SCI SYNOPSIS

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International Conference on

Biomedical Science and Engineering

November 06-08, 2023
Dubai, UAE

Exhibitor

MEDIS CENTRUL MEDICAL

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Conference Programme

Conference Programme

November 06-08, 2023 | Holiday Inn Express Dubai Airport, Dubai, UAE

Day 1, November 06, 2023

Meeting Hall: Meeting Room 5

08:00-08:40	**Registrations**
08:40-9:00	**Introduction**

Keynote Presentations

9:00-9:40	Zoran Djinović, ACMIT Gmbh, Austria

Title: Optimization of an Implantable Fiber-Optic Microphone for Use with Cochlear Implants

9:40-10:20	B. Bou-Saïd, INSAVALOR, France

Title: Computer Aided Surgery: Application To Aortic Dissection

10:20-11:00	Haider Butt, Khalifa University, UAE

Title: 3D Printing of Multifunctional Contact Lenses for Ocular Health Monitoring and Management

Group Photo (11:00-11:10)

Networking and Refreshments @ (11:10-11:30) Meeting Room 5

Exhibitor

11:30-11:55	Andreea CALENCIUC, MEDIS Test SRL, Romania

Title: MEDIS TEST is a Medical Center for Obstetrics and Gynecology, Medical Imaging and Endocrinology, located in the Municipality of Iasi, Juetul Iasi

Oral Presentations

Session Chair:	**Haider Butt, Khalifa University, UAE**
Session Chair:	**B. Bou-Saïd, INSAVALOR, France**

Session Chair: **Rosita Aniuliene, Lithuanian University of Health Sciences, Lithuania**

Sessions: Biological Engineering | Biological Sciences | Biomedical Engineering and Bioinformatics | Basic Science of Medicine | Clinical and Public Health | Gynecology and Obstetrics

11:55 -12:20 — Milad Salimibani, Wroclaw University of Science and Technology, Poland

Title: Investigation of Gravity Effect on Saccadic Movement of the Human Crystalline Lens: Implications for Astronauts

12:20-12:45 — Randa Hassan, University of Illinois at Chicago, USA

Title : Current Data on Surgical Ergonomics Training in Surgical Subspecialties

12:45-13:10 — Abdullah Ali Al Ghamdi, King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia

Title: Electronic Medical Record Implementation in A Large Healthcare System from A Leadership Perspective

Lunch @ (13:10-14:00) Great room restaurant

14:00-14.25 — Seema Devi, Indira Gandhi Institute of Medical Sciences, India

Title: Dosimetric Comparison of Rapid Arc Therapy and Three-Dimensional Conformal Radiotherapy in Locally Advanced Carcinoma Cervix

14.25 - 14.50 — Artur S. Bartosik, Kielce University of Technology, Poland

Title: Simulation of Turbulent Blood Flow with High Haematocrit Through a Stent

14.50 - 15.15 — Tatiana Flisikowska, Technische Universität München, Germany

Title: When Size Matters: Large Animal Models for Biomedicine

15.15 - 15.40 — Saher Hamed, SEBANA Medical, VADARA, Abu Dhabi, UAE

Title: Erythropoietin Silica-Based Controlled Release Dosage Form; A Novel Strategy to Enhance Autologous Fat Dermal Filling

15.40 - 16.05	Deepa Singh, Jaipur National University, India
Title : High Risk Pregnancy: Fibroids and their Impct on Maternal and Foetal Health - Insights From Prospective Study	

Refreshments @ Meeting Room 5 (16.05 - 16.30)

16.30 - 16.55	Shubhada Karnamadakala, Kasturba Medical College Mangalore, India
Title : A Case Series – Acute Fatty Liver in Pregnancy	

16.55 - 17.20	Maria Koriakina, The Ministry of Health of the Russian Federation, Russia
Title: Impact of Upper Extremity Motor Impairments on Cognitive Processes and Perception in Children	

17.20 - 17.45	Murad Ali, Khalifa University, UAE
Title: Alcohol-Responsive Fresnel Lens: A Novel Vat Photopolymerization Sensor for Diverse Applications	

17.45 - 18.10	Said El Turk, Khalifa University, UAE
Title: Implementation of the Seeded Growth Method in Fabricating 3D Printed Nanocomposite Contact Lenses for Color Blindness Management	

Day 1 Concludes followed by Awards Ceremony

Day 2 | November 07, 2023

Meeting Hall: Meeting Room 5

Keynote Presentations

09:00-9:40 — Rinat Esenaliev, University of Texas Medical Branch, USA

Title: Biomedical Optoacoustics: From Idea to Clinical Studies with Medical Grade Systems

9:40-10:20 — Veit Senner, Technical University of Munich, Germany

Title: Engineering the Interaction Between Footwear Design, Soil & Turf Properties and Human's Biomechanics

10:20-11:00 — Peter R. Corridon, Khalifa University, UAE

Title: Sustainable Xenograft Generation from Arabian Sheep and Camels: Pioneering Regenerative Medicine Solutions for Chronic Metabolic, Cardiovascular, and Traumatic Injuries

Refreshments @ (11:00 - 11:20) Meeting Room 5

11.20 - 12.00 — Ameneh Haghgoo, NIKAN Hospital, Iran

Title : Step by Step Endometriosis Surgery

Oral Presentations

Session Chair: **Haider Butt, Khalifa University, UAE**

Session Chair: **B. Bou-Saïd, INSAVALOR, France**

Session Chair: **Rosita Aniuliene, Lithuanian University of Health Sciences, Lithuania**

Sessions: Biological Engineering | Biological Sciences | Biomedical Engineering and Bioinformatics | Basic Science of Medicine | Clinical and Public Health | Gynecology and Obstetrics

12.00 - 12.25 — Blagovechtchenski Evgeny, The Ministry of Health of the Russian Federation, Russia

Title: Use of Neurotechnologies in Comprehensive Treatment of Children with Severe Upper Limb Function Disorders

12.25 - 12.50 — Abdelrahman Ahmed Sakr, Khalifa University, UAE

Title: Innovative Multifunctional Contact Lenses: Customized Color Correction and Tear pH Monitoring

12.50 - 13.15 | Muhammed Shebeeb C, Khalifa University, UAE

Title: Incorporation of Contact Lenses Through Chemical Volumetric Modulation

Lunch @ (13.15 - 14.00) Great room restaurant

14.00 - 14.25 | Arto Grasten, United Arab Emirates University, UAE

Title: Accelerometer-Measured Physical Activity, Sedentary Time, And Health-Related Outcomes in a Sample of Emirati Female Students

14.25 - 14.50 | Shahad Mamoun, University of Sharjah, United Arab Emirates

Title : Factors Associated with Age at Menarche, Menstrual Knowledge, and Hygiene Practices Among Schoolgirls in Sharjah, UAE

14.50 - 15.15 | Nita Lakra, CCS Haryana Agricultural University, India

Title: Regulatory Mechanism of OsRuvB Transgene in Improving Salt Stress Tolerance of Legume Crop

15.15 - 15.40 | Israr Ahmed, Khalifa University, UAE

Title: Optical Fiber Probe for Biomedical Monitoring

15.40 - 16.05 | Muhammed Hisham, Khalifa University, UAE

Title: 3D Printed Multimaterial Contact Lenses for Red-Green and Blue-Yellow Color Blindness Correction

Refreshments @ (16:05 - 16:30) Meeting Room 5

16.30 - 16.55 | Lyudmila Egorova, Siberian Federal University, Russia

Title: Hyperparameter Optimization for Electroencephalogram Data Analysis Using Hybrid Classification Algorithms

16.55 - 17.20 | Ivan Rozhnov, Siberian Federal University, Russia

Title: Application of Massively Parallel Hybrid Clustering Algorithms to Production Batches of Medical Devices

Poster Presentations

P-01 | Yun Hee Shon, Kyungpook National University Hospital

Title: Therapeutic Potential of Natural Minerals for Metabolic Diseases in Vitro and in Vivo: Regulation of Mitochondrial Function

P-02 Aleš Panáček, Palacký University, Czech Republic

Title: Light-Induced In Vitro Anticancer Photothermal Therapy Using Silver and Gold Nanoparticles

P-03 Parul Sharma, CCS Haryana Agricultural University, India

Title: Putrescine in Modulating Morpho-Physiological and Biochemical Traits: Enhancing Heat Tolerance in *Brassica juncea* Seedlings

P-04 Rosita Aniuliene, Lithuanian University of Health Sciences, Lithuania

Title : Female Epispadia: Stress Urinary Incontinence and Pelvic Organ Prolapse

P-05 Sharapat Moiynbayeva, KMU "KSPH", Kazakhstan

Title: Impact of COVID-19 on Reproductive Health: A Comparative Study of Women of Fertile Age in Kazakhstan

P-06 Magdalena Asejczyk, Wroclaw University of Science and Technology, Poland

Title: A Mechanical Model of The Human Eye to Investigate the Effect of Intraocular Pressure on Visual Functions

P-07 Dongmei Zhao, Shenyang Pharmaceutical University, China

Title: Identification of Novel Indole Derivatives as Highly Potent and Efficacious LSD1 Inhibitors

Day 2 Concludes followed by Panel Discussion - Awards & Closing Ceremony

Virtual Programme

Day 3 | November 08, 2023

11:00-11:15 — **Opening Ceremony and Introduction**

Oral presentations

11:15-11:40 — Uri Wormser, The Hebrew University, Israel

Title: Topical Iodine for Neuropathic Pain

11:40-12:05 — David Ambett, Christ University, India

Title: Insects Playing a Role in Solving Criminal Investigations- Forensic Entomology.

12:05-12:30 — Uri Wormser, The Hebrew University, Israel

Title: Novel Peptide for Treatment of Glioblastoma Multiforme

12:30-12:55 — Santosh Kumar Mishra, S. N. D. T. Women's University, India

Title: My Reflections on Precautions during Intercourse after Menopause for Safe Sexual Health

12:55-13:20 — Uri Wormser, The Hebrew University, Israel

Title: Novel Peptide for Treatment of Sepsis and Cytokine Storm

Lunch @ (13:20-14:00)

14:00-14:25 — Saleha Saeed, University of Peshawar, Pakistan

Title: Morphological Assessment of Glutamate Zerovalent Iron Nanoparticles by Scanning Electron Microscopy and its Combined Effect with Indole Acetic Acid on Amelioration of Lead Toxicity in Maize (*Zea mays L.*)

14:25-14:50 — Shahazadi Parveen, Rajiv Gandhi Proudyogiki Vishwavidya-laya, India

Title: Phytochemical Screening and Antimicrobial Activity of Herbal Plant Drug Achyranthus Aspera

14:50-15:15 — Kedir Abegaz, Frontieri Consult PLC, Ethiopia

Title: Artificial Intelligence-Driven Ensemble Model for Predicting Mortality Due to COVID-19 in East Africa

15:15-15:40	Shahazadi Parveen, Rajiv Gandhi Proudyogiki Vishwavidyalaya, India
Title: Nutracueticals- Immunity Booster in Covid 19	
15:40-16:05	Lakshmi Jayaraj Nithin, Wrexham Hospital, United kingdom
Title: Uncertain Safety of Vasopressors after Subarachnoid Block in Atypical Pre Eclampsia - A Case Report	
16:05-16:30	Nesim İSLAMOĞLU, Necmettin Erbakan University, Turkey
Title: Paracetamol Sensing with a Glassy Carbon Electrode Modified with HNPC	
16:30-16:55	Shahazadi Parveen, Rajiv Gandhi Proudyogiki Vishwavidyalaya, India
Title: Evalution of Anti-Inflammatory Activity of Tulsi (ocimum sanctum linn.) Using Carrageenan Induced Paw Edema Model	
16:55-17:20	Nesim İSLAMOĞLU, Necmettin Erbakan University, Turkey
Title: Differential Pulse Voltammetric Determination of Paracetamol at Guanine-Modified Pencil Graphite Electrode	
17:20-17:45	Saryia Javed, NHSGGC, United Kingdom
Title: Microbiome and Colorectal Cancer Management	

Day 1 Concludes followed by Awards Ceremony

Exhibitor

Medis Test SRL

MEDIS TEST is a Medical Center for Obstetrics and Gynecology, Medical Imaging and Endocrinology, located in the Municipality of Iasi, Juetul Iasi. The activity of the MEDIS Medical Center has developed progressively, by diversifying the medical services offered, always considering the comfort and safety of the patients who come to it. Medis Test offers patients a well-equipped office with high-tech equipment and a highly professional medical team, proven through multiple National and International specializations. Medis Test responds promptly and responsibly to patients' requests, and the medical services offered are of high competence

Day 1

Biomedical Conference 2023

Keynote Presentations

OPTIMIZATION OF AN IMPLANTABLE FIBER-OPTIC MICROPHONE FOR USE WITH COCHLEAR IMPLANTS

Zoran Djinović
ACMIT Gmbh, Austria

Abstract:

A common method of rehabilitation for people with moderate hearing loss is conventional hearing aids, which are worn either behind the ear or in the ear canal. However, these systems have a number of disadvantages, such as discomfort and social stigma. We already developed an optical microphone as a part of totally implantable hearing aid for cochlear device capable to overcome many of the current hearing bottlenecks. It is a specific type of Michelson interferometer based on a single-mode 3x3 fiber-optic coupler where one reflective surface is a vibrating ossicle inside the middle ear. In this paper we present the microphone optimization by improving the signal-to-noise Ratio (SNR) and Noise Equivalent Sound Pressure Level (N-SPL@1kHz), by decreasing power consumption and reducing the footprint of the implantable device. The improvements were achieved by implementation of an adaptive filter algorithm in the signal processing and by use of a low-noise light source (VCSEL) in the sensing configuration. The chosen VCSEL diode assured overall power consumption ≤5 mA. The size of the implantable device of about 350mm^2 was achieved. A few miniaturized optomechanical components, including an aspheric collimator and x-y-z motorized stage made of titanium were used for better alignment between the sensing fiber tip and the retroreflector attached onto the middle ear incus. The optomechanical stage allowed remote adjusting of fiber-optic probe over the target with a space resolution of about 5 µm. It was found that retroreflector inclination had a critical influence on the reliable measurement of amplitude of vibrations, but the good results were assured within ± 5° of inclination. It was experimentally shown that fiber-optic sensing configuration had the SNR of 44 dB with calibrated target vibrating at 1kHz/7nm that corresponds to N-SPL@1kHz of about 31dB SPL

Biography

Zoran Djinovic received doctoral degree in 1990 from the University of Belgrade in field of vapor phase epitaxy of II-VI compounds aimed to development of infrared detectors. He was a principal researcher at the Institute of Chemistry, Technology and Metallurgy, University of Belgrade where he became a full Researcher Professor in 2012. In 2002 he moved to the Vienna University of Technology at the Institute of Sensors and Actuators as a researcher fellow in field of Micro-electromechanical Systems (MEMS) and Fiber-optic sensing technology. Since 2012 he is within Austrian Center for Medical Innovation and Technology (ACMIT) acting as a Head of Fiber-optic laboratory. Currently, his research interest is focused on development of fiber-optic sensors for medical and industrial application.

COMPUTER AIDED SURGERY: APPLICATION TO AORTIC DISSECTION

B Bou-Saïd,W Pan and P Kulis
University of Lyon, France

Abstract:

Cardiovascular diseases are the leading cause of mortality in the industrialized world (OMS 2016). Among these diseases, aortic dissection is relatively unknown and difficult to treat, with a survival rate for most severe cases not exceeding 10%. This pathology occurs when an injury leads to a localized tear of the innermost layer of the aorta, called the entry port. It allows blood to flow between the layers of the aortic wall, forcing the layers apart and creating a false lumen. Endovascular treatment seeks to obliterate the entrances to the false lumen with a stent. The currently available surgical tools for endovascular procedures are selected only from information based on medical imaging techniques. There are few studies on the postoperative demonstration of blood flow phenomena in the aortic dissection endovascular treatment. It is crucial to study the hemodynamic of blood in the aorta after an intervention because the deployment of a stent leads to modifications in blood flow. For the surgeons, the procedure can only be performed empirically, using MRI-4D images to view the post-operative flow of the patient's blood in the aorta with the stent. We perform, from the open-source software FOAM-Extend®, the fluid-structure coupling between the hemodynamics and the arterial deformation to assist in the planning process. With these numerical simulations, we realize the hemodynamic in the aorta of postoperative to predict the modification of flow.

Biography

Benyebka Bou-Said is Professor at INSA de Lyon and researcher at LaMCoS in subjects concerned with both fundamental and applied hydrodynamics, fluid-structure interaction, rheology and biomechanics. Pr. Bou-Saïd is the head of a research group involved in Tribology. He is the supervisor of more than 50 PhD thesis and 80 Research Master. Pr Bou-Saïd is Fellow ASME and STLE , Co-Editor in Chief for Tribology International and associate editor for Tribology Transactions and Journal of Engineering Tribology . He is listed in the Who's Who in the World and has authored more than 140 papers. He has received the Tribology Gold Medal at the Japanese Tribology Conference Nagasaki October 2000 for his prospective work in the field of biotribology.

3D PRINTING OF MULTIFUNCTIONAL CONTACT LENSES FOR OCULAR HEALTH MONITORING AND MANAGEMENT

Haider Butt
Khalifa University, UAE

Abstract:

In this study we presented the fabrication of tinted contact lenses for color blindness, and several issues related to their mechanical properties and toxicity were reported. Gold nanoparticles were integrated into the soft hydrogel material based contact lenses, thus forming nanocomposite contact lenses targeted for red-green CVD application. The integration of nanomaterials into hydrogels is a prominent research challenge for a myriad of healthcare applications, such as bio-sensing, cancer therapy, and bone tissue engineering. In particular practical contact lenses, functionalized with metallic nanoparticles are of interest for therapeutics and targeted therapy. Several types of nanoparticles were synthesized, characterized and incorporated within the pHEMA hydrogel material. The materials were utilized along with Vat Photopolymerization based 3D printer for printing soft contact lenses, and their resulting optical, mechanical, hydration and material properties were assessed. The optical transmission properties of the 3D printed nanocomposite lenses were found to be analogous to those of the commercial CVD glasses, and their water content and wettability properties were better in comparison to some of the commercially available contact lenses used for cosmetic/vision correction purposes. Hence, this work demonstrates the potential of 3D printing multi-functional and nanocomposite contact lenses for ocular health management and, more generally, color filtering applications.

