their potential. These materials can be synthesized into hydrogels, particles, and capsules,

offering a broad spectrum of applications in pharmaceutical formulations.

The chemotherapeutic agent Disarib faces solubility challenges in aqueous environments, hindering its potential effectiveness. To address this limitation, we encapsulated Disarib within a P123 copolymer matrix, creating micelles through a thin film hydration technique. Comprehensive analyses, including UV spectroscopy, FTIR spectroscopy, dynamic light scattering, transmission electron microscopy, and small-angle X-ray scattering, revealed promising properties of the Disarib-loaded P123 micelle formulation (P123D). With a well-defined particle size and notable encapsulation efficiency, P123D exhibited enhanced cytotoxicity against various cancer cell lines compared to free Disarib.

The utilization of marine polysaccharides in drug delivery systems marks a significant stride towards more effective and targeted cancer treatments. The unique properties of these biocompatible resources hold immense potential for shaping the future of biomedical applications, contributing to advancements in cancer therapeutics.

Biography

Dr. Jinu George is an accomplished academic and researcher specializing in bio-organic chemistry. She holds a PhD from the National Institute of Technology Calicut and has over 15 years of experience in teaching and research. Currently, she serves as the Head of the Department of Chemistry at Sacred Heart College, Kochi, India.

Dr. George has published her research papers in reputed international journals and has successfully led huge funded research projects. Her research primarily focuses on drug delivery systems, biomaterials, and green chemistry. As a recognized research supervisor at Mahatma Gandhi University, she has guided several scholars in cutting-edge scientific research.

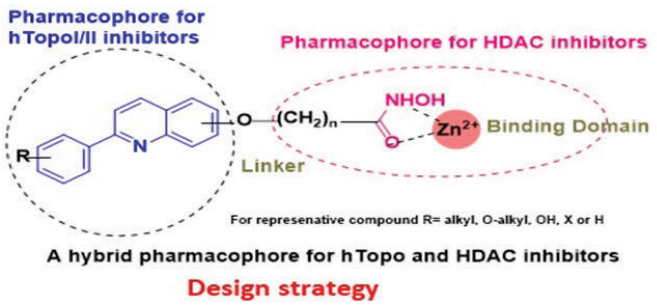
Beyond her academic contributions, Dr. George is actively engaged in fostering industry-academia collaborations, coordinating international exchange programs, and organizing scientific workshops. She has received multiple awards for her research excellence and has represented her institution at international conferences.

Quinoline-Hydroxamic Acid Inspired Dual Inhibitors of Topoisomerase-Histone Deacetylase: Design, Synthesis, *in vitro* and *in vivo* Anticancer Potential

Raj Kumar[1], Gaurav Joshi[1], Sandeep Singh[2] and **Kulbhushan Tikoo[3]**

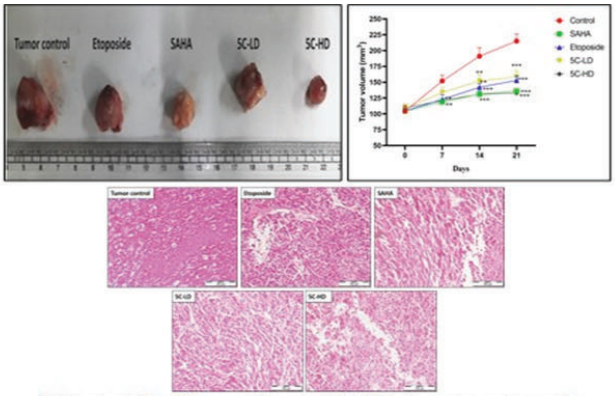
[1]Department of Pharmaceutical Sciences and Natural Products, Laboratory for Drug Design and Synthesis, Central University of Punjab, India
[2]Department of Human Genetics and Molecular Medicine, Central University of Punjab, India
[3]Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research, India

Topoisomerases (Topos) are among the most abundant proteins in the nucleus, second only to histone deacetylases (HDAC), both of which play crucial roles in regulating cellular processes. Despite the availability of several anticancer drugs that target these proteins, many have failed to deliver the desired therapeutic outcomes. These failures are often due to a lack of selectivity, low efficacy, excessive side effects, and the development of multi-drug resistance (MDR). Additionally, combination therapies face challenges such as varying pharmacokinetic profiles and drug-drug interactions. As a result, single-compound therapies with dual or multi-target inhibitory activity offer a more promising strategy for treating complex diseases like cancer. Synergistic effects between HDACs and human topoisomerases (hTopos) inhibitors have led to the development of multi-target inhibitors, which have garnered significant interest in cancer therapy.



A hybrid pharmacophore for hTopo and HDAC inhibitors

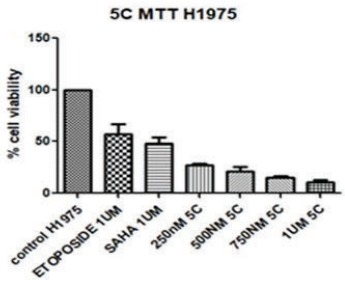
Design strategy

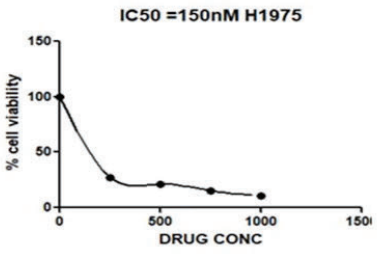


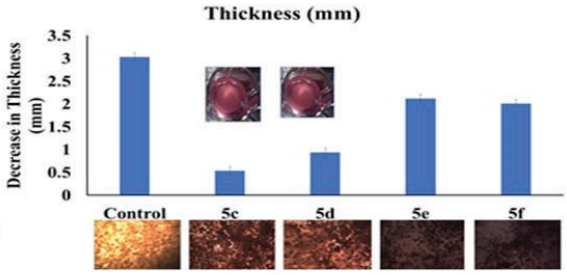
Effect of 5c, Etoposide and SAHA treatment on the tumor size in A549-induced lung cancer xenograft

5c anticancer potential (IC_{50}) *In vitro* analysis

A549	H1299	MDA-MB-231	MCF-7	HT-29	HDAC-1	HDAC-6	HDAC-8
0.702 ± 0.11	1.68 ± 0.18	0.879 ± 0.11	1.98 ± 0.28	5.76 ± 0.18	14.16 ± 0.18	49.97 ± 0.27	> 500







In this study, we aim to design and synthesize novel quinoline-bridged hydroxamate-based dual inhibitors targeting both hTopo and HDAC, and evaluate their potential as anticancer agents. The hybrid compounds demonstrated potent antiproliferative activity, with IC_{50} values ranging from low micromolar to nanomolar concentrations. Among these, compound **5c** exhibited the most robust inhibition of hTopo I/II and HDAC, with potency several times greater than the HDAC inhibitor SAHA. Furthermore, **5c** was shown to modulate key oncogenic pathways and displayed favorable pharmacokinetic properties, including superior microsomal stability. *In vivo* studies revealed that compound **5c** significantly inhibited tumor growth and improved survival in an A549 lung cancer xenograft model, outperforming standard anticancer drugs like vorinostat and etoposide. Compound **5c** represents a promising lead for the development of dual Topo and HDAC inhibitors and may pave the way for further research into multi-target cancer therapies.

