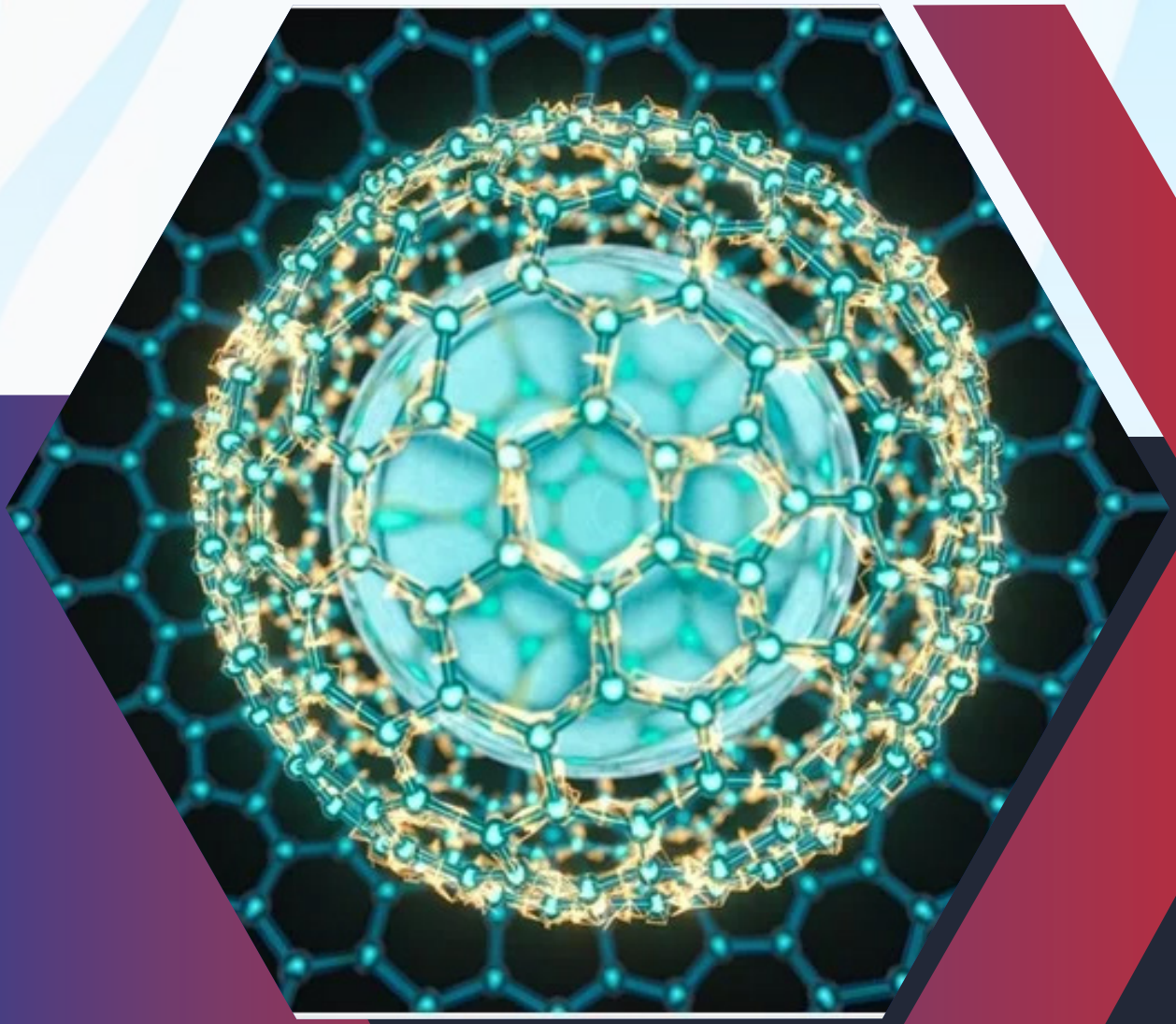
World

BIOPOLYMERS & POLYMER CHEMISTRY CONGRESS

10-11 July 2023 | Online



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Scientific Program

Day 1 | July 10, 2023 | Virtual | GMT

08:30-09:05 Registrations

09:00-09:15 Opening Ceremony

Keynote Forum

09:15-09:45	Title: Environment-assisted cracking: A challenge in the use of magnesium alloys as biodegradable implants **Raman Singh,** Monash University, Australia
09:45-10:15	Title: Industrial applications of nanotechnology **Yarub Al-Douri,** American University of Iraq, Iraq

Speaker Session

10:15-10:40	Title: State-Of-The-Art ensemble learning and unsupervised learning in fatigue crack recognition of Glass Fiber Reinforced Polyester Composite (GFRP) using acoustics **Samira Gholizadeh,** University of Cape Town, South Africa
10:40-11:05	Title: Chitosan aerogels as an alternative to desalination **Roy Kim,** The Knowledge Society, United States
11:05-11:30	Title: Stereolithographic additive manufacturing using nanoparticles pastes **Soshu Kirihara,** Osaka University, Japan

Networking and Refreshments Break @ 11:30-11:40

11:40-12:05	Title: Innovative advances of zinc oxide–coated carbon nanoparticles from pineapple leaves using sol gel method for optimal adsorption of Cu2+ and reuse in latent fingerprint application **Z Tywabi-Ngeva,** Nelson Mandela University, Gqeberha, South Africa
12:05-12:30	Title: Green synthesis of nanoparticles: From preparation to applications **Azeez A. Barzinjy,** Soran University, Iran
12:30-12:55	Title: Nanomaterial-based electrochemical DNA biosensor for the detection of the Sus scrofa **Abu Hashem,** Nanotechnology and Catalysis Research Centre, Malaysia
12:55-13:20	Title: Improving the fatigue design of mechanical systems such as refrigerator **Seongwoo Woo,** Ethiopian Technical University, Ethiopia

Break: 13:20-13:35

13:35-14:00	Title: An optical platform of material engineering for design of camouflage product against multidimensional combat backgrounds from 400 nm to 2500 nm **Md. Anowar Hossain,** RMIT University, Australia
14:00-14:25	Title: An analytical study of the effect of gravity on electronic wave functions in oxygen **Rushil Saraswat,** Cambridge Court World School, India
14:25-14:50	Title: Removal of anionic dye from wastewater using a hydroxyapatite/chitosan composite **Ayoub Grouli,** University Hassan II of Casablanca, Morocco

Networking and Refreshments Break @ 14:50-15:00

Keynote Forum

15:00-16:00	Title: Wave scattering by many small particles, creating materials with a desired refraction coefficient and other applications **Alexander G Ramm,** Kansas State University,USA
16:00-16:30	"Title: Resonantly-scattering nanoparticles as tools for subwavelength tailoring of electromagnetic fields" **Michael I. Tribelsky,** Lomonosov Moscow State University, Russia

Speaker Session

16:30-16:55	Title: A new double cross-linked amidated pectin-gelatin hydrogel films developed with oxidized tannic acid and in situ reduced silver nanoparticles **Benkhira Ilyas,** Universite Saad Dahlab Blida, Algeria
16:55-17:20	Title: Environmentally benign alginate extraction and fibres spinning from different european brown algae species **Ishrat Jahan Badruddin,** Cranfield University, UK
17:20-17:45	Title: The importance of synovial cytokine assessment in the course ofcorrective osteotomy associated with PRP and SVF post-treatments for tissueregeneration forecast **Elena Tchetina,** Nasonova Research Institute of Rheumatology, Russia
17:45-18:10	Title: Applications of nanofluids in machining operations: A comprehensive review **Aoha Roohi Amin,** Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology, Pakistan

Panel Discussions

Day 2 | July 11, 2023 | Virtual | GMT

Keynote Forum

09:00-09:30	Title: Peter Chew Formula for calculate Covid-19 Vaccine efficiency **Peter Chew,** National University of Malaysia, Malaysia
09:30-10:00	Title: Oral Thin Film - An alternative to IM & IV drug & vaccine delivery systems **Radwan Almofti,** TADA Consulting Solutions, Canada
10:00-10:30	Title: Therapeutic neural stem cell-derived exosomes loaded adhesive hydrogelpromotes cerebral angiogenesis and neural regeneration in ischemic stroke mice **Lukui Chen,** Southern Medical University, China

Speaker Session

10:30-10:55	Title: Rutin-Loaded hybrid nanoparticles for nasal administration the to protectfrom anthracycline-induced endothelial brain damages **Carla Serri,** University of Sassari, Italy
10:55-11:20	Title: Synergistic in vitro antifungal efficacy of naringenin-capped silver nanoparticles against candida species **Chanti Babu Katta,** NIPER, India

Refreshments Break @ 11:20-11:45

11:45-12:10	Title:Enhanced antitumor efficacy and attenuated cardiotoxicity of doxorubicin incombination with lycopene liposomes **Jinfang Zhu,** Xinjiang Agricultural University, China
12:10-12:35	Title: Nelumbo nucifera: A propitious biopolymer for novel drug delivery **Vishakha Jaiswal,** Amity University, India
12:35-13:00	Title: Synthesis of Pnp Ligand/Cr complexes for the selective oligomerization of Ethylene to 1-Hexene **Ahmed Al-Hulili,** SAECO, Saudi Arabia
13:00-13:25	Title: Rapid ultrasound-assisted emulsification micro-solid phase extraction based on molecularly imprinted polymer for HPLC-DAD determination of bisphenol A in aqueous matrices **Noorfatimah Yahaya,** University Sains Malaysia, Malaysia
Break @ 13:25-13:40	
13:40-14:10	Title: Synthesis, theoretical and biological studies of cyclometalated Iridium (III) Phenyl pyridine type complexes **Kahnu Charan Pradhan,** Utkal University, India
Keynote	
13:40-14:40	Title: Designing All-Optical Logic Half Adder with Photonic Crystal Multi-Ring **Dror Malka,** Holon Institute of Technology, Israel
Speaker Session	
14:40-15:05	Title: Unwanted degradation in pseudocapacitors: Challenges and opportunities **Siddharth Mahala,** University of Manchester, UK
15:05-15:30	Title: Green composites prepared from sheep wool reinforced vulcanised rubber with enhanced physical and mechanical properties **Seiko Jose,** Mahatma Gandhi University, India
15:30-15:55	Title: Reduced graphene oxide-zinc sulfide nanocomposite decorated with silver nanoparticles for wastewater treatment by adsorption, photocatalysis and antimicrobial action **Hafiz Muhammad Tofil,** Quaid-i-Azam University, Pakistan
15:55-16:20	Title: Performance of green membranes in harsh conditions **Atefeh Roozitalab,** Amirkabir university, Iran
Posters	
16:20-16:45	Title: Study of Self-assembly behaviour of β-Cyclodextrin & its functionalized derivatives **Siddanth Saxena, Polytechnic University of Catalonia, Spain**
16:45-17:10	Title: PLGA-based biomaterials as drug delivery devices: Research progress **Maria Ciocîlteu, University of Medicine and Pharmacy of Craiova, Romania**
17:10-17:35	Title: Zn–B–PLGA nanocomposite material for biomedical applications: challenges and future perspectives **Andrei Bita, BioBoron Research Institute, Romania**

17:35-18:00	Title: Medical grade biopolymer production, characterization, and synthesis of NDDS (Nanoparticle drug delivery system) from an application perspective **Navodit Kumar Singh, Indian Institute of Technology Delhi, India**
18:00-18:25	Title: 3D nanofibers scaffolds for boosting the repurposed dermatological effect of Spironolactone **Nahla Elhesaisy, The British University, Egypt**
18:25-18:50	Title: Development of cross-linked protein-based materials from vegetable sources **Sara Aquilia, University of Florence, Italy**

Panel Discussions & Closing Ceremony

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KEYNOTE SPEAKERS Day 1

Raman Singh
Monash University, Australia

Environment-assisted Cracking: A Challenge in the use of Magnesium Alloys as Biodegradable Implants

Magnesium (Mg) alloys possess great potential for their use as temporary implants such as pins, wires, screws, plates. Use of Mg alloys will completely avoid the cumbersome procedure of second surgery (which is required when such implants are constructed out of traditional materials such as titanium alloys or stainless steels). However, Mg also has limitations as a temporary implant material, viz., their unacceptably high corrosion rates and concurrent hydrogen evolution, and stress corrosion cracking (SCC) and/or corrosion fatigue (CF) under the simultaneous action of the corrosive human-body-fluid and the mechanical loading. This presentation will provide an overview of SCC and CF of different Mg alloys in simulated body fluid (SBF) and the associated fracture. The presentation will also discuss the need of investigations under such mechano-chemical conditions that appropriately simulate the actual human body conditions, and present new data generated under such conditions in the presenter's research group.

