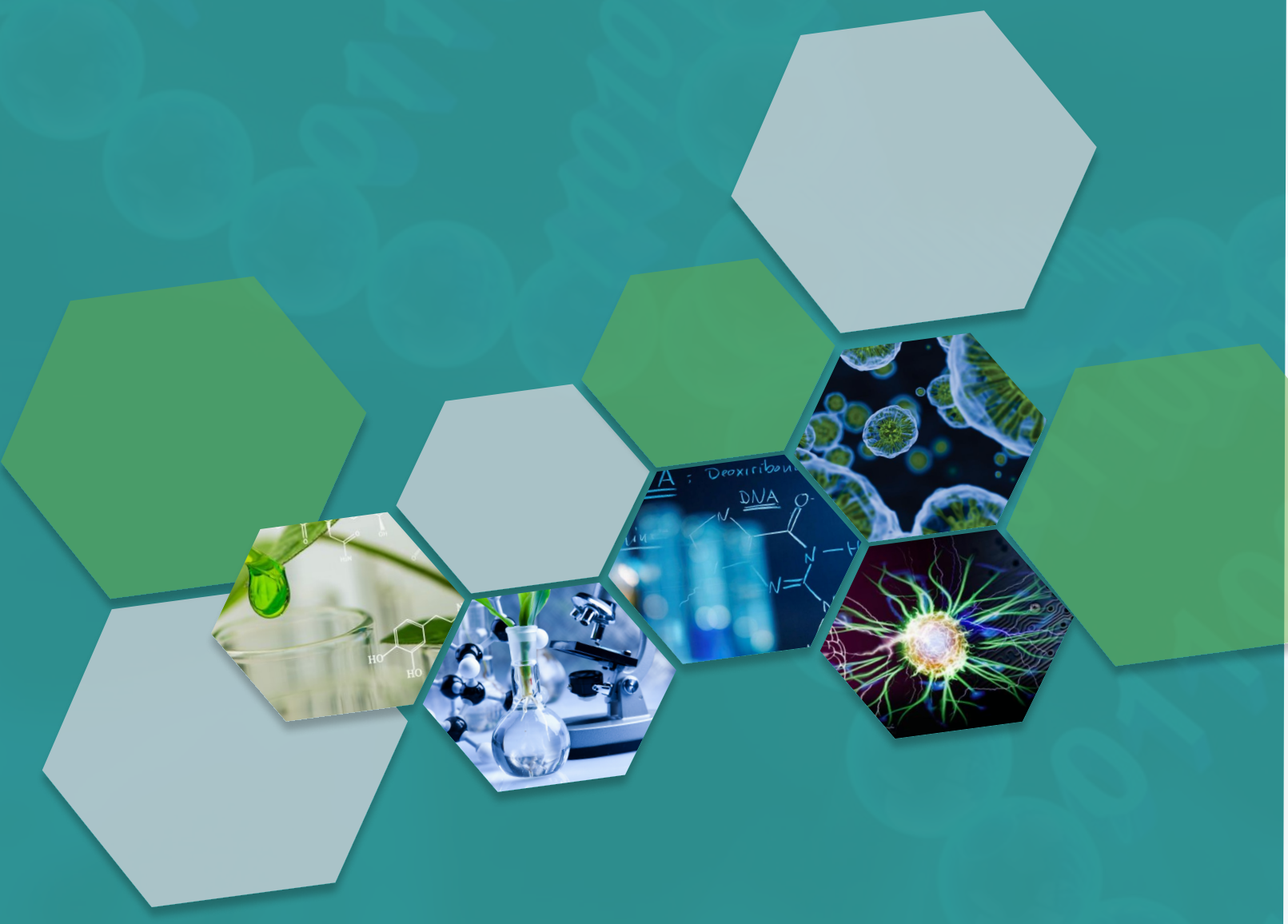
Linkin Science
Exploring & Connecting Science

Linkin
Science Conferences
Hybrid Mode (Onsite & Online)

October 08-09, 2024|Naples, Italy
Venue: Palazzo Salgar



HOSTING ORGANISATION

Linkin Science Pvt. Ltd

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Mission

Our mission is to bring the researchers on a common platform and provide opportunity for them to interact. This scientific networking helps for the betterment of science by exchanging the ideas in a broader way.

Vision

Magnifying Scientific Knowledge by sharing the research and ideas. We believe in accelerating the possibilities of novel discoveries and enhancement in scientific research, by connecting scientific community for knowledge sharing.

Why Linkin Science

Join us to redefine and explore new research, to provide a credible source to barter ideas for scientific studies. To revolutionize the true outcome of a distinct scientific discovery and grab the attention for rare emerging technologies.

Linkin Science Conferences

Linkin Science conferences are well crafted and designed by a team of skilled experts. Our conferences are vast expanded into medical, life sciences, health care, Engineering and other social sciences. Each conference, summit or executive briefing is tailored to the sector, topic and audience need. Our event structure varies depending on issue and market requirements featuring Keynote presentations, Oral talks, Poster presentations, Young research forum, Exhibitions, roundtables and variable formats.

Welcome to the Linkin Science

Linkin science organizes a wide range of scientific events worldwide and thus evolving to be a hub for scientists, researches, doctors, students, industries and delegates. We are dedicated to provide high quality online journals, conferences, events and information, through unparalleled speaking sessions, workshops and unique face-toface networking opportunities. This Scientific Networking creates meaningful relationships research and other scientific prospects and works done by individuals.

We schedule different Medical, Health Care, Clinical and engineering conferences to establish divergent platforms for delegates and other scientific researchers. Each conference, summit or executive briefing is a tailored to the sector, topic and audience need. Our event structure varies depending on issue and market requirements. Keynote presentations delivered to all works for some content, whilst other conferences feature multiple breakout sessions, panels, roundtables and variable format.

A team of highly skilled committee members dwell upon the trending topics of research to create a conference theme which can be used to exhibit ideas and research works among the scientific group laying the path for scientific discoveries.

Keynote Forum

Day 01

Linkin

Science Conferences

Hybrid Mode (Onsite & Online)

Nanowired delivery of cerebrolysin with mesenchymal stromal cells & monoclonal antibodies to neuronal nitric oxide synthase induce Neuroprotection in Alzheimer's disease neuropathology exacerbated by concussive head injury

Hari Shanker Sharma[*1,2], José Vicente Lafuente[2], Lianyuan Feng[3], Hongyun Huang[4], Lin Chen[5], Lars Wiklund[1], Aruna Sharma[1]

[1]*International Experimental Central Nervous System Injury & Repair (IECNSIR), Dept. of Surgical Sciences, Uppsala University, Sweden*

[2]*LaNCE, Dept. Neuroscience, University of the Basque Country, Spain*

[3]*Department of Neurology, Bethune International Peace Hospital, China*

[4]*Institute of Neurorestoratology, General Hospital of Chinese Armed Police Forces, China*

[5]*Department of Neurosurgery, Dongzhimen Hospital of Beijing University of Traditional Chinese Medicine, China*

Abstract:

Concussive head injury (CHI) is one of the major risk factors in developing Alzheimer's disease (AD) in military personnel at later stages of life. Breakdown of the blood-brain barrier (BBB) in CHI leads to extravasation of plasma amyloid beta protein (AbP) into the brain fluid compartments precipitating AD brain pathology. Oxidative stress in CHI or AD is likely to enhance production of nitric oxide, indicting a role of its synthesizing enzyme neuronal nitric oxide synthase (NOS) in brain pathology. Thus, exploration of the novel roles of nanomedicine in AD or CHI reducing NOS upregulation for neuroprotection are emerging. Recent research shows that stem cells and neurotrophic factors play key roles in CHI induced aggravation of AD brain pathologies. Previous studies in our laboratory demonstrated that CHI exacerbates AD brain pathology in model experiments. Accordingly, it is quite likely that nanodelivery of NOS antibodies together with cerebrolysin and mesenchymal stem cells (MSCs) will induce superior neuroprotection in AD associated with CHI. In this review, co-administration of TiO2 nanowired cerebrolysin- a balanced composition of several neurotrophic factors and active peptide fragments, together with MSCs and monoclonal antibodies (mAb) to neuronal NOS is investigated for superior neuroprotection following exacerbation of brain pathology in AD by CHI based on our own investigations. Our observations show that neurotrophic factors, MSCs and neuronal NOS play key roles in brain pathology of AD exacerbated by CHI, not reported earlier.

Biography:

Hari Shanker Sharma is Professor of Neurobiology (MRC) and Docent in Neuroanatomy (UU) at the Department of Surgical Sciences, Uppsala University Hospital (Sweden). After carrying out a series of Government of India-funded Research Projects on the Blood Brain Barrier (BBB) and brain dysfunction, Sharma was awarded the prestigious Alexander von Humboldt Foundation Fellowship of German Government for his work on hyperthermia-induced BBB dysfunction at the ultrastructural level in the laboratory of Professor Jorge Cervós-Navarro. Currently, his main research interest is Neuroprotection and Neurodegeneration in relation to the BBB in stress, trauma, and drugs of abuse in health and disease. Dr Sharma has published over 380 articles, 12 monographs and 70 international book chapters, and he has edited 15 book volumes.