Biography

Raj Kumar earned his Master's and PhD in Medicinal Chemistry from NIPER, Mohali, India, before undertaking a significant postdoctoral fellowship at the University of Maryland (UMBC), where he co-discovered the RK-33 molecule. Transitioning to an academic career, he began as an Assistant Professor at a Pharmacy College in India and later moved to the Central University of Punjab, Bathinda. His promotion to Professor of Medicinal Chemistry in 2018 underscores his expertise and contributions to the field. Kumar's research focuses on the design and synthesis of novel heterocycles and their PROTACs, particularly emphasizing their implications in cancer, inflammation and gout. His work stands at the forefront of advancing medicinal chemistry, promising potential breakthroughs in treating these complex diseases.

Tobacco Plant of Kyrgyzstan: A Valuable Crop for Biotechnology in Medicine

Smailov Eltar Ablametovich

International Kyrgyz-Uzbek University named after B. Sydykov, Kyrgyzstan

One of the main areas of our research is the non-traditional use of tobacco and its waste. In Kyrgyzstan, research in this direction was carried out until 1990 under the guidance of Corresponding Member of the Academy of Sciences K.R. Afanasyev F.A. at the Institute of Organic Chemistry of the Academy of Sciences. An experimental base for the processing of plant raw materials in the village of Ivanovka was designed, built and put into operation. Since 1999, research in this direction has been resumed under the leadership of Smailov E.A. The results of research and calculations of Afanasyev V.A. have shown that when processing 10 thousand tons of freshly harvested plant mass, the following can be obtained: - vegetable juice -5 thousand tons; - crude protein mass – 150 tons; - refined protein - 50 tons; - nicotine solution - 10 tons. Estimated total cost of products (3.98-5.7 million $). With the annual processing of 100 tons of tobacco waste, the following will be obtained: - solenasol - 100 kg;- tobacco oil - 1 ton; -Nicotine–; - polysaccharide – 7 tons; - tobacco meal – 50 tons. Estimated total cost of production ($15.9 million). Based on the research of our and other scientists, a list of products and individual components extracted from tobacco and its waste, and the possibility of their use in medicine, is given: 200 кг

- the protein of a young tobacco plant (851-105 kg/ha) is distinguished by a high content of independent amino acids and can serve as a dietary protein;
- Protein (up to 100 kg/ha) is a white powder resembling talc, odorless and tasteless. It has all the amino acids and exceeds the FAO (Food and Agriculture Organization of the United Nations) standards for the quality of nutritional proteins. It has an exceptional purity of 99.97% and can be especially useful for patients suffering from kidney disease who have to be connected to a dialysis machine;

- alkaloids – intermediates for the medical industry;
- solanesol – an intermediate product for the synthesis of medical drugs, in particular, Ubiquinone-9;
- carotene – vitaminization of feed, synthesis of vitamin A;
- phytol – vitamin industry; Pheofitin, nefytadiene – organic synthesis, vitamin industry; sterols – medical industry;
- Nicotinic acid – medical industry. We have obtained patents of the Kyrgyz Republic for "Tobacco oil", "Antiseptic agent "Cort", "Method for obtaining food protein", "Method for obtaining nicotine and tar from tobacco residues", which were awarded silver and bronze medals in South Korea. The results of the effectiveness of the "Antiseptic agent "Cort" for the treatment of external infected wounds is presented.

Biography

Eltar A. Smailov, born in 1952, Uyghur by nationality, was born in Shihu, China. He graduated from secondary school No. 1 in Uzgen in 1970. Higher education, graduated in 1975. Andijan Institute of Cotton Growing. From 1979 to 1983 he studied at the postgraduate school of the All-Russian Research Institute of Tobacco and Makhorka (Krasnodar, Russia), 1985 - Candidate of Technical Sciences, 2003 - Doctor of Agricultural Sciences. 2006-2009 - Member of the Dissertation Council (D.06.09.388) for the defense of doctoral dissertations. 2010 – Associate Professor in Mechanization and Automation.2010 – Professor in Technology. 2017 - Academician of the Engineering Academy of the Kyrgyz Republic in the direction of Agriculture, Light and Food Industry and Environmental Protection. 2018 - Academician of the Russian Academy of Natural Sciences (RAE). He has more than 300 scientific papers, including 17 monographs, 5 teaching aids, 3 recommendations for production with the stamp of the Ministry of Agriculture and Migration of the Kyrgyz Republic, 4 copyright certificates for the invention of the USSR, 17 patents of the Kyrgyz Republic and more than 20 rationalization proposals. He has trained 3 doctors of sciences and 12 candidates of sciences, scientific supervisor of 8 postgraduate students and scientific consultant of 5 doctoral students. Excellence in Education of the Kyrgyz Republic (2006), Excellence in Agriculture of the Kyrgyz Republic (2013), Honorary title "Founder of the Scientific School" (Russia, 2018), awarded the Order of Peter the Great "Unbelievable Happens" (Russia, 2018), awarded the A. Nobel Medal for Inventive Activity Russia, RAE, (2020), awarded the "Gold Medal of V.I. Vernadsky", (2022) "Honorary Engineer" of the Engineering Academy of the Kyrgyz Republic (2022). 07.2024 – PRC, appointed as an expert at the Central Asian Base for Joint Training of International Highly Qualified Personnel.

Innovative Nanotechnological Platforms for Drug Delivery Systems in Biomedical Applications

Pramod K. Avti

Department of Biophysics, Post Graduate Institute of Medical Education and Research (PGIMER), India

Nanomaterials derived from various lipid, polymeric, dendrimeric, carbon, metallic, semi-conducting and other origins engineered into various ultra-structural architectures and sizes acts as versatile sensors and cargo agents for delivery of specific drugs that help in molecular recognition through biomedical imaging platforms have varied applications in the Biomedical field. These high quality nanosized structural architectures have various advantages considering from enhanced uniform distribution, targeted and localized delivery, sustained and controlled release, tissue engineering & regenerative medicine, and enhanced therapeutic efficacy with fewer side effects. The tracking of these drug cargo agents is possible through the desired features that emanate from the unique inherent physiochemical properties (such as fluorescence, magnetic properties, SPR, SERS, acoustic signals, etc) of the nanosized particles. Therefore, retaining their unique inherent properties during the process of drug delivery through the biological/physiological systems poses varied challenges. To achieve the maximum efficacious potential of the drug delivery, the surface synthetic articulation of various ligands on these nanosized structures that hold these drug molecules is a fascinating area of research showing potential in improving the therapeutic efficacy. This talk presents some of the advanced smart nanomaterials and varied Nanotechnological platforms that could show immense potential for varied biomedical applications that evade the systemic toxicity, aggregation, unwanted accumulation and help in target specific location delivery. Further, the complex ligand designs and their engineered architectures make them potential contenders for selective delivery systems that could be tracked non-invasively through multimodal imaging platforms for efficient therapeutic applications.