Biography

Professor Raman Singh's primary research interests are in the relationship of Nano-/microstructure and Environment-assisted degradation and fracture of metallic and composite materials, and Nanotechnology for Advanced Mitigation of such Degradations. He has also worked extensively on use of advanced materials (e.g., graphene) for corrosion mitigation, stress corrosion cracking, and corrosion and corrosion-mitigation of magnesium alloys (including for the use of magnesium alloys for aerospace, defence and bioimplant applications). He is a senior professor at Monash University, Australia. He was a Visiting Professor at ETH Zurich, Switzerland, US Naval Research Lab, Indian Institute of Science, and University of Connecticut. He worked as a scientist at Indian Atomic Energy and as a post-doc fellow at University of New South Wales, Australia.

Yarub Al-Douri
American University of Iraq, Iraq

Industrial applications of nanotechnology

This seminar focuses on the usage of nanotechnology in different fields of engineering. So, the listener or readers will find valuable information as to how nanotechnology can help in improving our life of materials exposed to many circumstances, starting from the medieval period of time until processes in medicine, energy, environment, communications, technology, engineering, manufacturing and others including the studies and researches on physics, chemistry, biology, mathematics and others. Moreover, this unique information and knowledge present the latest research on nanoscale phenomena to display the multi-application for a brilliant future.

Biography

Prof. Dr. Yarub Al-Douri is from American University of Iraq, Sulaimani. Al-Douri has initiated Nanotechnology Engineering MSc Program and Nano Computing Laboratory. He has received numerous accolades including winner of IAAM Scientist Award by International Association of Advanced Materials, Sweden 2022, World's Top 2% Scientists by Stanford University, USA 2022, 2021 & 2020, OeAD Award, Austria 2020, JSPS Award 2019, AUA Award 2019, IFIA 2019, TWAS-UNESCO Associateship (Twice) Award 2015 & 2012, the total is 70 awards. Al-Douri is Associate Editor of Nano-Micro Letters (Q1), Editor-in-Chief of Experimental and Theoretical NANOTECHNOLOGY, Editor-in-Chief of World Journal of Nano Science and Engineering,

Sabrina Belbekhouche
East Paris University, France

Title: Development of Tailor Made Drug Delivery System based on Polyelectrolyte Multilayer Capsules

Recent progress in supramolecular chemistry leads to unparalleled control over the composition and shape factor of colloidal systems. Among them, the design of capsules is a new expanding area of physical-chemical research.1,2 Here, we report on the development of tailor made polymer capsules for potential applications in biomedical field. The primary focus is to enhance the loading/release of therapeutic agents. The implemented strategy is mainly based on colloidal templating and self-assembly.3 Size, dispersity and concentration of the nanocapsules are easily fixed by the initial nanoparticle template, while wall thickness is dependent on the number of layers. The present strategy is advantageous in comparison with other synthetic routes because at all steps, only water is used as a solvent and not organic one. The possibility to control the mechanical property of the capsules brings new promising property which will be evidenced during the talk. The benefits of using these capsules will be presented in numerous biological applications.

Biography

Sabrina Belbekhouche is an associate professor working at the East Paris Institute of Chemistry and Materials (East Paris University, France). Her core expertise is in polymer science, macromolecular assembly and surface modification. This includes the polymer modification, the study of the physical chemistry of surfaces/interfaces; and the use of controlled assembly at the sub-micrometer scale (nanoparticle, nanocapsule...) as well as stimuli-responsive systems. Current applications of her research are mainly for biological application

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SPEAKERS Day 1

Samira Gholizadeh
University of Cape Town, South Africa

State-Of-The-Art Ensemble Learning and Unsupervised Learning in Fatigue Crack Recognition of Glass Fiber Reinforced Polyester Composite (GFRP) Using Acoustic

Fatigue strength is one of the most important properties of composite materials because it directly relates to their lifespan. Acoustic emission (AE) is a passive structural health monitoring (SHM) technique that provides real-time damage detection based on stress waves generated by cracks in the structure. This study evaluates the damage progression on glass fiber reinforced polyester composite specimens using different approaches of machine learning. Different methodologies for damage detection and characterization of AE parameters are presented. Three different ensemble learning methods namely, XGboost, LightGBM, and CatBoost were chosen to predict damages and AE parameters. SHAP values were used to select AE key features and K-means algorithms were employed to classify damage severity. The accuracy of these approaches demonstrates the reliability of various machine learning techniques in predicting the fatigue life of composite materials using acoustic emission.

Biography

Samira is a PhD student in Mechanical engineering at University of Cape Town. She has been awarded the International Student Award 2023 at the University of Cape Town. She is also awarded as an Honorary Country Head (South Africa), She has a Master's degree (by research) from University Putra Malaysia (UPM) in Manufacturing Systems engineering. She also graduated in Postgraduate Diploma in Artificial intelligence & Machine learning from National Institute of Technology (NIT) of Warangal. She has obtained a wide range of professional certifications in Machine Learning, Data Science and Artificial Intelligence. She is a Member of the Institution of Engineers Australia as a Chartered Professional Mechanical Engineer, APEC Engineer, International Professional Engineer (IntPE), and National Engineering Register (MIEAust CPEng NER APEC Eng IntPE) In Mechanical Engineering, as well as Australian Composite Structures Society, and Associated Professional Member (APM) of the Australasian Association for Engineering Education (EA ID: 5348380).

Roy Kim
The Knowledge Society, United States

Chitosan Aerogels as an Alternative to Desalination

25% of the world lacks access to water, and current desalination methods are too expensive; an emerging alternative is aerogels. Aerogels are materials with extremely low densities ranging from 0.0011 to ~0.5 g cm³ and high porosity of > 85%. This makes them suitable absorbents for pollutants. They have already been used to absorb anionic dyes in industrial waste, with cellulose nanofibrils and chitosan aerogel composites exhibiting absorption capacities of 1428.7 mg g−1 towards anionic dyes (J. Chem. Eng. Data 2021, 66, 1068−1080). However, their applications within desalination have yet to be explored. This study uses chitosan-cellulose composite aerogels as an absorbent for sodium and chloride ions in seawater. For synthesis, chitosan powder is dispersed in a solution of urea/NaOH/H2O solution and undergoes physical crosslinking via freezing. Citric acid is then added as a chemical crosslinker, making the precursor more acidic to protonate the amine groups. Upon purification, the mixture is freeze-dried for 24 hours. The study is expected to yield an absorption capacity similar to 1428.7 mg g−1, and a reusability rate of around 4 uses. The aerogels are completely biodegradable, yet there is currently no clear method of disposal. Due to high costs relative to the status quo of reverse osmosis, this study finds using aerogels as biosorbents for desalination is not a feasible alternative. However, biomaterials are still an important consideration as an alternative to a much less energy-intensive water purification method in alleviating water scarcity.

Biography

Roy Kim is an entrepreneur and a chemical engineer that loves to explore the wonders of nature. He started his learning journey at The Knowledge Society (TKS), where he learned invaluable skills in business and technology to solve the world's biggest problems. As a consultant to CAE and Walmart, he was able to experience the business world firsthand, helping him to found his own bioplastic startup, SealX, in which he raised $15,000. Recently, he's explored aerogels to bring cheaper desalination to the market and is currently working on extracting metals from plastics in the Philippines to mitigate plastic-related deaths..

Soshu Kirihara
Osaka University, Japan

Stereolithographic Additive Manufacturing Using Nanoparticles Pastes

In stereolithographic additive manufacturing (STL-AM), 2-D cross sections were created through photo polymerization by UV laser drawing on spread resin paste including nanoparticles, and 3-D models were sterically printed by layer lamination. The lithography system has been developed to obtain bulky ceramic components with functional geometries. An automatic collimeter was newly equipped with the laser scanner to adjust the beam diameter. Fine or coarse beams could realize high resolution or wide area drawings, respectively. As the row material of the 3-D printing, nanometer sized metal and ceramic particles were dispersed into acrylic liquid resins at about 60 % in volume fraction. These materials were mixed and deformed to obtain thixotropic slurry. The resin paste was spread on a glass substrate with 50 μm in layer thickness by a mechanically moved knife edge. An ultraviolet laser beam of 355 nm in wavelength was adjusted to 50 μm in variable diameter and scanned on the spread resin surface. Irradiation power was automatically changed for an adequate solidification depth for layer bonding. The composite precursors including nanoparticles were dewaxed and sintered in the air atmosphere. In recent investigations, ultraviolet laser lithographic additive manufacturing (UVL-AM) was newly developed as a direct forming process of fine metal or ceramic components. As an additive manufacturing technique, 2-D cross sections were created through dewaxing and sintering by UV laser drawing, and 3-D components were sterically printed by layer laminations with interlayer joining. Through computer-aided smart manufacturing, design, and evaluation (Smart MADE), practical material components were fabricated to modulate energy and material transfers in potential fields between human societies and natural environments as active contributions to Sustainable Development Goals (SDGs).

Biography

Soshu Kirihara is a doctor of engineering and a professor of Joining and Welding Research Institute (JWRI), Osaka University, Japan. In his main investigation “Materials Tectonics as Sustainable Geoengineering” for environmental modifications and resource circulations, multi-dimensional structures were successfully fabricated to modulate energy and materials flows effectively. Ceramic and metal components were fabricated directly by smart additive manufacturing, design and evaluation (Smart MADE) using high power ultraviolet laser lithography. Original stereolithography systems were developed, and new start-up company “SK-Fine” was established through academic-industrial collaboration.