Biography

Haider Butt did his M. Phil. in Electrical Engineering from University of Cambridge (UK) in 2008, followed by a PhD in 2012. He was selected as the Henslow Research Fellow by the Cambridge Philosophical Society, University of Cambridge is October 2012. In 2013, he was appointed as a Lecturer of Nanotechnology at the School of Engineering, University of Birmingham (UK) and was promoted to Senior Lecturer in 2016. He joined Khalifa University as an Associate Professor in Mechanical Engineering in 2019, and was promoted to Full Professor in 2023. His is leading a Nanophotonic Research Laboratory, with particular focus on additive manufacturing of nanophotonic devices, smart contact lenses for sensing and color blindness related applications.

Day 1

Biomedical Conference 2023

Exhibitor Presentation

MEDIS TEST IS A MEDICAL CENTER FOR OBSTETRICS AND GYNECOLOGY, MEDICAL IMAGING AND ENDOCRINOLOGY, LOCATED IN THE MUNICIPALITY OF IASI, JUETUL IASI

Andreea CALENCIUC
MEDIS Test SRL, Romania

Abstract:

The activity of the MEDIS Medical Center has developed progressively, by diversifying the medical services offered, always considering the comfort and safety of the patients who come to it.

Medis Test offers patients a well-equipped office with high-tech equipment and a highly professional medical team, proven through multiple national and international specializations. Medis Test responds promptly and responsibly to patients' requests, and the medical services offered are of high competence.

Medis Medical Center offers the following Obstetrics services:

- Pregnancy monitoring through periodic clinical and ultrasound examinations.
- Ultrasounds of fetal morphology - with a role in the diagnosis of congenital malformations that can be visualized and diagnosed sonographically
- Assessing the risk of genetic abnormalities: double-test and triple-test
- Double-test – This investigation is performed in the first trimester of pregnancy (11 – 13 weeks) and requires fetal morphology ultrasound. This consultation is aimed at placing the child in the high-risk or low-risk category of having a fetus with genetic abnormalities.
- Triple-test – Triple-test is performed in the second trimester of pregnancy (16–18 weeks). This consultation aims to place the pregnant woman in the category of high risk or low risk of having a fetus with genetic abnormalities or neural tube abnormalities. To calculate the risk, ultrasound data are required, and if the result indicates an increased risk, the doctor recommends further investigations to establish the diagnosis with certainty.
- Amniocentesis – is a prenatal diagnostic test that is done to determine if the fetus has certain genetic abnormalities, malformations or infections. The procedure involves extracting a small amount of amniotic fluid from the uterus. Harvesting is done between 14 and 20 weeks of pregnancy, and possible complications are abortion or infections.
- Counseling for childbirth, breastfeeding.
- Birth assistance (collaboration with public and private centers)
- Consultations and postnatal counseling (surveillance of the hallucination period, ultrasound, contraceptive advice).

The company started operating in 2002 and has been managed since its inception until April 2021 by the same administrator, Dr. Grigore Mihaela. From April 2021, the management of the company is ensured by HAMOD CARMEN MARIA.

The management of the company pays attention to its employees, ensuring a clean, unpolluted, well-maintained, and safe working environment, especially by purchasing the most efficient and clean equipment in the field, in order to stimulate the yield and efficiency of work productivity.

The policy used by the company's management is one centered on the Administrator, who is, moreover, the initiator and coordinator of this business. The adopted management is a strategic one where short-term thinking is integrated with long-term thinking. For such thinking, there is only the present and the future, as it is highlighted below, proposing different objectives for the development of society and the penetration of new market segments.

The SC MEDIS TEST SRL project is the result of a young and experienced team, which puts passion into this profession, combining the useful with the pleasant in a unique way, whose The company's philosophy is mainly represented by quality obstetric and gynecological services where there are no compromises. The maximum efficiency is obtained through the equipment and arrangement of the clinic, as well as through the exemplary trained team.

The company addresses those people who are open to medical education and who are aware of the need for bilateral collaboration (patient-medical staff) to obtain and maintain a product resulting from the medical service.

The patients who come to the clinic are generally women (aged between 20-80 years). For SC MEDIS TEST SRL, the key word for the success of the entire business is the satisfaction of the patient, so that he returns to the clinic with a new patient.

From the point of view of the marketing component, the clinic understood to constantly invest in establishing a brand on the market for the development of the business owned by the quality of the services offered.

The evolution of SC MEDIS TEST SRL from its foundation (2002) until now, represented for MEDIS TEST a period of business consolidation in which it focused on maintaining current clients, but also on attracting new clients, by adapting the clinic's offer to the needs their. These aspects determined the increase in the number of patients and the volume of receipts per person, resulting in an increase in the clinic's income from one financial exercise to another. According to the clinic administrator, the next step in the clinic's evolution is the expansion of the range of medical services offered, namely: conducting full consultations and investigations in the field of obstetrics and gynecology. The project aims to equip the modern women's health center currently owned by the company with completely INNOVATIVE diagnostic and treatment equipment - which does not exist on the market of medical services in the NE region.

Each technique used within SC MEDIS TEST is carried out according to rigorous conduct to maintain very good quality. The medical staff is always up to date with new techniques, materials and treatment methods through continuous participation in congresses and scientific events, these characteristics are represented by

the manager of the clinic, Dr. Hamod Carmen Maria.

MEDIS TEST stood out on the market as a result of the specialized human resources at its disposal and the continuous improvement of the services offered to patients. The clinic's patients are treated with high-performance medical equipment, without having to wait for hours in front of a doctor's office for a consultation and subject to strict confidentiality.

SC MEDIS TEST SRL offers obstetrics and gynecology medical services, pregnancy surveillance and high-quality ultrasound. Medical services are offered in an environment with perfect hygiene and maximum comfort, with highly qualified staff, with extensive experience in medicine and using modern technologies and equipment.

In the current activity carried out until now, SC MEDIS TEST SRL stood out for the following strong points of the management :

- adopting and maintaining an integrated quality/environmental management system
- internal quality control planning
- is responsible for compliance with legal provisions
- keep data confidential.

In addition to all this, a real quality policy is added at the level of the company SC MEDIS TEST SRL. Through the quality policy, the company undertakes to respect and fulfill the present and future requirements of customers.

Its policy in the field of quality has 4 major coordinates, intended to ensure the success of the company's activity:

✓ proactive attitude towards customers

✓ care for the company's staff

✓ achieving the company's financial objectives

✓ last but not least, permanent concern for the quality of the services offered.

Day 1

Biomedical Conference 2023

Oral Presentations

INVESTIGATION OF GRAVITY EFFECT ON SACCADIC MOVEMENT OF THE HUMAN CRYSTALLINE LENS: IMPLICATIONS FOR ASTRONAUTS

Milad Salimibani
Wroclaw University of Science and Technology, Poland

Abstract:

Human lenses oscillate as classically damp harmonic oscillators with different dynamics induced by upwards, downwards, and temporal saccades. As a part of NASA's STARPAHC Program, NASA monitors physiological parameters such as blood pressure, eye, skin, nose, and so on. In their study, they documented a temporal correlation between lens wobble and post-saccadic suppression of vision. Symptoms of overuse include fatigued ciliary muscles and zonula fibers, which are responsible for a feeling of sleepiness. As a result of the muscles exerting force to change the position of the lens and cornea during saccadic movements, people usually have no sensation when the muscles are fatigued.

In order to construct a model of the eye, elastic materials and Newtonian liquids are used. These materials are used to model the cornea, sclera, crystalline lens, ciliary muscle, zonular fibers, and vitreous body. The simulation is a fluid-structure interaction simulation, where the eye is rotated in horizontal and vertical directions to provide control simulations in which overshooting and wobbling are observed. The geometry of the eye is taken from a real 2D eye model. The purpose of this research is to determine the displacement and time of wobbling that occur during overshooting in the presence of gravity. Based on the results of a study that was carried out experimentally, the results are validated.

Based on the results of our study, we have concluded that gravity contributes significantly to reducing and increasing of overshooting in crystalline lens accommodation and extending the duration of crystalline lens wobbling. This is because gravity affects overshooting. Compared with the center-side movements of the eyes, the center-down movements experience a considerable increase in the amount of crystalline lens overshooting and a slight change in the time at which the crystalline lens wobbles, compared to the center-side movements.

On Mars and the moon, astronauts face almost 2.6 and 6.1 times less gravity, respectively, than they do on Earth. There is no doubt that the ciliary muscles and zonular fibers are very rarely fatigued as a result of this study in looking down. Consequently, astronauts are able to move more freely in their daily lives and carry out their everyday chores more readily than their Earthly counterparts because they have a greater degree of mobility. This study's primary goal is to provide astronauts with more details about gravity's effect on their vision and to demonstrate to researchers what are the differences between looking up and looking down in terms of the amount of time the eyes are wobbling and the overshooting of the crystalline lens.

Biography

With a wealth of experience in hyperthermia, cardiovascular biomechanics, ocular biomechanics, and tissue engineering, Milad Salimibani is an accomplished manager, lecturer, innovator, and researcher. During his time at IUST, Erasmus MC Hospital, and the University of Science and Technology of Wroclaw, he has made significant contributions to the field. His strong background in these specialized areas has enabled Milad to develop groundbreaking solutions and advance knowledge. Expert and passionate scientists continue to advance science and drive innovation. Through his groundbreaking research and leadership, Milad Salimibani strives to improve healthcare outcomes.

CURRENT DATA ON SURGICAL ERGONOMICS TRAINING IN SURGICAL SUBSPECIALTIES

Randa Hassan and Nada Hussein
University of Illinois Chicago, USA

Abstract:

Surgical ergonomics training has gained increasing recognition as an essential component of modern surgical practice. This abstract provides an overview of the current data and trends related to surgical ergonomics training across various surgical subspecialties. The objective is to assess the prevalence, methods, and outcomes of ergonomics training programs, and to highlight the impact of these initiatives on surgeon well-being, performance, and patient outcomes.

Surgical ergonomics training programs have witnessed a growing adoption rate among surgical subspecialties, with a particular emphasis on minimally invasive and robotic-assisted procedures. These programs encompass a range of educational modalities, including didactic sessions, simulation training, and hands-on workshops. Virtual reality and augmented reality technologies have also emerged as valuable tools for enhancing surgeon ergonomics skills.

Research data suggests that effective ergonomics training can significantly reduce the risk of musculoskeletal injuries among surgeons, improve their overall comfort during procedures, and enhance surgical precision. Moreover, there is evidence to suggest that surgeons who undergo ergonomics training are more likely to experience reduced fatigue and burnout, leading to improved long-term career sustainability.

However, challenges remain in the implementation of ergonomics training across surgical subspecialties, including variations in program accessibility and the need for standardized curricula. Additionally, the long-term impact of ergonomics training on patient outcomes, such as reduced surgical complications and shorter recovery times, warrants further investigation.

In conclusion, surgical ergonomics training has become an integral part of surgical education and practice across various subspecialties. While initial data indicates its positive effects on surgeon well-being and performance, ongoing research efforts are essential to refine training approaches, standardize curricula, and establish the direct impact on patient outcomes. This abstract underscores the importance of continued research and collaboration within the surgical community to advance the field of surgical ergonomics and optimize surgical care.

Biography

Randa Hassan is currently a Clinical Assistant Professor at Ob/Gyn department at University of Illinois at Chicago. There she performs the full breadth of the field of Cbstetrics and Gynecology and serves as Gyn Sub-Intern Rotation Director, Medical Student Block 7 Co-Director. She has received numerous awards including the 2023 Golden Apple Resident Teaching Award and National Faculty Award for Excellence in Resident Education.

ELECTRONIC MEDICAL RECORD IMPLEMENTATION IN A LARGE HEALTHCARE SYSTEM FROM A LEADERSHIP PERSPECTIVE

Abdullah Ali Al Ghamdi, Yaseen M Arabi, Mohamed Al-Moamary, Abdullah Al Mutrafy, Raed H AlHazme and Bandar Abdulmohsen Al Knawy

King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia

Abstract:

Background: Information on the use of change management models to guide electronic medical records (EMR) implementation is limited. This case study describes the leadership aspects of a large-scale EMR implementation using Kotter's change management model.

Methods: This case study presents the experience in implementing a new EMR system from the leadership perspective at King Abdulaziz Medical City, a large tertiary care hospital in Riyadh, Kingdom of Saudi Arabia. We described the process of implementation and outlined the challenges and opportunities throughout the journey from the pre-implementation to the post-implementation phases.

Results: We described the corresponding actions to the eight domains of Kotter's change management model: creating a sense of urgency, building the guiding team, developing a change vision and strategy, understanding and buy-in, removing obstacles, creating short-term wins, building on the change and anchoring the changes in corporate culture.

Conclusion: The case study highlights that EMR implementation is not a pure information technology project but rather is a technical-based complex social adaptive project that requires a specific set of leadership competencies that are central to its success. It demonstrates that change management models might be useful for large-scale EMR implementation.

Biography

Abdullah Al Ghamdi is a board-certified family and addiction medicine physician from the University of Toronto, Canada, with over 20 years of clinical, academic, and training experience. He is an assistant professor of family medicine at King Saudi bin Abdulaziz University for Health Sciences in Riyadh. He holds a master's degree in health professions education from Maastricht University, the Netherlands, and a master's degree in leading innovation and change from York st. Johns University, the United Kingdom, and a diploma in health informatics from Sheffield University, the United Kingdom. He is a board-certified physician executive from the American Association of Physician Leadership. He participated at the national level in developing the healthcare model, designing national digital healthcare transformation, and leading train the trainer program for the postgraduate clinical training at the Saudi Commission for Health Specialties. He received leadership and academic awards internationally and nationally.

DOSIMETRIC COMPARISON OF RAPID ARC THERAPY AND THREE-DIMENSIONAL CONFORMAL RADIOTHERAPY IN LOCALLY ADVANCED CARCINOMA CERVIX

Seema Devi
Indira Gandhi Institute of Medical Sciences, India

Abstract:

Introduction: According to World Health Organization cervical cancer is the 4th most common cancer among the females worldwide with an estimated 6,04,000 new cases and 3,42,000 deaths in 2020. About 90% of new cases and deaths occurred in low- and middle-income countries globally (1) In Locally advanced carcinoma cervix concurrent radiotherapy in combination with brachy therapy has been established as standard treatment (2). The incidence and severity of radiation toxicity are multifactorial and technique of radiation delivery. Dosimetric studies have shown that intensity modulated radiation therapy can reduce the dose to gastro intestinal system, bladder and bone marrow as compared to conventional techniques (3-5,6,7,) Three- dimensional conformal Radiation Therapy (3DCRT) is the most used method of EBRT but this technique has been associated with significant side effects including genital urinary symptoms, gastrointestinal symptoms and bone marrow suppression when radiotherapy combined with concurrent chemotherapy (6).

Material and Method: This is study 60 patient of Locally advanced carcinoma cervix will be included in the study which is to be done in Department of Radiation Oncology State Cancer Institute, Indira Gandhi Institute of Medical Sciences, Patna. 30 patients in each technique will be planned 3- Dimensional Conformal Radiotherapy (3DCRT) and Rapid Arc Therapy on Varian Truebeam SVC linear accelerator using 6 MV/10MV/15MV. Total prescribed dose 50Gy/25 Fraction, 5Fraction/week to planning target volume.

Result: The study found that both 3DCRT and Rapid Arc Therapy provided similar PTV coverage (measured by Dmax and D95%), homogeneity index, and conformity index. However, Rapid Arc Therapy demonstrated a significant advantage in reducing the dose to organs at risk (OAR) compared to 3DCRT. Specifically, the doses to the Bladder, Rectum, and both femurs were significantly lower with Rapid Arc Therapy than with 3DCRT. Statistical analysis revealed significant p-values for Bladder doses at D15%, D35%, and D50% (p-value 0.006, 0.00031, and 0.008, respectively) and for Rectum dose at D15% (p-value 0.004). Furthermore, the doses to the right femoral head (Right F.H) and left femoral head (Left F.H) at Dmax were also significantly reduced with Rapid Arc Therapy (p- value 0.00027 and 0.0006, respectively).

Conclusion: We can reduce the dose to OAR with Rapid Arc planning resulting in reduced treatment toxicity significantly during external beam radiotherapy in comparison to 3DCRT.

Biography

Seema Devi is a versatile Radiation Oncologist with a total of 23 years of exemplary service in the medical field. She is currently working as Additional Professor in the Department of Radiation Oncology at Indira Gandhi Institute of Medical Science, Patna. She has done her M.D- Radiotherapy from S N Medical College Agra. She has already worked in several prominent Institutions across the country. She had published around 20 research papers in various national as well as International Journals also she is reviewer in National Journal of Maxillofacial Surgery (Editorial Board) as well

as in East Oncology group, Bihar. She has also been a recipient of Dr Arpita Roy Award in 2015.She has got experience in a variety of radiological healthcare settings and with many different patient age ranges. She is Dedicated, hardworking and compassionate professional striving to maintain the high standards of the field, seeking opportunities to leverage medical experience and research skills towards holistic excellence and delivery. She provides oncology evaluations, management, treatments and second opinions to patients from diverse background, She has got strong exposure in treatments such as chemotherapy, and targeted therapies. She has also counselled and educated patients and family members on pre and post palliative care treatment. She is continuous conducting research to further enhance skills and develop new treatment innovations.

SIMULATION OF TURBULENT BLOOD FLOW WITH HIGH HAEMATOCRIT THROUGH A STENT

Artur S. Bartosik
Kielce University of Technology, Poland

Abstract:

Most available studies on human blood flow in vessels regard laminar flow, although, under intensive physical exercise, a turbulent flow in vessels appears. Blood exhibits a yield shear stress and a nonlinear dependence of the shear stress on the shear rate, which is strongly affected by the concentration of erythrocytes (haematocrit). In this study, two samples of human blood were applied. i.e., with moderate and high haematocrit. The physical model assumes that the blood flow is turbulent and occurs in a horizontal stent and that the Reynolds number is less than 5000. The parameters of the rheological model were obtained based on the best match of the rheological model with the measurements available in the literature. The blood flow was described by time-averaged continuity and momentum equations, while the closure problem was solved by applying a two-equation turbulence model. The mathematical model is suitable for predicting the impact of chemicals used in treatment on blood flow. The objective of the study is to compare the frictional loss and velocity profiles of two samples of human blood. The results of the simulations demonstrated the influence of haematocrit on blood velocity profile and therefore on friction factor and wall shear stress. The results of the simulations are presented in the figures discussed, and conclusions were formulated.