Radiomics and artificial intelligence

Hesham Mahmoud Gamal Eldin Mohamed ELBehairy
Unilabs, Saudi Arabia

Abstract:

Radiomics and artificial intelligence (AI) are revolutionizing the field of medical imaging, offering unprecedented opportunities for enhanced diagnosis, prognosis, and treatment planning. This talk will explore the transformative impact of these technologies on clinical practice and research. Radiomics involves the extraction of quantitative features from medical images, enabling the conversion of visual data into high-dimensional, mineable data. These features can reveal underlying pathophysiological processes that are not discernible to the naked eye, leading to more accurate and personalized patient care. By integrating radiomics with AI, particularly machine learning algorithms, we can develop predictive models that improve diagnostic accuracy and patient outcomes. AI in imaging leverages deep learning techniques to analyze vast amounts of data, automating the detection and characterization of abnormalities. This capability not only enhances the efficiency and accuracy of radiological interpretations but also addresses the growing demand for imaging services in healthcare systems. AI algorithms can assist in detecting diseases at earlier stages, optimizing treatment plans, and monitoring disease progression with greater precision. The synergy between radiomics and AI holds the promise of advancing precision medicine. This talk will highlight key developments in the field, including the application of AI in oncological imaging for tumor characterization, the prediction of treatment responses, and the assessment of disease progression. Furthermore, it will address the challenges and future directions in implementing these technologies, such as data standardization, validation, and integration into clinical workflows. In conclusion, the fusion of radiomics and AI in medical imaging is set to revolutionize healthcare, providing clinicians with powerful tools for better patient management. This talk aims to provide an overview of the current landscape, recent advancements, and future prospects of radiomics and AI in imaging, underscoring their potential to enhance patient care and outcomes.

Biography:

24 years of experience in Health Care Industry, working with Globe multinational companies in 3 different markets (Africa, middle East Turkey, and Asia Pacific) with multinational corporation. He recived Biomedical Engineering with Excellent Honours , also received MIBA (Master International Business Administration) from ESLSCA France @ Strategy + Marketing Certified from ISRRT & BRACCO Education Licensing for Radiology Imaging certified. Certified Lean Six Sigma for management (green belt). Currently Business development manager UNILABS/Tibbiyah SAUDI ARABIA, sever experience at Medical Imaging / oncology Centres as a Consultant to improve ROI, Clinical outcome, increase operation efficiency, patient's workflow optimization and control/reduced cost. Expert in Cardiology / Neurology and Oncology practice at hospital landscape.

Electrochemical implantable sensors for in situ monitoring inside the body

Carla Arroyo[1,2,3], Josep Samitier[1,2,3] , Mònica Mir [1,2,3,*]

[1]*Centro de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN) ,Spain.*

[2]*Nanobioengineering Group, Institute for Bioengineering of Catalonia (IBEC) Barcelona Institute of Science & Technology (BIST), Spain.*

[3]*Department of Electronics and Biomedical Engineering, University of Barcelona, Spain*

Abstract:

Nanotechnology is a cutting-edge field that spans many possibilities for the study and treatment of different diseases. A key tool recently developed in biomedical engineering research thanks to this technology is implantable sensors. The development of miniaturized implantable biosensors in the human body has revolutionized the field of medicine in terms of diagnosis, treatment and monitoring of numerous conditions and diseases, such as cardiovascular disorders and metabolic problems. One of the great advances that these sensors have introduced is their ability to monitor clinical data practically in real time, obtaining records of the body's biophysical and biochemical parameters in a continuous way and for extended periods. This talk will present an overview of implantable sensors in blood vessels, followed by our developments in this field for different applications, such as ischemia monitoring for fetal growth restriction monitoring and cardiac disease biomarkers for an early diagnosis. Future trends and the advantages and limitations of this technology will be discussed.

Biography:

Dr. Mònica Mir received the Degree in Chemistry from University Rovira i Virgili, Spain in 1998. In 2006 she received her PhD in biotechnology in the same University. She realized different predoctoral stages at the Institute of Microelectronic in Demokritos, University of Bath and National Hellenic Research Foundation. From 2007, she held a postdoctoral position in Max Planck Institute for Polymer Research, Germany. Since 2008, she joins the Institute for Bioengineering of Catalonia (IBEC), Spain as Senior CIBER researcher, combined with her teaching as associate professor at the University of Barcelona. Along her carrier she was managing European, National and industrial research projects, supervising PhD ad Master students and collaborating in congresses organization as coordinator and scientific committee. Her main scientific interests are focused on electrochemical biosensor, integrated in lab-on-a-chip and point of care technologies, implantable sensors, and organ-on-a-chip for biomedical applications.

Nanowired delivery of cerebrolysin together with monoclonal antibodies to amyloid beta peptide, phosphorylated tau and tumor necrosis factor alpha induces superior neuroprotection in Alzheimer's disease brain pathology exacerbated by sleep deprivation

Aruna Sharma[*1], Lianyuan Feng[2], Hongyun Huang[3], Lin Chen[4], José Vicente Lafuente[5] Lars Wiklund[1], Hari Shanker Sharma[*1,5]

[1]*International Experimental Central Nervous System Injury & Repair (IECNSIR), Uppsala University, Sweden*

[2]*Department of Neurology, Bethune International Peace Hospital, China*

[3]*Institute of Neurorestoratology, General Hospital of Chinese Armed Police Forces, China*

[4]*Department of Neurosurgery, Dongzhimen Hospital of Beijing University of Traditional Chinese Medicine, China*

[5]*LaNCE, Dept. Neuroscience, University of the Basque Country (UPV/EHU), Spain*

Abstract:

Sleep deprivation (SD) induces amyloid beta peptide and phosphorylated tau deposits in the brain and cerebrospinal fluid together with altered serotonin metabolism [1]. Thus, it is likely that sleep deprivation is one of the pre-disposing factors in precipitating Alzheimer's disease (AD) brain pathology [2]. Our previous studies indicate significant brain pathology following sleep deprivation or AD [3]. In this investigation nanodelivery of cerebrolysin together with monoclonal antibodies to amyloid beta peptide (AbP), phosphorylated tau (p-tau) and tumor necrosis factor alpha (TNF-a) in sleep deprivation induced superior neuroprotection in AD exacerbated by sleep deprivation is discussed based on our own investigations. Our results suggest that nanowired delivery of monoclonal antibodies to AbP with p-tau and TNF-a profoundly induces superior neuroprotection in brain pathology in AD exacerbated by sleep deprivation, not reported earlier. There was a significant reduction in the blood-brain barrier (BBB) breakdown, brain edema formation and neuropathological consequences in AD with sleep deprivation caused by combined nanowired delivery of the above agents as compared to saline treatments. The possible mechanism of neuroprotection is discussed.

Biography:

Aruna Sharma, MD is currently Secretary of Research at Uppsala University Hospital, Uppsala University, Sweden. She is a qualified experimental Neurpathologist and received her training at Karl Marx University Leipzig Free University Berlin, Germany (1989-1991) and Neuropathology Institute Uppsala (1992-1995).She is the member of various Distinguished American Organizations and elected to receive the prestigious award "Women of the Years Representing Sweden Award 2009" for her outstanding contributions towards society by American Biographical Research Institute, USA; and "Best Professional Business Women Award 2010" For Setting Standard to Motivate, Excel and Inspire Others, Raleigh, North Carolina, USA. She has published over 50 original research papers in Reputed Neuroscience Journals and is currently Acquisition Editor of American Journal of Neuroproetction and Neuroregenartion.

Exploring the impact of nanomaterials' morphology in cell viability assays

Paulo C. De Morais [1,2]
[1]*Catholic University of Brasilia, Brazil*
[2]*University of Brasilia, Brazil*

Abstract:

This plenary talk presents a prospective immersion on the Hill's model, introduced more than a century ago, aiming to explain the binding of oxygen molecules to hemoglobin and subsequently used to explain a huge variety of biological data. Evaluation of cell viability challenged by a particular bioactive compound, including bioactive nanomaterials, is among the experiments Hill's model has been applied. Nevertheless, even after half of a century has passed since the "NANO" term was coined and introduced into the scientific literature, only recently emerged a proposal on how to incorporate the morphological characteristics (mean size and size dispersity) of a nanomaterial in the description of in vitro bioassays, as for instance cell viability assays. Moreover, in recent years, the standard Hill's model has been used to describe cell viability assays performed with nanomaterials. In view of this long-standing gap in the literature, the present talk aims to present a recently developed Hill-inspired model that successfully accounts for the description of MTT assays performed with nanomaterials, emphasizing the impact of the mean size and size dispersity in the biological response. The concept of "biological polydispersity" of a nanomaterial is then introduced, meaning the size characteristics of a nanomaterial while recognized by a particular biological assay. Last, but not least, for a nanomaterial, the "biological polydispersity" is compared with the morphological polydispersity, the latter assessed from high-resolution microscopy micrographs.

Biography:

Professor Paulo César De Morais, PhD, was full Professor of Physics at the University of Brasilia (UnB) – Brazil up to 2013, Appointed as: UnB's Emeritus Professor (2014); Visiting Professor at the Huazhong University of Science and Technology (HUST) – China (2012-2015); Distinguished Professor at the Anhui University (AHU) – China (2016-2019); Full Professor at Catholic University of Brasília (CUB) – Brazil (2018); CNPq-1A Research Fellow since 2010; 2007 Master Research Prize from UnB. He held two-years (1987-1988) post-doc position with Bell Communications Research, New Jersey – USA and received his Doctoral degree in Solid State Physics (1986) from the Federal University of Minas Gerais (UFMG) – Brazil. With more than 12,000 citations, he has published about 500 papers (Web of Science) and more than 15 patents.