Z Tywabi-Ngeva
Nelson Mandela University, South Africa

Innovative advances of zinc oxide–coated carbon nanoparticles from pineapple leaves using sol gel method for optimal adsorption of Cu2+ and reuse in latent fingerprint application

This project underlines a latest approach of preparing nitrogen carbon nanoparticles fused on zinc oxide nanoparticle nanocomposite (N-CNPs/ZnONP nanocomposite) for the uptake of copper ions (Cu2+) from wastewater using a sol gel method. The metal loaded adsorbent was then applied in the latent fingerprint application. N-CNPs/ZnONP nanocomposite proved to be a good sorbent for the optimal adsorption of Cu2+ at pH 8 and 1.0 g/L dosage. Langmuir isotherm best fitted the process with the maximum adsorption capacity of 285.71 mg/g that was superior to most values reported in other studies for the removal of Cu2+. At 25 °C, the adsorption was spontaneous and endothermic. Furthermore, Cu2+-N-CNPs/ZnONP nanocomposite revealed to be sensitive and selective for latent fingerprint (LFP) identification on a variety of porous surfaces. As a result, it is an excellent identifying chemical for latent fingerprint recognition in forensic science.

Biography

During her career as a scientist, she has received much acclaim. In 2019, she was ranked 30th in the #100 Most Influential Young South African in the Personal Development Academic category, in 2018 she was a Mrs South Africa semi-finalist and founded the Dr ZTN Foundation in the same year. Her Foundation is a science youth education engagement programme that helps matric pupils find bursary opportunities and university admission. In addition, in 2021, she was a Herald Citizens of the year award winner.

Azeez A. Barzinjy
Soran University, Iraq

Green Synthesis of Nanoparticles: From Preparation to Applications

Nanotechnology is an emerging field of science. The base of nanotechnology is nanoparticles. The size of nanoparticles ranges from 1 to 100 nm. The nanoparticles are classified into different classes such as inorganic nanoparticles, organic nanoparticles, ceramic nanoparticles and carbon base nanoparticles. The inorganic nanoparticles are further classified into metal nanoparticles and metal oxide nanoparticles. Similarly, carbon base nanoparticles classified into Fullerene, Carbon nanotubes, Graphene, Carbon nanofiber and carbon black. Nanoparticles are also classified on the basis of dimension such as zero-dimension, one-dimension, two-dimension and three-dimension nanoparticles. The nanoparticles are synthesized by using two approaches like top-down approach and bottom-up approach. Since the main methods for producing nanoparticles are chemical and physical methods which are often expensive and potentially harmful to both the environment and the user. So, we did our best in our researches to synthesize metallic and metal oxide nanoparticles using plant extracts and stay away from expensive and toxic chemicals at the same time. Therefore, it is with great pride that our research group is considered a pioneer in the region, and many high quality research articles have been published by our group highlighting the necessary needs of the community [1-22] regarding green synthesis nanomaterials. After synthesizing different types of nanoparticles, using easy, one-pot, inexpensive and green process, from locally grown plant extracts, different characterization techniques have been used to investigate structure, size, morphology, thermal behavior, surface area, surface charge, chemical composition and optical properties of the nanoparticles. After synthesizing and characterization process, the green synthesized nanoparticles were employed in thin film application, gas-sensing, enhancing solar panel efficiency, wastewater treatment, catalytic application, harvesting sunlight for solar thermal generation and many other applications.

Biography

Dr Azeez Abdullah Barzinjy: was born in Erbil-Iraq. He completed his PhD (Materials Science) at the Materials Science centre, University of Leicester/UK in 2014. He is currently Associated Professor at Scientific Research Centre in Soran University and teaching in Tishk International University in Iraq. His current research interests include Green Synthesis of Nanoparticles, metal electroplating from novel ionic liquids and investigating their properties, solar selective coating, surface plasmon resonance and nanotechnology. He is currently supervising several master and PhD students in different universities.

Abu Hashem
Nanotechnology and Catalysis Research Centre, Malaysia

Nanomaterial-Based Electrochemical DNA Biosensor for the Detection of the Sus scrofa

A DNA-based electrochemical biosensor was developed to detect Sus scrofa based on in silico-designed probes using bioinformatics tools, and the sensor was validated in wet-lab experiments. A screen-printed carbon electrode (SPCE) modified with graphene (Gr) and gold nanoparticles (AuNPs) was used as a detection platform. The nanocomposite was characterized based on its morphological, structural, and electrochemical properties. The thiol-modified synthetic DNA probe was immobilized on a modified composite SPCE to facilitate hybridization with the reverse complementary (RC) DNA. The target DNA of Sus scrofa was identified based on hybridization-induced electrochemical changes in the presence of methylene blue (MB) as a redox indicator measured by deferential pulse voltammetry (DPV). The analytical results demonstrated that Gr and AuNPs were successfully fabricated on the SPCE surface, as indicated by morphological and structural characteristics, effective surface area, and electrochemical properties. The developed biosensor exhibited a selective response towards complementary DNAs of the Sus scrofa and could discriminate mismatches and non-complementary DNA both in synthetic DNAs and DNA isolated from real samples. The modified electrode displayed good linearity for the RC DNAs of the Sus scrofa in the range of 1×10-11 M to 5×10-6 M with a limit of detection of 0.98×10-12 M. The detection capability of the modified electrode indicates that the proposed biosensor has the potential to be applied for real-time Sus scrofa species sample detection. This strategy could be applied to the development of electrochemical DNA biosensors for other species.

Biography

Dr. Abu Hashem is a Principal Scientific Officer and Head of the Division of Microbial Biotechnology at the National Institute of Biotechnology (NIB). He also serves as the coordinator of NIB. He obtained his Ph.D. in Nanobiotechnology with Distinction from the Nanotechnology and Catalysis Centre, Institute for Advanced Studies, University of Malaya, Malaysia. He has published numerous articles in reputed journals like Trends in Analytical Chemistry, Molecular and Cellular Probes, IEEE, Electrocatalysis, Beilstein Journal of Nanotechnology, Applied Surface Science Advances, Critical Reviews in Clinical Laboratory Sciences, Lubricants, etc., and several book chapters with prestigious publishers like Academic Press, Springer Nature, and the IOP. Dr. Hashem also got a number of awards and honours because of how well he did in research and administrative work.

Seongwoo Woo
Ethiopian Technical University, Ethiopia

Improving the Fatigue Design of Mechanical Systems such as Refrigerator

To enhance the lifetime of mechanical system such as automobile, new reliability methodology – parametric Accelerated Life Testing (ALT) – suggests to produce the reliability quantitative (RQ) specifications—mission cycle—for identifying the design defects and modifying them. It incorporates: (1) a parametric ALT plan formed on system BX lifetime that will be X percent of the cumulated failure, (2) a load examination for ALT, (3) a customized parametric ALTs with the design alternatives, and (4) an assessment if the system design(s) fulfil the objective BX lifetime. So we suggest a BX life concept, life-stress (LS) model with a new effort idea, accelerated factor, and sample size equation. This new parametric ALT should help an engineer to discover the missing design parameters of the mechanical system influencing reliability in the design process. As the improper designs are experimentally identified, the mechanical system can recognize the reliability as computed by the growth in lifetime, LB, and the decrease in failure rate. Consequently, companies can escape recalls due to the product failures from the marketplace. As an experiment instance, two cases were investigated: 1) problematic reciprocating compressors in the French-door refrigerators returned from the marketplace and 2) the redesign of hinge kit system (HKS) in a domestic refrigerator. After a customized parametric ALT, the mechanical systems such as compressor and HKS with design alternatives were anticipated to fulfil the lifetime – B1 life 10 year.

Biography

Dr Woo has a BS and MS in Mechanical Engineering, and he has obtained PhD in Mechanical Engineering from Texas A&M. He majors in energy system such as HVAC and its heat transfer, optimal design and control of refrigerator, reliability design of thermal components, and failure Analysis of thermal components in marketplace using the Non-destructive such as SEM & XRAY. In 1992.03–1997 he worked in Agency for Defense Development, Chinhae, South Korea, where he has researcher in charge of Development of Naval weapon System. He was working as a Senior Reliability Engineer in Refrigerator Division, Digital Appliance, SAMSUNG Electronics. Now he is working as associate professor in mechanical department, Ethiopian Technical University.

Anowar Hossain
RMIT University, Australia

An optical platform of material engineering for design of camouflage product against multidimensional combat backgrounds from 400 nm to 2500 nm

Military textiles encompasses reflection, spectral and chromatic matching in UV (ultraviolet), Vis (visible) and NIR (near infrared) spectrums for concealment of target signature against modern surveillance devices. Reflection of materials have been simulated for camouflage applications against multidimensional combat backgrounds (CBs) from 400 nm to 2500 nm under the techniques of 'Monte Carlo cross validation'. The four-dimensional techniques of zero reflection (ZR), low reflection (LR), high reflection (HR) and HR-LR (HLR) materials are applied for materials simulation versus camouflage product design. Optical principle of camouflage textiles also coalesces for synthetic dyes, mixing principle of synthetic dyes and LR materials, mixing principle of synthetic dyes and HR materials, synthetic dye-metal formulation, synthetic dye-pigment formulation. This optical concept of material engineering summarizes the reflection profile of synthetic dyes, natural sand-based silicon dioxide/ natural stone-based silicon dioxide (NSSD), natural plant based natural dyes (NPND), pigment, nano materials, metallic and non-metallic particles against combat materials of dry leaves, green leaves, tree bark-woodland CB; water-marine CB; sand-desertland CB; stone-stoneland CB; snow-snowland CB; sky CB and ice-iceland CB (DGTWSIB). The reflections of aluminium (Al), titanium dioxide (TiO2), calcium oxide (CaO), tin metal (Sn), tin oxide (SnO2) and iron (Fe) powder are irradiated as HR materials. Oppositely boron carbide (B4C), magnesium (Mg) powder, carbon black (C) nano particle and titanium carbide (TiC) are illuminated as LR materials. Consequently, the mixing principle of HR and LR materials are also classified as HLR materials. Spectral properties of NPND and NSSD materials are also depicted as ZR materials against selected CBs of woodland, desertland and stoneland. Spectral signal of ZR, LR, HR and HLR materials are identified and compared as expedient camouflage materials for concealment of target signature than six selected synthetic dyes such as Isolan Black 2S LDN, Isolan Orange, Telon Blue A 2R, Telon Red A 2R, Telon Violet 3R and Telon Yellow A 2R. Nine CB materials have been compared with ZR, LR, HR, HLR materials to develop adaptive camouflage textiles for universal matching against DGTWSIB. Hence, this research outcome aims to simulate, formulate, investigate and design of materials for coated/dyed/printed camouflage textiles, develop camouflage measurement techniques for concealment, detection, recognition and identification of target signature against DGTWSIB under Vis-NIR spectrums. Spectral matching model is relevant for broader area of camouflage engineering related to weapon and vehicle design for defence protection. This method clarifies the development of camouflage textiles against modern remote sensing threat of advance surveillance technologies. Reflection profile of combat dyes and DGTWSIB materials have also versatile optical applications in materials engineering in addition to camouflage textile formulation of dyeing-coating-printing.

Biography

Md. Anowar Hossain is presently a Lecturer (study leave) in Textile Engineering, Department of Textile Engineering, City University, Dhaka, Bangladesh. He is a former Assistant Professor and Head of Department of Textile Engineering, BCMC College of Engineering and Technology, Jessore, Affiliated by University of Rajshahi. He is also a former Lecturer and Head of Department of Textile Engineering and Assistant Registrar (Additional), Newcastle University College, Chittagong, Affiliated by University of Chittagong.