Biography

Artur Bartosik has been appointed as a researcher and academic teacher in the Department of Production Engineering at the Kielce University of Technology. Together with his team, he works to establish a structure for university-wide multidisciplinary collaboration in fluid mechanics, rheology, and renewable energy. His scientific interest is focused on experiments, modelling, and simulation of single- and two-phase flows, including convective heat transfer. Artur, as a researcher, spent 2 years at University of Saskatchewan in Canada and some time at Ilmenau Technical University in Germany. He is editor-in-chief of WSEAS Transactions on Fluid Mechanics and associate editor of the Journal of Hydrology and Hydromechanics. He gives lectures on fluid mechanics; heat transfer; fluid-flow machinery; hydrotransport; renewable energy sources; transnational technology transfer; applied fluid mechanics.

WHEN SIZE MATTERS: LARGE ANIMAL MODELS FOR BIOMEDICINE

Tatiana Flisikowska
Technische Universität München, Germany

Abstract:

Mice have come to dominate basic research in mammals because they are convenient, cheap to house and have long been amenable to precise genetic modification. They have provided powerful insights into the molecular basis of many human diseases and enabled proof-of-principle studies for potential biomedical applications. However, mice differ significantly from humans in size, lifespan, physiology, anatomy and diet, limiting their usefulness for some studies. Pigs are increasingly recognised as a valuable adjunct to pre-clinical research, and their value is considerably increased by the engineering of precise genetic modifications that replicate lesions responsible for human disease conditions. The production of genetically modified pigs has been technically challenging but can now be significantly streamlined by using gene editing enzymes.

In our group combinations of genetic engineering technologies are being employed to follow two main aims: altering the porcine genome to enable xeno-organ transplantation into humans and to provide a series of genetically-defined pigs that model serious and common human cancers. The latter will allow new diagnostic and therapeutic strategies to be investigated at human scale, and longitudinal studies under conditions that mimic the human patient.

Successful xenotransplantation requires that donor pigs carry a series of genetic modifications to overcome hyperacute, acute vascular and cellular rejection. In contrast, precise mutations of a single amino acid in a proto-oncogene can be sufficient to induce cancer, if carried out in tissue and cell specific manner.

The talk will give an overview of technologies developed for the generation of large animal models. Provide examples of what has been achieved in both areas: xeno-organ transplantation and modelling human cancers in pig and highlight advantages as well as disadvantages when working with large animal models.

Biography

Tatiana Flisikowska is a Senior Scientist at the Chair of Livestock Biotechnology at the Technical University of Munich. She received her Ph.D. in Animal Biotechnology from the Poznan University of Life Sciences in Poland and moved to Germany in 2005 to work with Prof. Angelika Schnieke, a leading researcher in the field of livestock biotechnology. Flisikowska has extensive experience in the production and characterisation of genetically modified biomedical pig models, with a particular focus on cancer research. She has played a key role in the development of new gene editing techniques, including the use of zinc finger nucleases to edit genes in livestock embryos. She was involved in the generation of several genetically modified livestock models, including pigs. Flisikowska has made significant contributions to the field of livestock biotechnology, publishing several articles on the development of genetically modified animal models for biomedicine. Her work has received widespread recognition, and she has been invited to speak at scientific conferences and events around the world. Flisikowska is a respected mentor and supervisor, and her guidance has helped numerous students and young researchers advance their careers in biotechnology.

ERYTHROPOIETIN SILICA-BASED CONTROLLED RELEASE DOSAGE FORM; A NOVEL STRATEGY TO ENHANCE AUTOLOGOUS FAT DERMAL FILLING

Saher Hamed
SEBANA Medical, VADARA, Abu Dhabi, UAE

Abstract:

Autologous fat presents a burgeoning approach for addressing soft tissue augmentation, commonly referred to as dermal filling. This treatment encompasses an aesthetic process wherein autologous fat is employed for many indications such as facial contouring, breast and buttock augmentation, and breast reconstruction, enhancing the appearance of the treated individual. The utilization of autologous transplanted fat, however, poses a challenge due to its substantial rapid resorption rate. Currently, a solution to counteract this resorption following autologous fat grafting remains elusive. Erythropoietin (EPO), recognized for its non- hematopoietic targets, has displayed the potential to enhance long-term fat graft survival by virtue of its pro- angiogenic and anti-apoptotic attributes. In response to this, we have developed SEBA – an innovative, sterile, silica-matrix hydrogel infused with EPO. SEBA serves as a sustained-release injectable EPO formulation specifically tailored for individuals undergoing dermal filling with autologous fat. Engineered to enable gradual EPO delivery into fat grafts, SEBA holds the promise of potentially mitigating fat resorption, given EPO's versatile, multi-faceted actions. SEBA is meticulously designed to bolster fat acceptance and viability during the critical period following fat grafting procedures. It can be mixed easily with processed autologous fat prior to injection. The silica matrix hydrogel within SEBA is adeptly calibrated to biodegrade over the desired interval, ensuring optimal EPO delivery rate and quantity to match the volume of grafted fat across different fat filling procedures. Our primary objective was to ascertain the impact of SEBA on the survival of human fat tissue after transplantation, utilizing nude mice as the experimental model.

Biography

Shaer Hamed is a seasoned professional with a strong background in Research & Development and business leadership. His expertise spans pharmaceutical development, from drug discovery to regulatory affairs, and he has a successful track record as an entrepreneur and founder. With a passion for science and innovation, he led Remedor Biomed and Sebana Medical as CEO for nearly a decade. Driven by his commitment to improving health and wellbeing, he applies a contextual evaluation model based on adaptive learning principles. His extensive knowledge and leadership abilities enable him to identify market gaps, establish strategic partnerships, and drive transformative research.

HIGH-RISK PREGNANCY: FIBROIDS AND THEIR IMPACT ON MATERNAL AND FOETAL HEALTH-INSIGHTS FROM PROSPECTIVE STUDY

Deepa Singh
Jaipur National University, India

Abstract:

Introduction: Leiomyomas are common benign tumours affecting 40-60% of women. During pregnancy, most leiomyomas are asymptomatic but can lead to complications such as abdominal pain and increased risk of miscarriage. Submucosal fibroids are associated with decreased pregnancy and implantation rates. Complications include fibroid red degeneration, myomectomy, preterm labour, foetopelvic disproportion, and breech presentation. This study aims to investigate the incidence, clinical presentation, outcomes, and management of leiomyoma in pregnant women.

Material & Methods: This prospective observational study was conducted at a JNUIMSR from August -January to assess the impact of fibroids on pregnancy outcomes. A total of 30 pregnant women with fibroids detected during pregnancy were included. Patients gave informed assent and assessed maternal attributes, inconveniences, conveyance and foetal results. Data collection involved the use of questionnaire. Data analysis was performed using Microsoft Excel and SPSS software. The study aimed to examine the association between fibroids and pregnancy outcomes.

Results: This study on high-risk pregnancy and the impact of fibroids revealed that among 206 women who delivered, 48 patients were diagnosed with fibroids during pregnancy. The age distribution showed that the majority of patients with fibroids were in the age group of 20-24 years (40%). Common complications associated with fibroids included pain abdomen (60%), foetopelvic disproportion (46.6%) and UTI (20%). Subserosal fibroids (40%) were the most prevalent, followed by intramural fibroids (33.3%). Study significance early detection and management strategies are essential for pregnant women with fibroids.

Conclusion: This prospective study on high risk pregnancy and fibroids impact Maternal and Foetal Health. Fibroids were detected in 48 pregnant women, subserosal fibroids being most common type and associated with decreased pregnancy rates. Management including myomectomy and caesarean section employed for specific cases. Timely diagnosis, appropriate interventions, and comprehensive care contributed to successful pregnancy outcomes. Further research is warranted to explore preventive measures and optimize management strategies for Pregnant Women with Fibroids.

Biography

Deepa Singh is a Post Graduate Student, of M.S.Obs & Gynae, from Jaipur National University, Rajasthan, India She has done a research on topic "High-risk Pregnancy: Fibroids and their impact on Maternal and Foetalhealth-insights from prospective study" with the help of her guide Deepa Masand (Professor at her University).

A CASE SERIES – ACUTE FATTY LIVER IN PREGNANCY

Shubhada Karnamadakala
Kasturba Medical College, India

Abstract:

Introduction: Acute Fatty Liver in Pregnancy (AFLP) is a rare illness that is potentially life threatening for both the mother and the foetus. Most commonly AFLP occurs during the third trimester of pregnancy and may manifest earlier during the second trimester or even as late as postpartum. The underlying pathology of the disease is thought to be associated with an abnormality in free fatty acid metabolism. Pathophysiology of AFLP however, is related to coagulopathy that is common in other types of acute liver failure. Diagnosis is one of exclusion, and as such the disease shares features with other conditions that commonly complicate pregnancy such as pre-eclampsia, HELLP syndrome, viral hepatitis and cholestasis of pregnancy.

Objectives: The aim of the study is to explore the clinical outcomes of patients with AFLP and evaluate the effects of treatment. Methods: Seven patients who were diagnosed with AFLP were retrospectively analyzed from July 2020 to July 2023 from the clinical records of the Hospital. They were reviewed for clinical features, laboratory investigations and maternal and perinatal outcomes.

Results: Six out of seven patients were primigravidae, and the seventh patient was a second gravida with one previous abortion. All except one patient presented during the third trimester with 57% presenting after 36 weeks of gestation. Six patients out of seven presented with jaundice (85.7%) and all presented with sudden onset nonspecific symptoms, including abdominal pain and vomiting. Pregnancy was terminated surgically for all patients. Out of the seven patients reviewed, only one survived (85.7% maternal mortality). All except the case which survived were diagnosed with AKI and coagulopathy. There was also one case that developed encephalopathy and altered sensorium. Two patients had intra-uterine foetal demise at presentation (28.5%), and one was an early neonatal death on day 8 of life. It was noted that two cases were COVID positive, and one was a case of retroviral disease.

Conclusion: AFLP has a rapid and dramatic progression, from initially nonspecific symptoms to coagulopathy, AKI, and death, resulting in alarming maternal and perinatal mortality. Early diagnosis is challenging due to the non-specificity of symptoms, but crucial, and prompt termination of pregnancy is the need of the hour. Supportive measures and multidisciplinary approach may significantly improve prognosis.

Biography

Shubhada Karnamadakala is a final year Post Graduate OBG resident from Mangalore, Karnataka, India. She is associated with two hospitals in her residency viz., Government Lady Goschen Hospital, Mangalore and KMC Attavara, Mangalore hospitals.
She is a keen researcher and has recently presented a poster on "A Rare Case of Uterine Carsinosarcoma with Haematometra". She is also currently working on a thesis "Estimation of the Accuracy of the Clinical Estimation of Fetal Weight with respect to Body Mass Index".
As a Junior Resident, she has conducted over 500+ deliveries and assisted in 400+ sections over the last three years.
Shubhada is registered with the Karnataka Medical Council, Bengaluru for her clinical practice and aspires to specialize in surgical gynecology and high-risk obstetrics as well as be associated with a teaching hospital as being a teacher is her forte.

IMPACT OF UPPER EXTREMITY MOTOR IMPAIRMENTS ON COGNITIVE PROCESSES AND PERCEPTION IN CHILDREN

Koriakina Maria M
The Ministry of Health of the Russian Federation, Russia

Abstract:

The current study aimed to examine the cognitive development and cerebral processing differences in children with upper limb motor disorders compared to healthy controls. A total of 89 children were involved in the study, with 57 having upper limb motor disorders and 32 being healthy. The results indicated that motor disorders can have a negative impact on cognitive functions, particularly memory. Children between the ages of 8 and 11 with upper limb disorders showed significant differences in auditory and visual memory scales compared to their healthy peers. These findings suggest that the development of cognitive functions is dependent on the normal development of motor skills, and a delay in motor skill development can affect cognitive functions. However, no significant relationship was found between other cognitive functions (attention, thinking, intelligence) and motor function. These results highlight the importance of considering cognitive impairments in the habilitation programs for children with motor disorders. The study also revealed that evaluation of children with motor impairment often neglects their cognitive development. Early intervention, specifically focused on memory, could help mitigate learning difficulties and daily life functioning in children with movement disorders.

Additionally, the study explored the impact of motor dysfunctions on cerebral processing of videos featuring goal-directed movements and content without humans. Electroencephalography recordings were obtained from healthy children and those with congenital motor dysfunction. The analysis revealed divergent neural responses in individual patients, as evidenced by significantly lower inter-subject correlation of brain activity compared to healthy children during video viewing. These differences in cerebral processing were not correlated to the motor-related content of the videos, suggesting that upper limb motor dysfunctions affect the perceptual-cognitive processing of videos beyond simply mirroring motor actions. This indicates that perceptual-cognitive processes in the brain have a more robust embodiment than previously thought.

Biography

M.M. Koriakina has devoted herself to studying the complex relationship between motor impairments and cognitive development in children with a rare movement disorder - congenital arthrogryposis (arthrogryposis multiplex congenita, AMC) and obstetric brachial plexus palsy (OBPL). The studies, as part of a research team, shed light on the significant impact of motor impairment on cognitive function, especially in the area of memory. In addition to the findings, the authors examined the neural mechanisms underlying the interaction between motor impairments and cognitive processes. In attempting to create an assessment model, the authors consider individual needs and contextual factors to create individualized pathways to improve health care outcomes. This approach ensures that assessment is not only comprehensive, but also meaningful and impactful. Researches has shown that children with motor impairments demonstrate marked differences in auditory and visual memory abilities compared to typically developing peers, as well as abnormal attention development, altered word and video processing. The experience and contributions of Koriakina M.M. et al. emphasize the need to incorporate cognitive difficulties into rehabilitation programs designed for children with motor impairments. Recognizing and targeting memory improvement from an early intervention perspective can prevent additional problems in learning and daily life.

ALCOHOL-RESPONSIVE FRESNEL LENS: A NOVEL VAT PHOTOPOLYMERIZATION SENSOR FOR DIVERSE APPLICATIONS

Murad Ali
Khalifa University, UAE

Abstract:

A Fresnel lens that can detect alcohol has been created using additive manufacturing with vat photopolymerization (VPP). This lens is constructed from a transparent resin called hydroxyethyl methacrylate and is designed to capture and concentrate light through a transmission-based sensing system. When exposed to alcohol solutions, the polymer material swells, leading to changes in both the lens's focal length and the strength of its focal point. This swelling effect in the polymer is reversible and occurs due to the diffusion of alcohol molecules into the porous structure of the Fresnel lens, which consequently alters the lens's optical response, as measured by the transmitted power intensity. The sensitivity of this lens sensor was tested with ethanol, isopropanol, and methanol, yielding sensitivities of 0.36, 0.33, and 0.23 μW/vol%, respectively. The response time was found to be 25-30 minutes, and the lower limit of detection (LOD) was 5 vol.%. This manufactured sensor holds great promise for applications in various fields, including healthcare, biomedicine, the food and beverage industry, and improving human safety.

Biography

Murad Ali is a Postdoctoral Fellow at the Department of Mechanical Engineering, Khalifa University of Science and Technology, Abu Dhabi, UAE. Murad Ali completed his Ph.D. from Khalifa University in additive manufacturing from Khalifa University. Mr. Ali completed his master's degree from KFUPM, Saudi Arabia. He was previously a visiting student at the Massachusetts Institute of Technology. His research interests are additive manufacturing, optical devices, healthcare sensors, corrosion and mechanical properties of biomaterials, nanotechnology, and characterization.

IMPLEMENTATION OF THE SEEDED GROWTH METHOD IN FABRICATING 3D PRINTED NANOCOMPOSITE CONTACT LENSES FOR COLOR BLINDNESS MANAGEMENT

Said El Turk
Khalifa University, UAE

Abstract:

Color vision deficiency (CVD), often known as color blindness, is an optical disorder that is congenital. CVD impacts a large population, with males being more affected than females. There is no existing treatment for the disorder, therefore sufferers must rely on wearing devices such as color-filtering lenses and spectacles. The use of such wearable devices does not cure the disease, but it does improve patients' color perception by filtering/blocking out the problematic wavelengths at which corneal cones overlap causing the perception of two colors at once. Custom gold nanocomposite contact lenses are created using additive manufacturing to filter out the problematic wavelengths of red- green color blindness (540-580 nm). The seeded growth method was implemented for synthesizing gold nanoparticles with varying radii. Nine growth steps were used to vary the nanoparticle assemblies and achieve the desired plasmonic optical properties. Gold nanoparticles and resin composite (made of TPO, HEMA, and PEGDA) were used to fabricate nanocomposite 3D-printed contact lenses. Following that, three contact lenses with varying gold nanoparticle concentrations and particle sizes have been developed. The transmission spectra, wettability, water content, material mechanical characteristics, and optical properties of the developed contact lenses were measured and compared to those of commercial CVD wearables. The results indicated that the lenses could successfully block wavelengths of 539 nm, 552 nm, and 563 nm. The comparison of commercial CVD wearables with additively produced nanocomposite lenses reveals that the latter has appropriate color filtering capabilities for CVD management and can possibly be used commercially by actual CVD patients.

Biography

Said is a forward-thinking engineer who is at the forefront of technical breakthroughs. He has built a place in the field of specialty eyeglasses by combining needs with new technologies. Said, who utilizes 3D-printed lenses for color blindness, aims to change the lives of many people by allowing them to see the world in brilliant colors. His innovative work is not limited to eyesight enhancement; he is also leading research into bacteria reduction using nanoparticle technology. Said's work extends beyond visual improvement; he is skilled in the use of nanoparticle technology to fight bacteria, setting new standards for ocular health. His commitment to innovation and diversity has gained him knowledge in both the scientific and commercial fields. With his sights set on the future, Said sees a scenario in which his innovations continue to grow and extend. He anticipates a larger variety of possibilities for customized lenses beyond color blindness. Said is committed to improving 3D printing technology in order to achieve even better accuracy and customization in lens manufacture.