Biography

Dr. Pramod Avti, currently Additional Professor, Department of Biophysics, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India was a research associate at Department of Electrical Engineering, Ecole Polytechnique and McGill University, Montreal, Canada. He was also a postdoctoral associate at the Department of Biomedical Engineering, at Departments of Biomedical Engineering, Stony Brook University, New York, USA. He earned many national and international awards for his research in developing innovative integrative approaches as Nanotechnological platforms for a variety of biomedical applications – Translational and Molecular Imaging award, Mount Sinai School of Medicine. New York and Young Investigator award to name a few. He published more than 120 peer reviewed high impact international research articles, reviews, books and book chapters. He is also the editorial board member of 4 international journals including the Nature publishing group and is an active reviewer since 2010 for more than 30 internationals journals in the fields of Nanomaterials, Biomaterials, Chemical Engineering, Biomedical Engineering, Tissue Engineering etc. He is also member of various international and national scientific societies. He has delivered more than 70 invited lectures at various national and international conferences/meetings/workshops. Recently, he is honored as a Fellow of International Medical Science Academy (FIMSA) and an elected member of National Academy of Medical Sciences (NAMS). His current research interests include Nanobiomaterials, Drug Designing, Molecular Integration systems development for rapid diagnostic and therapeutic strategies in various biomedical applications.

PEERS ALLEY MEDIA

Joint Event

ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY

INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY

April 03-04, 2025 | Amsterdam, Netherlands

The Brown Algae *Padina pavonica* Methanol and Hexane Partitions Showed Antidepressant Effects in Mice

N Asgari, A Mesripour and **A Yegdaneh**

Isfahan University of Medical Sciences, Iran

Background: *Padina pavonica*, a brown algae, displays antioxidant and anti-inflammatory properties, offering protection against oxidative stress, neuroinflammation, mitochondrial dysfunction, and neurodegenerative disorders. While inflammatory processes, mitochondrial dysfunction, and oxidative stress are involved in the pathophysiology of depression. Considering the good effects of *P. pavonica* and since its antidepressant effects have not been studied before, we investigated *P. pavonica* methanol partition (PMP) and *P. pavonica* hexane partition (PHP) in mice model.

Material and Methods: Male mice (25±2g) were used, each group consisted of 7 animals. To actuate depression, dexamethasone was injected subcutaneously at a dose of 15 µg/kg for two weeks. PMP (80 and 160 mg/kg) and PHP(80mg/kg) and PMP (160 mg/kg)-dexamethasone and PHP (80 mg/kg)-dexamethasone were administered intraperitoneally daily for 14 days. After the locomotor test, different depression criteria were evaluated by forced swimming test (FST), marble burying test (MBT), sucrose preference (SP) test, and novelty-suppressed feeding test (NSFT).

Results: PMP160mg/kg reduced immobility time during FST (84.6±10.4 s vs. control, $p<0.001$), proved to have antidepressant effect. PMP160mg/kg elevated SP to 81% and increased food intake (21.1±2.5 mg/g vs. control, $p<0.001$). Dexamethasone increased immobility time (196.0±12.3 s vs. control, $p<0.05$).The combination treatment of PMP160mg/kg and dexamethasone reduced immobility time (104.0±8.3 s vs. control, $p<0.01$). PHP80mg/kg reduced immobility time (124.5±6.7 s vs. vehicle, $p<0.05$). Following PHP80mg/kg the average number of buried marbles after 30 minutes decreased (3.5±1.2 *vs. control*, $p<0.01$). PHP80mg/kg increased SP up to 85%. These changes were in the absence of important changes in the locomotor activity.

Conclusion: PMP160mg/kg and PHP80mg/kg exhibited antidepressant-like effects in mice, potentially attributed to their antioxidant and neuroprotective properties. Their protective effects against neuroinflammation warrant further investigation. Additionally, a decrease in the average number of buried marbles after the administration of PHP80mg/kg suggests a reduction in obsessive-like behavior.

Biography

Dr. Negar Aasgari is a dedicated pharmacist who graduated from Isfahan University of Medical Sciences. With a passion for pharmaceutical research, Dr. Asgari has focused on developing herbal medicine for depression, contributing to advancements in natural mental health treatments. Currently, Dr. Asgari is engaged in research on producing a natural and gerbiotic anti-eczema cream, aiming to offer innovative skincare solutions.

In addition to research, Dr. Asgari serves as the technical manager of Adorateb, a leading drug distribution company in Iran. Adorateb, established in 2009, operates as part of the Cobel Darou Group, employing over 1,000 professionals across 25 distribution centers. The company specializes in the sales and distribution of pharmaceutical products from Cobel Darou and Dr. Abidi. Through expertise in both research and pharmaceutical distribution, Dr. Asgari continues to contribute to the healthcare industry in Iran.

PEERS ALLEY MEDIA

Joint Event

ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY

INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY

April 03-04, 2025 | Amsterdam, Netherlands

Antibacterial Activity of Silver Nanoparticles Derived from Extracellular Extract of *Enterococcus aerogenes* Against Dental Disease Bacteria Isolated

Mohammed A. Abd Ali

Misan University, Iraq

Purpose: Bacteria are known to have a high ability to manufacture many compounds with biological functions in a short time compared with eukaryotic cells due to the fact that bacterial cells possess efficient metabolic mechanisms for the manufacture of these compounds (intracellular or extracellular). Herein, the goal of this study is to use pathogenic *Enterococcus aerogenes* bacteria strains, namely, S1, S2, and S3, isolated from the mouths of individuals with dental decay to produce silver nanoparticles in an environmentally friendly and cost-effective manner.

Methods: These nanoparticles have been tested for antibacterial activity against *Streptococcus* mitis, an MDR bacterium, either alone or in combination with antibiotics. These bacteria were identified using morphological characteristics and bio chemical tests, in addition to molecular methods such as PCR and DNA sequences. Besides, their identification was done on the basis of their alignment with the reference strains in the NCBI blast to calculate the degree of similarity among these strains (S1, S2, and S3).

Results: The results of the current study showed a clear synergistic effect in the inhibition of Streptococcus mitis bacteria when mixing silver nanoparticles with some antibiotics, and it was found that there is a synergistic effect when mixing those AgNPs with erythromycin, followed by streptomycin and tetracycline. In contrast, the effect was antagonistic in the case of streptomycin and tetracycline antibiotics. Conclusion *Enterobacter aerogenes* AgNPs.