Rushil Saraswat
Cambridge Court World School, India

An Analytical Study of the Effect of Gravity on Electronic Wavefunctions in Oxygen

We can determine the presence of oxygen in the sun by observing its absorption spectrum. However, no single wavelength observed in the oxygen spectrum of the sun directly corresponds to the Ritz wavelength of either the oxygen atom or the oxygen molecule. To account for this inconsistency, the study hypothesizes that the shells of the oxygen atom expand or compress under the presence of gravity, and it causes the change of difference in energy levels. To verify the hypothesis, the study assumes the shells in the atom to be different levels of a modified version of an infinite potential well. The relative distance between two shells of atoms present on the earth and the sun can be worked out by comparing the energies of the modified infinite potential wells. The study finds that the ratio of distances between the atoms present on the earth and the sun is not same, hence, verifying the hypothesis. To further verify the hypothesis, analysis of spectrums of more elements under the influence of a large gravitational field and with significant screening effects is required. The findings of the study are significant and provide vital insights into the effects of gravity on electronic wavefunctions and can serve as a starting point for future research in this area.

Biography

Rushil Saraswat is currently pursuing higher secondary education from Cambridge Court World School, India. He has been awarded merit in I.O.Q.M.. He has achieved 2nd rank in N.A.E.S.T. zonal round and 1st rank in C.B.S.E. state science exhibition, he has also been awarded the “Baal Vaigyanik Purushkar”. He has been selected in the top 10 solvers in Samsung Solve for Tomorrow Challenge and has received a certificate of appreciation in S.D.R.O. Stem Challenge.

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KEYNOTE SPEAKERS Day 1

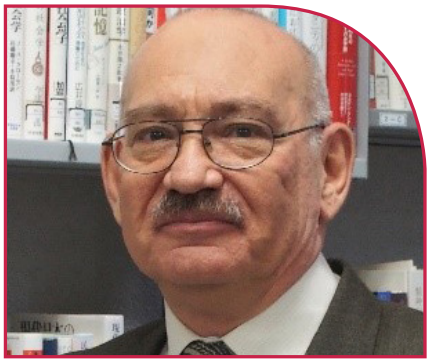
Alexander G Ramm
Kansas State University, USA

Wave scattering by many small particles, creating materials with a desired refraction coefficient and other applications

The theory of wave scattering by many small impedance particles of arbitrary shapes is developed. The basic assumptions are: a is smaller than d, where a is the characteristic size of particles, d is the smallest distance between the neighbouring particles, is the wavelength. This theory allows one to give a recipe for creating materials with a desired refraction coefficient. One can create material with negative refraction: the group velocity in this material is directed opposite to the phase velocity. One can create a material with a desired wave focusing property. Quantum-mechanical scattering by many potentials with small supports is considered.

Biography

Alexander G. Ramm was born in Russia, emigrated to USA in 1979 and is a US citizen. He is Professor Emeritus of Mathematics with broad interests in analysis, scattering theory, inverse problems, theoretical physics, engineering, signal estimation, tomography, theoretical numerical analysis and applied mathematics. He is an author of 716 research papers, 20 research monographs and an editor of 3 books. He has lectured in many Universities throughout the world, gave more than 150 invited and plenary talks at various Conferences and had supervised 11 Ph.D students. He was Fulbright Research Professor in Israel and Ukraine; distinguished visiting professor in Mexico and Egypt; Mercator Professor in Germany; Research Professorin France; invited plenary speaker at the 7-th PACOM; he won Khwarizmi international award in 2004 and received other honors.



Michael I. Tribelsky
Lomonosov Moscow State University, Russia

Resonantly-scattering nanoparticles as tools for subwavelength tailoring of electromagnetic fields

Resonant light scattering by nanoparticles provides a unique opportunity to concentrate a high-amplitude electromagnetic field in a subwavelength area of space as well as to tailor and control its pattern. In addition to purely academic interest, this is extremely important for numerous applications ranging from medicine and biology to telecommunication and data processing. Despite more than a hundred years of extensive study, the problem is still far from completion. In this contribution, the author presents a review of his results in this field. In many cases, despite the smallness of the scattering particles, their light scattering has very little in common with the conventional Rayleigh case. New, counterintuitive effects, especially those related to the violation of the quasi-static description of the scattering occurring at the action of (ultra)short laser pulses, are pointed out and inspected, discussed, and classified.The author acknowledges the financial support of the Russian Science Foundation (Project No. 21-12-00151).

Biography

The author received his MS from Lomonosov Moscow State University in 1973, PhD from Moscow Institute of Physics and Technology in 1976, and Dr. of Sci. (habilitation) from Landau Institute in 1985. He received numerous national and international awards: Leninsky Komsomol Prize (1979); COE Professorship, the University of Tokyo, (2006, 2008) and Kyushu University (2007), Japan; Honorary PhD, Yamaguchi University, Japan (2016), etc. Now he heads a laboratory at Lomonosov Moscow State University. His field is theoretical and mathematical physics. Presently, his interest lies in subwavelength optics. He is the author of several books, book chapters, review articles, and more than 100 research papers. See https://polly.phys.msu.ru/en/labs/Tribelsky/ for more details.

World

BIOPOLYMERS & POLYMER CHEMISTRY CONGRESS

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SPEAKERS Day 1

Ayoub Grouli
University Hassan II of Casablanca, Morocco

Removal of anionic dye from wastewater using a hydroxyapatite/chitosan composite

Chitosan chemistry is fascinating because the abundant hydroxyl and amino groups on its surface are amenable to chemical modification and would result in the efficient generation of polymeric materials and has great potential use in environmental adsorption applications but generally suffers from low specific gravity and pH sensitivity. In this study, a hydroxyapatite-CS (HA-CS) composite was developed via the integration of HA into CS. and used for the removal of Congo red (CR) dye from an aqueous solution. The effects of different weight contents of CS in the HA-CS composite, adsorbent dosage, initial pH, contact time, and initial dye concentration on the Congo Red (CR) dye. The effect of contact time and initial dye concentration on CR removal was studied in detail using batch adsorption at room temperature. The pseudo-second-order model best described the kinetic data ($R2 > 0.9998$), while the thermodynamic study of CR adsorption by the HA-CS composite confirmed spontaneous adsorption. Other studies showed that the adsorption model fitted well with the Langmuir model ($R2 > 0.9699$) but less well with the Freundlich model ($R2 < 0.9399$). FT-IR spectroscopy and XRD studies showed significant results for CR adsorption, including ion exchange, surface complexation, and hydrogen bonding. The HA-CS composite containing 55 wt.% CS showed an adsorption capacity of 770mg.g-1 for CR (Langmuir model), which is greater than pristine CS, HA and other previously reported adsorbents.

Ishrat Jahan Badruddin
Cranfield University, UK

Environmentally Benign Alginate Extraction and Fibres Spinning from Different European Brown Algae Species

To support the growing demand of natural fibres extensively in various applications, sustainable alternatives for their extraction and fibre formation are needed. Four different Sodium alginate species from European seaweed- Saccharina latissimi (SAC), Laminaria digitata (LAM), Sacchoriza polyschides (SACC), and Himanthalia spp. (HIM) using sustainable protocol were extracted and were investigated to produce fibre. After extraction (3% w/v biomass) using citric acid based sustainable protocol, crude alginate represented 61-65 % of the dry biomass weight for SAC and LAM, and 34-41 % for SACC and HIM when experiments were performed at lab scale (1.5 g of starting material). Interestingly, decreased yields to 26-30 % was observed when scaling-up extraction (60 g of starting material). SAC and LAM alginates had the highest molecular weights and M/G (mannuronic acid/guluronic acid) ratios when compared to those from SACC and HIM (MW: 302 and 362 kDa, M/G:1.98 and 2.23, vs 268 and 168 kDa, 1.83 and 1.86). To study the spinnability and mechanical properties, the four types of alginates were cross-linked with CaCl2, only SAC and LAM alginates were spinnable. These fibres showed no clumps or cracks and were uniform under stretching action and presented a similar Young's modulus (2.4 and 2.0 GPa). We have demonstrated successful spinning of alginate extracted from S. latissima and L. digitata into functional fibres cross-linked with CaCl2. The mechanical tests performed allowed to identify significant differences on the mechanical properties of the fibres. Future work involves the cross-linking of these fibres using natural cross-linkers to tune the mechanical properties of the fibres for varied applications.

Biography

Ishrat Jahan Badruddin is currently pursuing her PhD in Manufacturing at Cranfield University. She is exploring the potential of natural polymers for varied engineering applications in the Department of Manufacturing.

Benkhira Ilyas
Universite Saad Dahlab Blida, Algeria

A New Double Cross-Linked Amidated Pectin-Gelatin Hydrogel films Developed With Oxidized Tannic Acid And In Situ Reduced Silver Nanoparticles

This work aims to assess the effect of different mass fraction of oxidized tannic acid (OTA) (0 to 5% wt.%) on the physicochemical, barrier and mechanical properties of nanocomposite hydrogel films based on gelatin (GE), amidated pectin (AP) and in situ formed silver nanoparticles (AgNPs). The prepared double-crosslinked hydrogel films (AP-GE/OTA/Ag), by casting technique, were characterized using various techniques, viz, FTIR, XRD, SEM, TGA, and tensile strength tests. The fluid uptake ability, the water retention capacity, and the water vapor permeability have been also evaluated. The FTIR and XRD patterns demonstrate that crosslinking is achieved by the interactions of the OTA quinone groups with the free amino groups present in both AP and GE. Moreover, the SEM images showed homogenous and interconnected structures characterized by a sought dispersion of the AgNPS on the surface of the films. The TG measurements indicated a significant improvement in the thermal stability of the AP-GE/OTA/Ag compared to the AP-GE film. Additionally, the obtained results demonstrate that crosslinking with 2% (wt.%) of OTA noticeably improved the water vapor transmission rate of the hydrogel film from 1653,92 g/m2/day to 1976.42 g/m2/day. Likewise, this OTA mass fraction was found to further increase the tensile strength of the film, reaching values up to 200 MPa. The overall results claimed that the AP-GE/OTA/Ag hydrogel films present an attractive prospect in the biomedical field. However, it is recommended to conduct further clinical studies to evaluate the efficacy of this hydrogel film as a wound dressing material.

Biography

BENKHIRA Ilyas is a PhD student in chemical process engineering at Saad Dahlab University – Blida, Algeria. His main research activities are devoted to the synthesis and characterization of bio-based materials and their pharmaceutical applications. To achieve the requested objectives, the activities are specifically performed on natural polymers and concerned drug design and synergy of biopolymers with commercial drugs.