AI-Enhanced design of a compact four-channel silicon nitride MMI WDM multiplexer for energy-efficient O-band data transmission

Dror Malka
Holon Institute of Technology (HIT), Israel

Abstract:

The operation of a four-channel multiplexer, utilizing multimode interference (MMI) wavelength division multiplexing (WDM) technology, can be designed through the cascading of MMI couplers or employing angled MMI couplers. However, conventional designs often occupy a larger footprint, spanning a few millimeters, thereby escalating the energy power requirements for the photonic chip. In response to this challenge, we propose an innovative design for a four-channel silicon nitride (Si_3N_4) MMI coupler with a compact footprint. This design utilizes only a single MMI coupler unit, operating within the O-band spectrum. The resulting multiplexer device can efficiently transmit four channels with a wavelength spacing of 20 nm, covering the O-band spectrum from 1270 to 1330 nm, after a short light propagation of 22.8 μm. Notably, the multiplexer achieves a power efficiency of 70% from the total input energy derived from the four O-band signals. Power losses range from 1.24 to 1.67 dB, and the MMI coupler length and width exhibit a favorable tolerance range. Leveraging Si_3N_4 material and waveguide inputs and output tapers minimizes light reflections from the MMI coupler at the input channels. Consequently, this Si_3N_4-based MMI multiplexer proves suitable for deployment in O-band transceiver data centers employing WDM methodology. Its implementation offers the potential for higher data bitrates while maintaining an exemplary energy consumption profile for the chip footprint.

Biography:

Dror Malka received his BSc and MSc degrees in electrical engineering from the Holon Institute of Technology (HIT) in 2008 and 2010, respectively, Israel. He has also completed a BSc degree in Applied Mathematics at HIT in 2008 and received his Ph.D. degree in electrical engineering from Bar-Ilan University (BIU) in 2015, Israel. Currently, he is a Senior Lecturer in the Faculty of Engineering at HiT. His major fields of research are nanophotonics, super-resolution, AI silicon photonics and fiber optics. He has published around 70 refereed journal papers, and 80 conference proceedings paper.

Metrology - Characterization of precision optics for laser applications

RamaGopal V Sarepaka
Optics, Optics & Allied Engg.Pvt.Ltd., India

Abstract:

Majority of Laser Application-related Precision Optical Systems deploy non-spherical optical surfaces. These novel optical surfaces are precision engineered by using the Diamond Turning Machining (DTM) to meet the desired weight-footprint-performance criteria. DTM allows high precision surfaces to be manufactured quickly and efficiently. As part of Precision Engineering envelope, Diamond Turn Machining (DTM) also involves two un-separable dimensions of material processing viz., deterministic fabrication and error free metrology. The need to qualify the fabricated component for its adherence to both dimensions and surface quality within prescribed tolerance ranges necessitates this holistic treatment of surface measurement. This qualification involves both surface metrology and surface characterization. Often these two terms, metrology and characterization are used without differentiation in between. However, it is necessary to bring clarity in this matter, by a comprehensive discussion and clear understanding of the surface features as per desired quality criteria. Metrology refers to broad (physical) measurement of the geometrical features and surface features of the component fabricated. Characterization refers to a holistic approach of assessing the features' departures from the specifications, analyzing them in relation with each other, with inputs for their possible reduction by process optimization. The precision surfaces generated by DTM are generally assessed a) for their dimensional accuracies (whether or not, they met the specified geometrical dimensions within the prescribed tolerances) and b) for their surface quality criteria (in terms of form, figure and finish). A well-planned evaluation methodology to assess the usefulness of the DTM generated precision components is planned to be discussed in detail in the proposed talk.

Biography:

RamaGopal V Sarepaka has been serving as the President of R&D Operations & DTM at IR Optics (Optics & Allied Engineering Pvt. Ltd., Bengaluru, India) since January 2017. Prior to this, he held the position of Senior Vice President at Precision Optical Industry, Mumbai, India, from 2015 to 2016. From 2009 to 2015, he contributed his expertise as a Professor at the Academy of Scientific & Industrial Research (AcSIR), under the Government of India. Between 2011 and 2015, he also served as the Chief Scientist at CSIR-CSIO, Chandigarh, India, a federally funded R&D laboratory. His extensive career began as a Scientist at CSIR-CSIO, Chandigarh, India, where he worked from 1983 to 2011. Earlier in his career, from 1978 to 1983, he was a Senior Research Fellow, completing his Masters and Doctoral studies at the Indian Institute of Technology (IIT), Delhi, India.

Role of stem cells in Neural and hematopoietic diseases

Anand Srivastava
GIOSTAR, USA

Abstract:

The experimental evidences strongly suggest that embryonic stem (ES) cell lines can be created from human blastocyst-stage embryos and stimulated to develop into practically all types of cells found in the body. Cellular treatments produced from ES cells have attracted fresh interest. The potential utility of ES cells for gene therapy, tissue engineering, and the treatment of a wide spectrum of currently untreatable diseases is simply too vital to ignore; however, further improvements in our understanding of the basic biology of ES cells are required to deliver these forms of therapy in a safe and efficient manner. In this meeting, I'll share my research using ES cells and how they can be used to treat hematopoietic and neurodegenerative disorders.

Biography:

Dr. Anand Srivastava is a Chairman and Cofounder of California based Global Institute of Stem Cell Therapy and Research (GIOSTAR) headquartered in San Diego, California, (U.S.A.). The company was formed with the vision to provide stem cell based therapy to aid those suffering from degenerative or genetic diseases around the world such as Parkinson's, Alzheimer's, Autism, Diabetes, Heart Disease, Stroke, Spinal Cord Injuries, Paralysis, Blood Related Diseases, Cancer and Burns. Dr. Srivastava has been associated with leading universities and research institutions of USA. In affiliation with University of California San Diego Medical College (UCSD), University of California Irvine Medical College (UCI), Salk Research Institute, San Diego, Burnham Institute For Medical Research, San Diego, University of California Los Angeles Medical College (UCLA), USA has developed several research collaborations and has an extensive research experience in the field of Embryonic Stem cell which is documented by several publications in revered scientific journals. Furthermore, Dr. Srivastava’s expertise and scientific achievements were recognized by many scientific fellowships and by two consecutive award of highly prestigious and internationally recognized, JISTEC award from Science and Technology Agency, Government of Japan. Also, his research presentation was awarded with the excellent presentation award in the “Meeting of Clinical Chemistry and Medicine, Kyoto, Japan. Based on his extraordinary scientific achievements his biography has been included in “WHO IS WHO IN AMERICA” data bank two times, first in 2005 and second in 2010.

Oral Talk
Day 01

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Orbital motion of gold heterodimer driven by circularly polarized light

Yun-Cheng Ku[1,2], Chun-Yi Yang[1], Jiunn-Woei Liaw[2,3], Mao-Kuen Kuo[1*]

[1]*Institute of Applied Mechanics, National Taiwan University, Taiwan*

[2]*Department of Mechanical Engineering, Chang Gung University, Taiwan*

[3]*Department of Mechanical Engineering, Ming Chi University of Technology, Taiwan*

Abstract:

This theoretical study explores the two-dimensional orbital motion of an optically bound heterodimer consisting of two gold Nanoparticles (NPs) with different sizes, driven by circularly polarized light. This phenomenon arises from the interaction between the optical force and torque generated by the circularly polarized light and the reactive drag force from the surrounding medium. We calculate the optical forces exerted on each NP by analyzing the Maxwell's stress tensor on their surfaces and simulate their trajectories using dynamic equations of motion. Our results demonstrate that, regardless of the initial conditions of the two NPs, they will become optically bound together, exhibiting rigid-body translation and rotation. Notably, the center of mass of the heterodimer undergoes an orbital revolution around a fixed point eventually. The heterodimer's orbital radius and direction of revolution are influenced by the size disparity between the two NPs. The circularly polarized light-manipulated heterodimer behaves like a boomerang, acting as a spinning rotor on a circular path. Additionally, each NP experiences spin motion, with the spin direction determined by the handedness of the circularly polarized light. These findings offer valuable insights into the opto-mechanical manipulation of non-monodisperse NP clusters using circularly polarized light.

Biography:

Mao-Kuen Kuo received his B.S. and M.S. degrees in Civil Engineering from National Taiwan University, Republic of China, in 1977 and 1979, respectively, and Ph.D. degree in Civil Engineering from Northwestern University, United States of America, in 1984. Presently, he is a Distinguished Professor in the Institute of Applied Mechanics, National Taiwan University. He joined the faculty of National Taiwan University in 1984. His research work was mainly on Elastodynamic Fracture Mechanics and Nondestructive Evaluation, and has been switched to quantum dots and surface plasmon, recently. He was a recipient of the 1987 Teaching Award sponsored by the Ministry of Education, Republic of China. He was also recipients of the 1987, 1988, 1989 and 2002 Teaching Award sponsored by the College of Engineering, National Taiwan University.