Day 2

Biomedical Conference 2023

Keynote Presentations

BIOMEDICAL OPTOACOUSTICS: FROM IDEA TO CLINICAL STUDIES WITH MEDICAL GRADE SYSTEMS

Rinat Esenaliev
University of Texas Medical Branch, USA

Abstract:

In early 90s we proposed to use optoacoustics (photoacoustics) for diagnostic applications. Optoacoustic diagnostic modality is based on thermoelastic generation of ultrasound waves by short optical pulses and combines high optical contrast and ultrasound spatial resolution. We proposed to use the optoacoustic technique for a number of applications including stroke detection and characterization (ischemic vs. hemorrhagic); cancer detection in breast, prostate, and other organs; hematoma detection and characterization; monitoring of thermotherapy (hyperthermia, coagulation, freezing); monitoring of cerebral blood oxygenation in adults, neonatal patients, fetuses during late stage labor; monitoring of central venous oxygenation, total hemoglobin concentration, and water content in tissues. Here we present our major recent achievements in optoacoustic instrumentation, pre-clinical and clinical studies, image reconstruction, and continuous monitoring. We built medical grade, nanosecond systems operating in the visible and near-infrared spectral range that are based on: 1) tunable optical parametric oscillators (OPOs); and 2) highly compact, multiwavelength, fiber-coupled, diode lasers. Moreover, we designed and built custom-made, highly sensitive, wide-band optoacoustic sensors (single-element and arrays) that combine light delivery systems and ultrasound detection. We tested these systems and pre-clinical and clinical studies and demonstrated: 1) optoacousitc wave detection from tissues at depths well beyond the light diffusion limit; 2) high-resolution detection of microscopic tissue volumes; 3) reconstruction of optoacoustic images with high contrast and resolution. We performed continuous, real-time measurements of cerebral blood oxygenation in large animal studies and in clinical studies in healthy volunteers and patients with traumatic brain injury, circulatory shock, anemia; and in neonatal and fetal patients. Recently, we proposed to use optoacoustic therapy which combined with optoacoustic diagnostics can be used for noninvasive theranostics of traumatic brain injury and other neurological disorders.

Biography

Rinat Esenaliev is Professor and Director of Laboratory for Optoacoustic Imaging and Monitoring at UTMB, Fellow of OSA and SPIE. He has 30 years of experience in biomedical optics and ultrasound, optoacoustics, optoacoustic instrumentation, and applications in monitoring, sensing, and imaging. He has pioneered a number of optoacoustic applications in biomedical imaging, sensing, monitoring, therapy, and theranostics.

ENGINEERING THE INTERACTION BETWEEN FOOTWEAR DESIGN, SOIL & TURF PROPERTIES AND HUMAN'S BIOMECHANICS

Veit SENNER
Technical University of Munich, Germany

Abstract:

3D-printing technologies, wearable sensors, powerful processors and machine learning offer great opportunities for innovative products, not only for sports, but also for robotics, ambient living or rehabilitation. However before we can make use of these, it is essential to systematically gain knowledge to understand the sensory-motor coupling in human motion. Modeling and simulations based on sophisticated experiments, but also on subjective ratings are the key to explore cause-effect-relationships, relevant confounding variables and to distinguish them from individual variability.

The presentation will take a look at footwear design, such as the stud configuration, the boot sole's friction behavior, the shoe's mass or the sole's deformation behavior under load. It will also consider the mechanical properties of the shoes' intermediate sole and its insole and how these interact with varying soil and turf conditions. Examples from trail running and typical soccer maneuvers, practiced on the sports field but also in steep stony terrain will be shown. The major focus of this talk will be on the wide spectrum of methods necessary to gain knowledge. They range from in vivo elasticity and damping measurements at the foot sole, to ground reaction force measurements with buried force plates, Laser Speckle Contrast Imaging (LSCI), leg-surrogate-studies and co-simulation using both, multi-body-models of human muscle-skeletal system and finite element models of the foot, the shoe and of different type of soil.

Biography

Veit SENNER is associate professor at Technical University of Munich (TUM), School of Engineering and Design. He holds an academic degree in mechanical engineering and a second one in sport science. 1995 he started his career in industry at TÜV SÜD, Germany's leading trusted body for certification of quality systems. During his time in industry he continued to work on his University career, receiving his Ph.D in Mechanical Engineering (Dr.-Ing.) in 2001. One year later he has been appointed as associated professor at TUM. Since then he is heading the professorship for Sport Equipment and Materials, which today is part of the department of Mechanical Engineering. Between 2005 and 2009 he has served as Associate Dean for the Faculty of Sport Science. In 2021 he has taken over the responsibility as Academic Program Director for the School's study courses in mechanical engineering. Senner's research is focusing on human-centered engineering, biomechanics, athlete equipment interaction, personal protection gear and wearables. He has supervised 20 dissertations and 28 as co-supervisor or second examiner. He has published more than 100 articles in national and international journals as first and as co-author (97 listed in scopus), his actual h-index is 13.

SUSTAINABLE XENOGRAFT GENERATION FROM ARABIAN SHEEP AND CAMELS: PIONEERING REGENERATIVE MEDICINE SOLUTIONS FOR CHRONIC METABOLIC, CARDIOVASCULAR, AND TRAUMATIC INJURIES

Peter R. Corridon
Khalifa University, UAE

Abstract:

The increasing global prevalence of chronic metabolic, cardiovascular, and traumatic injuries amplifies the urgency for viable tissues and organs for transplantation. Regrettably, the supply remains inadequate to the soaring demand. As tissue engineering and regenerative medicine progress, they present promising avenues to bridge this disparity through innovative materials and methods. Our laboratory is at the forefront of this evolution, introducing high-throughput platforms for generating sustainable xenograft models. We have engineered functional xenografts by utilizing discarded ovine, camel eyes, and blood vessels, efficiently repurposing waste. The process involves simplified, cost-effective, scalable, and sustainable techniques. This approach has allowed us to focus on addressing medical challenges such as age-related macular degeneration, corneal opacity, and diabetic retinopathy, as well as hemodialysis access line and bypass vascular graft, utilizing a biomaterial-centric approach. This method generates hundreds of tissue-specific extracellular matrix templates and hydrogels from decellularized scaffolds, extracting vital bioactive factors using assorted extraction techniques. The work hinges on discarded tissues/organs from the prominent Arabian sheep (Najdi, Awassi (Nuaimi), and Orb) and Arabian camel (Dromedary) breeds in the UAE are being repurposed to generate native and acellular keratoprostheses and vascular prostheses. All cameline and ovine samples are obtained from the Automated Slaughter local slaughterhouse, and camel samples are collected from the Advanced Scientific Group under the benevolent auspices of HH Sheikh Hamdan Bin Zayed and HH Sheikh Hazaa Bin Zayed. All tissues are treated with antibiotics and various antiseptic techniques to limit pathogenicity. Various biochemical, biomechanical, spectroscopic, and flow-based assessments are conducted to examine scaffold quality. Moreover, an additional uniqueness of our approach lies in its amalgamation with advanced computational tools and artificial intelligence-driven evaluations, underpinning high-throughput therapeutic models. This presentation will discuss various aspects of our approaches and highlight how our models facilitate pharmacological interventions for the abovementioned conditions. The insights from our research herald a promising future for addressing transplantation deficits and bolster the potential for groundbreaking advancements in regenerative medicine and biotechnology in a sustainable manner.

Biography

Peter R. Corridon is Assistant Professor of Immunology and Physiology in the College of Medicine and Health Sciences at Khalifa University. Dr. Corridon is a Medical Biophysicist, inventor, and entrepreneur whose expertise lies at the intersection of biomedicine, microvascular surgery, mathematics, physics, and engineering. He has published several papers in peer-reviewed international journals and conferences and received research grants with colleagues from Germany, and the United States, the United Kingdom, and the United Arab Emirates. His research focuses on microvascular remolding that supports tissue/organ regeneration and replacement and uses functional dynamic imaging to study these processes.

STEP BY STEP ENDOMETRIOSIS SURGERY

Ameneh Haghgoo
Nikan Hospital, Iran

Abstract:

Endometriosis as a common disease may needs surgical approach and as it involves some crucial and important parts of pelvic and abdominal organs , therefore it's surgical approach needs careful considerations, knowledge and experience.

Pre-operative assessment and preparation for surgery include a complete medical history, clinical examination and imaging techniques such as ultrasonography and lab tests, and if it needed more investigations for assessing the ureter, bladder, bowel involvement, or malignancy screening, further assessment like MRI, DTPA scan or colonoscopy could be necessary.

Initial steps of Deep Endometriosis (DE) surgery consist patient's lithotomy positioning which provides better approach to pelvic cavity, uterine, bladder and bowel as well as preventing nerve injury. Consequently, after inserting the laparoscope, systematic laparoscopic inspection is recommended, after that the placement of secondary trocars for the various instruments should be individualized according to the anatomical situation and surgical needs.

Generally, endometriosis surgery steps include: Identify the lesions, free and isolating the lesions, adhesiolysis with exploration and assessment of the extent of endometriosis and restore pelvic anatomy in addition to complete excision of endometriosis. Initiate the dissection in areas free of disease (Dissection of Para-vesical and lateral Para-rectal spaces, Ureterolysis, Nerve dissection, Rectovaginal space dissection, Vescico-vaginal space dissection, Ureteric tunnel dissection, optimize exposure by using manipulators, ovariopexy and additional ports, if necessary.

Analyzing perioperative management, intraoperative evaluation during surgery makes final decision for surgical planning based on intraoperative findings. A multidisciplinary approach and collaboration between gynecologists, urologists, and colorectal surgeons enabled a successful management of the disease.

There are several surgery techniques for ureter endometriosis including ureteral dissection, ureterolysis and/or double J Pigtail stent (JJ) insertion, Uterouretrostomy, Ureteroneocystostomy. These methods individualized depending upon the extent, site, and severity of lesions, severity of hydronephrosis and Renal function.

Certain techniques are suggested for Bladder endometriosis in surgical treatment including Transurethral Resection (TUR), partial resection, as well as shaving. However, a complete resection with TUR is unachievable, since the nodule develops from the outer layer towards to the inner layer of the bladder wall. Furthermore, an endometriosis nodule is not always detectable with cystoscopy. TUR has a high risk of bladder perforation and a recurrence of endometriosis. Therefore, TUR cannot be considered as an efficient treatment of bladder endometriosis.

Several techniques for the Second step of surgery for DE involving rectovaginal such as shaving, discoid, segmental resection could perform depending on the size, location, extension of the lesion, severity of nodule and number (single or multifocal), as well as the degree of infiltration.

surgical strategy for diaphragmatic endometriosis could be combining resection and ablation techniques, the laparoscopy and thoracoscopy route, conventional and robotic-assisted minimally invasive approach, that is as conservative as possible, and can limit postoperative adhesions between the liver and the diaphragm, and avoid diaphragmatic paralysis.

Excisional techniques used to surgically treat Deep Endometriosis (DE) can result in inadvertent damage to the autonomic nervous system of the pelvis, leading to Urinary, Anorectal, and Sexual Dysfunction. Proper identification and preservation of the hypogastric nerves within the USL (uterosacral ligament) DE complex during laparoscopic nerve-sparing DE surgery is important and can minimize the risk of inadvertent nerve injury. Laparoscopic excision of deep endometriosis nodules involving the sciatic nerve is a challenging procedure, requiring good anatomic knowledge, surgical skills, preliminary specific training, and multidisciplinary postoperative care. By following sequential steps, the surgeon may reduce the risk of hemorrhage originating from the external iliac, obturator, and pudendal vessels; preserve somatic nerves; and successfully excise deep endometriosis nodules.

Biography

Ameneh Haghgoo born on March of 1975, she is a Member of American Association of Gynecologic Laparoscopists (AAGL), Iranian Society of Gynecologists & Obstetricians (ISGE), executive committee NAIGO and ISMIG, Former Board member of Iranian Society of Minimally Invasive Gynecology (ISMIG), International Society for Gynecologic Endoscopy (ISGE) and Responsible for International Relations of NAIGO and ISMIG. From 2016 till date she is working as a head of minimally invasive gynecological surgery at Nikan Hospital, Iran.
Teaching Experience:
Actively involved in Post graduate and undergraduate training:
-Holding several training workshops in trocar insertion, suturing, myomectomy, hysterectomy, ureter dissection, pelvic anatomy and diagnostic hysteroscopy, hysteroscopy-myomectomy, uterine septum.
-setting, programming and holding 6-month fellowship course in laparoscopy as dry lab, theory and hands-on training.
Working position:
I work as a head of minimally invasive gynecological surgery department of Nikan hospital.
Annually more than 600 surgical procedure perform in gynecology, laparoscopy and hysteroscopy fields.
Complicated endometriosis and hysteroscopy as well as complicated gynecologic surgery referred to my office. Also advanced and complicated laparoscopy and hysteroscopy is my interest and professionality.
Furthermore, I work in endometriosis team work consist of colorectal surgeon, endourologist and radiologist expert of endometriosis in Nikan hospital. Advanced Endometriosis surgery including segmental resection, ureteral resection, nerve sparing, ureteral implantation and ureteral re-anastomosis are my other skills.

Day 2

Biomedical Conference 2023

Oral Presentations

USE OF NEUROTECHNOLOGIES IN COMPREHENSIVE TREATMENT OF CHILDREN WITH SEVERE UPPER LIMB FUNCTION DISORDERS

Blagovechtchenski Evgeny
Ministry of Health of the Russian Federation, Russia

Abstract:

Despite the achievements of modern medicine, the problem of the effectiveness of restoring the function of the upper limbs remains relevant. It uses modern possibilities of neurotechnologies and psychology. Our data show the need for additional techniques for treating patients with motor dysfunction, in addition to the unique surgical intervention and standard therapy. The research results indicate the need to modify the general educational programs for children with motor disorders, considering the identified age and symptomatic features. This will allow patients to match healthy children in overall development. In addition, recent studies show the importance of moving to a personalized approach in treating extremely severe patients.

In our study, we tried to assess the possible reflection of the disease arthrogryposis in children in the amplitude and neurodynamic parameters of the EEG (10). This work showed a significant difference in EEG power in the ranges of 4-8, 8-12, and 12-16 Hz in children with arthrogryposis and healthy children. Probably, the fact of a decrease in the amplitude of rhythms in the EEG in sick children is explained by their lower general motor activity. We can conclude that the lower amplitude values in patients are not associated with sick children's low motor activity but rather reflect some reduced tonic level of neuronal activity of the cerebral cortex. To contrast the processing of motor-related and non-motor-related words in healthy children and children with motor impairments, we used an EEG mismatch negativity (MMN) paradigm. Our study showed altered MMN patterns in children with upper limb motor disorders. The effect was mainly observed only in the oddball series containing verbs associated with hand movement. The leg-verb and pseudoword series did not produce statistical differences in the MMN waveform between the affected children and their control peers. We hypothesize that altered motor development with selectively impaired movements influences language processing in a semantically specific manner.

Our data also indicate that children with motor disorders (arthrogryposis and Erb's paresis) also have psychophysiological abnormalities. Such deviations manifest themselves at the level of brain biopotentials and impairment of cognitive skills. Treatment of such children should not only be limited to surgical intervention and a course of standard rehabilitation procedures but also to a personalized approach, using modern neuro- and psychological technologies and, possibly, editing educational programs for such children.

Biography

Evgeny Blagoveshchensky was born and raised in Veliky Novgorod, Russia. In 1994, he graduated from high school N2 in Veliky Novgorod. His passion for neuroscience led him to pursue higher education at St. Petersburg State University, where he earned his Bachelor of Arts in Higher Nervous Activity and Psychophysiology in 1998. He furthered his academic journey at the same institution, obtaining his MD in neuroscience in 2000 and completing his PhD in physiology in 2003. Currently, Blagoveshchensky serves as a Senior Researcher at St. Petersburg State University's Department of Higher Nervous Activity and Psychophysiology. He holds a similar position at the National Research University "Higher School of Economics," specifically in the Centre for Cognition & Decision Making. Additionally, he shares his expertise as an Associate Professor at St.

Petersburg State Institute of Psychology and Social Work. Blagoveshchensky possesses a diverse skill set in the field of neuroscience, including expertise in behavioral tests, intracellular recording of neuronal activity, multicell recording, implantation of stimulating electrodes in various brain regions, histological control of brain damage, PCR, confocal microscopy, patch-clamp techniques, transcranial magnetic stimulation, and electroencephalogram (EEG) and electromyogram (EMG) recording. He is also proficient in programming languages such as C, C++, Java, PHP, Matlab, and SQL, showcasing his interdisciplinary approach to research. Evgeny Blagoveshchensky continues to make significant contributions to the field of neuroscience, both through his research endeavors and educational initiatives, inspiring future generations of scientists and researchers.

INNOVATIVE MULTIFUNCTIONAL CONTACT LENSES: CUSTOMIZED COLOR CORRECTION AND TEAR PH MONITORING

Abdelrahman Ahmed Sakr
Khalifa University, UAE

Abstract:

Color vision deficiencies, often referred to as color blindness, present notable obstacles in perceiving and distinguishing specific colors, significantly affecting daily activities. Existing solutions like color-filtering eyeglasses and contact lenses have been developed to mitigate these challenges. Nevertheless, creating personalized eyewear tailored to individual patients remains a complex task. This study endeavors to craft multifunctional contact lenses amalgamating color filtering and pH sensing functionalities to cater to personalized color vision correction. The novelty lies in a pH-responsive hydrogel infused with Neutral red dye, fine-tuned for 3D printing through vat photo polymerization. Employing an innovative in-house multimaterial 3D printing approach, lenses were manufactured to possess both color filtering and pH sensing capabilities. The lenses featured outer radial rings fashioned from a porous, pH-responsive polymer and a central portion containing a dye-doped resin, allowing customizable wavelength blockage. The outcomes underscore the seamless amalgamation of color filtering and pH sensing attributes within the designed multifunctional and multimaterial contact lenses. These lenses not only show promise in customized color vision correction but also in the ongoing monitoring of tear film pH, a critical aspect of evaluating ocular health. The dye exhibited impressive responsiveness to shifts in pH, transitioning from a deep reddish hue under acidic conditions to lighter yellowish tones with increasing alkalinity. This inherent sensitivity eliminates the need for intricate post-processing of signals and offers a practical means of early inflammation detection in the eyes. Pioneering the integration of color filtering and pH sensing in contact lens technology, this research paves the way for superior visual experiences and bespoke solutions for individuals grappling with color vision impairments, heralding a future marked by more precise and efficacious visual impairment management.

Biography

Abdelrahman is currently dedicated to the pursuit of a Master's degree in Mechanical Engineering at Khalifa University. His primary focus lies in engaging with research projects at the cutting edge of technology, notably delving into the realms of 3D printing, biotechnology, hydrogels, nanomaterials, and composite materials. This academic journey underscores his commitment to exploring and unraveling the potential of emerging technologies, poised at the crossroads of mechanical engineering and its innovative applications. Khalifa University, esteemed for its research-intensive approach and academic distinction, provides an ideal platform for Abdelrahman to delve into these specialized domains. Through his academic and research pursuits, he endeavors to contribute significantly to the field of mechanical engineering, driving progress and innovation that will shape the future of these disciplines.