Elena Tchetina
Nasonova Research Institute of Rheumatology, Russia

The importance of synovial cytokine assessment in the course of corrective osteotomy associated with PRP and SVF post-treatments for tissue regeneration forecast

Objective: To examine functional outcomes and synovial fluid (SF) cytokine concentrations in response to platelet-rich plasma (PRP) or stromal vascular fraction (SVF) post-treatments following open wedge high tibial osteotomy (HTO)

Methods: Six weeks after surgery, the knees of 10 patients with knee osteoarthritis were injected with autologous PRP (PRP subgroup), while another 10 patients were injected with autologous SVF (SVF subgroup) and monitored for 1.5 years. Pain assessment (VAS score) and functional activity (KOOS, KSS, Outerbridge, Koshino scores) were applied. SF was collected before and one week after PRP or SVF injections and tested for concentrations of 41 cytokines (Multiplex Assay).

Results: PRP subgroup performed better compared with the SVF subgroup according to KOOS, KSS, and VAS scores, while the SVF subgroup demonstrated superior results in Outerbridge and Koshino testing. In the PRP subgroup, a significant decrease in IL-6 and CXCL10 synovial concentrations was accompanied by an increase in IL-15, sCD40L, and PDGF-AB/BB amounts. The SVF subgroup demonstrated a significant decrease in synovial TNFα, FLT-3L, MIP-1β, RANTES, and VEGF concentrations while SF concentrations of MCP-1 and FGF2 increased.

Conclusion: Intra-articular administration of SVF produced more pronounced improvements related to cartilage regeneration while PRP post-injection resulted in a better functional outcome and pain control. Both post-treatments have a potential for increased tissue regeneration, presumably due to the downregulation of inflammation and augmentation of synovial growth factor concentrations.

Acknowledgments: This study was funded by Russian Ministry of Education and Science.

Biography

Elena Tchetina is a Leading Scientist, Principle Investigator, Immunology & Molecular Biology Department, Oct.2006-present. Research in genetics, cellular, and molecular physiology of osteoarthritis, rheumatoid arthritis, and osteoporosis. The importance of metabolic signalling pathways for the disease progression, inflammation, pain perception, joint destruction, and the response to therapy has been investigated in osteoarthritic, rheumatoid arthritis, and osteoporotic patients.

Aoha Roohi Amin
Institute of Applied Sciences and Technology, Pakistan

Applications of Nanofluids in Machining Operations: A Comprehensive Review

Nanofluids have gained attention and interest as a strong and potential class of materials having unique properties with large number of applications and advantages in research and industries. Nanofluids are actually the colloidal suspensions that are produced when different nanoparticles get dissolved in base fluids depending upon different factors including their compatibility with each other. In recent few years, interest in the use of nanofluids in various machining operations has gained tremendous attention for increasing the process efficiency. This comprehensive review article's objective is mainly to conduct in-depth studies on the nanofluid applications in various machining processes. This comprehensive review focuses on the detailed analysis of recent advancements in the formulation and characterization of nanofluids specifically designed for machining operations. Different types of nanofluids prepared from various nanoparticles in combination with base fluids and surfactants used for different machining processes and their impacts with respect to various aspects are being discussed, in terms of their effect on the efficiency of the machining operation. Furthermore, this review article also addresses the limitations as well as challenges that are related to the use of various nanofluids in machining operations. It emphasises the need for further research to regulate nanofluid formulations in terms of various factors, investigate their effects on different machining parameters, and assess their long-term performance and environmental impact, along with other key factors. In conclusion, this review paper provides a thorough and organised explanation of the uses of nanofluids in machining operations.

Biography

Aoha Roohi Amin belong to Peshawar, Pakistan. She had done my matriculation from WMSC, Peshawar, with A grade, while Intermediate education from PMDC, Peshawar, in Pre-Engineering Group, where I stood third in BISEP. Currently, she is a student of 6th Semester, BE Chemical Engineering at PAF-IAST, Haripur with CGPA 3.95.

World

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KEYNOTE SPEAKERS Day 2

Peter Chew
National university of Malaysia, Malaysia

Peter Chew Formula for calculate Covid-19 Vaccine efficiency

The article Covid-19 Vaccination Education App. shows that most people do not take the covid-19 vaccine because they question the safety and effectiveness of the vaccine. To address this issue, it is important to create a simple formula, Peter Chew formula for calculate the efficiency of the covid-19 vaccine. The purpose of creating this calculation formula is to allow the public to calculate the efficiency of the covid- 19 vaccine by themselves, so that they can confidence with the efficiency of the covid-19 vaccine and decide to take the vaccine. This helps to get a high response to COVID vaccination. The Peter Chew formula is also advantageous because it relies on data that is readily available in the news, and it allows individuals to compare the average infection rates of vaccinated and unvaccinated groups. Another advantage of Peter Chew formula is that we can assume a high target population of vaccination with k = 100, such as the medical worker group. When k = 100, the Peter Chew formula calculation becomes very simple. The article emphasizes that the purpose of the Peter Chew formula is to simplify a complex formula and make it accessible to the general public, in line with Albert Einstein's famous quote: "Everything should be made as simple as possible, but not simpler".

Biography

Peter Chew is Mathematician, Inventor and Biochemist from National University Of Malaysia (UKM). Global issue analyst , Reviewer for Europe Publisher, Engineering Mathematics Lecturer , Author for 44 Book and 7 preprint articles published in the World Health Organization (WHO) and President of Research and Development Secondary School (IND) for Kedah State Association [2015-18]. Peter Chew also is CEO PCET, Ventures, Malaysia, PCET is a long research associate of IMRF (International Multidisciplinary Research Foundation), Institute of higher Education & Research with its HQ at India and Academic Chapters all over the world, PCET also Conference Partner in CoSMEd2021 by SEAMEO RECSAM.

Radwan Al Mofti
TADA Consulting Solutions, Canada

Oral Thin Film - An Alternative to IM & IV Drug & Vaccine Delivery Systems

The administration of drugs and vaccines through intramuscular (IM) and intravenous (IV) routes is a widely used practice. However, these methods have certain limitations, such as needle-related anxiety, pain, and infections. The development of alternative drug and vaccine delivery systems is therefore essential for patient comfort and safety. Oral thin film (OTF) is a promising alternative delivery system that offers several advantages over traditional routes. OTF is a flexible, paper-thin strip that dissolves in the mouth, releasing the drug or vaccine. OTF can be easily administered without the need for needles or health professional to administer them, and it has been shown to improve patient compliance and adherence to medication regimens. Moreover, OTF offers an excellent platform for the delivery of drugs and vaccines that are unstable in the stomach or require specific absorption sites. OTF also provides a more precise dose delivery, reducing the risk of over or under dosing. Moreover, numerous studies have shown that embedding thermos-susceptible biomolecules such as vaccines in OTF stabilizes these vaccines at room temperature for long term, eliminating the need for deep freezers. In conclusion, the use of OTF as a drug and vaccine delivery system has the potential to revolutionize the field of medicine. It offers a safer, more comfortable, and more convenient alternative to traditional delivery methods, and its benefits extend to both patients and healthcare providers. The current presentation highlights 1) the advantages of OTF delivery system over non-mucosal delivery systems such as IM and over other mucosal delivery systems such as intranasal and inhalers, 2) the improvements needed to OTF, and 3) future trends.

Biography

Dr. Radwan Almofti is a pharmacist with Master and PhD degrees in pharmaceutical science and technology. His research has been focusing on developing liposomes as gene delivery system and studying the mechanisms of transfection and ways to enhance efficiency and minimize toxicity. Next Dr. Almofti moved to work for pharmaceutical industries participating in the development, quality and regulatory aspects of various dosage forms including inhalers and intranasals. In 2018, Dr. Almofti founded TADA Consulting Solutions through which he and his highly professional team of experts are offering professional Research & Development, compliance, and regulatory services to pharmaceutical industry. For the last couple of years, Dr. Almofti has been extensively involved in the development of oral thin film (OTF) delivery system for conventional small molecules and macro biomolecules including various vaccines (mRNA, DNA, and proteins) encapsulated in Lipid Nano Particles (LNP) and viral vectors.

Chen Lukui
Southern Medical University, China

NSC Derived Exo-Loaded Adhesive Hydrogel Controlled-Release Promotes Cerebral Angiogenesis and Neurological Function for Ischemic Stroke

Ischemic stroke has become one of the leading diseases for disability and death, which brings burden to the economy and society. Exosome (Exo) production can be increased 4–5 times using the medicated plasma of Buyang Huanwu Decoction to stimulate neural stem cells (NSCs), and can promote neurogenesis and migration of NSCs. However, Exos themselves are easily to be removed in vivo. Our study is to investigate whether NSC-derived-Exos loaded by adhesive hyaluronic acid hydrogel (HAD-Exo) would be controllably released to further promote the recovery of ischemic stroke.

Biography

Lukui Chen had completed his PhD at the age of 35 years from Central South University, China. He is the director and professor of Neuroscience Center in Integrated Hospital of Traditional Chinese Medicine, Southern Medical University, China, since 2019. He has over 40 publications that have been cited over 1000 times. He has been serving as Guest Editor of Frontiers Journals.

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SPEAKERS
Day 2

Carla Serri
University of Sassari, Italy

Rutin-Loaded Hybrid Nanoparticles for Nasal Administration the To Protect From Anthracycline-Induced Endothelial Brain Damages

Anthracyclines treatment results in brain damage induced by endothelial inflammation cell damage1. Rutin is a natural flavonoid compound with great anti-inflammatory potential. Still, the pharmacological activity of Rutin is generally restricted because of its low water solubility, poor oral bioavailability, and short half-life. The nasal route is an alternative administration route characterised by e rapid and high absorption in the systemic circulation, avoiding the first-pass metabolism and direct nose-to-brain transportRutin-loaded hybrid nanoparticles (LCPHAR) were developed as intranasal delivery systems for protecting endothelial brain cells. LCPHARs were prepared by modified nanoprecipitation technique by solvent evaporation. Hybrid-nanoparticles have been characterised by size, zeta potential (P), morphology, differential scanning calorimetry (DSC), total drug in dispersion and thermal properties were studied were investigated, as well as their cytotoxicity and in vitro anti-inflammatory activity in human endothelial cells. LCPHAR were spherical, with a mean size of 209.4 ± 4.3 nm and negative charge (-30±0.5 mV). The total amount of Rutin in dispersion was 1.33 ± 0.13 mg/mL, corresponding to 68,9 % of Rutin used for the preparation. In vitro permeation studies indicate a high LCPHAR affinity to the nasal mucosa's hydrophilic components. Cellular studies demonstrated that LCPHAR could significantly reduce cell death and inflammation induced by epirubicin by inhibiting NLRP3 and Myd-88-related cytokines. Based on these promising results, we believe that Hybrid Nanoparticles strategies could promote Rutin's potential pharmacological activity for nasal delivery of anti-inflammatory and vasculoprotective bioactives in cancer patients treated with anthracyclines.

Biography

I am Carla Serri, an Assistant Professor or research of Pharmaceutical Technology and Legislation at the University of Sassari (Italy). I am teaching Pharmacy for the course Pharmaceutical Technology; my class focuses on the Active, Drug and conventional farmaceutical forms. My research is focused on preparing, characterising and studying the controlled release of Drugs. In particular, evaluate the analysis of the use of different polymeric and lipid materials and their interactions in the preparation of Nano and Microparticles and loading of poorly soluble drugs. For the past year, I have been working on developing hybrid nanoparticle systems to be delivered for Naso to the brain.