Hierarchical mordenite zeolite prepared using soft-templating synthesis for cyclic acetals production via acetylation of glycerol and benzaldehyde

Eng-Poh Ng[1*], Jiang-Tian Gong[1], Ludovica Pace[2], Pedro Maireles-Torres[3], Joon Ching Juan[4] & Svetlana Mintova[2]

[1]*School of Chemical Sciences, Universiti Sains Malaysia, Malaysia*

[2]*Normandie University ENSICAEN, UNICAEN, CNRS, Laboratorie Catalyse Spectrochimie, France*

[3]*Departamento de Química Inorgánica Cristalografía y Mineralogía (Unidad Asociada al ICPCSIC), Facultad de Ciencias Campus de Teatinos, Universidad de Málaga, Spain*

[4]*Nanotechnology & Catalysis Research Centre (NANOCAT), Universiti Malaya, Malaysia*

Abstract:

Mordenite is one of the most important industrial zeolites with two-dimensional pores (6.5×7.0 Å^2 ↔ 2.5×5.7 Å^2). It has widely been used in the agricultural, petrochemical and separation processes. However, the microporosity of mordenite limits its application in certain catalytic reactions involving bulky molecules, where the presence of small micropores creates a barrier to molecular diffusion. Furthermore, the restricted pore size of zeolites also leads to mass transfer for reactant molecules, causing coking and catalyst deactivation. In this work, highly active hierarchical mordenite zeolite with micro/mesoporosity (TM-*n*) for selective synthesis of cyclic acetals via acetylation reaction is reported. The hierarchical zeolite is synthesized using soft-templating approach with variations in octadecyltrimethoxysilane (OTMS/Al_2O_3 ratio, $n = 0.2$, 0.3 and 0.4) in precursor hydrogels. The results reveal that OTMS not only creates secondary mesoporosity in zeolite framework (larger mesopore volume, external surface area, average pore diameter), but also influences the crystallization process, altering the crystal morphology, crystallinity and Si/Al ratios. Among TM-*n* zeolites prepared, TM-0.3 hierarchical mordenite has the optimum OTMS amount incorporated while further increasing the OTMS amount leads to the formation of ANA/GIS intergrowth. Thanks to the accessible hierarchical porosity, reduced acidity and morphological effects, the TM-0.3 hierarchical mordenite exhibits excellent catalytic performance (84.1% conversion, TOF = 0.087 s^{-1}, 61.5% dioxolane selectivity) in acetylation of glycerol and benzaldehyde (160 °C, 20 min) better than pristine mordenite. In addition, comparative catalytic tests with classical homogeneous and heterogeneous catalysts, including H^2SO^4, HCl, CH_3COOH, H–Y, H-LTL, Na-X, Na-A, are performed. Furthermore, the catalytic performance is superior than of the pristine mordenite and other conventional homogeneous and zeolite-based catalysts. More importantly, the catalyst is reusable for five runs with minimal loss of activity (TOF = 0.087 → 0.084 s^{-1}), offering it as a potential acid catalyst for chemical productions involving bulky molecules.

Biography:

Eng-Poh Ng received his BSc. (Ind. Chem.) degree in 2004 from Universiti Teknologi Malaysia. He obtained his MSc. (Chem.) degree in 2006 and under the supervision of Prof. Dr. Halimaton Hamdan. Then, he received his PhD degree in 2009 from University of Upper Alsace, France under the supervision of Prof. Dr. Svetlana Mintova. He joined Universiti Sains Malaysia in 2010 as a Senior Lecturer before being promoted to Associate Professor in 2016. Currently, he has published more than 170 indexed journals including top-tier journals like Science, Chemistry of Materials, Green Chemistry, Chemical Engineering Journal, etc. His current H-index is 46 with a total citation of 6590. He was also one of the World's Top 2% Scientists in his research field listed by Stanford University since 2019 until 2022. His main research interests are synthesis, investigation and application of nanoporous silica-based materials for adsorption, catalysis and other advanced applications.

Multi-modal AI for translational research & precision medicine

Alan Jerusalmi
Bio-AI Health, USA

Abstract:

At BioAI, we develop world-leading machine learning technology to develop digital biomarker tests for patient selection and screening. The BioAI PredictX platform is capable of ingesting a range of data types, including Digital Pathology, Multiomics and Real-World Evidence. Using multimodal data, state-of-the-art AI methods, and integrated deep learning, we can build predictive and prognostic models across a wide range of therapeutic areas. BioAI has built numerous models that can be used to classify both molecular status and tissue biomarkers directly from H&E slides without the need for additional molecular or IHC testing. PredictLung, currently in development, is an AI-powered digital test panel for NSCLC patient tumor tissue samples that can predict actionable mutations and biomarkers from H&E stained images. This test leverages an existing H&E image (available as a standard diagnostic procedure) and is a rapid, generalizable screening test that can help guide therapy selection.

Biography:

Alan Performance-driven professional with 20 years of experience in the health care and life sciences industry, with a strong focus on Digital Pathology and data sciences. Proven track record in running a global organization and building strategic partnerships with leading Pharma/Biotech companies with focus in oncology. Strong technical background in drug development process, companion diagnostic strategy, business development, genomics, pathology and clinical implementation of tissue and image-based assays. Ability to drive complex strategies forward and guide multi-disciplinary teams to success while managing a global team in a matrix environment. Significant achievements across professional services, product development, operations, and alliance management. Demonstrated success in solving key problems and implementing solutions leading to successful delivery of projects and establishment of partnerships as a trusted advisor, team leader and partner.

Rethinking post operative delirium prevention: A precision medicine approach

Sarita Khemani
Stanford University School of Medicine, USA

Abstract:

With aging population, the number of patients undergoing surgeries annually are increasing. Post-operative delirium (POD) is one of the most common and serious complications after surgery, affecting 10% to 50% of surgical patients. POD significantly contributes to patient morbidity, prolonged hospital stays, and increased healthcare costs. Moreover, research indicates that POD can have long term consequences, including cognitive impairment that may persist and potentially contribute to neurodegeneration. In this talk, we will discuss the current state of post-operative delirium research, highlighting the heterogeneity in risk factors, clinical presentation, and underlying mechanisms. We will briefly discuss updates on current treatment approaches and their limitations. We will go over why one-size-fits-all approach needs to shift towards a precision medicine model tailored to individual patient profiles. Drawing from the broader literature, we will explore the application of biomarkers indicating oxidative stress, neuroglial damage, and inflammatory responses that could help recognize patients with preoperative vulnerability to subsequent cognitive decline. We will conclude by discussing the challenges and opportunities in implementing precision medicine strategies in post operative delirium prevention, including the need for interdisciplinary collaboration and the integration of biomarker assessments into routine clinical practice. By implementing a precision medicine approach, we can develop personalized, targeted practices to mitigate the risk of post operative delirium and improve outcomes for our aging population.

Biography:

Sarita Khemani, MD is a Clinical Associate Professor of Medicine and Neurosurgery Hospitalist at Stanford University School of Medicine. Her clinical duties involve managing medical co-morbidities, with the primary goal of preventing post operative complications in the hospital setting. She is also the head of Stanford's Lifestyle Medicine Stress Neuroscience pillar. Dr. Khemani is actively involved in medical education, serving as the Director of the Perioperative Medicine Rotation for medical students. She has been awarded for excellence in teaching and has presented at various local, regional, and national conferences. Her work focuses on integrating clinical practice with advancements in neuroscience and lifestyle medicine, with a commitment to enhancing patient care and medical training.

Stem cell research in human longevity

Deven Patel
Global Institute of Stem Cell Therapy and Research (GIOSTAR), USA

Abstract:

The life expectancy or longevity is the number of years a person is expected to live. It depends on various factors including genetics, gender, individual life style and socio-economic factors. According to the United Nations, the global life expectancy as of 2023 was 70.8 years for males and 76.0 years for females, for an average of 73.4 years. Longevity, vary significantly by region as well as by country. Various scientific discoveries in the recent decades, in the area of human health, have contributed towards improvement in longevity. Biologically, human aging is associated with reduced tissue regeneration, increased degenerative disease, and cancer. Stem cells persist throughout life in numerous mammalian tissues, replacing cells lost to homeostatic turnover, injury, and disease. With the aging process, stem cell function declines in numerous tissues as a result of gate-keeping tumour suppressor expression, DNA damage, changes in cellular physiology, and environmental changes in tissues. Like all cells, stem cell aging is determined partly by the accumulation of damage over time. Declines in stem cell function during aging can be attributed to telomere shortening, DNA damage, and mitochondrial damage. Mitochondrial activity, tissue growth, and metabolic rates during development can also influence life span and the rates of cellular aging at later stages of life. The criticality of normal mitochondrial function, required for embryonic stem cell proliferation, regulating differentiation, and preventing the emergence of tumorigenic cells during the process of differentiation, was demonstrated by GIOSTAR Chairman Dr Anand Srivastava in his work at UCLA. The author showed that by arresting the mitochondrial function the cell division ability of stem cells were enhanced. This was a significant finding as the role of genes associated with pluripotency were linked to the mitochondrial function. Indirectly, it was observed that aging can be controlled by modulating the mitochondrial function. GIOSTAR is the pioneer and leading institute working in area of stem cells and regenerative medicine. Under the scientific leadership of Dr Anand Srivastava, the institute developing and providing the therapeutic interventions harnessing the power of stem cells.