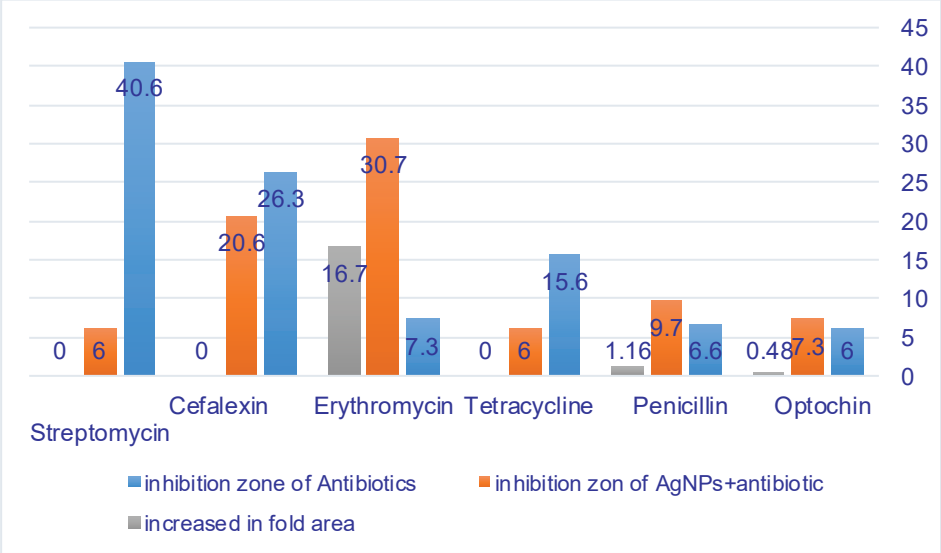


Fig. 2. Percentage fold increases of AgNPs produced by S2 strain in combination with antibiotics against MDR *Streptococcus mitis*

Table(2): Index of FIC to establishes the interaction between antibiotics agents.

No	AgNPs+Antibiotics	Interaction
1	Optochin + AgNPs	Indifferent
2	Penicillin + AgNPs	Synergistic
3	Tetracycline+ AgNPs	Antagonistic
4	Erythromycin+ AgNPs	Synergistic
5	Cefalexin+ AgNPs	Indifferent
6	Streptomycin+ AgNPs	Antagonistic

[FIC index to use for identify of the interaction between the two antibacterial combinations.The index is interpreted as follows: 1≥ synergistic, 0.2≤ antagonistic, 1=additive; 1.1-2.0 indifferent (non-interacttive) Habiba *et al.*,(2015).

Conclusions:

1- This first study at the level of Iraq, used bacterial isolated from oral cavity of some dental caries patients and used in the production of silver nanoparticles for bactericidal of multi-drug *Streptococcus mitis*.

2- Same species of *Enterobacter aerogenes* strains differ in synthesis of nanoparticles properties.

3- Nanoparticles AgNPs of *Enterobacter aerogenes* may be useful either alone or when combined with antibiotics against oral pathogens MDR *Streptococcus mitis* bacterial isolates.

Biography

Mohammed A. Abd Ali received his Master of Science, from the University of Basrah and is pursuing her Doctorate of Philosophy in Biology. He has published two books in Microbial Genetics and more than sixteen research papers published in reputable scientific journals in his field of expertise. He works an assistance prefacer (lecturer) at Misan University College of Science Biology Department, Iraq.

Discovery of Antibodies that Modulate Macrophage Functions in Boosting Cancer Immunotherapy

Jianyong Wang

Genentech, USA

As one of the most abundant cell types in many solid tumors, tumor-associated macrophages (TAMs) play critical roles in cancer progression. TAM is a type of immune cells characterized as high plasticity with both pro- and anti-tumor functions, depending on the environmental stimuli. On one hand, TAMs are capable of engulfing dying tumor cells, leading to the clearance of associated tumor antigens, which helps the tumor escape the host immune surveillance. TAMs also secret immune-suppressive cytokines that maintain a pro-tumor microenvironment. Consequently, TAMs contribute to the resistance of checkpoint inhibitors, chemotherapeutic agents, and adoptive T cell immunotherapies in clinic. On the other hand, when TAMs are properly activated, they can also actively engulf and destroy cancer cells and other pro-tumor immunosuppressive cells, acting as a defensive mechanism against tumors by killing them directly and indirectly. Thus, modulation of TAMs functions in tumors represents an attractive approach for cancer immunotherapy. Here, we share two case studies to exemplify that antibody drugs enhance cancer immunotherapy by modulating macrophage functions. First, we outline the discovery of anti-MerTK monoclonal antibodies (mAbs) that inhibit macrophage-mediated phagocytosis of apoptotic cancer cells both i*n vitro* and *in vivo*. Dosing of anti-MerTK mAb in syngeneic mouse models resulted in robust anti-tumor responses when combined with anti-PD-L1, a checkpoint inhibitor that by itself only exhibited modest anti-tumor activity. Second, we will discuss how to exploit the antibody-dependent cellular phagocytosis (ADCP) function of TAMs to destroy regulatory T (Treg) cells, the major immunosuppressive cell type in tumors. More specifically, we discovered a specific mAb with enhanced antibody-dependent cellular cytotoxicity (ADCC) and ADCP that depletes the tumor-infiltrating Treg cells. In a syngeneic mouse tumor model, this specific mAb showed anti-tumor effects as a single agent and enhanced anti-tumor activities when combined anti-PD-L1.

Biography

Dr. Jianyong Wang is a senior principal scientist at Genentech with more than fifteen years of working experience in antibody drug discovery and development. His responsibilities include developing and implementing discovery strategies for antibody-based biologic drugs, driving and evolving antibody molecules from the earliest screening efforts to the characterization of the final clinical candidate. He is also interested in adapting and evolving innovative technology platforms to facilitate discovery of the next generation of biologic drugs. Dr Wang has a research interest in the roles of macrophages in various health conditions. Macrophages are versatile immune cells that can modulate inflammation, tissue repair, and tumor progression. Dr Wang's recent research aims to understand macrophage functions in different pathological conditions, in order to develop novel drugs that modulate their activities in diseases and improve clinical outcomes.

Chitosane - Antibiotic Based Composites and their Application in Medicine

Dilyana Todorova Zvezdova

Department of Pre-Clinical and Therapeutic Studies, Faculty of Public Health and Health Care, Prof. Dr. Assen Zlatarov University, Bulgaria

Diabetes mellitus and its complications pose a number of socially significant problems for health care and require innovative approaches in the prevention and treatment of complications. The long-term prognosis and quality of life of diabetic patients depend on the development and severity of the latest complications. The most dangerous cases are when peripheral arterial disease (PAD) develops, leading to ischemia of the lower limb.

This process makes it difficult to control any superimposed infection, difficult wound healing, the appearance of phlegmon and devitalization of tissues due to the developing vascular-degenerative syndrome. In this direction, a motivating goal of the research is to create a therapy based on the biocarrier chitosan and sustained release antibiotics on the affected tissues with bacterial infection.