Chanti Babu Katta
National Institute of Pharmaceutical Education and Research, India

Synergistic in vitro antifungal efficacy of naringenin-capped silver nanoparticles against candida species

The present research was designed to investigate the synergistic efficacy of a phyto molecule, naringenin (NRG) mediated silver nanoparticles (NRG-SNPs) against *Candida albicans* (*C. albicans*) and *Candida glabrata (C. glabrata)*. NRG-SNPs were prepared by reducing silver nitrate with NRG, and its formation was confirmed by a color change and surface plasmon resonance peak at 425 nm. The size, PDI, and zeta-potential of NRG-SNPs were 35±0.21-nm, 0.19±0.03, and -17.73±0.92-mV, respectively. *In silico* results demonstrated that NRG had a strong affinity towards the sterol 14-α demethylase of fungal strain. The docking with ceramide revealed the skin permeation efficiency of the NRG-SNPs. The MIC_{50} of NRG solution and SNPs against *C. albicans* was found to be 50-µg/mL and 4.8-µg/mL, respectively, significantly ($P<0.05$) higher than 0.3625-µg/mL of NRG-SNPs. Similarly, MIC_{50} of NRG, TSC-SNPs, NRG-SNPs, and miconazole nitrate against *C. glabrata* were found to be 50-µg/mL, 9.6-µg/mL, 0.3625-µg/mL, and 3-µg/mL, respectively. Interestingly, MIC_{50} of NRG-SNPs was significantly ($P<0.05$) lower than MIC_{50} of miconazole nitrate against *C.glabrata*. The FICI values against both the *C. albicans* and *C. glabrata* were 0.016 and 0.011, respectively, indicating the synergistic antifungal activity of NRG-SNPs. Furthermore, NRG-SNPs were formulated as a topical gel for the treatment of cutaneous candidiasis.

Biography

Katta Chanti Babu is pursuing his Ph.D. at the National Institute of Pharmaceutical Education and Research (NIPER)- Hyderabad in the department of pharmaceutics. He has been awarded a NIPER fellowship for his master's degree and his Ph.D. degree. He is involved in various industrial projects. He worked on an industry project which has filed for an Indian patent. He has published over 10 research/review papers in peer-reviewed journals, including one book chapter. He achieved 1st prize during the BITS ATMOS conference and gave an oral presentation at the PHARMACON 2022 international conference.

Jinfang Zhu
Xinjiang Agricultural University, China

Enhanced antitumor efficacy and attenuated cardiotoxicity of doxorubicin in combination with lycopene liposomes

The aim of this study was to evaluate whether lycopene-loaded liposomes (L-LYC) could interfere with the antitumor efficacy and cardiotoxicity of doxorubicin (DOX). L-LYC were prepared by a thin-film hydration method to overcome the instability, insolubility, and low bioavailability of lycopene. The mean diameter and morphology of the liposomes were determined by dynamic light scattering and transmission electron microscopy, respectively, and then, in vitro cytotoxicity and in vivo antitumor activity were determined to evaluate the effects of L-LYC and their combination with DOX. Finally, we evaluated whether L-LYC could decrease the DOX-induced cardiotoxicity in vivo. The results showed that the particle size of L-LYC appeared uniform, and the average diameter was approximately 160.4 nm. Compared to DOX treatment alone, the combination of L-LYC and DOX showed significantly increased cytotoxicity in vitro and decreased the tumor size in B16 Melanoma-bearing mice in vivo. Furthermore, the DOX-induced cardiotoxicity was clearly relieved in combination with L-LYC. The overall findings indicated that L-LYC have a great potential for improving the therapeutic efficacy and attenuating the cardiotoxicity of the chemotherapy drug DOX.

Biography

Miss Jinfang Zhu is a student at College of Food Science and Pharmaceutical Science, Xinjiang Agricultural University, 311 Nongda East Road, Urumqi 830052, China

Vishakha Jaiswal
Amity Institute of Pharmacy, India

Nelumbo nucifera: A Propitious Biopolymer for Novel Drug Delivery

It has been always interesting and favourable to incorporate natural polymers in drug delivery systems. Nelumbo nucifera is a perennial, emergent edible aquatic plant found in tropical and subtropical Asia. In this research Nelumbo nucifera explored for its mucoadhesive character and its potential as film former for drug delivery. The biopolymer was isolated from the stems of the Nelumbo nucifera incorporated as film former and other co-processing agents like plasticizer, penetration enhancer etc. Five optimized flexible films viz. F1-F5 were formulated in varying concentration of biopolymer (0.5%, 0.75%, 1%, 1.5% & 2%). All formulations were subjected to different evaluation parameters like weight variation, thickness, and content uniformity, surface pH, folding endurance, in-vitro drug release studies. The biopolymer possesses unique in-built mucoadhesive property due to its proteinaceous and carbohydrate nature. The isolated biopolymer can deliver the therapeutic agent local as well as systemically. It's non-toxic, biocompatible and biodegradable properties make it a good candidate for API delivery. Furthermore, biopolymers are tender to cell line and Generally Regarded as Safe (GRAS). Some of other applications of this biopolymer are in areas like ophthalmic, nasal, buccal, sublingual, gastro-retentive, pulmonary, transdermal and vaginal drug delivery.

Ahmed Al-Hulili
SAECO, Chemist, Saudi Arabia

Synthesis Of PNP Ligand/Cr Complexes for The Selective Oligomerization Of Ethylene To 1-Hexene

Linear alpha olefins (LAOs) possessing a reactive C-C-double bond at the α-position are used as starting material for the production of a great variety of organic intermediates and specialty chemicals. LAOs are nearly exclusively produced via homogeneously catalyzed oligomerization of ethylene. The oligomerization, catalyzed by transition metals, often creates a wide spectrum of linear α-olefins. LAOs (1-Octene and 1-hexene) in particular, are highly desirable due to their use as co-monomers in the production of linear low-density polyethylene (LLDPE) or high-density polyethylene (HDPE). Various catalyst systems have been developed for the oligomerization of ethylene. The chromium-based catalytic system has received more attention than other systems in the oligomerization of ethylene. The increased interest in chromium-based systems is due to their high activity and selectivity. The most widely used technology for the synthesis of these olefins is the oligomerization of ethylene, which affords a broad range of LAOs and, therefore, requires energy-intensive separation steps that complicate the commercialization of the LAOs in the mixture. Due to which, selective catalytic oligomerization of ethylene was developed. It is an active and hot topic in research community and most of the research focus on improving the system by enhancing the activity and selectivity. A selective catalytic system toward the desired product for the oligomerization of ethylene is a must due to the reduction of the costs by not needing an energy-intensive separation processes compared to a not-selective process which will produce a wide range of α-olefins, hence more difficulties to commercialize the process. This is the driving force for the selective oligomerization of ethylene for the synthesis of higher α-olefins using complex organometallic catalysts. In summary, five diphosphinoamine (PNP) ligands (L1-L5) bearing various m-functionalizationwere synthesized, characterized, and evaluated towards trimerization of ethylene to 1-hexene. The catalytic reactions were performed using a pre-catalyst mixture, Cr(acac)3/PNP ligand/MMAO-3A, at ethylene pressure of 10 bar with reaction time of 10 min. Optimization study reveals that polar solvent was suitable for higher catalytic performance compared with non-polar solvents. The temperature enhancement from 45 to 75 oC was observed to improve the catalytic efficiency. Using optimized identical condition (chlorobenzene solvent and 75 oC temperature) various m-functionalized ligand with the Cr source was evaluated for the trimerization reaction. m-Functionalized ligands bearing CF3, and bis-methyl moieties provide the highest catalytic productivity and methyl substituted ligand provides the α-olefin products with lowest rate. The most efficient catalyst system was achieved using L1, which provides the highest 1-hexene selectivity and α-olefin selectivity.

Biography

I am a Ahmed Al-Hulili who graduated from King Fahd University of Petroleum and Minerals (KFUPM) with a bachelor's degree in chemistry. Also, I have gained my master's degree in polymer science & engineering from KFUPM. I had a pre-professional experience with Saudi Aramco as a Coop trainee in Jizan Economic City.

Noor Fatimah Yahaya
University Sains Malaysia, Malaysia

Rapid ultrasound-assisted emulsification micro-solid phase extraction based on molecularly imprinted polymer for HPLC-DAD determination of bisphenol A in aqueous matrices.

Molecularly imprinted polymer (MIP) was employed as sorbent in ultrasound-assisted emulsification molecularly imprinted polymer micro-solid phase extraction (USAE-MIP-μ-SPE) of bisphenol A (BPA) in water, beverages, and the aqueous liquid in canned foods prior to high-performance liquid chromatography-diode array detector (HPLC-DAD) analysis. Several effective variables, such as types of emulsification solvent and its volume, types of desorption solvent and its volume, salting out effect, pH of sample solution, the mass of sorbent, extraction and desorption time, and sample volume, were optimized comprehensively. Under the optimized USAE-MIP-μ-SPE and HPLC-DAD conditions, the method demonstrated good linearity over the range of 0.5–700 μg L−1 with a coefficient determination of R2=0.9973, low limit of detection (0.07 μg L−1), good analyte recoveries (82.2–118.9%) and acceptable RSDs (0.7–14.2%, n=3) with an enrichment factor of 49. The method was applied to thirty samples of drinking water, mineral water, river water, lake water, as well as beverages and canned foods, the presence of BPA was identified in four samples. The proposed method showed good selectivity and reusability for extraction of BPA, and hence the USAE-MIP-μ-SPE is rapid, simple, cost-effective, and environmentally friendly.

Biography

Dr Noorfatimah Yahaya was trained as an analytical chemist in the fields of separation chemistry, including chromatography and electrophoresis, as well as the development of green sample preparation procedures employing nanomaterial sorbents. Several advanced materials, such as molecularly imprinted polymers, biopolymers, silica, carbon-based sorbents, and magnetic nanoparticles, have been conceived in her research. Currently, she is the Associate Professor in the Department of Toxicology at the Advanced Medical and Dental Institute of Universiti Sains Malaysia. She has published more than ninety peer- reviewed scientific articles in journals such as Food Chemistry, Talanta, and the Journal of Separation Science. Over the years, she and her students have made substantial contributions to analytical and bioanalytical method development, as well as the application of mass spectrometry in conjunction with green separation technologies.

Kahnu Charan Pradhan
Utkal University, India

Synthesis, theoretical and biological studies of cyclometalated Iridium (III) Phenyl pyridine type complexes

Cyclometallated Ir (III) complexes as phosphorescence emitters have gained widespread interest as attractive candidates for use in organic light emitting diodes (OLEDs), bioimaging probes1, oxygen sensors, anticancer agents, photo redox catalysts, pH sensors, and so on because of their remarkable optoelectronic properties. To date, numerous examples of Iridium complexes have been prepared2 and most of them can be categorized as IrL3, IrL2L', IrL2A, and IrL2A' where L and L' are different cyclometallating ligands that chelate to an Ir (III) ion via carbon and hetero atoms, 'A' depicts a symmetric ancillary ligand that binds to Ir (III) via two hetero atoms, and A' represents a non-symmetric ancillary ligand. Tris-heteroleptic Ir(III) complexes containing an Ir(III) ion with three different cyclometallating ligands (IrLL'L") or a combination of two different cyclometallating ligands and one ancillary ligand (IrLL'A or IrLL'A') represent new classes of highly functionalized Ir(III) complexes, which may open new avenues for the finetuning of their photochemical and electrochemical properties and could fill a function gap between a series of the homoleptic and bis-heteroleptic Ir(III) complexes. The Phenyl Pyridine and related derivatives have attracted interest as precursors to highly fluorescent metal complexes of possible value as organic light emitting diodes(OLEDs). In all cases, complexation of the metal with the nitrogen donor and metallation at an ortho-position of the phenyl ring gives rise to a five-membered chelate ring.