Biography:

Mr. Deven Patel, the CEO, President and Cofounder of Global Institute of Stem Cell Therapy and Research (GIOSTAR) is based in San Diego, California, U.S.A. GIOSTAR was formed with the vision to provide affordable stem cell based therapies to the masses around the world suffering from many incurable degenerative diseases. He was honored with USA Congressional Recognition for his efforts in spreading the advancement of stem cell science around the world. He was also bestowed upon Asian Heritage Award for his business leadership in the field of stem cell science. GIOSTAR under the leadership of Mr. Patel has developed several stem cell research and treatment facilities around the globe including USA, Mexico, India, Costa Rica plus few more in near future in China, Thailand, Greece , Bahamas, Dubai and Australia. GIOSTAR, in collaborations with Govt. of Gujarat, India, developing world's largest Stem Cell Treatment Hospital in India.

Human umbilical cord-derived mesenchymal stem cells in combination with small extracellular vesicles improve survival & dramatically reduce fibrosis and cirrhosis in Wistar rats receiving CCL4

Navneet Boddu
Therapeutic Solutions International Inc, USA

Abstract:

Background: Umbilical cord-derived Mesenchymal Stem Cells (UC-MSCs) exert potential anti-inflammatory properties and in previous studies have shown anti-fibrotic effects in animal models of liver fibrosis and cirrhosis. In this proof-of-concept, first in animal study, we examined the effect of human UC-MSCs combined with small extracellular vesicles (SEVs) on liver fibrosis in a rat model of fibrosis and cirrhosis.

Methods: Human UC-MSCs were cultured via a xenofree, explant process with modifications to passage 3 and SEVs were obtained from supernatant of the cultured UC-MSCs. Two groups, each of 14 Wistar male rats, aged 7-8 weeks, received oral CCL4 with olive oil (1ml/kg) twice weekly for a total of 6 weeks from week 1 to week 6. Starting at week 4, after all animals in both groups received 6 induction doses of CCL4, one group of 14 animals received three weekly IV doses of UC-MSC + SEV at a dose of 1 million MSCs and 5 billion SEV each. All animals alive at week 7 were sacrificed. 14 animals who received CCL4 alone from weeks 4-7 were control animals. The primary objectives were to examine the survival differences between two groups of animals and the effect of UC-MSC + SEV on fibrosis stage by Trichrome and Sirius Red.

Results: Six animals in the control group died before week 6 whereas all 14 animals in the US-MSC + SEV were alive at week 6. The survival difference at 6 weeks was significant between two groups (100% with UC-MSC + SEV vs 57%, p=0.0066). The necropsy of 6 dead animals in the control group showed cirrhosis in all 6 animals. The comparison between 8 animals in the control group and 14 animals receiving US-MSC + SEV is shown in Table1. Notably, liver fibrosis stage by both Trichrome and Sirius Red was significantly lower in the UC-MSC + SEV group. While there were no animals in the UC-MSC + SEV group had cirrhosis, there were 12 animals in the control group with cirrhosis. There were corresponding favorable liver biochemistry and liver immunohistochemistry changes in the UC-MSC +SEV group.

Conclusion: Human UC-MSCs cultured to passage 3 in combination with SEV significantly improved the survival of the animals receiving lowdose CCL4. UC-MSC + SEV dramatically reduced the development of fibrosis and cirrhosis induced by CCL4. Further studies are needed to validate our observations and to test the combination of UC-MSC + SEV in other animal models and in humans with fibrotic liver diseases and liver failure.

Biography:

Dr. Navneet Boddu is a specialist in Regenerative Medicine. He is triple board-certified in Pain Medicine, Anesthesiology and Echocardiogram with more than 25 years of experience. At Advanced Pain and Regenerative Specialists, Dr. Boddu provides personalized treatments for his patients' spine and joint disorders. Using the latest medical technology and evidence-based cellular therapies, like autologous bone marrow, fat stem cells and other biologics, Dr. Boddu uses the patient's own cells to regenerate and heal joints, tendons, ligaments, and spine disorders. Dr Boddu is a five-time Top Doctor in Pain Medicine and Anesthesiology in San Diego County. He is a contributing author of chapters about nerve blocks and interventional pain injections in the textbook Interventional Orthopedics Procedures. He also co-authored chapters in the Textbook of Regenerative Medicine. He conducted FDA-authorized umbilical cord stem cell treatments for patients with severe COVID. Dr Boddu is an anesthesiologist at Scripps Medical Center, Encinitas. He is a member of the scientific board at Therapeutic Solutions International Inc., a biotech company and industry leader in stem cell, exosome, and immunotherapy technologies. Dr. Boddu was chairman of the Anesthesiology Department at TriCity Medical Center from 2015 to 2017. Prior to that he was chairman at Providence Mission Hospital Laguna Beach, where he practiced Pain Medicine and Anesthesiology.

Use of mesenchymal stemcells for systemic illnesses

Navneet Boddu
Therapeutic Solutions International Inc, USA

Biography:

Dr. Navneet Boddu is a specialist in Regenerative Medicine. He is triple board-certified in Pain Medicine, Anesthesiology and Echo-cardiogram with more than 25 years of experience. At Advanced Pain and Regenerative Specialists, Dr. Boddu provides personalized treatments for his patients' spine and joint disorders. Using the latest medical technology and evidence-based cellular therapies, like autologous bone marrow, fat stem cells and other biologics, Dr. Boddu uses the patient's own cells to regenerate and heal joints, tendons, ligaments, and spine disorders. Dr Boddu is a five-time Top Doctor in Pain Medicine and Anesthesiology in San Diego County. He is a contributing author of chapters about nerve blocks and interventional pain injections in the textbook Interventional Orthopedics Procedures. He also co-authored chapters in the Textbook of Regenerative Medicine. He conducted FDA-authorized umbilical cord stem cell treatments for patients with severe COVID. Dr Boddu is an anesthesiologist at Scripps Medical Center, Encinitas. He is a member of the scientific board at Therapeutic Solutions International Inc., a biotech company and industry leader in stem cell, exosome, and immunotherapy technologies. Dr. Boddu was chairman of the Anesthesiology Department at TriCity Medical Center from 2015 to 2017. Prior to that he was chairman at Providence Mission Hospital Laguna Beach, where he practiced Pain Medicine and Anesthesiology.

Linkin Science

Poster Presentation

Day 01

Linkin

Science Conferences

Hybrid Mode (Onsite & Online)

Multifocal kinoform diffractive lenses based on the aperiodic Silver Mean sequence

Walter D. Furlan[1], Adrián Garmendía-Martínez[2], Anabel Martínez-Espert[1], Vicente Ferrando[2], Francisco M. Muñoz- Pérez[2,3],and Juan A. Monsoriu[2]

[1]*Departamento de Óptica y Optometría y Ciencias de la Visión, Universitat de València, Spain Centro de Tecnologías Físicas, Universitat Politècnica de València, Spain*

[2]*Laboratorio de Fibra Óptica, Universidad Politécnica de Tulancingo, Mexico*

Abstract:

In this communication, we present a new kind of diffractive-kinoform lenses characterized by the phase distribution of the Silver Mean (SM) sequence. The focusing properties of these aperiodic lenses are analytically studied. It is shown that, under monochromatic illumination, the SM lenses direct most of the incoming light into four foci whose focal lengths are related to the Silver ratio. Two different photonics applications are proposed. First, we present the implementation of multi-trap optical tweezers. We show that The quadrifocal- kinoform feature of the SM lenses enables multiple axial trapping, providing an alternative method for three-dimensional manipulation. Positioning particles along a line at controlled distances allows for the exploration of interactions between them under laser irradiation. Second, we propose the application of this approach in ophthalmology to design a multifocal intraocular lens. Multifocal lenses are currently the most popular surgical alternative for correcting presbyopia and cataracts. We show that under broadband illumination, the superposition of the different foci creates an extended depth of focus in the intraocular lens. Finally, the application of this type of aperiodic lens in other fields, such as microscopy or quantum computing, is also suggested.

Biography:

Dr. Walter D. Furlan received his PhD in Physics from the National University of La Plata (Argentina) in 1988. He is now Professor of Optics at the University of Valencia (Spain) since 2010. His research spans the field of Optics, initially focusing on phase-space formalisms and later on the design and applications of diffractive optical elements with aperiodic geometries.: He is currently the co-director of the "Diffractive Optics Group", where the research primarily targets the design of structured diffractive lenses and their applications in optical trapping and ophthalmology.

Keynote Forum

Day 02

Linkin

Science Conferences

Hybrid Mode (Onsite & Online)

Machine learning algorithms for surface plasmon resonance bio-detection applications, A short review

Malathy Batumalay
INTI International University, Malaysia

Abstract:

Surface plasmon resonance sensors have shown great growth in the last few decades. Surface plasmon resonance sensors have good sensitivity and fine resolution which made them suitable for bio-medical application and industrial quality control. However, surface plasmon resonance sensor face the challenges of costly construction, complex data processing, cross sensitivity, and the need for specialized interrogator setup. Use of machine learning algorithms can ease some of these challenges. In this brief review, the sensing principal of surface plasmon resonance sensors is discussed. Then current state of machine learning algorithms in surface plasmon resonance sensing is presented. This paper is concluded by the potential future direction of using surface plasmon resonance sensing with machine learning in building compact, affordable, and easy-to-use sensor. Here, the speaker will discuss the sensing principle of surface plasmon resonance sensors, the current challenges faced by surface plasmon resonance sensors that can be addressed by Machine learning technologies. The use of machine learning is to improve the sensing performance of surface plasmon resonance sensors and the machine learning algorithms used are discussed in detail.