Chitosan derived from demineralization and deproteinization of raw material from the Black Sea was used in order to reach derivation of the composite membranes. In this study, the possibility of immobilizing antibiotics onto chitosan (CS) and chitosan/zeolite (CSZ) composite membranes for wound healing applications was investigated. The structure of the derived compounds has been confirmed by FTIR, NMR, DSC and SEM analysis. To study the loading capacity of antibiotics onto the CS/CSZ membranes UV-spectroscopy was employed. The main challenge was to provide antibacterial properties through a local delivery of antibiotics in order to prevent infection in wounds during the wound treatment procedures. The antibacterial activity against *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 29213 strains of the developed membranes was assessed through disk-diffusion method by means of Mueller-Hinton agar. The obtained

results showed that chitosan/zeolite membranes loaded with antibiotics exhibited better antimicrobial properties compared to other studied objects.

Biography

Dilyana Zvezdova has graduated with a Master's degree in "Water Technology", "Biotechnologies", and "Pedagogy" from "Prof. Dr. Assen Zlatarov" University. She has specialized at the Faculty of Bioscience engineering, Ghent University. Since 2008 she has been a PhD in Organic Chemistry of the Bulgarian Academy of Sciences and a lecturer at the Department of Physiochemistry and Organic Chemistry. Since 2016 she has been Associate Professor of Biochemistry at the Faculty of Public Health and Health Care, “Prof. Dr. Assen Zlatarov” University. She has more than 90 scientific publications, 3 monographs and 1 chapter of a monograph, published in Bulgaria and abroad, in the fields of organic chemistry, water treatment technologies, biotechnologies and biochemistry. Her scientific interests are in the sphere of obtaining, characterization and medical application of biopolymer compounds from Black Sea raw material sources and their application in medicine.

Social Determinants for the use of Complementary and Alternative Therapies among Women During Pregnancy, Labor and Postpartum Period in Low Income Countries: A Scoping Review

Mabel K. M. Magowe and **Norman Karl Swart**

University of Botswana, Botswana

Introduction and Objective: Complementary and alternative therapies (CAM) use is reported worldwide, ranging between 36 to 62%. Africa and Asia are leading at 80%. CAM is used for socio-economic reasons, but it can have positive and adverse outcomes on the mother-baby dyad, requiring further research and interventions.

Scope: The purpose and scope of the project was to explore social determinants for the use of CAM among women during pregnancy, labor and the postpartum period, in low resourced countries, to suggest interventions that promote informed use and safety.

Methods Used: A scoping review was conducted in Web of Science, Google Scholar, PubMed, and EBACOHOST. Key words used were: "Complementary AND alternative therapies AND Pregnancy AND Labor, AND post-partum AND low resourced settings". Full text, published between 2019 and 2024, relevant to the topic, were reviewed. The review and screening processes were presented in a PRISMA diagram. The accepted articles were presented in a table and were synthesised to guide discussion and conclusions.

Results: Social determinants of CAM use among the study population have been identified including positive experiences with symptom and side effects management, lack of knowledge about adverse effects, popular culture and low access to conventional medicines.

Discussion: Women use CAM for positive health outcomes because of socio-economic disadvantages, but demonstrate low knowledge of potential negative outcomes such teratogenicity for the fetus, requiring more education and research.

Conclusion: Further research and education to explore social determinants to address the benefits and threats of CAM use, especially teratogenicity and drug interactions.

Biography

Professor Mabel Magowe is an Associate Professor in the School of Nursing, Deputy Dean and Acting Dean in the Faculty of Health Sciences, University of Botswana. She has a PhD in Nursing, Master of Science with specialty in Midwifery, and a Bachelor of Nursing Education. Her research focus is on behavior change communication to prevent and control sexually transmitted infections, HIV, and unplanned pregnancies among adolescents and young women in Botswana, and understanding of social determinants that influence behavior and health outcomes. She has recently submitted a grant application on Intensifying Postpartum Follow-up Using USSD/IVR technology.

She has contributed immensely to teaching; clinical practice guidelines and students research skills through graduate and undergraduate supervision, served as an internal and external examiner at national and regional universities and ethical review committees at the University and Ministry of Health. Her research outputs include 38 peer reviewed publications, book chapters, and conference proceedings.

ADV. MED CHEM 2025
DRUG CONCLAVE 2025

DAY 02

JOINT EVENT

ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY

&

INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY

AMSTERDAM, NETHERLANDS

APRIL 03-04, 2025

SPEAKER TALKS

Eliminating Infection through Nanomedicine: 30,000 Human Cases and Still Counting

Thomas J. Webster[1,2,3]

[1]School of Health Sciences and Biomedical Engineering, Hebei University of Technology, China
[2]Division of Pre-College and Undergraduate Students, Brown University, USA
[3]School of Engineering, Saveetha University, India

This presentation will cover a close to 30 years journey researching and commercializing nanotechnology for improving disease prevention, diagnosis, and treatment which has led to numerous products including nano spinal implants now in over 30,000 patients to date showing no signs of failure according to the FDA MAUDE database. Traditional orthopedic implants face a failure rate of 5 – 10% and sometimes as high as 60% for bone cancer patients. The talk will cover not only human clinical evidence of the unprecedented efficacy of nanotechnology in medicine but also fundamental evidence of how nanotechnology can be used clinically to kill bacteria, inhibit inflammation, and promote tissue growth (if needed) without drugs. This talk will also describe the future of nanotechnology and how it will in the not too distant future combat traditional failures in our global healthcare system including reversing the current decrease in global average life expectancy, creating a reactive compared to predictive healthcare system, transforming a healthcare system that relies too much on drugs and pharmaceutical agents to treat ailments, facilitating a non-personalized healthcare system, combating increasing costs, treating a growing global population, and more through the future use of implantable nano sensors, 4D printed nano materials, smart nano materials, environmentally-friendly nanomaterials, and AI as well as other predictive models in medicine and more.

Biography

Thomas J. Webster's (H index: 129) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 30,000 patients.

His technology is also being used in commercial products to improve sustainability and renewable energy. He is currently helping those companies and serves as a professor at Brown University, Saveetha University, Hebei University of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society for Biomaterials and has over 1,350 publications to his credit with over 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.