GRAPHENE INCORPORATION OF CONTACT LENSES THROUGH CHEMICAL VOLUMETRIC MODULATION

Muhammed Shebeeb C
Khalifa University, UAE

Abstract:

Multifunctional contact lenses can be synthesized by adding different additives to increase their value. The incorporation of graphene is used to improve the water retention in contact lenses, providing superior comfort and extended wearability. The excellent thermal and electrical conductivity of graphene allows for integrating advanced sensors and electronic components directly into the lens, opening up new avenues for monitoring eye health and providing augmented reality experiences. The current works in contact lenses having graphene involves attaching graphene grown through Chemical Vapor Deposition (CVD) onto contact lenses through molding. There have been investigations into how they can improve functionalities such as microwave protection and dehydration reduction. However, the complexity of the procedure makes it difficult to manufacture. Also, the decrease in transparency upon increasing graphene layers limits the scope. In this work, we incorporate graphene into commercial contact lenses through the breathing in - breathing out (BI-BO) technique. Graphene was exfoliated in water using high-speed shear mixing to produce graphene ink. This graphene ink was used as the aqueous solution in BI-BO, whereby a hydrated contact lens shrunken in aprotic solvent is then placed in an aqueous solution containing nanoparticles to swell. The BI-BO cycles were repeated to obtain the necessary attachment without losing transparency beyond acceptable limits. Scanning Electron Microscopy was utilized to see graphene dispersion within contact lenses. The UV-Vis spectroscopy indicated steady absorption throughout the visible region as a tinting additive for visible light, suggesting for uses such as sunglasses. Since the technique does not involve complex procedures such as CVD, it could synthesize large amounts of functionalized contact lenses with acceptable transparency in a short span.

Biography

Muhammed Shebeeb C is a dedicated researcher and Ph.D. candidate in Materials Science and Engineering at Khalifa University, Abu Dhabi. Under the expert guidance of Professor Haider Butt, he research the potential of hydrogels in revolutionizing contact lens technology focusing practicality and innovation. His primary focus lies in enhancing the functionality of contact lenses beyond vision correction. With a passion for materials science, he is determined to make a difference in the lives of individuals with visual impairments. One of his key areas of interest is addressing color vision deficiency, a common visual impairment affecting many individuals worldwide. His research aims to develop contact lenses that not only provide vision correction but also assist in mitigating color vision deficiencies, thereby enriching the daily experiences of those affected. In addition to color vision correction, Muhammed is deeply committed to advancing drug delivery systems through hydrogel-based contact lenses. His work explores the possibility of these lenses serving as a discreet and efficient method for controlled drug administration, potentially revolutionizing the treatment of various ocular and systemic conditions.

ACCELEROMETER MEASURED PHYSICAL ACTIVITY, SEDENTARY TIME, AND HEALTH-RELATED OUTCOMES IN A SAMPLE OF EMIRATI FEMALE STUDENTS

Arto Gråstén
United Arab Emirates University, UAE

Abstract:

Technological development has dramatically changed people's lifestyles in past decades. As a result, previous research has consistently revealed insufficient physical activity engagement and excessive sedentary time in young adults worldwide. In the United Arab Emirates, nearly 75% of young Emirati females self-report being physically inactive and spending 80% of their waking hours in sedentary behaviour. Insufficient physical activity may increase the risks of developing unhealthy conditions, e.g., overweight, obesity, and high blood pressure. This pilot study examined Emirati female students' accelerometer-measured physical activity, sedentary behaviour, and health-related outcomes. The data were collected from a sample of 158 undergraduate female college students. The data were collected during the spring semester in March 2023. The findings confirmed insufficient physical activity in female college students measured using accelerometers. Most participants accumulated extremely low moderate- to vigorous-intensity activity and excessive sedentary time. Great variations, for example, in blood pressure and body composition scores were found. A significant concern arising from these findings is a need for more awareness of the importance of engaging in physical activity among young Emirati female students.

Biography

Arto Gråstén, PhD in sports sciences, master's in education, is an associate professor in physical education at the College of Education, United Arab Emirates University, and an Adjunct Researcher at the Faculty of Sport and Health Sciences, University of Jyväskylä, Finland. His research covers the topics of physical activity enhancement, physical education, motor competence, and self-determined motivation. His interests include applying and developing quantitative research methods in the field.

FACTORS ASSOCIATED WITH AGE AT MENARCHE, MENSTRUAL KNOWLEDGE, AND HYGIENE PRACTICES AMONG SCHOOLGIRLS IN SHARJAH, UAE

Shahad Mamoun, Ahmed Amena Mohamad Ali, Sara Alaaeldin Bashier, Hiyam Husam Eddin Subeh, Rania Mahmoud Taha, Samah Ali Ibrahim, Rahaf Fouad Altelbani, Nada Ayman Yakout, Asiyeh Ibrahim Davoodi, Amna Khalid and Asima Karim

University of Sharjah, UAE

Abstract:

Background: Age at onset of menarche is an important milestone in a female's life, generally affected by several factors. The study aimed to determine the mean menarcheal age and whether anthropometric, environmental, and socioeconomic status influences age at onset of menarche in the girls from Sharjah, United Arab Emirates. It also aimed to assess their knowledge regarding menstruation and associated hygiene practices.

Methods: This cross-sectional study was conducted in 4 private schools in Sharjah, recruiting 410 school-going girls aged 8-17 years. Menarcheal status data and knowledge were obtained *via* a self-administered questionnaire, and the anthropometric data were collected by using weighing scale and portable stadiometer. Inferential statistics tests were applied for comparison, $P<0.05$ was considered statistically significant.

Results: The age at menarche was normally distributed and mean was 11.5 years (±1.17 SD) in the study population. BMI along with other factors were not significantly correlated with the mean age at menarche. A significant correlation was found between lower household income and delayed menarche onset ($p=0.005$). Students who are currently less than 12 years are attaining menarche earlier than older students. Only 57.7% of schoolgirls had good knowledge about menstruation and 54.7% adopted adequate practices. Girls having school as their primary source of knowledge were 2.54 and 1.6 times more likely to have adequate knowledge and proper hygiene practices, respectively.

Conclusion: The mean age at menarche in Sharjah, UAE is 11.5 years which is earlier than other gulf regions. Considering impact of schools on knowledge regarding menstruation, we recommend earlier implementation of menstrual education programs.

Biography

Shahad Mamoun is a fifth-year Medical student at the University of Sharjah who possesses a keen interest in research and has actively participated in numerous studies. She exhibits a profound passion for the fields of Obstetrics/ Gynecology and Internal Medicine and aspires to pursue a career in either of these specialties.

REGULATORY MECHANISM OF OSRUVB TRANSGENE IN IMPROVING SALT STRESS TOLERANCE OF LEGUME CROP

Nita Lakra, Deepak Kumar, Parul Sharma and Annu Luhach
CCS Haryana Agricultural University, India

Abstract:

Legumes are indeed a nutritious and affordable source of protein. They contain many essential nutrients, including vitamins, iron, calcium, potassium, phosphorus, zinc, carbohydrates, and fiber. Legumes also contribute to global crop production, accounting for approximately 27 percent. Additionally, legumes have the unique ability to fix atmospheric nitrogen. Chickpea is one of the most important legume crops of India. However, production in legume crops is adversely affected due to salinity in arid and semi-arid regions of the world. Biotechnological approaches are advancing daily, and the future of legume production depends on successfully utilizing these techniques to develop tolerant cultivars. Several genes have been transferred in plants to increase salinity-stress tolerance. However, our knowledge about the regulatory mechanisms of tolerance is still enigmatic. The present study revealed the mechanism of action of the helicase gene using proteomics in transgenic chickpea for salinity stress tolerance. Results showed that number of proteins related to photosynthesis, stabilization of membranes and anti-oxidative defence process were more accumulated in transgenic plants as compared to non-transgenic (WT) plants. It revealed the role of OsRuvB gene in providing salt tolerance to chick pea by maintaining the anti-oxidative system and membrane stability.

Biography

Nita Lakra is a distinguished scientist specializing in plant molecular biology, with a primary research focus on understanding how crop plants respond to abiotic stressors such as salinity, high temperature, and drought. Her expertise extends to various fields, including molecular biology, proteomics, immunological techniques, microbiological techniques, and the proficient handling of analytical instruments. Lakra has a strong international presence, having actively participated in numerous conferences and workshops worldwide. Her outstanding contributions have earned her several awards. Notably, she holds lifetime memberships in both the American Society of Plant Biologists, USA, and the Indian Society for Plant Physiology at the Indian Agricultural Research Institute in New Delhi. She visited UMASS, Amherst, Massachusetts, USA (July 2016): Under a Bilateral Agreement between the University of Massachusetts Amherst and the Jawaharlal Nehru University, New Delhi for research collaboration. Currently, she holds a position at CCS Haryana Agricultural University in Hisar, where many MSc and PhD students are working under her supervision and guidance.

OPTICAL FIBER PROBE FOR BIOMEDICAL MONITORING

Israr Ahmed
Khalifa University, UAE

Abstract:

Optical fiber sensors are critical optical devices with excellent sensing capabilities and the capacity to operate in remote and hostile environments. However, integrating functional materials and micro/nanostructures into the optical fiber systems for specific sensing applications has compatibility, readiness, poor control, robustness, and cost-effectiveness limitations. Herein, we have demonstrated hydrogel-based optical fiber sensors integrated with photonic nanostructures for different biomedical applications, including Alcohol and Glucose. A low-cost, simple and rapid process was used for the replication of nanostructures on stimuli-sensitive hydrogel material. The sensor fabrication involved one step UV-polymerization process where hydrogel was polymerized on the tip of commercial optical fiber. Integrating photonic nanostructures plays a vital role in enhancing the proposed sensing system's sensitivity and limit of detection. The hydrogel matrix undergoes swelling in response to external stimuli, altering the optical response of sensor which was recorded in the form of diffraction efficiency. The real-time sensing capability of the developed sensors was demonstrated in response to various concentrations of different alcohols (0 – 100vol%) and glucose (0 – 50 mM) concentrations. The change in the optical response of the sensor was demonstrated in both transmission and reflection modes. Higher sensitivity, lower limit of detection and fast response time were recorded for all measurements. The practicality of the sensors was tested using smartphone readout. The optical power was measured using a smartphone exploiting its photodiode, and the power changes were correlated with the sensing entity. These developed sensors may have applications in remote, continuous, and real-time monitoring systems.

Biography

Israr Ahmed completed his M.Sc. in Physics at Heidelberg University, Germany, in 2017. He is pursuing his Ph.D. in Material Science & Engineering at Khalifa University, United Arab Emirates. His current research focuses on developing hydrogel-based fiber-optic probes for sensing applications.

3D PRINTED MULTIMATERIAL CONTACT LENSES FOR RED-GREEN AND BLUE-YELLOW COLOR BLINDNESS CORRECTION

Muhammed Hisham
Khalifa University, UAE

Abstract:

Color blindness is an illness that affects one in 12 males and one in 200 females around the world. It occurs when cone cells in eye retina are either absent or malfunctioning. The two common types of color blindness are red-green color blindness and blue-yellow color blindness. Although, color blindness correction glasses are available in the market, they are not fully effective and not suitable for everyday use. This work presents a novel technique of multimaterial 3D printing for producing customizable contact lenses with color blindness correction capabilities. Contact lenses are produced using a hydrogel resin consisting of hydroxyethyl methacrylate (HEMA) and polyethylene glycol diacrylate (PEGDA). Two dyes, Atto565 and Atto488 were added to the hydrogel for wavelength selective filtering of light. A vat-photopolymerization printer was used for 3D printing. Multimaterial contact lenses were printed by pausing the printer at required points and changing the material in the vat. Multimaterial contact lenses with these two dyes deposited in separate regions were produced using 3D printing. Atto565 displayed light absorption around 570nm providing correction for red-green color blindness. Atto488, on the other hand, had light absorption around 510nm providing correction for blue-yellow color blindness. A HEMA:PEGDA ratio of 35:1 was best for optimal contact lens properties. The 3D printed contact lenses had good water absorption behavior and suitable mechanical properties. AFM studies revealed good surface quality for the lenses. The light spectra of 3D printed contact lenses were comparable with commercial color blindness correction glasses. 3D printed contact lenses had the additional benefit of easy patient specific customization and better aesthetic appearance.

Biography

Muhammed Hisham received B.Tech. Degree in Mechanical Engineering from National Institute of Technology Calicut, India in 2016. He received M.S. Degree in Interdisciplinary Engineering from Indian Institute of Madras, India in 2021. His master's thesis focused on dimensional accuracy, properties and shape morphing behavior of vat photopolymerized functionally graded hydrogels. He is currently pursuing a PhD in Mechanical Engineering at Khalifa University, Abu Dhabi, UAE. His PhD thesis focuses on 3D printed multifunctional contact lenses. He seeks to explore novel 3D printing techniques for efficient production of contact lenses with advanced abilities for vision correction, health monitoring and drug delivery. He also has previous industry experience working in retail engineering department at Hindustan Petroleum Corporation Ltd., Chennai, India. He has also previously worked on the addition of graphite oxide for fracture toughness improvement of glass fiber reinforced epoxy composites. His other research interests include process optimization for 3D printing and shape-change materials.

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HYPERPARAMETER OPTIMIZATION FOR ELECTROENCEPHALOGRAM DATA ANALYSIS USING HYBRID CLASSIFICATION ALGORITHMS

Lyudmila Egorova
Siberian Federal University, Russia

Abstract:

The accumulation of huge amounts of biomedical data has stimulated progress in the formation of automatic classification methods used by machine learning and artificial intelligence systems in medical automated systems. The main direction of this development is to increase recognition accuracy, algorithm performance, and achieve the ability to process large volumes of data in real time.

The search for the optimal hyperparameters has a significant impact on the performance quality of classification algorithms. To solve this problem, various optimization methods are widely used, including those based on genetic algorithms.

Over the past few decades, many approximate optimization algorithms have been developed. One of the main groups of approximate algorithms are specific heuristics and metaheuristics. Although they do not guarantee the achievement of a global optimal solution, metaheuristics can solve optimization problems by finding solutions of sufficient quality in a reasonable time. Many metaheuristic algorithms mimic natural metaphors to solve various complex optimization problems.

Automatic classification methods have been developed in such fields of science as neurobiology and bioinformatics for analyzing the functional state of the brain in research and clinical applications, including in such a promising area of research as BCI (brain-computer interface) technology.

In these areas of research, one of the important tools for studying human higher nervous activity is the electroencephalogram (EEG). EEG is a recording of electrical potentials formed by huge populations of neurons in the brain and is a reflection of the information processes occurring in it. EEG technology is used to diagnose various neurological disorders such as epilepsy, Alzheimer's disease, strokes and many others and is widely used in clinical practice.

Currently, in medical practice, EEG recordings are analyzed primarily manually. This process is time-consuming and requires the participation of a qualified specialist - a neurologist. The development of methods for automatic analysis of electroencephalogram data with high accuracy and performance will significantly reduce the research time, reduce its cost, and eliminate the influence of the subjective factor on the research result.

Fundamental to solving this problem is the search for suitable informative features. This paper discusses the use of nonlinear features for classifying time series of electroencephalograms, such as entropy, Lyapunov exponents, and fractal characteristics. These informative signs reflect the chaotic nature of the processes occurring in the brain as a complex system.

Biography

Lyudmila Egorova is a researcher at the laboratory "Hybrid methods of modeling and optimization in complex systems" at Siberian State University. Her research interests include optimization, machine learning and artificial intelligence methods and their applications in the field of medical technology. Lyudmila Egorova is the author of a number of scientific papers on the problem of automatic processing and analysis of electroencephalogram signal data in order to identify pathologies associated with epilepsy.

APPLICATION OF MASSIVELY PARALLEL HYBRID CLUSTERING ALGORITHMS TO PRODUCTION BATCHES OF MEDICAL DEVICES

Ivan Rozhnov
Siberian Federal University, Russia

Abstract:

Progress in the formation of automatic grouping methods has the main direction on their fast performance, which are involved in such branches of science as artificial intelligence, data mining, etc. Due to the application of models of optimal placement and automatic grouping of objects, the requirements, including economic efficiency, increase. Clustering methods can group objects by building models of object relationships in a continuous space of characteristics. Such methods have the possibility to be applicable at sufficiently large data volumes. Algorithms similar to k-means find all groups to partition simultaneously. Tasks should be solved interactively under limited running time with a large amount of input data.

Since features of the target and constraint functions, such as modality, convexity and smoothness, limit the applicability of exact methods, many approximate algorithms have been developed over the past few decades. One of the main groups of approximate algorithms are specific heuristics and metaheuristics. Although they are not guaranteed to achieve a global optimal solution, metaheuristics can solve optimisation problems by finding solutions of sufficient quality in a reasonable time. Many metaheuristic algorithms mimic natural metaheuristics to solve a variety of complex optimisation problems.

Virtually no country produces the entire range of specialised components for use in medical equipment due to the low volume of their consumption. The tasks of equipment completion are solved through the use of foreign-made components and equipment completion with domestically manufactured components, often through specialised technical centres. To reduce the computational time of selecting potentially unreliable products of electronic component base, parallel algorithms with a greedy agglomerative heuristic procedure for solving problems of automatic grouping of large amounts of data, adapted to the CUDA architecture, have been proposed.

It was shown that parallel implementation of individual steps of the greedy agglomerative heuristic procedure allows to construct automatic grouping algorithms with a high acceleration factor reducing the computation time by tens of times without deterioration of the achieved value of the target function.

Biography

Ivan Rozhnov is a specialist in the field of data science. He is a member of the Russian Association of Artificial Intelligence and a senior researcher at the Hybrid Methods of Modelling and Optimisation in Complex Systems laboratory. Author of more than 140 scientific publications, books and textbooks, as well as more than a dozen Rospatent certificates. He is a reviewer in leading scientific and technical journals.