Biography:

Dr. Malathy Batumalay earned her master's degree in engineering from the University Malaya, Malaysia, and subsequently pursued her PhD in Photonics Engineering at the same institution. Her research focuses on lasers, fiber optics, and fiber sensors. Previously, she innovated fiber optics into sensors capable of detecting changes in relative humidity and chemical solutions. She collaborates with both local and international researchers to delve deeper into the behavior and characteristics of fiber optics sensors and plasmonic sensors, resulting in numerous high-quality publications in relevant journals. Additionally, she actively serves as a reviewer for several journals and holds a committee position in the Optical Society of Malaysia (OSM), where she contributes to activities involving young researchers. Furthermore, she is also registered as a professional engineer with the Board of Engineer Malaysia (BEM) and as a Chartered Engineer with The Institution of Engineering and Technology (IET). Presently associated with a prestigious private university in Malaysia, renowned for its expertise in Communication, Networking, and Cloud Computing, she holds pivotal leadership positions. As the Director of the Center for Data Science and Sustainable Technologies, the Deputy Chair of the University Research Committee, and the Chief Internal Auditor for Malaysia Research Assessment, Dr. Batumalay epitomizes academic excellence. Her fervent aspiration is to engage with emerging talents and prospective research candidates, thereby enhancing the academic landscape.

Re-inventing the lecture—physics education innovation

Rick Trebino
Georgia Institute of Technology, USA

Abstract:

The academic lecture was invented in ancient Sumer, using a stylus to inscribe cuneiform on a clay tablet. While it was a good idea then, it hasn't improved in the 5000 years since then. It has even nearly completely sat out the spectacular ongoing digital revolution, continuing to comprise a stark talking head before a bleak black (or white) board. Worse, lecture preparation is quite time-consuming, and teaching materials, such as lecture notes, are not helpful. So, the tedious task of preparing lectures is currently performed independently—and hence massively redundantly—by every teacher on earth. In other words, the world's current educational-lecture paradigm is analogous to that of books prior to Gutenberg's invention of the printing press. As a result, lecture preparation by the world's 50 million post-primary-school instructors currently absorbs tens of billions of human-hours annually, corresponding to a cost of roughly a trillion dollars a year. So, it's time to re-invent the lecture and to do for lectures what Gutenberg did for books. And I've done so for two college courses, Modern Physics and Optics. During the pandemic, I created highly polished talking-head-free multimedia videos of all the lectures for the entirety of both courses. And I freely share them with the world, saving students much boredom and stress and lecturers much time—freeing up instructors' time for more personal interaction with their students. In short, I believe that this societal transformation is long overdue, and the resulting better educated population would yield additional benefits for the entire world for the foreseeable future.

Biography:

Rick Trebino was born in Boston on January 18, 1954. He was quite poor as a child, but, on scholarships, he earned his high-school degree from Phillips Academy in Andover, Massachusetts, his B.A. from Harvard in 1977, and his Ph.D. from Stanford in 1983. Shortly afterward, while at Sandia National Laboratories in Livermore, California, he invented Frequency-Resolved Optical Gating (FROG), the first technique for the complete measurement of an ultrashort laser pulse in time, solving this long-standing famous problem in the field of ultrafast optics and advancing pulse measurement from blurry black-and-white snapshots to high-resolution full-color displays. In 1998, he accepted a Chair at Georgia Tech, where he extended humankind's measurement capability to the complete spatiotemporal electromagnetic field of even highly complex ultrashort pulses. He currently also develops more advanced approaches to optics and physics education, doing for lectures what Gutenberg did for books. He's received numerous prestigious awards, including 2024's R.W. Wood Prize and several for his pioneering contributions to optics and physics education, and is a Fellow of four scientific societies.

AI and Healthcare

Harvey Castro
Helpp.ai, USA

Abstract:

Dr. Harvey Castro, a leading expert in AI and healthcare, presents an engaging and insightful talk on how artificial intelligence is revolutionizing the medical landscape. In this 25-minute presentation, Dr. Castro explores the current and future applications of AI in healthcare, focusing on its transformative role in enhancing patient care, optimizing workflows, and addressing the growing demand for personalized medicine. He highlights AI's potential in predictive analytics, medical imaging, diagnostic accuracy, and preventive healthcare, sharing real-world examples of how AI tools are already being used to improve outcomes and reduce costs. Dr. Castro also delves into the ethical and practical challenges of integrating AI into healthcare, stressing the importance of maintaining the human element in medicine. He discusses the need for healthcare providers to adopt a proactive stance towards AI, ensuring that technology complements rather than replaces the clinician's expertise. By drawing on his experience as an emergency room physician, entrepreneur, and AI futurist, Dr. Castro provides actionable insights on how healthcare professionals can embrace AI to deliver better care while navigating the complexities of this rapidly evolving field. This talk is designed to inspire healthcare leaders, clinicians, and decision-makers to rethink the future of medicine with AI as a vital partner, ultimately aiming to improve patient outcomes and healthcare systems' efficiency globally.

Biography:

Dr. Harvey Castro is an emergency physician, healthcare futurist, and a recognized authority in AI-driven innovation. With over 20 years of experience in the medical field, he has been a pioneer in integrating AI into healthcare practices to enhance patient care and operational efficiency. Dr. Castro is the Chief Medical AI Officer at Helpp.ai and the CEO of Medical Intelligence Ops, where he leads initiatives that use AI for fall prevention, predictive analytics, and workflow automation in healthcare. He frequently speaks at global conferences and has authored several books on AI in medicine, demonstrating his commitment to the ethical and practical implementation of AI technologies in healthcare.

Oral Talk
Day 02

Linkin
Science Conferences
Hybrid Mode (Onsite & Online)

Opportunities in digital biomarkers

Nardev Ramanathan
Lux Research, Singapore

Abstract:

Digital biomarkers are emerging as a key technology in health and wellness, opening up new ways to use established sensors for early identification and management of disease. Digital biomarkers are key to personalizing healthcare, in the sense of both maintaining wellness and treating disease. Unlike traditional biomarkers, digital biomarkers provide distinct advantages, in that data can be collected continuously and noninvasively and can be analyzed and processed at scale in combination with other data streams, unlocking deeper insights. The current landscape of companies in digital biomarkers is populated by a wide range of market participants, from big tech and medical device companies to startups. Big tech companies like Apple, Samsung, and Huawei have a range of consumer devices and smartwatches in the market that focus on areas such as step tracking and vital sign detection, offering insights into wellness parameters such as sleep and stress. Big medical device companies like Dexcom and Abbott are increasingly positioning their CGM technology, originally focused on diabetic patients, to the nondiabetic, consumer marker. Consumers and patients can thus benefit from early diagnostics and timely interventions, and healthcare providers benefit from a more seamless and accessible technology for managing disease. Given the major shift toward consumer health monitoring with recent U.S. FDA approvals for over-the-counter devices, industry players, especially those in the food and nutrition, personal care, and apparel segments, should seize the opportunity to engage innovative digital biomarker players for the delivery of real-time health insights as part of their food consumption and personal care routines.In this presentation, I will delve deeper into what digital biomarkers are, discuss new and emerging opportunities, and share examples of innovative developers making progress in this space.

Biography:

Nardev Ramanathan is an associate research director and leads Lux Research's coverage of Consumer Health Sciences as part of the CPG team. In this role, Nardev works closely with senior innovation leaders across the globe to guide and shape their corporate innovation strategies around new and emerging consumer health technologies, such as digital biomarkers, digital therapeutics, health wearables, AI in consumer health, and consumer genomics. As one of the senior members of the CPG team, he is also involved in planning the research agenda for the CPG team with other research leaders and more broadly supports cross-functional research related to the intersection between food, nutrition and agricultural innovation impact consumer health, working with subject matter experts across Lux. Nardev earned his Ph.D. in Clinical Biochemistry from the University of Cambridge on an A*STAR Overseas Ph.D. scholarship. For his doctoral thesis, he identified a novel genetic mutation responsible for a rare inherited disease called lipodystrophy in a patient in the Middle East and went on to elucidate the molecular mechanism underlying the disease. Nardev has authored multiple peer-reviewed publications around metabolic health topics, many of which continue to be highly cited.