Joint Event

ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY

INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY

April 03-04, 2025 | Amsterdam, Netherlands

A Randomized, Double-Blind, Placeo-Controlled Trial Assessing the Efficacy and Safety of a Fixed-Dose Combination (FDC) of MEtformin Hydrochloride 1000 mg ER, SItagliptin Phosphate 100 mg, and DApagliflozin Propanediol 10 mg in Indian Adults with Type 2 Diabetes: The MESIDA Trial

Akhilesh Sharma[1], Mayur Mayabhate[1], Awadhesh Kumar Singh[2], Rakesh Sahay[3] and **Navneet Gill[4]**

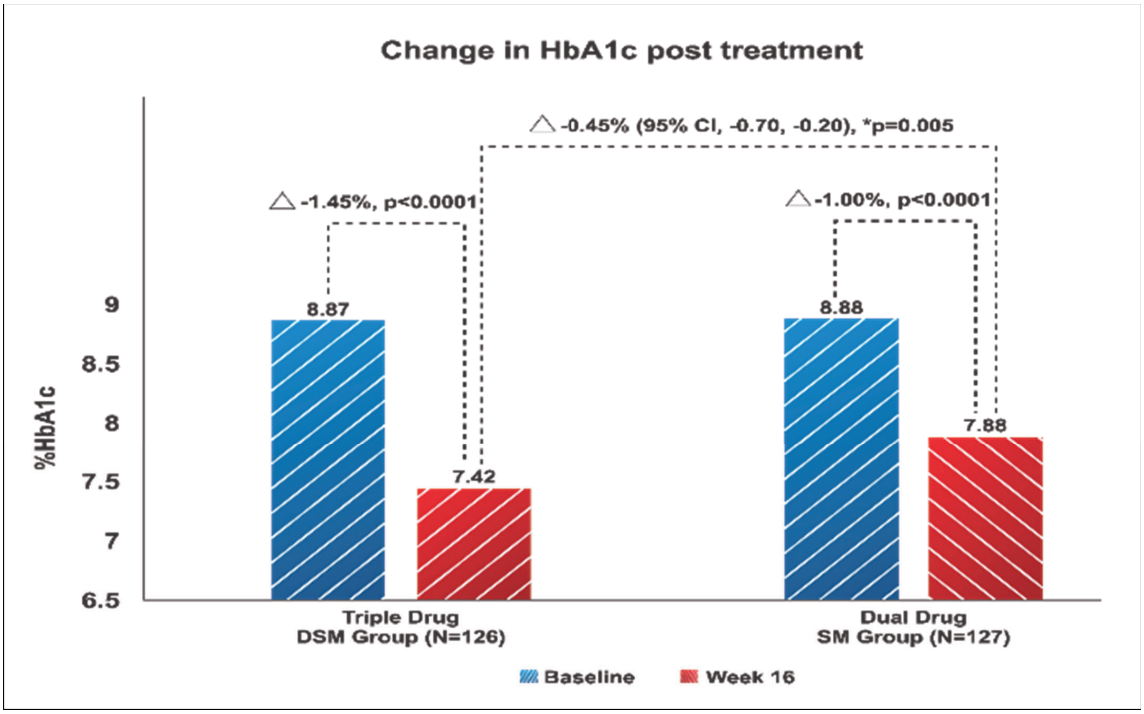
[1]Medical Affairs, Alkem Laboratories Mumbai, India
[2]G. D. Hospital & Diabetes Institute, India
[3]Osmania Medical College, India
[4]Aakash Healthcare Pvt. Ltd. Hospital, India

Background and Aims: To assess the efficacy and safety of fixed-dose combinations (FDC) of triple-drug dapagliflozin, sitagliptin, and metformin (DSM) compared with FDC of two-drug sitagliptin and metformin (SM), in Indian adult patients with type 2 diabetes (T2D).

Methods: A multicentric, randomized, double-blind, active-controlled, Phase 3 study (CTRI/2021/10/037461) was conducted on 274 Indian adult patients with T2D. Patients were randomized (1:1) to receive either an FDC of triple-drug (n = 137) dapagliflozin propanediol 10 mg, sitagliptin phosphate 100 mg, and metformin hydrochloride 1000 mg extended-release (DSM) or FDC of two-drug (n = 137) sitagliptin phosphate 100 mg and metformin hydrochloride 1000 mg sustained-release (SM), for 16 weeks. The primary endpoint was a change in HbA1c, while the secondary endpoints were changes in fasting plasma glucose (FPG), postprandial glucose (PPG), body weight, and safety.

Results: Both DSM and SM FDCs reduced HbA1c significantly (-1.45% and -1.00%, respectively, both P < 0.0001), however, HbA1c lowering was superior with DSM (Δ -0.45%; P = 0.0005) compared to SM, at week 16. Similarly, both DSM and SM FDCs reduced FPG and PPG significantly, however, FPG (Δ -12.4 mg/dl; P = 0.003) and PPG reduction (Δ -18.45 mg/dl; P = 0.01) were significantly superior to DSM compared to SM, respectively. No significant reduction in body weight was observed between the two arms. Both FDCs were well tolerated.

Conclusion: FDC of DSM was superior to SM in reducing HbA1c, FPG, and PPG in Indian adults with T2D. Both triple and dual FDCs had optimal safety profiles.



HbA1c change at Week 16 from baseline. Abbreviations: HbA1c: haemoglobin A1c; SM: Sitagliptin 100 mg + Metformin 1000 mg sustained release; DSM: Dapagliflozin 10 mg + Sitagliptin100 mg + Metformin 1000 mg extended release.

Biography

Dr. Akhilesh Sharma- M.D. from Mumbai, Fellow of Royal Liverpool hospital society-U.K., advanced training in Clinical Research at Berkley Extension, California State University, USA and Global Pharmacovigilance, Luton Medical Centre, UK. Has around 30 years of worldwide experience in areas of Clinical Research, Medical Affairs, Market Access, Regulatory, Pharmacovigilance, Translation Medicine, Biomarkers, Clinical Pharmacology across various multinational pharmaceutical companies, based at US & India.

Currently President & Chief Medical Officer for Alkem Laboratories Ltd.

Also, co-founded biomarker research organization GeneXY in Philadelphia, USA jointly with Wistar institute, Pennsylvania university campus.

Advisor to special projects at Harvard-Wyss, visiting faculty at Texas Tech University- Innovation hub (USA). Been on panel of Drug Development, Clinical Research and Drug Safety at various national and international forums including at USFDA workshops and an invited faculty at leading international conferences & institutes. Passionate about translational research and innovations in drug developments and clinical trials.

Has to credit more than 58 scientific & research publications, 52 patents and holds membership of International Pharmaceutical Society, American Academy of Dermatology, American Diabetes Association, European Society of Respiratory Medicine.