Day 2

Biomedical Conference 2023

Poster Presentations

THERAPEUTIC POTENTIAL OF NATURAL MINERALS FOR METABOLIC DISEASES *IN VITRO* AND *IN VIVO*: REGULATION OF MITOCHONDRIAL FUNCTION

Yun Hee Shon
Kyungpook National University Hospital, South Korea

Abstract:

Deep sea water (DSW), containing high levels of minerals such as magnesium (Mg), calcium (Ca), and potassium (K), is a natural resource that has received much attention for its biological and clinical applications in the fields of health food and medicine. Several studies suggest that DSW may prevent metabolic disorders. Our previous studies revealed that balanced deep-sea water (BDSW) has potential as a treatment for diabetes and obesity. A decrease of mitochondrial biogenesis and dysfunction is recognized as a core feature of metabolic diseases. In this study, we aimed to investigate the mechanism by which BDSW regulates diabetes and obesity by studying its effects on mitochondrial metabolism. To determine whether BDSW regulates mitochondrial biogenesis and function, we investigated its effects on mitochondrial DNA (mtDNA) content, mitochondrial enzyme activity, and the expression of transcription factors, mitochondria specific genes, as well as on the phosphorylation of signaling molecules associated with mitochondria biogenesis and its function in C2C12 myotubes. BDSW increased mitochondrial biogenesis in a time-and dose-dependent manner. Quantitative real-time PCR revealed that BDSW enhance genes expressions for mitochondrial transcription, mitochondrial fusion, mitochondrial fission, mitochondrial protein import, fatty acid oxidation and oxidative phosphorylation. Upregulation of these genes was validated by increased mitochondria staining, citrate synthase activity, cytochrome c oxidase activity, NAD+ to NADH ratio, and the phosphorylation of signaling molecules such as AMPK and SIRT1. Moreover, drinking BDSW remarkably improved mtDNA content in the muscles of HFD-induced obese mice. In conclusion, our findings suggest that the stimulatory effect of BDSW on mitochondrial biogenesis and function may provide further insights into the regulatory mechanism of BDSW-induced anti-diabetic and anti-obesity action.("This research was a part of the project titled 'Global multi-combination product development and export utilizing deep seawater extracted minerals (FDA notification)' funded by the Ministry of Oceans and Fisheries, South Korea.")

Biography

Yun Hee Shon has completed her PhD from Eastern Virginia Medical School (USA). She has published more than 70 papers in SCI(E) journals and has registered 18 patents. She has years of research, evaluation and teaching experience in hospitals and educational institutions.

LIGHT INDUCED *IN VITRO* ANTICANCER PHOTOTHERMAL THERAPY USING SILVER AND GOLD NANOPARTICLES

Aleš Panáček
Palacký University, Olomouc, Czech Republic

Abstract:

For many years, cancer diseases have been among the major threats to human health. Light-based phototherapy is a promising technique used in anticancer approaches and, in combination with noble metal nanoparticles (NPs), represents an effective way to treat cancer diseases. The main goal of this work is controlled synthesis of noble metal NPs with tunable plasmonic properties for in vitro studies of anticancer photothermal (PT) efficacy. Silver and gold NPs with tunable optical properties within visible spectral region were synthesized using wet reduction process and deposited on a 96-well plate using the layer-by-layer technique to evaluate in vitro photothermal anticancer efficacy to human cervical carcinoma cells (HeLa). To induce the photothermal effect, laser sources of different powers and wavelengths corresponding to the plasmon band of the metal NPs were used. Temperature increase during irradiation of the Ag and AuNPs-coated cultivation plates was determined by a thermographic camera. A significant decrease in cell viability was observed in HeLa cells cultivated on both Ag and AuNPs-coated plates subjected to irradiation of various irradiation energy doses (exposure time). The highest photothermal anticancer effect with cell viability decreasing under 35% was induced using AuNPs-coated plates irradiated by 660 nm laser (100 mW) at irradiation energy of 10 J. However, the viability of the cells cultivated on normal plates and subjected to the same energy doses remained unchanged. Based on the obtained results we can conclude that this relatively non-invasive and novel technique based on physico-chemical properties of plasmonic materials is offered as an effective and promising tool to fight against cancer diseases.

Biography

Aleš Panáček is a senior researcher at the Department of Physical Chemistry, Faculty of Science, Palacký University. His scientific work is focused on controlled synthesis of noble metal-based nanomaterials, study of their chemical, physical, optical, catalytical and biological properties. He specializes in antimicrobial and cytotoxic efficiency including photothermal effect of metallic nanoparticles and silver-based nanocomposites applicable in medicine. Its main contribution is the development of the field of nanomedicine, especially thanks to research in the field of synthesis and application of so-called nanoantibiotics – i.e. nanostructured antimicrobial substances potentially usable for elimination of pathogenic bacteria and treatment of bacterial infections, including cytotoxicity against mammalian cells. Through his research, he significantly contributed to the possibility of overcoming bacterial resistance to antibiotics by restoring the effectiveness of antibiotics using biologically active silver nanoparticles. Like one of the first researchers, he discovered and described the mechanism of bacterial resistance to silver nanoparticles, including how to overcome it. He has over 70 publications that have been cited over 6000 times, and his publication h-index is 29.

PUTRESCINE IN MODULATING MORPHO-PHYSIOLOGICAL AND BIO-CHEMICAL TRAITS: ENHANCING HEAT TOLERANCE IN *BRASSICA JUNCEA* SEEDLINGS

Parul Sharma
CCS Haryana Agricultural University, India

Abstract:

A variety of environmental issues are affecting crops all across the world, but rising temperatures are posing the greatest threat. High temperature has been found to drastically inhibit seedling emergence and cause leaf necrosis at the seedling stage, which results in poor plant stand and significantly decreased yields. Polyamines (PAs) are positively charged, low-molecular-weight aliphatic nitrogenous bases present in all living organisms and are involved in various biological processes in plant growth and development, including senescence and response to different abiotic stresses. Putrescine (Put) functions as a master growth regulator that promotes optimal plant development and greater stress tolerance. Here, the current study aimed to elucidate how Put (1 mM) functions in reducing the negative impacts of high temperature on four varieties of *Brassica juncea* (RH-1707, RH-1708, RH-1566 and RH-1999-42). Exposure of plants to high temperature resulted in decrease in growth parameters, chlorophyll content and relative water content. Simultaneously, increases were found in antioxidant enzymes namely SOD, Catalase and Peroxidase, electrolyte leakage, lipid peroxidation, hydrogen peroxide content, proline content and stomata related parameters such as density and pore size. High temperature more significantly affected varieties RH-1707 and RH-1708, while RH-1566 and RH-1999-42 showed lesser effects. Exogenous application of Put mitigated the negative impacts of high temperature by enhancing growth, chlorophyll content, relative water content and antioxidant enzyme activities and, simultaneously, it reduces oxidative damage, stomatal pore size and density. This study specifies that varieties RH-1707 and RH-1708 are sensitive whereas RH-1566 and RH-1999-42 are tolerant of high temperature and provides an insight into the effectiveness of Put in mitigating the effects of high temperature to a significant extent in *B. juncea* seedlings.

Biography

Parul Sharma is a Senior Research Fellow specializing in the field of plant science, currently pursuing her doctoral dsegree at CCS Haryana Agricultural University, Hisar. Her research focuses on understanding plant responses to abiotic stresses with expertise in plant physiology, biochemistry, and anatomical studies. Her academic journey includes achieving a gold medal in MSc Botany and securing a prestigious fellowship from the Council of Scientific and Industrial Research. She is an active participant in various scientific conferences. Driven by a desire to make meaningful contributions to plant science, Ms. Parul is determined to uncover new insights and solutions for the challenges in agriculture. Her dedication and expertise makes her a promising scholar in the field of plant science.

FEMALE EPISPADIA: STRESS URINARY INCONTINENCE AND PELVIC ORGAN PROLAPSE

Rosita Aniuliene
Lithuanian University of Health Sciences, Lithuania

Abstract:

Background: Female Epispadia is a rare congenital Urogenital system syndrome, which is characterized by a bifid clitoris, depressed mons pubis, the labia is separated and variable urethral defect. The dorsal wall of the urethra is defective and via cystoscopy it is seen as short and wide. The syndrome is presented with primary urinary incontinence and abnormal anatomical features. Urinary incontinence level in female patient depends from level of the defect and imperative surgical treatment. Incidence of epispadia without extrophy is 1/117000 in males and 1/480000 in females. This malformation can be diagnosed in the fetus during pregnancy. In female epispadia often vagina and internal genitalia is normal, but can be associated with sexual dysfunction.

Method: We describe here a 34 years old patient who was born with epispadia – extrophia of urethra to abdominal wall, without pubic bone. At the age of 8 she underwent an operation . During the operation the neck of the bladder was formed as well as urethra, which opens in vulva, place of clitoris. When she was 8 years old, her bladder capacity was 30 ml, in teenage years – 90 ml. The patient also reported history of recurrent urinary tract infections. At 34 years old the patient took medical advice in out patient department of Kaunas University Hospital with a complaint of stress urinary incontinence : when going, coughing, sneezing, doing exercises, having sex and at rest of time. Also it was the sexual intercourse problems with orgasm. Gynecological examination: absence of pubic bone, vulva is abnormal: absence of labium major and clitoris. Urethra opens into the place of clitoris. Front and back walls of vagina are moving down (POP-Q II-III stage prolapsed).

Results: Surgical treatment- TOT (Tension Obturator Tape). Anterior and posterior colporrhaphy and perineoplastic was performed. There were no complications during and after surgery. On the 2 day after operation patient was released from the hospital. 2 months later patient visited outpatient department. She could hold urine well during intercourse, when resting, walking, but there is urine leakage when coughing and during physical exercises. Patient is satisfied with sexual life, she manages to achieve orgasm in about 90% of all intercourses. The patient estimates the treatment effectiveness about 60%.

Conclusion: Cosmetic appearance is very important for the patients with epispadia, because abnormal external genitalia restricts sexually active female patients from sexual intercourse nearly 30%. This congenital anomaly can present serious psychological problems and social disruption.

Biography

Rosita Aniuliene is a Professor of Obstetrics and Gynecology in Lithuanian University of Health Sciences (LUHS) since 2014 till now. She received her Ph.D degree in LUHS University in Ob/Gyn on 1999. Since 2000 till now she works as the head of Outpatient department and Obstetrician Gynecologyst in University Hospital of LUHS. Prof.Rosita Aniuliene completed her postgraduate training in Germany (Kiel and Baden -Baden), Austria (Zalcburg), Sweden (Stockholm), France (Lyon), USA (Chicago), Italy (Cagliari) and Switzerland (Geneva). She is an author over 100 Scientific papers and 16 books, and is reviewer for 7 Obst/Gyn Scientific Journals. The professor gave more than 100 presentations at International Conferences around the World. Also she gives lectures to students and residents at the Universities of Cagliari, Lyon and Prague under Erasmus program. Rosita Aniuliene is a member of EUGA, ISGE, LSOG and is the president of Lithuanian Society of Urogynecology. Her areas of expertise include Urogynecology, Reproductive Health, Gynecology problems and pelvic floor disorders

IMPACT OF COVID-19 ON REPRODUCTIVE HEALTH: A COMPARATIVE STUDY OF WOMEN OF FERTILE AGE IN KAZAKHSTAN

Sharapat Moiynbayeva, S Erkenova, A Auezova, M Kulmaganbetov, M Kamaliev and V Lokshin

KMU «KSPH», Kazakhstan

Abstract:

Abstract: In October-November 2019, a novel coronavirus outbreak emerged in China, caused by the SARS-CoV-2 virus and subsequently termed COVID-19. This infection was declared a global pandemic due to its high transmissibility and multi-organ impact. Particularly concerning is its effect on the reproductive systems of both men and women. This study aims to investigate the impact of COVID-19 on the reproductive health of women aged 18 to 45.

Objective of the Study: To assess the repercussions of COVID-19 on the reproductive system of women of childbearing age.

Materials and Methods: The study included a sample of 150 women of reproductive age, divided into two cohorts. The primary cohort consisted of 75 women diagnosed with COVID-19 and experiencing post-infection reproductive system disorders. The control cohort included 75 women without COVID-19 and devoid of reproductive system abnormalities. The severity of COVID-19 was assessed according to the standards set by the Ministry of Healthcare of the Republic of Kazakhstan.

Inclusion Criteria: Women between the ages of 18 and 45, with a history of COVID-19, and written informed consent.

Exclusion Criteria: Pre-existing reproductive disorders and chronic somatic pathology.

Analytical methods employed involved hormonal level assessments, ultrasound and Doppler studies of the pelvic organs, as well as measurements of hemostatic system indicators.

Results and Discussion: The average age of participants in both cohorts was 33.5 ± 1.28 years. Hemostatic system analysis revealed elevated levels of D-dimer, fibrinogen degradation products, and prothrombin time in the primary cohort compared to the control cohort. These findings suggest an increased probability of systemic thromboses and circulatory disorders in the pelvic organs.

Conclusion: Our findings indicate that women who have contracted COVID-19 may experience disruptions in their reproductive system. These outcomes highlight the necessity for further research to better understand the implications of coronavirus infection on female reproductive health and to develop effective strategies for its restoration

Biography

Moiynbayeva Sharapat is a young scientist in the field of public health. She has a master's degree in medicine and completed a doctorate in Public Health. Currently, he is the Deputy Director of the Department of Science and Consulting at the Kazakhstan Medical University "Higher School of

Public Health".

Currently, Dr. Moiynbayeva is the responsible executor of a project aimed at understanding the impact of COVID-19 on the female reproductive system. This research is conducted under the auspices of grant funding provided by the Ministry of Science and Higher Education of the Republic of Kazakhstan, which underlines its national importance.

Over the course of her illustrious career, Dr. Moiynbayeva has published more than 15 peer- reviewed scientific papers in reputed international journals.

In addition to her academic responsibilities, Dr. Moiynbayeva actively participates in various scientific committees and review boards, both nationally and internationally. Her insights and expertise are frequently sought after for framing guidelines and recommendations in the field of reproductive health.

As a recipient of numerous awards and honours, Dr. Moiynbayeva work has been recognized for its excellence and impact. The current study on COVID-19 and its implications for female reproductive health promises to be another milestone in her distinguished career, addressing a critical public health issue during an unprecedented global crisis.

A MECHANICAL MODEL OF THE HUMAN EYE TO INVESTIGATE THE EFFECT OF INTRAOCULAR PRESSURE ON VISUAL FUNCTIONS

Magdalena Asejczyk
Wroclaw University of Science and Technology, Poland

Abstract:

Numerous studies have separately addressed the biomechanical and optical aspects of the eye. However, a comprehensive understanding of the eye's functionality necessitates an integrated approach that combines both these facets, as neither biomechanics nor optics alone can entirely explain the complexity of the ocular function. The study is driven by the optomechanical self-adjustment hypothesis (OMSA), which suggests that the eye has built-in mechanisms to adjust its biomechanical properties to maintain clear vision. Simulations and FEM models require appropriate selection of boundary conditions concerning, in the case of the eye, e.g. extraocular tissue parameters (fatty tissue). The goal of these studies is to construct the eye FEM model, including extraocular tissues, and to simulate changes in intraocular pressure (IOP). Nest, to determine changes in eye geometry caused by IOP changes and relate them to three different extraocular tissue modelling proposals. Changes in eye geometry are directly related to changes in the optical system of the eye and the process of vision.

A three-dimensional symmetric finite element model of the eye globe was created, integrating components such as the sclera, cornea, limbus, zonules, lens, and extraocular tissue (ABAQUS® FEA Software, 2020). Specifically, hyperelastic properties were assigned to the cornea, limbus, and sclera, while the lens and zonules were assumed to be elastic materials. Furthermore, the viscoelastic properties of fatty tissue around the eye were simulated using a Kelvin-Voigt model.

It has been found that the stiffer the boundary conditions of the tissue around the eye (higher stiffness), the greater the effect of changes in IOP on the geometry of the eye. This indicates that an increase in IOP has less impact on the geometry of the eye under spring boundary conditions.

This study, through the adoption of the OMSA hypothesis, provides deeper insight into the complex mechanisms governing the function of the eye.

Biography

The area of professional and scientific activity of Professor Magdalena Asejczyk is related to interdisciplinary research related to optics, eye biomechanics, medical equipment, and ophthalmic diagnostics. Experience in this matter results from long-term international and national cooperation, cooperation with health care units and professionals. Scientific research and achievements concern the following disciplines: physics, biomedical engineering (a field of engineering and technical sciences), health sciences, medical sciences. The main purpose of the research is to learn about the processes that take place in the eyeball that affect the quality of the optical system of the eye. She is the leader of the Optics of Vision research group of the Department of Optics and Photonics at the Wroclaw University of Science and Technology. She also conducts specialist lectures in the field of eye biomechanics and ophthalmic equipment for students of Optometry, Biomechanics and Biomedical Engineering.

IDENTIFICATION OF NOVEL INDOLE DERIVATIVES AS HIGHLY POTENT AND EFFICACIOUS LSD1 INHIBITORS

Dongmei Zhao
Shenyang Pharmaceutical University, China

Abstract:

Methylation regulation was considered to be a dynamic and reversible process until the identification of Lysine-specific demethylase I (LSDI) in 2004. LSDI is a highly conserved flavin adenine dinucleotide (FAD) dependent oxidative enzyme, which specifically demethylates H3K4 and H3K9. Biochemical and genetic evidence indicates that LSDI plays a crucial role in gene expression regulation as well as cancer initiation, whereby overexpression of LSDI leads to aberrant silencing of tumor suppressor genes. Additionally, studies with knockdown or inhibition of LSDI in cell and animal models demonstrated that a reduction in LSDI lead to increase the levels of methylated H3K4 and reactivate expression of tumor suppressor genes. These findings suggest that inhibition of LSDI represents an effective strategy for cancer therapy. Thus, highly selective and competitive LSD1 inhibitors with strong cytotoxicity against cancer and minimal side effects remain to be discovered. Starting with a previously discovered highly effective compound 17i, structure-based optimization of novel indole derivatives was described by a bioelectronic isosteric strategy. A total of four rounds of structure optimization was completed and efficiently yielded a series of low nanomolar LSD1 inhibitors. One of these inhibitors, B35, exhibited excellent LSD1 inhibition (IC50 = 0.050 ± 0.005 μM) and anti-proliferation activity against A549 cells (IC50 = 0.74 ± 0.14 μM). Additionally, a preliminary drug ability evaluation showed that compound B35 displayed favorable liver microsomal stability (t1/2 = 145.0 min) and weak inhibitory activity against CYPs at 10 μM. Furthermore, A549 xenograft tumors studies also revealed that B35 demonstrated robust in vivo antitumor efficacy without significant side effects. Meanwhile, compound B35 regulated genes that are closely associated with transcriptional dislocation in cancer and PI3K/AKT pathway involving IGFBP3. Taken together, B35 could be a potent LSD1 inhibitor for further drug development.