Recent advances in optimum stable pulsed fiber lasers

Haroon Asghar
National Centre for Physics, Quaid-i-Azam University Campus, Pakistan

Abstract:

Pulsed fiber lasers have been considered significant attention in recent decades due to their potential applications in spectroscopy, micro-machining, telecommunications, and medical. To establish a pulse operation in lasers, a Saturable Absorber (SA) is desired in the cavity that modulates the optical losses. Therefore, to achieve a pulsed operation, SA is paramount in the fiber lasers. Various SAs based on carbon nanotubes, black phosphorous, graphene, transition metal oxides, Metal-Organic Frameworks (MOFs), MXenes, MAX Phase materials, transition metal dichalcogenides, and semiconductor Saturable-Absorbers Mirrors (SESAMs) have been proposed and demonstrated in fiber lasers. However, complicated optical alignment, stability, complex fabrication processes, and environmental sensitivity restrict practical applications of SAs for Q-switching and mode-locking operation. To date, many experimental techniques such as deposition of nanoparticles on a fiber ferrule, thin-film based SAs, and pulsed laser deposition technique have been proposed and demonstrated to fabricate SAs in laser cavities for Q-switching and mode-locking of optical pulses. However, the SAs including thin-film and nanoparticles-based techniques are highly unstable and difficult to align inside the laser cavity as they are environmentally sensitive and have a low damage threshold. To address this challenge, we successfully proposed and demonstrated an optimum stable ZnO-SA prepared using a pulsed laser deposition technique.

Biography:

Haroon Asghar is currently working as an Assistant Professor in Physics at the National Center for Physics, Quaid-i-Azam University Campus, Islamabad, Pakistan. He completed his M.Sc. and M.Phil. degree in Physics from Quaid-I-Azam University, Islamabad, Pakistan in 2010, and 2012, respectively. He received his Ph.D. degree in Physics from the Department of Physics/Tyndall National Institute University College Cork, Ireland in 2018. His Ph.D. research involved the stabilization of quantum nanostructure-based semiconductor mode-locked lasers using delayed optical feedback and optical injection locking techniques. He has authored and co-authored more than 65 peer-reviewed journals, and 19 international conference proceedings. He also delivered many invited and contributed talks at international and national conferences. His current research interests include the generation of ultra-short and ultra-fast optical pulses from semiconductor mode-locked lasers, and fiber lasers and to improvement of their timing stability for potential applications in telecommunications.

Azodye photoaligned nanolayers: new liquid crystal technology

Vladimir G. Chigrinov[1,2]
[1]*Hong Kong University of Science and Technology, Hong Kong*
[2]*Nanjing Jingcui Optical Technology Co., LTD, China*

Abstract:

Photoalignment and photo patterning has been proposed and studied for a long time [1]. Light is responsible for the delivery of energy as well as phase and polarization information to materials systems. It was shown that photoalignment liquid crystals by azodye nanolayers could provide high quality alignment of molecules in a liquid crystal (LC) cell. Over the past years, a lot of improvements and variations of the photoalignment and photopatterning technology has been made for photonics applications. In particular, the application of this technology to active optical elements in optical signal processing and communications is currently a hot topic in photonics research [2]. Sensors of external electric field, pressure and water and air velocity based on liquid crystal photonics devices can be very helpful for the indicators of the climate change. We will demonstrate a physical model of photoalignment and photopatterning based on rotational diffusion in solid azodye nanolayers. We will also highlight the new applications of photoalignment and photopatterning in display and photonics such as: (i) fast high resolution LC display devices, such as field sequential color ferroelectric LCD; (ii) LC sensors; (iii) LC lenses; (iv) LC E-paper devices, including electrically and optically rewritable LC E-paper; (v) photo induced semiconductor quantum rods alignment for new LC display applications; (vi)100% polarizers based on photoalignment; (vii) LC smart windows based on photopatterned diffraction structures; (vii) LC antenna elements with a voltage controllable frequency.

Acknowledgements:

[1] V.G. Chigrinov, V.M. Kozenkov and H.S. Kwok, Photoalignment of liquid crystalline materials, Wiley, 2008
[2] V.G. Chigrinov, Liquid Crystal Photonics, Nova Science Publishers, 2015

Biography:

Professor Vladimir G. Chigrinov is Professor of Hong Kong University of Science and Technology since 1999. He is an Expert in Flat Panel Technology in Russia, recognized by the World Technology Evaluation Centre, 1994, and SID Fellow since 2008. He is an author of 6 books, 31 reviews and book chapters, about 317 journal papers, more than 668 Conference presentations, and 121 patents and patent applications including 36 US patents in the field of liquid crystals since 1974. He got Excellent Research Award of HKUST School of Engineering in 2012. He obtained Gold Medal and The Best Award in the Invention & Innovation Awards 2014 held at the Malaysia Technology Expo (MTE) 2014, which was hosted in Kuala Lumpur, Malaysia, on 20-22 Feb 2014. He is a Member of EU Academy of Sciences (EUAS) since July 2017. He got A Slottow Owaki Prize of SID in 2018. He is 2019 Distinguished Fellow of IETI (International Engineering and Technology Institute). Since 2018 he works as Professor in the School of Physics and Optoelectronics Engineering in Foshan University, Foshan, China. 2020-2024 Vice President of Fellow of Institute of Data Science and Artificial Intelligence (IDSAI) Since 2021 distinguished Fellow of Institute of Data Science and Artificial Intelligence.

Properties of manganites under extreme conditions of high pressure, low temperature and high magnetic field

Thiyagarajan Raman

Department of Physics, Materials Science Research Center, Indian Institute of Technology Madras, India

Abstract:

The magnetic and transport properties of manganite system are controlled by the electron bandwidth of e_g orbitals, which is directly depends on electron transfer between A- and B- sites. The bandwidth of the systems can be effectively tuned by internal pressure like doping and/or external perturbations like magnetic field (H) and hydrostatic pressure (P). Thus, investigation on manganites under both internal and external parameters may give clear picture on the electronic nature. In this regard, this abstract is focused to investigate the effect of H and P on magnetic, magnetocaloric and transport properties of various perovskite manganites and bilayer manganites. Further, the critical behavior is also analyzed for a second-order ferromagnetic phase transition of perovskite manganites. P compresses the lattice constants, increases the Mn-O-Mn bond angle, makes the unit cell more cubic, and hence reduces the local distortion of the MnO_6 octahedra, Jahn-Teller distortion and electron-lattice coupling. As a result, the overlap of the Mn^{3+} e_g orbital and O^{2-} $2p$ orbital is increased - thus enhancing the electron hopping rate through Zener Double-Exchange interaction. Indeed, for proposed manganites with paramagnetic insulating (PMI) to ferromagnetic metallic (FMM) phase transitions, T_c increases almost linearly with P. But, P effect on T_c is larger than that predicted by band theory. This implies that the electron-phonon coupling is also reduced by P. Thus, the manganites are sensitive to all types of perturbations internal or external pressure and they strongly influence the magnetic, magnetocaloric and transport properties of the manganite systems.

Biography:

Thiyagarajan Raman is graduated Ph.D., Physics from Bharathidasan University, Trichy in 2014 and completed two Post-Doctoral Positions: (i) High Pressure Science and Technology Advanced Research (HPSTAR), Shanghai, China and (ii) Technical University of Dresden (TUD), Dresden, Germany. Currently, working as a Research Scientist at Indian Institute of Technology Madras, Chennai. Briefly to say, he has adequate experience on High Pressure experiments with different kind of high pressure cells for various measurements (XRD at world-wide synchrotron facilities, Raman, electrical resistivity, and magnetization). It has been resulted in 38 peer-reviewed publications (150 impact factors) including 20 numbers of Q1 publications and 10 numbers of Q2 publications.

Preclinical study of tetrahydrocurcumin loaded lipidic nanoparticles incorporated into tacrolimus ointment: In vitro and in vivo safety study

Komal Saini[1,2,3*], Kamalinder K Singh[2], Vandita Kakkar[1]

[1]*Department of Pharmaceutics, University Institute of Pharmaceutical Sciences, Panjab University, India*

[2]*School of Pharmacy and Biomedical Sciences, University of Central Lancashire, UK*

[3]*Chandigarh College of Pharmacy, Chandigarh Group of Colleges, India*

Abstract:

Atopic dermatitis (AD) is a common chronic inflammatory skin disease with a complex pathophysiology and the lifetime prevalence of AD is estimated to be 10% to 30% in children and 2% to 10% in adults, with a two- or threefold increase over the past 3 decades in industrialized nations. Inspite of current therapies (i.e., topical corticosteroids (first-line) and/or topical calcineurin inhibitors and other over-the-counter drugs to manage the sleep disturbances and skin infections), AD is associated with potential and undesirable adverse effects. We proposed the combination of tetrahydrocurcumin (THC) lipidic nanoparticles (LNs) incorporated into an ointment with tacrolimus. The prepared THC-LNs were characterized for particle size, zeta potential, HRTEM, FTIR and THC-Tacro ointment was characterized for pH, rheology and occlusivity. Safety studies i.e., in vitro cell line studies (cell viability, quantitative analysis, and wound healing scratch assay) were performed using human dermal fibroblast (HDF). In vivo skin toxicity was performed and confirmed the non-toxic effects of formulation via histopathological studies. The combination of THC and tacrolimus ointment through topical application provides an efficient and commercially viable alternative for dermatitis treatment, achieving a higher efficacy and potency with reduced toxicity.

Biography:

Dr Komal Saini is an Assistant Professor in Chandigarh College of Pharmacy, Chandigarh Group of Colleges, Landran, Mohali and has a research experience of more than 6 years. She has completed her research training in pharmaceutical industry. She was the Gold Medalist during her master programme. She has worked on topical nanoformulation of tetrahydrocurcumin and tacrolimus for treatment of atopic dermatitis for which she has received the commonwealth scholarship in UK. She has presented her research work at National and International conferences and received several Best Paper Awards. With her ability to comprehend the taught lessons, she has published 11 research and 8 review papers (h-index: 9 and citation: 285), more than 30 magazine articles in Ingredient South Asia (Saffron Pvt Ltd) and 4 book chapters to her credit. She is also a co-inventor in one Indian patent (granted). She has received the research fellowship from DST-SERB, Commonwealth Commission (UK).