Now a days the studies on iridium complexes are being designed with heteroleptic iridium complexes composed of phenyl pyridine, substituted phenyl pyridine and ancillary ligands, and thus obtained iridium complexes expected to act as phosphors. Each combination of ligands would give rise to HOMO-LUMO separation which would reflect in luminescence behaviour of new complexes. In other words, tuning of emission colour could be achieved through subtle changes in the structure of phenyl pyridine, it's derivatives and ancillary ligands.

Biography

I wish to introduce myself to you. I am Kahnu Charan Pradhan, have completed M.Sc. (2014) in Chemistry from Odisha University of Agriculture & Technology, Bhubaneswar. I started my short-term research tenure in CSIR-Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, India. I have submitted my PhD thesis (2023) in Utkal University, BBSR. My topic was based on Organic and Organo metallic synthesis with photo physical, theoretical, electrochemistry studies and biological applications.

World

BIOPOLYMERS & POLYMER CHEMISTRY CONGRESS

10-11 July 2023 | Online

KEYNOTE SPEAKERS Day 2

Dror Malka
Holon Institute of Technology, Israel

Designing All-Optical Logic Half Adder with Photonic Crystal Multi-Ring Resonators

Optical logic components have attracted much attention due to their strong capability in the optical communication field and potential to support computing techniques for the future improvement of signal processing in all-optical data networks A novel design of an all-optical half adder (HA) based on two two-ring resonators in 2-dimensional square lattice photonic crystals (PC) structure without nonlinear materials is proposed. The all-optical HA comprises AND and XOR gates where each gate is composed of cross-shaped waveguides and two ring resonators in 2D square lattice PC that are filled with silicon (Si) rods in silica (SiO2). The AND and XOR gates were analyzed and simulated using plane-wave expansion (PWE) and finite difference time domain (FDTD) methods. Simulation results show that light guiding inside the device functions as AND and XOR gates. Thus, the proposed device has the potential for use in optical arithmetic logic units for digital computing circuits. The structure comprises an optical AND gate and an optical XOR gate that were designed to work at the C-band spectrum. Results show that there is a clear distinction between logic states 1 and 0 with a narrow power range that leads to a better robust decision on the receiver side for minimized logic errors in the photonic decision circuit. Thus, the proposed HA can be a key component for designing a photonic arithmetic logic unit.

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, silicon photonics and fiber optics. He has published around 50 refereed journal papers, and 50 conference proceedings papers.

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SPEAKERS
Day 2

Siddharth Mahala
University of Manchester, UK

Unwanted degradation in pseudocapacitors: Challenges and opportunities

Pseudocapacitors are a potential family of electrochemical energy storage devices that have received a lot of interest because of their high-power density, long cycle life, and inexpensive cost. However, as with all energy storage devices, Pseudocapacitors degrade over time, resulting in decreasing performance and lifetime. We analyse the mechanisms and conditions that cause undesirable degradation in Pseudocapacitors in this study and propose fresh techniques to increase their energy storage capacity. To evaluate the degradation behaviour, experimental experiments are performed on Pseudocapacitors samples with various electrode materials, electrolytes, and operation circumstances. According to the findings, undesirable degradation in Pseudocapacitors can be ascribed to a variety of reasons, including electrode corrosion, electrolyte decomposition, and side reactions. However, the extent and rate of degradation vary depending on the material compositions and operating conditions. To mitigate unwanted degradation, we review several strategies, including the use of protective coatings, improved electrode designs, and optimized operating conditions. These strategies are evaluated through theoretical simulation and experimental tests, and the results demonstrate significant improvements in the energy storage performance and lifetime of the Pseudocapacitors. Overall, the study of undesired degradation in Pseudocapacitors provides vital insights into the technology's limitations and opens new paths for improving its energy storage capacities. The presented methodologies have tremendous industrial application potential, helping to produce sustainable and efficient energy storage solutions.

Biography

Siddharth Mahala is a passionate materials scientist and engineering student with a drive for excellence. Earning an MEng in Materials Science and Engineering at the University of Manchester, He had achieved outstanding academic results while actively contributing to research and projects. As a published author in the Journal of Energy Storage, his research focused on Pseudocapacitors. Additionally, he is undertaking research projects on corrosion and chemistry of nuclear reactors and research facilities.

Seiko Jose
Mahatma Gandhi University, India

Green composites prepared from sheep wool reinforced vulcanised rubber with enhanced physical and mechanical properties.

Green composites are an alternative to conventional non-biodegradable composites in many applications. In the reported work, the mechanical and physical properties of vulcanised natural rubber (NR) reinforced with wool fibre were investigated. A comparative study of vulcanised rubber with vulcanised rubber-wool composite was conducted with emphasis on diffusion characteristics, moisture absorption, thermal and UV degradation, biodegradation, acoustic properties, cure characteristics etc. The developed NR-wool composite contained 50% vulcanised rubber and 50% wool fibre. Various analytical techniques such as XRD, SEM, FTIR, etc. were adopted to characterize both vulcanised rubber and the composites. The thermal and UV degradation of the composites were also investigated by keeping the composites for ageing under standard conditions. The results showed that, in comparison with the vulcanized rubber sample, the tensile strength of the NR-wool composites was reduced whereas, the hardness increased by 84.26%. During diffusion studies, it is observed that the mol % uptake of toluene into the matrix of the composites was considerably less in comparison to that of vulcanised rubber. The cure time data shows that the maximum torque in the cure curve which is an indication of the extent of crosslinking increased to almost 500% in the NR-wool composites in comparison with vulcanized rubber. After incorporating 50% wool in NR, the curing time was reduced to almost half in comparison with vulcanized rubber. The cross-sectional SEM images depict fibre pull out and voids, which indicates less interfacial adhesion of the wool fibre with the rubber matrix. The FTIR studies indicate no specific chemical interaction between the wool and NR inside the composites. The moisture uptake of the NR-wool composite was found to be higher than the vulcanized rubber due to the presence of hydrophilic wool fibre.

Biography

Seiko Jose is a scientist, working at Central Sheep and Wool Research Institute, Avikanagar, Rajasthan, India. He is specialized in Textile Chemistry and having more than 17 years of experience in textiles. He is having seven years of experience in the cotton, silk, and linen processing industry. In the past ten years of his research, he has handled many natural fibres like, jute, pineapple leaf fibre, coconut fibre, flax, silk, wool, ramie, etc. He contributed to 48 research articles and 14 book chapters. His major research areas are extraction and characterization of natural fibre, utilization of agro residues, textile dyeing and finishing, eco-friendly textile processing, nano technology, and fibre composites. His Google citations are more than 950. He published 3 books, and another 3 books are in progress in the field of textiles, and composites with reputed publishers namely Wiley and Elsevier. He managed 10 industrial consultancy works in the national and international level. Currently is holding the position of Editor in 6 Journals.

Hafiz Muhammad Tofil
Quaid-i-Azam University, Pakistan

Reduced Graphene Oxide-Zinc Sulfide Nanocomposite Decorated with Silver Nanoparticles for Wastewater Treatment by Adsorption, Photocatalysis and Antimicrobial Action

Reduced graphene oxide nanosheets decorated with ZnS and ZnS-Ag nanoparticles are successfully prepared via a facile one-step chemical approach consisting of reducing the metal precursors on a rGO surface. Prepared rGO-ZnS nanocomposite is employed as an adsorbent material against two model dyes: malachite green (MG) and ethyl violet (EV). The adsorptive behavior of the nanocomposite was tuned by monitoring some parameters, such as the time of contact between the dye and the adsorbent, and the adsorbent dose. Experimental data were also simulated with kinetic models to evaluate the adsorption behavior, and the results confirmed that the adsorption of both dyes followed a pseudo 2nd order kinetic mode. Moreover, the adsorbent was also regenerated in a suitable media for both dyes (HCl for MG and ethanol for EV), without any significant loss in removal efficiency. Ag doped rGO-ZnS nanocomposite was also utilized as a photocatalyst for the degradation of the selected organic contaminant, resorcinol. The complete degradation of the phenolic compound was achieved after 60 min with 200 mg of rGO-ZnS-Ag nanocomposite under natural sunlight irradiation. The photocatalytic activity was studied considering some parameters, such as the initial phenol concentration, the photocatalyst loading, and the pH of the solution. The degradation kinetics of resorcinol was carefully studied and found to follow a linear Langmuir–Hinshelwood model. An additional advantage of rGO-ZnS and rGO-ZnS-Ag nanocomposites was antibacterial activity against Gram-negative bacterium, E. coli, and the results confirmed the significant performance of the nanocomposites in destroying harmful pathogens.

Biography

H.Muhammad Tofil a student of M.Phil Physical Chemistry at Quaid-i-Azam University Islamabad Pakistan. Work in the Polymer and Surfactant Lab.

Atefeh Roozitalab
Amirkabir University of Technology, Iran

Performance of green membranes in harsh conditions

Polymeric and inorganic membranes have recently been used extensively in separation process. Membrane processes, which are distinguished by lower energy consumption and chemical use, have attracted greater attention as environmentally friendly alternatives to conventional technologies. However, the most significant membrane fabrication methods frequently depend on the use of artificial polymers and harmful solvents, which lessens the environmental advantage. The application of bio-polymers (green polymers) and bio-solvents (green solvents) in polymer membranes makes them environmentally friendly. Additionally, using inorganic membranes reduces the negative effects on the environment and human health owing to the use of mineral raw materials. First, green polymers, green solvents, and inorganic membranes for membrane synthesis are discussed in terms of the 12 principles of green chemistry in this review. Following that, a standard for harsh conditions for the working environment of membranes was introduced as a result of the performance of polymer membranes and the performance of membrane processes. Last but not least, the use of inorganic membranes under harsh conditions (high temperature, high pressure, high and low pH) is reviewed. As a result, it was determined by looking at several studies that ceramic membranes function well under harsh conditions.