Joint Event
ADVANCES IN MEDICINAL CHEMISTRY AND PHARMACOLOGY
INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT & DELIVERY
April 03-04, 2025 | Amsterdam, Netherlands

Electroencephalographic Guided Propofol-Remifentanil TCI Anesthesia with and without Dexmedetomidine in a Geriatric Population: Electroencephalographic Signatures and Clinical Evaluation

Fernando Zurita[1], Dominik M. Mehler[2], Matthias Kreuzer[2], David P. Obert[2,3,4], Luis F. Cardenas[1], Ignacio Barra[1], Francisco A Lobo[5], Stephan Kratzer[2], Gerhard Schneider[2] and **Pablo O. Sepúlveda[1]**

[1]Department of Anesthesiology, Hospital Base San José, Chile
[2]Department of Anesthesiology and Intensive Care, School of Medicine, Technical University of Munich, Germany
[3]Department of Anesthesia, Critical Care and Pain Medicine, Massachusetts's General Hospital, USA
[4]Harvard Medical School, USA
[5]Anesthesiology Institute, Cleveland Clinic Abu Dhabi, UAE

Elderly and multimorbid patients are at high risk for developing unfavorable postoperative neurocognitive outcomes; however, well-adjusted and EEG-guided anesthesia may help titrate anesthesia and improve postoperative outcomes. Over the last decade, dexmedetomidine has been increasingly used as an adjunct in the perioperative setting. Its synergistic effect with propofol decreases the dose of propofol needed to induce and maintain general anesthesia. In this pilot study, we evaluate two highly standardized anesthetic regimens for their potential to prevent burst suppression and postoperative neurocognitive dysfunction in a high-risk population. Prospective, randomized clinical trial with non-blinded intervention. Operating room and post anesthesia care unit at Hospital Base San José, Osorno/Universidad Austral, Valdivia, Chile. 23 patients with scheduled non-neurologic, non-cardiac surgeries with age > 69 years and a planned intervention time > 60 min. Patients were randomly assigned to receive either a propofol-remifentanil based anesthesia or an anesthetic regimen with dexmedetomidine-propofol-remifentanil. All patients underwent a slow titrated induction, followed by a target controlled infusion (TCI) of propofol and remifentanil (n = 10) or propofol, remifentanil and continuous dexmedetomidine infusion (n = 13). We compared the perioperative EEG signatures, drug-induced changes, and neurocognitive outcomes between two anesthetic regimens in

geriatric patients. We conducted a pre- and postoperative Montreal Cognitive Assessment (MoCa) test and measured the level of alertness postoperatively using a sedation agitation scale to assess neurocognitive status. During slow induction, maintenance, and emergence, burst suppression was not observed in either group; however, EEG signatures differed significantly between the two groups. In general, EEG activity in the propofol group was dominated by faster rhythms than in the dexmedetomidine group. Time to responsiveness was not significantly different between the two groups ($p = 0.352$). Finally, no significant differences were found in postoperative cognitive outcomes evaluated by the MoCa test nor sedation agitation scale up to one hour after extubation. This pilot study demonstrates that the two proposed anesthetic regimens can be safely used to slowly induce anesthesia and avoid EEG burst suppression patterns. Despite the patients being elderly and at high risk, we did not observe postoperative neurocognitive deficits. The reduced alpha power in the dexmedetomidine-treated group was not associated with adverse neurocognitive outcomes.

Biography

Dr. Fernando Zurita is a highly experienced anesthesiologist with 20 years of medical practice. He is from Osorno, a little town in the south of Chile. He is a devoted husband and father of three kids. He is deeply engaged in clinical and research work and in his hospital he and his team focusing on neurophysiology and neurochemistry. He is excited to join in Adv. Med Chem 2025 and share his experience.

Evaluation of the Antimalarial Properties of *Solanum incanum* L. Leaf Extract Fractions and its Ability to Downregulate Delta Aminolevulinate Dehydratase to Prevent the Establishment of Malaria Infection

Ogocukwu Caroline Chiamah[1], Diana Atieno[2], Lewis Karani[3], Jean Chepng'etich[3], Maureen Osano[3], Beatrice Gachie[3], Gilbert Kipkoech[2], Mercy Jepkorir[2], Jecinta Wanjiru Ndungu[2], James Kuria[2], Francis Kimani[3], Sospeter Ngoci Njeru[2] and **Jeremiah Waweru Gathirwa[2]**

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This study investigated the effectiveness of *Solanum incanum* leaf extracts as a curative and prophylaxis in malaria parasite infection and evaluated its ability to decrease δ-ALAD expression. The leaves of *S. incanum* were pulverized and subjected to a successive extraction protocol to obtain crude, hexane, ethyl acetate, and aqueous extract fractions. Phytochemical and GC-MS analyses were conducted on extract fractions. An acute toxicity study was also performed on the extracted fractions. The potency of the extract fractions as curative and prophylactic antimalarial was then evaluated using *Plasmodium berghei*-infected mice at 100 mg/kg. The extract fraction with the highest activity was further evaluated at varying doses and its effect on δ-ALAD was measured using RT-qPCR. Parasitemia, chemosuppression, and mean survival time were used as activity indices. Phytochemical analysis revealed the presence of terpenoids, flavonoids, and phenols in the ethyl acetate and aqueous extract fractions while alkaloids were only present in aqueous extract, and quinones were found in the crude extract. However, all extract fractions contained saponins but lacked tannins. While the plant extracts were found to be non-toxic, they did not exhibit curative antimalarial activity. However, all extract fractions showed prophylactic antimalarial activity, with the ethyl acetate extract having the highest chemo suppressive activity. In the negative control, the expression of δ-ALAD was 5.4-fold,

but this was significantly reduced to 2.3-fold when mice were treated with 250 mg/kg of the ethyl acetate fraction. GC-MS analysis of the ethyl acetate fraction revealed the presence of 2-methyloctacosane, tetracosane, and decane. The fractions extracted from *S. incanum* leaves have been found to possess only antimalarial prophylactic properties, with the ethyl acetate extract fraction showing the most effective results. The activity of this fraction may be attributed to its ability to decrease the expression of δ-ALAD, as it contains an alkane compound implicated with enzyme-inhibitory activity.

Biography

Dr. Ogochukwu Caroline Chiamah is a senior lecturer in the Department of Biology at the Faculty of Biological Sciences, Alex Ekwueme Federal University (AEFUNAI) in Ndufu-Alike, Ebonyi State, Nigeria. She holds a Bachelor of Science degree in Zoology, as well as a Master's Degree and a Doctor of Philosophy in Parasitology and Public Health from the University of Nigeria. Dr. Chiamah is a recipient of the IUIS-FAIS (International Union of Immunological Societies) IMMUNO-ETHIOPIA 2020 sponsorship and has also been awarded a research and advanced training fellowship from TWAS (The World Academy of Sciences). She has authored several publications on neglected tropical diseases, particularly soil-transmitted helminths and schistosomiasis. Additionally, she has authored publications on malaria, a significant health issue on the African continent, with a specific interest in traditional herbal medicinal agents as potential treatments for malaria.