A Novel THC-Tacro ointment for atopic dermatitis: synergistic antioxidant and anti-inflammatory effects through nanoparticle delivery

Vandita Kakkar
Panjab University, India

Abstract:

Envisaging the multiplex pathogenic events in atopic dermatitis, which include inflammation, oxidative stress and involvement of immune system, we evaluated a synergistic combination comprising of tetrahydrocurcumin (THC) loaded into nanoparticles (THC-LNs) for its antioxidant and anti-inflammatory properties in addition to being a non-staining and non-irritating molecule with high stability (pH 7.4) along with tacrolimus in form of an ointment. Particle size analysis and nanoparticle tracking analysis confirmed the particle size and concentration of THC-LNs. The confirmation of encapsulation of drug into nanoparticles was observed using FTIR and DSC. THC-LNs were found to be non-toxic and safe. In-vitro cytotoxicity and biocompatibility were confirmed by incubating THC-LNs with HDF cells, which showed high cell viability at 24 and 48 h. Flow cytometry was carried out to quantify the intracellular accumulation of nanoparticles. HDF cells demonstrated the concentration dependent uptake showing increase in uptake with increase in R-THC-LNs concentration. In case of pharmacodynamic study, biochemical estimation and histopathological investigations confirmed the efficacy of developed THC-Tacro ointment for the treatment of inflammation induced in animal model of atopic dermatitis. THC-Tacro ointment is expected to be safe, cost effective and a patient compliant product especially for pediatrics segment where no treatment is available till date.

Biography:

Dr Vandita Kakkar is an Assistant Professor in the Department of Pharmaceutics, University Institute of Pharmaceutical Sciences, Panjab University, Chandigarh and has a research experience of more than 14 years. Her area of research lies in: Bioavailability enhancement of phytopharmaceuticals using nanoparticle technology via oral and topical routes; Scale up of the nanoparticle production from lab scale to pilot stage; Combatting antimicrobial resistance, & developing targeted delivery systems for cancer treatment. She has to her credit 45 international/national research papers and review articles with h-index 21 and 2895 citations; 12 book chapters in international books; more than 30 magazine articles in ingredient south asia and 4 national patent applications. She has been awarded around 10 million Research grants from UGC, Panjab University, BIRAC, DST, ICMR and commonwealth commission (UK). She has transferred the technology to Hi Tech formulation and is consulting a project of Cedrus Bio-product. She has industrial experience of 2 years. She has to her credit several awards and accreditions.

Special Session

Day 02

Linkin

Science Conferences

Hybrid Mode (Onsite & Online)

Overview of Pulse Measurement

Rick Trebino
Georgia Institute of Technology, USA

Abstract:

The vast majority of the greatest scientific discoveries of all time have resulted directly from more powerful techniques for measuring light. Indeed, our most important source of information about our universe is light, and our ability to extract information from it is limited only by our ability to ***measure*** it. Interestingly, most of the light in our universe remains ***immeasurable***, involving long pulses or continuous beams of relatively broadband light, necessarily involving ultrafast and extremely complex temporal variations in their intensity and phase (color). As a result, it's important to develop techniques for measuring, ever more completely, light with ever more complex ultrafast variations in time. The problem is severely complicated by the fact that the timescales involved correspond to the shortest events ever created, and measuring an event in time seems to require a shorter one, which, by definition, doesn't exist! And, unfortunately, many methods currently in common use measure only artifacts and/or cannot distinguish between short, simple, stable pulses and long, complex, unstable ones. Fortunately, we have developed simple, elegant techniques for reliably and completely measuring such light, using the light to measure itself and extracting a light pulse's complete intensity and phase vs. time—and, more recently, time and space simultaneously. One such technique involves making an optical spectrogram of the pulse, whose mathematics is solvable only because the Fundamental Theorem of Algebra ***fails*** for polynomials of two variables. More recent methods allow the simple measurement of the ***complete spatio-temporal electric field*** [E(x,y,z,t)] of a single, arbitrary, potentially complex light pulse without the need to average over multiple pulses.

Biography:

Rick Trebino was born in Boston on January 18, 1954. He was quite poor as a child, but, on scholarships, he earned his high-school degree from Phillips Academy in Andover, Massachusetts, his B.A. from Harvard in 1977, and his Ph.D. from Stanford in 1983. Shortly afterward, while at Sandia National Laboratories in Livermore, California, he invented Frequency-Resolved Optical Gating (FROG), the first technique for the complete measurement of an ultrashort laser pulse in time, solving this long-standing famous problem in the field of ultrafast optics and advancing pulse measurement from blurry black-and-white snapshots to high-resolution full-color displays. In 1998, he accepted a Chair at Georgia Tech, where he extended humankind's measurement capability to the complete spatiotemporal electromagnetic field of even highly complex ultrashort pulses. He currently also develops more advanced approaches to optics and physics education, doing for lectures what Gutenberg did for books. He's received numerous prestigious awards, including 2024's R.W. Wood Prize and several for his pioneering contributions to optics and physics education, and is a Fellow of four scientific societies.

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Hybrid Mode (Onsite & Online)

Influence of laser and plasma parameters on LIPSS formed on the surface of niobium alloys

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Abstract:

We studied the effect of laser fluence on the spatial frequency distribution of laser-induced periodic surface structures (LIPSS) on niobium alloys. We also analyze the plasma emission spectra by calculating the electron impact parametr and density at conditions that correspond to the formation of laser-induced periodic surface structures and nanospikes on the surface of the Nb target. Nd:YAG picosecond laser system with 1064 nm centre wavelength, 28 ps pulse duration and 50 Hz repetition rate was used for the experiments. For the first time, the Stark broadening coefficients for high-charge ion transitions of the element niobium (Nb IV) were determined from the spectral distribution of plasma generated by a 28 ps pulsed laser on the surface of a niobium alloy in a solid state of aggregation. The transition from low spatial frequency LIPSS (LSFL) to high spatial frequency LIPSS (HSFL) was found to be a continuous process strongly influenced by the single pulse fluence. Highly organized LIPSS were observed on the target surface at higher accumulated fluences of the ablating laser pulses, resulting in the deposition of nano/microparticles on the surface of LIPSS structures. The results provide insights into the laser fluence-dependent formation and evolution of surface structures in niobium.

Biography:

Murodbek is teacher at Urgench State University “Interfaculty general technical disciplines”. He is involved in teaching various subjects like physics, Electrical engineering and electronics. His area of research interest focuses on Laser Physics.

Poster Presentation

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Hybrid Mode (Onsite & Online)

The impact of reducing dimethyl sulfoxide (DMSO) from 10% to 5% on the viability of CD34 hematopoietic stem cells after cryopreservation

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Abstract

Background: DMSO is a toxic cryoprotective agent that can be used to store Hematopoietic Stem Cells (HSCs) at low temperatures (-140 ºC to 196 ºC) for long-term storage1. Although using a 10% DMSO concentration is considered safe for cryopreservation, it still might cause cell death during the freezing process and adverse reactions in patients when infusing the thawed cells for treatment2.

Objective: The aim of the study was to investigate the stability rate of human HSC viability post- thawing using two DMSO concentrations on the same sample, 5% and 10%, at different time intervals.

Study Design: The data were collected retrospectively from a performance improvement (PI) project. A total of 10 hematopoietic stem cell products (n = 10), 9 allogeneic peripheral stem cell products, and only 1 allogeneic stem cell from the bone marrow were harvested from healthy donors and cryopreserved in two concentrations: 10% DMSO (following the lab's standard operating procedure) and a reduced one, 5% DMSO. No informed consent was obtained since this was a retrospective study. Each sample was divided into two sub-samples, one frozen in 10% DMSO and another in 5% DMSO. Each sub-sample was aliquoted into three aliquots to thaw at three different time points (2-, 4-, and 8-week differences). Hematology and flow cytometry analysis were performed to enumerate white blood cells (WBC x 109/L), HSC marker CD34+ (CD34+ cells/µL), and viability (%), then compared with the crude sample values (pre-freezing).

Results: Based on the statistical analysis, it can be inferred that at the 5% concentration level, DMSO may produce better viability rates than at the 10% level, although the differences between the two concentrations are not significant ($p > 0.05$). In terms of the CD34 levels, the results indicate that there is a statistically significant difference between the 5% and 10% DMSO concentration groups ($p < 0.05$), with the 5% group showing consistently higher levels of CD34 across the four time points when compared to the 10% group.

Conclusion: The results hint that using a concentration of 5% DMSO for cryopreserving HSCs is non-inferior to 10% DMSO. More studies are recommended to validate the hypothesis with a larger sample size.

Biography:

Rawan Aldubaian is a dedicated stem cell therapy technologist working at KFSH&RC. After completing her Master's in Tissue Bioengineering at the University of Cambridge, she embarked on a PhD program in cell and gene therapy at UCL. Driven by a passion for translational research and regenerative medicine, Rawan is committed to advancing innovative therapies that improve patient outcomes."

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again at our upcoming conference....