Biography

Zhao Dongmei was graduated from Shenyang Pharmaceutical University in 2007, then she served as a professor and doctoral supervisor at Shenyang Pharmaceutical University since 2008. In 2006, Zhao proceeded to the University of California, San Francisco School of Pharmacy as visiting scholar. Professor Zhao's research interests include innovative drugs for cardiovascular disease, anti-tumor drugs, antifungal infection drugs, and the synthesis process of drugs and their intermediates. As the project leader, Professor Zhao has directed four general projects of the National Natural Science Foundation of China. Additionally, as the sub-project leader, Zhao was responsible for one key project of the National Natural Science Foundation of China and two major new drug creation projects under the National Major Science and Technology Special Project. Furthermore, Zhao has led one basic research project at the Key Laboratory of the Liaoning Provincial Department of Education. Professor Zhao has had over 90 SCI papers published in areas related to her research, including over 30 articles in high-impact journals such as Journal of Medicinal Chemistry, Europe *Journal of Medicinal Chemistry, and Organic Letter.* The relevant research findings have been awarded 16 invention patents, including one international patent, and 13 additional invention patents are currently under review.

Virtual Presentations

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Oral Presentations

TOPICAL IODINE FOR NEUROPATHIC PAIN

Uri Wormser
The Hebrew University, Israel

Abstract:

Neuropathic pain is a burning, prickling or stabbing sensation, numbness, hyperesthesia, or a deep ache which stem from a lesion or disease of the somatosensory system. It affects 7–10% of the general population. The main illnesses associated with neuropathic pain are diabetic neuropathy and postherpetic neuralgia. The currently available pharmacological treatments for chronic neuropathic pain are effective in <50% of patients and may be accompanied with adverse effects that limit their clinical utility thus, there is a great need for a unique approach to alleviate symptoms in the affected patients.

Intensive studies in our lab demonstrated that topical iodine is potent protectant against skin burns caused by chemical and heat stimuli. Early post-exposure treatment with iodine significantly reduced and in most human cases nullified skin lesions induced by exposure to hot liquid or metal. Additional mechanistic research of our group revealed that the release of substance P (SP), a chemomediator of nociceptive impulses, from skin nerve terminals is inhibited by topical treatment with iodine. There is growing evidence for the central role of SP in the pathogenesis of neuropathic pain. This led us to suggest topical iodine for amelioration of neuropathic pain by inhibition of SP release from nerve terminals in the skin.

Our novel nanometric iodine formulation consists of low concentration of molecular iodine. In contrast to the currently available iodine preparations whose active ingredient is the charged I3- form, our unique formulation consists of uncharged form of molecular iodine (I2) enabling rapid penetration into the skin, high accessibility to the nerve terminals and pain relief without skin staining.

The proposed iodine formulation is a promising preparation not only for the unmet need of neuropathic pain but also for skin irritation caused by noxious stimuli such as heat and corrosive chemicals.

Biography

Uri Wormser is a Faculty member in the Institute of Drug Research, School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem. His fields of interest include skin irritation, autoimmune diseases and cancer. Prof. Wormser developed a simple and cheap antidote to prevent/treat skin burns caused by noxious stimuli. He discovered that topical treatment of skin with povidone-iodine after exposure to chemical or heat stimuli dramatically reduced and even nullified skin damage and dermal inflammation. The therapeutic effect of povidone-iodine was demonstrated in experimental animals and hundreds of human cases. These findings led Prof. Wormser to the discovery of novel peptides for treatment of autoimmune diseases including multiple sclerosis and systemic lupus erythematosus. He also developed potent peptides for treatment of various types of malignancies including mammary and glioblastoma multiforme cancers. Prof. Wormser has over 35 years of experience in basic and applied drug research. His academic background includes B.Sc. and Ph.D. (direct program) at the Hebrew University and post-doctoral studies at the ETH, Zurich, Switzerland. Prof. Wormser is the author of more than 100 publications and patents.

INSECTS PLAYING A ROLE IN SOLVING CRIMINAL INVESTIGATIONS-FORENSIC ENTOMOLOGY

David Ambett
Christ University, India

Abstract:

The predictable and measurable stages of insect growth and development are one component of entomology that helps to solve crimes. The use of insects and arthropods in legal investigations is known as forensic entomology. It is a multidisciplinary approach to forensics that involves applied biology, ecology, criminology and entomology. The use of forensic entomology dates as far back as the 13th-century, when a farmer in China was found murdered by a sharp object with blow flies attracted to the trace amounts of blood on one sickle, leading the suspects to confess to the murder. Studying the arthropods present on a corpse helps investigators determine the amount of time elapsed since the victim died, known as the POSTMORTEM INTERVAL (PMI). There are five stages of colonisation by different kinds of insects. The first insect to colonise are the blow flies. Their different stages are studied in order to determine the degree day model and can conclude whether the cadaver is old or not. In the second stage we need to identify the species of blow fly or other colonising fly, found on the cadaver in order to estimate the PMI. Third stage is the estimation of the development stage at which the insect was collected. It can be examined from the head capsules to infer the instar. In some cases, number of spiracles can also be examined at each instar. In fourth stage we study the climatic data and whether the body was wrapped and affected the insect colonising activity. In fifth stage we study the post mortem interval. Other than stages, insects can tell us whether the cadaver was initially present on the spot where the cadaver was found or moved by their distribution. Challenges are also faced by the forensic entomologist which are being studied further.

Biography

David Ambett is deeply interested in the field of entomology. He works on the diversity of insects such as ants. His recent work was to study the diversity of ants in Bangalore city, Karnataka, India and gave a guest talk in few seminars on it. He is also specialising in the field of forensic entomology. He is studying on how insects can help in solving crimes and contribute in the department of public health. He has communicated his research work on forensic entomology in Scopus journal and Web of Science. He is doing his PhD in myrmecology from CHRIST (DEEMED TO BE UNIVERSITY), Bangalore, Karnataka, India. He is currently working on to understand the role of different species of ants which contribute to the field of forensic entomology.

NOVEL PEPTIDE FOR TREATMENT OF GLIOBLASTOMA MULTIFORME

Uri Wormser
The Hebrew University, Israel

Abstract:

Glioblastoma multiforme (GBM) is a devastating brain cancer and the most common CNS malignancy. In spite of the significant progression in the medical treatment of various malignancies, GBM is unfortunately an unsolved problem with poor curability with overall five-year survival of 6.6 percent. The present study demonstrates the *in vivo* and *in vitro* anti-tumoral effects of a novel peptide termed RRJN1 on human glioblastoma.

Athymic nude mice were subcutaneously injected in the thoracic-abdominal part with human malignant glioblastoma U-251 MG cells. Upon reaching tumor size of 0.3-0.4 cm in diameter animals started to receive iv injections of the peptide or saline (control) twice a week. Tumor size was measured by caliper along the experiment. RRRJN1 inhibited tumor growth at a dose dependent manner; the percent tumor size ratio (treated vs. control) was 34, 26, 16, and 7 at peptide doses of 0.1, 1, 2 and 4 mg/kg, respectively. In vitro studies showed concentration-dependent reduction in cell viability as measured by MTT test. In addition, FACS analysis showed that RRJN1 is a PDL1-inducer in U-251 MG cells. This effect occurred at lower peptide concentrations than those required for growth inhibition. PDL1 induction may increase efficacy of immune checkpoint inhibitors (ICI). The peptide showed anti-proliferative activity in other types of tumors such as the triple negative human breast cancer cells MDA-MB-231 and the human prostatic carcinoma cells LNCaP. Preliminary *in vivo* studies showed that oral administration (by gavage) of the peptide caused reduction in tumor growth. These data suggest RRJN1 as potential drug candidate for GBM (via burr hole), other malignancies and ICI adjuvant.

Biography

Uri Wormser is a Faculty member in the Institute of Drug Research, School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem. His fields of interest include skin irritation, autoimmune diseases and cancer. Prof. Wormser developed a simple and cheap antidote to prevent/treat skin burns caused by noxious stimuli. He discovered that topical treatment of skin with povidone-iodine after exposure to chemical or heat stimuli dramatically reduced and even nullified skin damage and dermal inflammation. The therapeutic effect of povidone-iodine was demonstrated in experimental animals and hundreds of human cases. These findings led Prof. Wormser to the discovery of novel peptides for treatment of autoimmune diseases including multiple sclerosis and systemic lupus erythematosus. He also developed potent peptides for treatment of various types of malignancies including mammary and glioblastoma multiforme cancers. Prof. Wormser has over 35 years of experience in basic and applied drug research. His academic background includes B.Sc. and Ph.D. (direct program) at the Hebrew University and post-doctoral studies at the ETH, Zurich, Switzerland. Prof. Wormser is the author of more than 100 publications and patents.

MY REFLECTIONS ON PRECAUTIONS DURING INTERCOURSE AFTER MENOPAUSE FOR SAFE SEXUAL HEALTH

Santosh Kumar Mishra
S. N. D. T. Women's University, India

Abstract:

Menopause has a huge impact on sexual function; it can lower sexual urge among women. The author of this research work argues that in addition to lower level of desire (for sex), menopause has the potential to make it harder for women to become adequately aroused. This is because of the fact that the end of menstrual cycle makes the vaginal canal less stretchy, as a result of which (some) women experience dryness. All these changes in the sexual & reproductive organs of women, in turn, can cause intercourse to be 'painful'. According to the author of this work, it becomes more challenging for women to address such situations wherein sex drive of their male counterparts is on the higher side (due to various reasons). In this context, the pertinent question that arises is: "what are medically approved solutions for vaginal dryness, and painful intercourse after menopause, while ensuring safe sexual practices (for both men and women)"? Use of lubrication has been found to be safest way to (a)"get wetness back", and (b) "prevent painful intercourse". The lubricant has the potential to relieve vaginal dryness (that can lead to friction during intercourse). Sexologists need to encourage partners to put it in vagina, on penis, and fingers, each time they engage in sex . Most importantly, engaging in foreplay for "extended period of time" and "with close intimacy" helps (a) "get more aroused during intercourse", and (b) "prevent vaginal dryness".

The present work primarily aims to investigate into precautions that engaging sexual partners need to take during sex after menopause for the purpose of ensuring (a) wet vagina, (b) adequate arousal, (c) enjoying (painless) intercourse, and (c) safe sexual health (for both male and female). In terms of research methodology employed, (a) secondary data (largely 'quantitative' in nature) have been used by the author; (b) and method of data analysis is descriptive, involving "desk-based research" approach. Data presented in this work has been analysed by the author only from academic and research point of view. The author briefly concludes that maintaining safe (and hygienic) sexual and reproductive health practices after menopause is of utmost importance, in addition to pleasure considerations. Both engaging partners have a role to play. The author of this research suggests sexual partners to reduce sexual complications while engaging in regular sexual activities after menopause. It is possible by three modes (in addition to other measures): (a) "applying a vaginal lubricant before intercourse", "using a vaginal moisturizer regularly, including before intercourse"; & (c) "engaging in enjoyable and satisfying foreplay".

NOVEL PEPTIDE FOR TREATMENT OF SEPSIS AND CYTOKINE STORM

Uri Wormser
The Hebrew University, Israel

Abstract:

Sepsis is a severe clinical syndrome related to overactivation of the immune system expressed by overwhelming cytokine production termed cytokine storm leading to organ dysfunction and death. This systemic inflammation is a response to viruses like COVID-19 and certain toxins including bacterial cell wall components such as lipopolysaccharide (LPS) and peptidoglycan. There is no efficient cure to this life-threatening condition and the global burden death is ~11 million persons annually. The present study demonstrates anti-sepsis activity and cytokine storm reduction of a novel peptide termed JNEFS1 in *in vivo* mouse model and *in vitro* human cells. Injection of high dose of LPS (48 mg/kg, n=45) into mice caused mortality of 77.2% within 7 days whereas a single injection of 10 µg/kg JNEFS1 30 minutes after LPS significantly increased animal viability (4.98 fold) and reduced the mortality to 15.5% (n=22). The protective effect of the peptide was dose-dependent. Cytokine analysis of plasma of mice injected with LPS and treated 30 minutes later with JNEFS1 demonstrated a statistically significant reduction (in parentheses) in TNF-alpha (83.4%), MCP-1 (80.8%), IL-12p70 (83.0%), IL-10 (84.6%), IL-6 (46.3%) and IL-4 (57.4%). The beneficial effect of the peptide was also shown in human cells. Fresh blood from healthy donors (collected in citrate-containing tubes) was incubated with LPS and 10 minutes later with JNEFS1. Samples were removed 24 hours after LPS treatment, centrifuged and plasma was analyzed. A reduction of 78% in plasma TNF-alpha level was observed in the peptide-treated samples as compared to the control (LPS plus peptide vehicle). Similar results were obtained with human THP-1 monocyte/macrophage cells. In conclusion, JNEFS1 peptide is a potent drug candidate for sepsis and cytokine storm.

Biography

Uri Wormser is a Faculty member in the Institute of Drug Research, School of Pharmacy, Faculty of Medicine, The Hebrew University of Jerusalem. His fields of interest include skin irritation, autoimmune diseases and cancer. Prof. Wormser developed a simple and cheap antidote to prevent/treat skin burns caused by noxious stimuli. He discovered that topical treatment of skin with povidone-iodine after exposure to chemical or heat stimuli dramatically reduced and even nullified skin damage and dermal inflammation. The therapeutic effect of povidone-iodine was demonstrated in experimental animals and hundreds of human cases. These findings led Prof. Wormser to the discovery of novel peptides for treatment of autoimmune diseases including multiple sclerosis and systemic lupus erythematosus. He also developed potent peptides for treatment of various types of malignancies including mammary and glioblastoma multiforme cancers. Prof. Wormser has over 35 years of experience in basic and applied drug research. His academic background includes B.Sc. and Ph.D. (direct program) at the Hebrew University and post-doctoral studies at the ETH, Zurich, Switzerland. Prof. Wormser is the author of more than 100 publications and patents.

MORPHOLOGICAL ASSESSMENT OF GLUTAMATE ZEROVALENT IRON NANOPARTICLES BY SCANNING ELECTRON MICROSCOPY AND ITS COMBINED EFFECT WITH INDOLE ACETIC ACID ON AMELIORATION OF LEAD TOXICITY IN MAIZE (*ZEA MAYS L.*)

Saleha Saeed
University of Peshawar, Pakistan

Abstract:

Background: Food safety is a priority issue for sustainable global development that can be affected by heavy metals, contributing to morbidity and even mortality in crop growth. Heavy metals often accumulate in the soil due to the use of extensive chemical fertilizers and pesticides;

Objective: therefore, the current experiment was aimed to determine the effect of glutamate zerovalent iron nanoparticles (Glu-ZVFeNPs) and indole acetic acid (IAA) on physiological mechanism of lead (Pb+2) stress tolerance at 4 and 8 ppm in *Zea mays* variety.

Methods: Seeds of the selected variety were collected from Cereal Crop Research Institute Persabaq Nowshera and planted in earthen pots in triplicate in the greenhouse of the Botany Department of the University of Peshawar. Nanoparticles were analyzed *via* scanning electron microscopy and energy dispersive X-ray analysis.

Results: Maximum growth responses were recorded from T12 (untreated + NPs + IAA), while minimum were recorded from T5 (8 ppm) indicating from the minimum amplitude of chlorophyll "a" and "b" contents, root length, shoot length, and root/shoot ratio. T5 (8 ppm) enhanced the values of osmolytes and antioxidant enzymes peroxidase and superoxide dismutase which has been ameliorated by the combined application of Glu-ZVFeNPs + IAA, indicating that the plant may resist the toxic effects of heavy metal stress at high concentration.

Conclusion: From the present study, we concluded that adverse result of Pb^{+2} has been condensed by application of Glu-ZVFeNPs + IAA treatment as compared to the foliar application of IAA and Glu-ZVFeNPs individually.

Biography

Saleha Saeed graduate from the University of Peshawar, Pakistan with a Master of Science in Botany, and specialization in Plant Physiology. While my experiences as a graduate have been diverse, research has unquestionably been the most important and rewarding component of my graduate education. Committing myself to the world of scientific research has instilled an investigative mindset and a passion for the scientific process and an appreciation for the results of plants research.

PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY OF HERBAL PLANT DRUG ACHYRANTHUS ASPERA

Shahazadi Parveen
Rajiv Gandhi Proudyogiki Vishwavidyalaya, India

Abstract:

An antimicrobial as an agent which is used to kill microorganisms and stop the growth. Antimicrobial medicine can grouped on basis on which microbes primarily acts against, such as, an antibacterial i.e used against bacterial growth and antifungal i.e. used against fungi growth. they can also be grouped on basis of their functional properties. Agents which kill microorganisms are called bacteriocidal, whereas that causes inhibition of growth are called as biostatic. The anti-bacterialial chemotherapy done by using antimicrobial medicines which are used for treatment of infection , while those antimicrobial medicines used for prevention of inflectional diseases is called anti-microbial prophylaxis. antimicrobial agents are mainly classified as the disinfectants ("non-selective anti-microbials", bleach), are used kill wide varities of microorganisms and different microorganisms on non living things and the antiseptics are used for applied to livings tissues/bodies and the antibiotics destroy microorganisms inside the body. Antibacterial agents can also be further sub-divided in bactericidal agent, that are used to killing bacteria, and the bacteriostatic agent that slows down and still bacteria growth.

Achyranthes aspera (Amaranthaceae) is an important medicinal herbal plant found throughout in India. The parts which are used medicinally are seeds, roots and shoots. The information of updated data about the phytochemical properties and pharmacological properties of the herbal plant achyranthes aspera is all given by the present article. it reveal that wide types of the phytochemical constituents have been isolated from the plant which possesses many pharmacological activities and many various important medicinal properties. For the last few decades or so, extensive research work has been carried out to prove the pharmacological activities and biological activities of extracts. oleonolic acid, saponins, alkaloids, dihydroxy ketones, long chain compounds and many compounds have been isolated.

The plant achyranthes aspera extracts for antioxidant and antimicrobial activity consists of chemical constituents. These extracts have greater minimal anti-bacterial activity. For the work, Achyranthes aspera, local name: latjeera; family: Amaranthaceae was used. Achyranthes aspera is mostly found and used as herbal plant in Bangladesh for treatment of infectious diseases. The study was conducted to approach antimicrobial activities against pathogenic bacteria when extraction was done with their leaf and stem parts in various organic solvents such as petroleum ether, methanol, ethyl acetate, chloroform.

The plant species Achyranthes aspera from the family Amaranthaceae is a vital healthful and medicated herb found throughout in India. Although most of its components are employed in ancient systems of medicines such as seeds, roots and shoots are foremost necessary components that are used for treatment of disease. The article provides associate degree account on updated info about phyto- chemical and anti-microbial activity. Chloroform and methyl alcohol root and shoot extracts of A. aspera showed sensible quantity of medication

activity against enterobacteria sp. Root extract showed the activity against B. Substilis solely antifungal activity of roots was found in extracts with petroleum ether, chloroform and methyl alcohol against fusarium sp. Phytophothora and Sclerouum sp. Results recommend that extract has important medication and antifungal activities against tested microorganisms

Biography

Shahazadi Parveen is well equipped with the knowledge of improving the wellbeing of people through her expertise in health research, professional teaching associated with both medical educational institutions and medical health service facilities throughout the country, her experiences have helped her develop prototypes best suited to maximize healthcare benefits that arrives from allopathic research & traditional knowledge of therapeutic and medicinal properties of plants & herbs. She wrote numerous research articles nationally and internationally in the field of Pharmacology, biochemistry and biotechnology related to hypertension, cancer treatment, asthama, smoking cessation, epilepsy and many more.