In vitro Study of Sonodynamic Therapy using Gemcitabine loaded PEG-Gold Nanoparticles against MCF-7 Breast Cancer Cells

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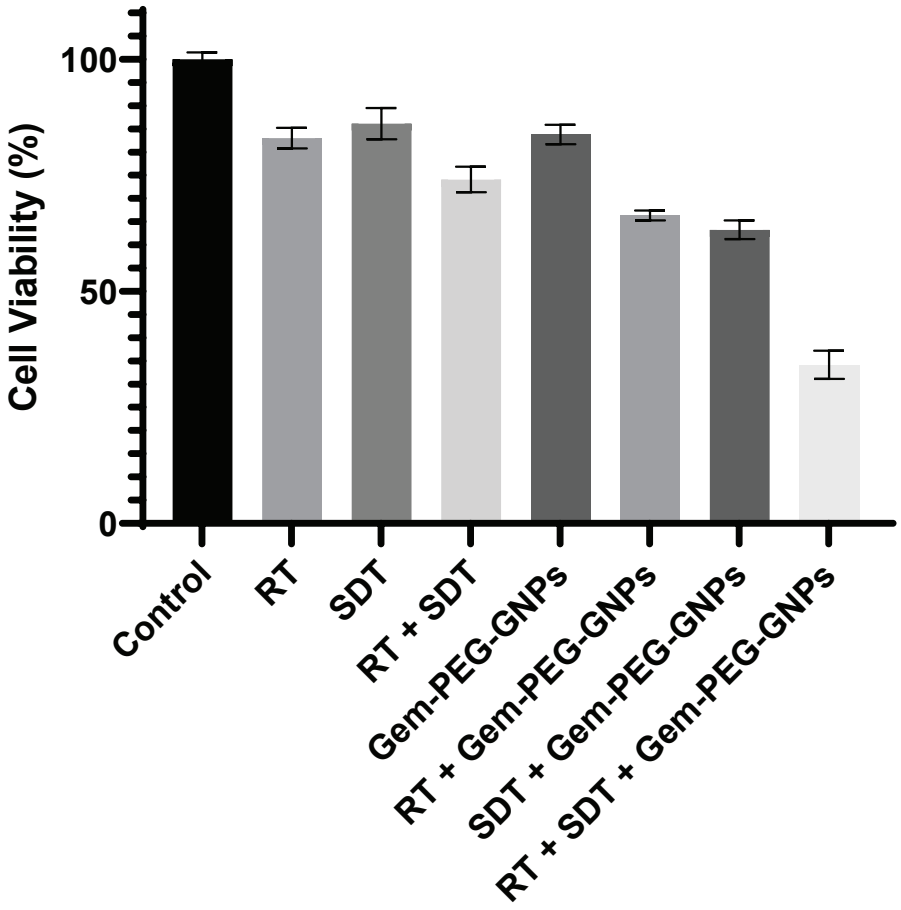
[2]Islamic Azad University, Iran

Traditional breast cancer treatments have several side effects, such as poisoning of the heart and lung during chemotherapy and cardiovascular disease during radiotherapy. Moreover, many patients suffer from acute and chronic pain, loss of breast shape, and limited arm mobility after surgery. Researchers strive to reduce adverse effects by finding more effective strategies. Sonodynamic therapy is a newly developed cancer treatment that offers safety, high penetration depth into soft tissues, accessibility, affordability, etc. In addition to these benefits, sonodynamic therapy also enhances chemotherapy effectiveness. Therefore, the combination of sonodynamic therapy and chemotherapy along with a multifunctional sensitizer can enhance treatment effectiveness while minimizing side effects. In this study, PEGylated gold nanoparticles (PEG-GNPs) were synthesized and loaded with an anticancer agent, Gemcitabine (Gem-PEG-GNPs). Then, Gem-PEG-GNPs were investigated using several techniques including UV-visible spectrum analysis, transmission electron microscopy and dynamic light scattering method. The synthesized Gem-PEG-GNPs act as sonosensitizers and nanocarriers, which improve the efficacy of sonodynamic therapy and chemotherapy as well as reduce harmful effects. Ultrasound waves combined with Gem-PEG-GNPs increased apoptosis and decreased survival rates in MCF-7 cells. When Gem-PEG-GNPs and Ultrasound waves were combined, a significant synergistic effect was observed compared to ultrasound waves alone. In conclusion, Gem-PEG-GNPs have the potential to be effective sonosensitizers and drug delivery agents in treatment of breast cancer. Until now, no studies have been conducted for examining the effects of ultrasound waves on gemcitabine conjugated with gold nanoparticles.



Biography

Ahmed Shanei is a faculty of Isfahan University of Medical Sciences. He has about 30 years of teaching experience. He is interested in research in the field of medical physics. He specializes in various fields, including radiation therapy.

ACE-Dependent Alzheimer's Disease (AD)

Sergei M. Danilov

Department of Medicine, Division of Pulmonary and Critical Care, University of Illinois at Chicago, USA

An analysis of 1200+ existing missense ACE mutations revealed that >400 are predicted to be damaging and led us to hypothesize that heterozygous carriers of these loss-of-function (LoF) ACE mutations (which result in low ACE levels) may be at risk for the development of late-onset Alzheimer's disease (AD) [Danilov, 2024].

The **1st stage** of this **ACE-dependent AD** project is characterization of blood ACE levels, catalytic properties, and conformations (**ACE phenotyping**) using a wide set of mAbs to ACE that were developed in our lab. We already have performed ACE phenotyping in >200 carriers of 80+ different ACE mutations and 500+ controls [Kryukova, Biomedicines, 2024, PloS One, 2024, unpublished]. Several of the relatively frequent AD-associated ACE mutations (present in at least 2% of the population) are truly damaging and, likely transport-deficient, resulting in plasma ACE levels only ~50% of controls. Some other AD-associated ACE mutations were not associated with a decrease in blood ACE levels, and likely do not affect ACE surface expression. Thus, their mechanism of association with AD is likely different, such as *via* catalytic changes. However, both these types of ACE mutations may result in reduced degradation of amyloid beta peptide Aβ42, an important component for amyloid deposition, and may pose a risk factor for the development of AD. Therefore, a systematic analysis of blood ACE levels in patients with ACE mutations has the potential to identify individuals at increased risk of late-onset AD.

The **2nd stage** of this project will include 1) Cell-based *in vitro* model (HEK cells transfected with cDNA of different ACE mutations) in order to find **transport-deficient** ACE mutations, which may be amenable to rescue of impaired trafficking of mutant ACE to the cell surface; 2) medico-genetic analysis of 50-100 families of carriers with the most damaging and transport-deficient ACE mutations. This stage will identify prospective candidates

for a future limited clinical trial of preventive or therapeutic interventions to delay the development of ACE-dependent AD.

The **3rd stage** of the project could be a limited clinical trial in individuals with several **transport-deficient** ACE mutations (starting with the most frequent damaging ACE mutation, Y215C) aiming to enhance mutant ACE protein traffic, as we previously demonstrated for the transport-deficient ACE mutation, Q1069R, using a combination of chemical and pharmacological chaperones and proteosome inhibitors [Danilov, PloS One, 2010].

Biography

Sergei M. Danilov, MD completed his PhD and postdoctoral studies from the National Cardiology Research Center, Moscow, Russia. He is the Principal Investigator and Head of the laboratory of ACE biology in the Division of Pulmonary and Critical Care, (Department of Medicine in the University of Illinois at Chicago). His laboratory developed more than 40 mAbs to ACE. He has published more than 200 papers on ACE biology and ACE immmunochemistry in highly respected journals and has been serving as an editorial board member of *Biomedicines*.

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