ARTIFICIAL INTELLIGENCE-DRIVEN ENSEMBLE MODEL FOR PREDICTING MORTALITY DUE TO COVID-19 IN EAST AFRICA

Kedir Hussein Abegaz
Frontieri Consult PLC, Ethiopia

Abstract:

East Africa was not exempt from the devastating effects of COVID-19, which led to the nearly complete cessation of social and economic activities worldwide. The objective of this study was to predict mortality due to COVID-19 using an artificial intelligence-driven ensemble model in East Africa. The dataset, which spans two years, was divided into training and verification datasets. To predict the mortality, three steps were conducted, which included a sensitivity analysis, the modelling of four single AI-driven models, and development of four ensemble models. Four dominant input variables were selected to conduct the single models. Hence, the coefficients of determination of ANFIS, FFNN, SVM, and MLR were 0.9273, 0.8586, 0.8490, and 0.7956, respectively. The non-linear ensemble approaches performed better than the linear approaches, and the ANFIS ensemble was the best-performing ensemble approach that boosted the predicting performance of the single AI-driven models. This fact revealed the promising capability of ensemble models for predicting the daily mortality due to COVID-19 in other parts of the globe.

Biography

I am a senior researcher at Frontieri Consult PLC, in Ethiopia. I am assistant professor of Biostatistics and Health Informatics. I previously worked as a research coordinator at the American Cancer Society Project (Addis Ababa Cancer Registry) and as a research consultant at the Ethiopian Ministry of Innovation and Technology. I am a Global burden disease collaborator and have participated in more than 50 published researches, and managed more than 10 projects. Also, I am a recognized reviewer for the BMC Series, Elsevier and PlosOne journals. I also sit as the Editorial Board member of several international journals.

NUTRACUETICALS- IMMUNITY BOOSTER IN COVID 19

Shahazadi Parveen
Rajiv Gandhi Proudyogiki Vishwavidyalaya, India

Abstract:

Nutraceuticals are the nutritional supplements consumed for the arrival of health, they will suspend senescence, infection and disturb and support the proper functioning of the human body. Currently; Nutraceuticals are gaining considerable consideration for the parrot's nutritional and therapeutic capabilities. Nutraceuticals nourish the organism to migrate health, prevent chronic misfortunes, increase the appetite for life and further support the structure and function of the organism. The source of this product is herbal, nutritional supplement, transformative food (soups, grains and beverages) and nutrient isolate. It also improves immune functions that provide relief to affected people, donates virus encapsulated RNA, increases immune risk against flu and coronavirus, suppresses cholesterol and blood pressure, and also reduces diabetes. Immunity is the multicellular organism's qualification to fight and dangerous microorganisms, toxins and unwanted biological invasions that cause infections and diseases. SARS-CoV-2 is a new virus responsible for an epidemic of respiratory disease, known as COVID-19, which has spread to various countries around the world. The word corona means "crown" and the round virus has a "crown" of protein called peplomers that protrude from its center in every direction. Corona virus is a single-stranded positive-sense RNA virus with a nucleoprotein within a capsid composed of matrix protein belonging to the Coronaviridae family. It is a respiratory disease, most people infected with the COVID-19 virus overlap with mild to moderate respiratory disease. A new coronavirus has long been noted as Covid-19 and a large family of single-stranded RNA viruses. Some significant reasons for low immune levels are stress, lack of sleep, poor diet, isolation and lack of exercise, malnutrition, etc. It is important to follow a good diet to strengthen immunity. Several vitamins with trace elements, probiotics and nutraceuticals are necessary only for the proper functioning of the immune system. Ayurveda is one of the world famous forms of medicine originating from India which has a unique traditional value, mentions a variety of immunity enhancing therapies. The practice of Yoga will create a vital rule in the migration of weakened immunity and besides pranayama it helps in the condition of the lungs. As a powerful host immune system it is a key factor in the protection against viral infection and avoids reaching critical stages of the disease. In this review, we show the potential preventive and therapeutic application of vitamins, trace elements, various nutraceuticals and probiotics. In the current global response with limited travel, it is difficult to have a balanced and varied diet. Therefore, it lists the amount of calories and micronutrients that an AIDS will be. Selective micronutrient supplements can be used especially for vulnerable populations such as the elderly. Nutraceuticals are currently receiving recognition thanks to the parrot playing an active role in many health problems such as obesity, diabetes and digestive problems and in other chronic diseases. In many almost, the preference if given to the natural product over chemical therapy. However, with a bright future in this new area of health products. The awareness of these products must be necessary for the Indian masses.

Biography

Shahazadi Parveen is well equipped with the knowledge of improving the wellbeing of people through her expertise in health research, professional teaching associated with both medical educational institutions and medical health service facilities throughout the country, her experiences have helped her develop prototypes best suited to maximize healthcare benefits that arrives from allopathic research & traditional knowledge of therapeutic and medicinal properties of plants & herbs. She wrote numerous research articles nationally and internationally in the field of Pharmacology, biochemistry and biotechnology related to hypertension, cancer treatment, asthama, smoking cessation, epilepsy and many more.

UNCERTAIN SAFETY OF VASOPRESSORS AFTER SUBARACHNOID BLOCK IN ATYPICAL PRE-ECLAMPSIA - A CASE REPORT ON SEVERE PRE-ECLAMPSIA DURING CAESAREAN SECTION

Lakshmi Jayaraj Nithin
Betsi Cadwaladr University Health Board, United Kingdom

Abstract:

CASE: A 27-year-old Primigravida, booked in at 7 weeks of gestation, had an uncomplicated course throughout her pregnancy until 37 weeks. She went into spontaneous labour and progressed adequately until second stage. She was taken to theatre for caesarean section due to foetal malposition and a subarachnoid block was administered. Her pre-spinal heart rate was 50 bpm with some atrial ectopic beats. She was started on phenylephrine infusion after intrathecal injection of Diamorphine and Bupivacaine to prevent hypotension. Post spinal, her heart rate was reduced to 35 bpm with atrial bigeminy and ectopic beats. Patient had an adequate motor block at this point. Ephedrine 6 mg was given but had no effect on the heart rate. Cyclizine was administered as it had both antiemetic and anticholinergic effects and the heart rate increased to 100- 110bpm. Alongside the increase in heart rate there was a concurrent massive rise in BP up to 220/130 mm Hg with severe occipital headache.

The phenylephrine infusion was stopped. After 3 minutes BP remained significantly elevated with severe headache despite cessation of vasopressors. 2 boluses of iv Labetalol 25 mg were given over 3 minutes and BP settled to 120/70 mm Hg with resolution of the headache. BP stayed around 120/70 mm Hg afterwards and heart rate remained stable at 60 bpm. The surgery was completed without any complications and a bedside post op echocardiography was done which was normal.

Her bloods showed an elevated protein to creatinine ratio of 72 mg/mmol, ALT of 141U/L and creatinine of 106 umol/L, all pointing towards severe pre-eclampsia. She was discharged on Day 3 Post Op with a view for further community follow up.

Summary: Prophylactic vasopressors should be used with caution in pregnant women due to risk of atypical pre-eclampsia progressing to severe PET and eclampsia causing catastrophic consequences.

Biography

Lakshmi Jayaraj Nithin, MBBS, MS (OBG), MCh (Reproductive Medicine and Infertility), MRCOG, currently work as a speciality doctor in Obstetrics and Gynaecology in North Wales, UK. Her areas of interests are Reproductive Medicine, Obstetrics and Medical education.

PARACETAMOL SENSING WITH A GLASSY CARBON ELECTRODE MODIFIED WITH HNPC

Nesim İslamoğlu
Necmettin Erbakan University, Turkey

Abstract:

An electroanalytical method for determining acetaminophen (AC) was developed in the present study. GC was modified by synthesized 4-hydroxyphenethyl-4-(4-nitrophenyl)piperazine-1-carbodithioate (HNPC) using cyclic voltammetry (CV) technique. The CV method was used in the potential range of 0.4 V to 2.0 V in 0.1 M tetrabutylammonium tetrafluoroborate (NBu4BF4) in acetonitrile (CH3CN) for 50 cycles. Then the electrochemically reduced rHNPC was obtained by CV in the potential range of 0 V to -1.2 V in 0.1 M HCl for 50 cycles. Using hexacyanoferrate (III) (K3Fe(CN)6) and ferrocene as redox probes, the electrochemical properties of GC/HNPC and GC/rHNPC were investigated. The analytical sensitivity of the GC/rHNPC electrode was higher than that of the bare electrode and the GC/HNPC electrode. 0.1 M Britton-Robinson (BR) buffer solution containing 1.0 mM AC was used in square wave voltammetry (SWV) to determine the pH effect. The maximum current value was obtained at pH 7 and it was used as a supporting electrolyte. The sensor exhibits excellent analytical performance in the determination of paracetamol (10 µM) at neutral pH using SWV and it is well suited for the analysis of pharmaceutical formulations. FTIR and NMR (1H and 13C) analysis results: Yield: 69%. m.p. 197.5°C. FTIR (ATR) cm-1: 3394 (O–H), 1577–1425 (C=C), 1516-1303 (NO2), 821 (1,4-disubstituted benzene). ^{1}H-NMR (500 MHz, DMSO-d6): δ = 2.84 (2H, t, *J*=8.00 Hz, -CH_2-), 3.46 (2H, t, *J*=7.50, CH2), 3.71 (4H, t, J=5.50 piperazine CH2), 4.09 (2H, s, piperazine CH_2), 4.39 (2H, s, piperazine CH2), 6.71(2H, d, J=8.50, 1,4-phenyl), 6.95 (2H, d, J=9.50, 1,4-phenyl), 7.09 (2H, d, J=8.00, 1,4-phenyl), 8.11 (2H, d, *J*=9.50, 1,4-phenyl), 9.25 (1H, s, OH). ^{13}C-NMR (125 MHz, DMSO-d6): δ =34.11, 38.18, 51.19, 53.17, 112.32, 115.66, 126.26, 129.87, 130.61, 137.35, 154.21, 153.35, 195.97. HRMS (m/z): [M+H]+ calculated for C19H-21N3O3S2: 404.1097; found 404.1098.

Biography

Nesim islamoğlu is a passionate and dynamic teacher who has been working in education for over a decade. She holds a master's degree in inorganic chemistry. She holds a PhD in analytical chemistry from the Institute of Science, Necmettin Erbakan University, and is an expert in electroanalytical chemistry. She is interested in drug analysis. She has built this model after years of experience in research in laboratories. She is a dedicated educator with a diverse background in research and teaching. She has taught chemistry from secondary school (at National Centre for Distinguished) to college-level courses. Nesim loves to incorporate technology and laboratory experiments into her lessons and is constantly seeking new and innovative ways to engage her students. She is known for her patience and her ability to inspire students to achieve their academic and personal goals. She also encourages students to participate in science competitions and has mentored several award-winning teams.

EVALUTION OF ANTI-INFLAMMATORY ACTIVITY OF TULSI (*OCIMUM SANCTUM* LINN.) USING CARRAGEENAN INDUCED PAW EDEMA MODEL

Shahazadi Parveen
Rajiv Gandhi Proudyogiki Vishwavidyalaya, India

Abstract:

The predominant cause of global morbidity and mortality is lifestyle related chronic diseases, many can be addressed through Ayurveda with focus on healthy life practices and regular consumption of adaptogenic herbs. all the herbs used within Ayurveda, tulsi (*Ocimum sanctum* Linn) is pre-eminent and scientific research is confirming its beneficial effects. There is mount evidence that tulsi can physical, chemical, metabolic and psychological stress through a unique combination of pharmacological and therapeutic actions. Tulsi has found to protect organs and tissues against chemical stress from industrial pollutants and heavy metals, and physical stress from prolong physical exertion, ischemia, physical restraint and exposure of cold and excessive noise. Tulsi has shown to counter metabolic stress through normalization of blood glucose, blood pressure and lipid level, and psychological stress through positive effects on memory and cognitive function and through its anxiolytic and anti-depressant properties. Tulsi's broad-spectrum antimicrobial activity, which include activity against range of human and animal pathogens, it can be used as a hand sanitizer, mouthwash and water purifier as well as in animal rearings, wound healing, preservation of food stuffs and herbal raw materials and traveler's health. Cultivation of tulsi has both spiritual and practical significance that connects the grower to the creative powers of nature, and organic cultivation offers solutions for food security, rural poverty, hunger, environmental degradation and climate change. The use of tulsi in daily rituals is a testment to Ayurvedic wisdom and provides an example of ancient knowledge offering solutions to modern problems.

TULSI- *Ocimum sanctum* (L.) is commonly used as a herbal remedy for various ailments. But the scientific basis for its medicinal use is unknown, especially in pain and inflammation. Therefore, the present study aimed to investigate the anti-inflammatory effects of *Ocimum sanctum* stems in laboratory animals. Inflammation remains an area of great research interest, possibly due to the unavailability of a safer and more effective anti-inflammatory agent. This has led to an increased demand for natural products with anti-inflammatory activity which have fewer side effects. Non-steroidal anti-inflammatory drugs (NSAIDs) such as indomethacin are used to treat inflammation, fever, and pain. However, NSAIDs cause gastric damage as a major adverse reaction. Mathanol, ethanol extract from *O. sanctum* stem was used to study the acute effect of inflammation in rats using a carrageenan-induced paw edema model in wistar albino rats. The ethanolic extract of *O.sanctum* stem showed more impact at doses of 200 mg / kg of body weight at the fourth hour of the study shown dose-dependent and anti-inflammatory activity in acute inflammation (carrageenan-induced hind paw edema, $p < 0.05$)) of inflammation.

Hence, present investigation established some pharmacological evidences to support the folklore claim that *Ocimum Sanctum* stem is used as anti-inflammatory agent.

Biography

Shahazadi Parveen is well equipped with the knowledge of improving the wellbeing of people through her expertise in health research, professional teaching associated with both medical educational institutions and medical health service facilities throughout the country, her experiences have helped her develop prototypes best suited to maximize healthcare benefits that arrives from allopathic research & traditional knowledge of therapeutic and medicinal properties of plants & herbs. She wrote numerous research articles nationally and internationally in the field of Pharmacology, biochemistry and biotechnology related to hypertension, cancer treatment, asthama, smoking cessation, epilepsy and many more.

DİFFERENTİAL PULSE VOLTAMMETRİC DETERMİNATİON OF PARACETAMOL AT GUANİNE-MODİFİED PENCİL GRAPHİTE ELECTRODE

Nesim İslamoğlu
Necmettin Erbakan University, Turkey

Abstract:

Using differential pulse voltammetry (DPV), a simple and highly selective electrochemical method was developed for the determination of paracetamol (N-acetyl-p-aminophenol, also known as acetaminophen) in aqueous media (PBS buffer solution, pH 7.2) with modified pencil graphite electrode PGE. This study investigates the modification of guanine (Gu) and its ability to determine paracetamol. Cyclic voltammetry oxidation of Gu was conducted on PGE with 1 mM guanine in 0.1 M H_2SO_4 as supporting electrolyte in aqueous media from +0.6 V to +1.8 V potential ranges using 0.1 V s^{-1} sweep rate with 10 cycles to get Gu/PGE. The surface was activated by reducing it with 0.1 M HCl in the potential range of 0 and -1.1 V using 0.1 V s^{-1} scanning rate with 5 cycles to get rGu/PGE. The electrochemical responses of paracetamol on the rGu/PGE in PBS buffer in the pH range 6.2–8.2 were examined by DPV. The effect of scan rate on the electrochemical behavior of paracetamol was investigated by linear sweep voltammetry (LSV) in PBS of pH 7.2 from 25 to 500 mV s^{-1}. rGu/PGE exhibited a high selectivity and sensitivity toward paracetamol. There are good linear range in the calibration curve for the DPV peak current observed for paracetamol oxidation versus paracetamol concentration at the rGu/PGE. It showed an excellent linear response from 5 µM to 0.1 mM with a correlation coefficient of 0.992. The detection limit of paracetamol and the limit of quantification is 0.24 µM and 0.72 µM, respectively. The electroanalytical method proposed here is considerably less time-consuming and less expensive than other methods, that also apply to determining these substances.

Biography

Nesim islamoğlu is a passionate and dynamic teacher who has been working in education for over a decade. She holds a master's degree in inorganic chemistry. She holds a PhD in analytical chemistry from the Institute of Science, Necmettin Erbakan University, and is an expert in electroanalytical chemistry. She is interested in drug analysis. She has built this model after years of experience in research in laboratories. She is a dedicated educator with a diverse background in research and teaching. She has taught chemistry from secondary school (at the National Centre for Distinguished) to college-level courses. Nesim loves to incorporate technology and laboratory experiments into her lessons and is constantly seeking new and innovative ways to engage her students. She is known for her patience and her ability to inspire students to achieve their academic and personal goals. She also encourages students to participate in science competitions and has mentored several award-winning teams.

MICROBIOME AND COLORECTAL CANCER MANAGEMENT

Saryia Javed
NHSGGC, United Kingdom

Abstract:

Globally, colorectal cancer (CRC) is one of the most typical lethal cancers. One of the main factors for better outcomes in CRC management is the early detection of the disease. As an integral component of human metabolism and homeostasis, gut microbiome has recently been a subject of extensive research for its role in the pathogenesis, diagnosis, and treatment of CRC. Microbial dysbiosis (the decrease in beneficial gut flora and the increase of detrimental populations) leads to chronic inflammation and genetic alteration in the host cells, triggering and promoting CRC carcinogenesis. Identifying these microbial changes in depth would potentially isolate the pathogenic microbiota species and establish biomarker models for early detection of CRC. On the other hand, modifying these microbial changes would help formulate preventative and therapeutic strategies for CRC, developing a more precise CRC management plan according to each patient's microbial print. This essay explains gut microbiome composition, microbial changes (dysbiosis) in CRC carcinogenesis, the probability of creating microbiome-based CRC biomarkers, and potential microbiome-targeted treatment options.

Biography

Saryia Javed has her expertise in evaluation and passion for improving health and wellbeing. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching and administration both in hospital and education institutions.

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