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10-11 July 2023 | Online

E-Posters Day 2

Siddanth Saxena
Polytechnic University of Catalonia, Spain

Study of Self-assembly behaviour of β-Cyclodextrin & its functionalized derivatives

The study of aggregation behaviour of cyclodextrin (CD) is important for various purposes like drug complexation, solubilisation of different compounds and in delivery applications for various compounds, but there are very few studies regarding this topic. Here, we have tried to understand the self-assembly behaviour of the three cyclodextrins: β-cyclodextrin, Hydroxypropyl β-cyclodextrin (HP-β-CD) & Sulfobutylether β-cyclodextrin (SBE-β-CD). The aggregate size values for different cyclodextrins were observed with respect to concentration and time from Dynamic Light Scattering (DLS) as shown in Graph 1, 2 & 3. DLS measurement revealed the presence of mostly three different populations of aggregates. Optical microscopy of the samples was performed to obtain information about the growth behaviour of the cyclodextrin aggregates with the change in the concentration. It was seen that in case of β-CD and SBE-β-CD, the higher concentration samples possess more thick & oriented connections to form the aggregates while the ones with the lower concentration possess only thin fibrous type connectivity and there is either no formation of aggregates or very small aggregates are formed, while in case of HP-β-CD, due to lack of interaction between molecules, observable size aggregate was found at 2.5% w/v. The cyclodextrins aggregates were observed to grow in a worm like fashion and there were some nodules acting as an interconnecting junction for these worms like chains. The results showed that the increment in concentration is directly proportional to the size of aggregate in all the 3 cases. We also compared the aggregate formation within the three types of cyclodextrins with respect to concentration & time and found the order of the aggregate growth to be in following manner: β-CD>>SBE-β-CD>>HP-β-CD as shown in graph 4,5&6. The critical Aggregation Concentration (CAC) values were also calculated and are reported in the table.

Biography

I am from India & currently a doctorate student at Polytechnic University of Catalonia working under the supervision of Professor Manuel Jose Lis Arias. I have a background in Polymer science. I love to work in the packaging domain & currently I am trying to develop functional packaging with cyclodextrins. Previously I have worked in a different project related to bio-packaging during my graduation and post-graduation. After that I have also worked in a Project on Wastewater remediation at Indian Institute of Technology-Delhi (INDIA)

Maria Ciocîlteu
University of Medicine and Pharmacy of Craiova, Romania

PLGA-based biomaterials as drug delivery devices: Research progress

The advantages of drug delivery devices (DDD) target both the health system by reducing the costs generated by long hospitalization periods, repeated surgical interventions, the cost of treatment and the patient by limiting the risks of re-infection and improving treatment compliance. PLGA remains a worldwide accepted polymer in the synthesis of DDD's due to its increased biocompatibility and biodegradability. Various PLGA-based biocompozite nanomaterials were synthesized using low-cost methods (water/oil/water double emulsion or solvent evaporation technique): PLGA-polyphenols (gallic acid, quercetol, chlorogenic acid), PLGA-bisphosphonates (alendronate, zolendronate), or PLGA-antibiotic. The morphological aspects were shown by SEM indicating a typical spherical morphology, with nanopores that improve the release of the encapsulated active principle. Particle size distribution was revealed by DLS, with the particle size in the range of [0-350] nm, this dimension being influenced by certain synthesis conditions (PLGA concentration, emulsification speed, etc.). Dynamic light scattering was also used to determine Zeta potential, as an important indicator of the aggregation of composite particles, obtaining values that indicate a stability of these materials. HPLC-MS or HPLC-DAD was used for determination of encapsulation efficiency or loading efficiency. Although the encapsulation capacity remains relatively low, up to 30%, these methods remain extremely used because they are inexpensive, have adjusting parameters and are non-toxic methods.

Biography

Dr. Ciocilteu Maria-Viorica, Postdoctoral researcher, Pharmacy Department, University of Medicine and Pharmacy in Craiova.

Andrei Bita
BioBoron Research Institute, Romania

Zn–B–PLGA nanocomposite material for biomedical applications: challenges and future perspectives

The aim of the study was to synthesize and characterize a new nanocomposite biomaterial with PLGA as a transporter of zinc–boron (Zn–B) complex for systemic administration. PLGA is an FDA-approved biodegradable polymer, with prolonged circulation time in the plasma, allowing distribution and accumulation in targeted tissues and offering protection of the encapsulated active principle against enzymatic and chemical degradation. The chosen synthesis method is simple, inexpensive, being able to optimize certain parameters to adjust the amount of Zn–B complex incorporated into the polymer sphere, as well as the material dimensions. Since Zn–B complex is soluble in water, the water/oil/water double emulsion was successfully used, evaporating by stirring the organic solvent (dichloromethane) that can become problematic due to its high toxicity. The synthesized material was characterized by SEM. The particle size distribution (determined by DLS) showed that most of the synthesized particles have sizes in the [190–291] nm range. The double emulsion method was a good option for the gradual release of Zn–B complex from the polymer matrix since the morphological analysis of the composite surface showed the formation of pores that facilitate this type of release. Zn–B–PLGA nanocomposite exhibits a negative zeta potential, indicating no aggregation of the biomaterial. All these characteristics influence the activity of cells by triggering some molecular events at the cell–biomaterial interface: cell migration, proliferation, and differentiation. The nanocomposite material has promising characteristics and can be further studied for future biomedical applications.

Biography

Andrei Biţă – Postdoctoral experienced researcher, aged 33, Pharmacist (2013), PhD in Pharmaceutical Sciences (2017), Lecturer of Pharmacognosy and Phytotherapy (2018) at the Faculty of Pharmacy, University of Medicine and Pharmacy of Craiova, Romania, with research interest on natural organic boron compounds. As a member of the research team (BioBoron Research Institute), he participated in four research grants and two PED Projects. Main scientific contributions: 24 ISI Web of Science papers (H-index 5), 12 abstracts in journals/proceedings of scientific meetings.

Navodit Kumar Singh
Indian Institute of Technology Delhi, India

Medical grade Biopolymer production, characterization, and synthesis of NDDS (Nanoparticle drug delivery system) from an application perspective

The inevitable increase in world population has resulted in an increase in human plastic usage, which has resulted in an increase in plastic pollution due to the nonbiodegradable properties of plastic, which has eteriorated our environment. It has had a catastrophic effect on marine life, human health, the environment, waste streams, and landfills. Plastic made from petroleum finally pushed researchers to develop an alternative source for polymer synthesis in order to minimise their reliance on fossil fuels. PHA, which possesses properties such as biocompatibility, biodegradability, thermoplasticity, and elastomeric nature, could be a viable alternative to polypropylene-derived polymers. Bacillus sp. has been investigated as a possible candidate for PHB production in both stirred tank reactors (STRs) and airlift reactors (ALRs), with the results indicating that increasing the volumetric mass transfer coefficient (KLa), gas holdup, and decreasing mixing time can improve yield and productivity. The current study sought to evaluate the utilisation of Bacillus sp. in the production of a medical-grade biopolymer (PHB). The first goal was to try to build a process for synthesizing PHB utilising a pneumatic bioreactor (Airlift Bioreactor) in different configurations, such as outer aeration mode, inner aeration mode, and bubble column mode. The effectiveness of these various arrangements was investigated to determine what might result in the highest PHB production. Moreover, stirred tank bioreactor (STR) experiments were conducted on PHB production using a cheap carbon substrate. That's because 40% of PHB's production costs come from the price of the carbon source material (Khosravi-Darani, Mokhtari, Amai, & Tanaka, 2013). Research was conducted using inexpensive carbon sources such crude glycerol, which is a renewable carbon source. Starting with media optimization in flasks, this research then moved on to optimising PHB production in the Batch mode, then to developing a mathematical model for the Batch process and the fed-batch process in MATLAB, and finally to scaling up PHB production from 3.5 litres to 15 litres in a bioreactor.

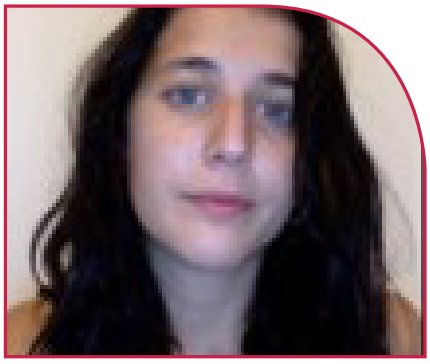
Nahla Ahmed Salem Elhesaisy
The British University in Egypt, Egypt

3D Nanofibers Scaffolds for Boosting the Repurposed Dermatological Effect of spironolactone

Spironolactone (SP) proved its oral efficacy in the treatment of many dermatological diseases orally but its use has been accompanied with severe systemic side effects like cramps, gynecomastia, hypotension, irregular menstruation, hyperkalemia, and reduced libido. These challenges for the repurposed use of SP can be overcome via its reformulation in suitable nano-drug delivery system which proved a crucial role in such drug repurposing related obstacles. One of the most promising drug delivery systems that can be tailored for a wide range of drug release patterns are nanofibers (NFs). NFs are solid fibers with a diameter size starting from a few nanometers to 1000 nm with multiple unique functionalities and characteristics. NFs can be used in multiple routes of administration but topical route was the route of choice in our study. Polyvinylpyrrolidone (PVP) and Polycaprolactone (PCL) polymers were used for the fabrication of SP-PCL NFs and SP-PVP NFs via electrospinning method. the scanning electron microscopy showed that SP-PVP NFs have smooth homogenous surface with diameter size about 426.6 nm while SP-PCL NFs showed beadles fibers with fiber diameter about 500 nm. The entrapment efficiency (EE%) for SP-PVP NFs is of 96.34%± 1.2 and its loading capacity (DL%) of 11.89% ± 0.15. Solid state, and mechanical properties of NFs scaffolds were evaluated. The obtained values showed the durability of the prepared scaffolds. The in-vitro release study showed that higher amount of SP was released from SP-PVP NFs within 24 hours. While SP-PCL NFs provided more controlled pattern till 168 hours. Higher percentage of SP was retained in skin from NFs compared to pure SP gel. The pharmacological effect of both scaffolds was evaluated in two different in-vivo models and a significant enhancement for SP dermatological effects was achieved. Electrospun polymeric nanofibers are safe promising carrier of SP.

Biography

Nahla A.Elhesaisy is a teaching assistant, Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, The British University in Egypt, Cairo, Egypt. She is also a M.Sc. student at Faculty of Pharmacy, Cairo university, Egypt. Nahla graduated from faculty of pharmacy, the British university in Egypt with cumulative degree: Excellent with high honours. She ranked 3rd among her class. She is an editorial board member for Open Journal of Pharmaceutical Science and Research. Also she is an editorial board member at MAT Journals “Trends in Pharmaceuticals and Nanotechnology”. She is a member of the Egyptian National Nanotechnology Network, ENNN. She participated with many posters and oral presentation in many prestigious conferences and awarded best poster award in more than one conference. She was a Co-PI an awarded Young Investigators Research Grant. The British University in Egypt and also was a member in another granted project. She worked also as supervisor for fifth year graduation project for pharmacy students. Presenting Author Details and Photo



Sara Aquilia
University of Florence, Italy

Development of Cross-linked Protein-based Materials from vegetable sources

Petrol-based polymers are widely used in the production of both common and high added value products, due to their exceptional properties, versatility, and low price. However, their uncontrolled disposal and extremely low degradability have resulted in one of the most serious environmental problems of the last two centuries. Therefore, in recent years there has been a rising interest in the development of polymeric materials based on natural biopolymers as a renewable alternative to petrol-based plastics1. The availability of proteins from agricultural by-products and their favorable properties fostered a renewed interest in protein-based materials, ueling research in innovative technologies for the preparation of bioplastics2. The presented study is the first step toward the development of a protein-based material for multiple applications. Proteins from rapeseed meal have been chosen as first candidates for our bioplastic's main ingredient. Rapeseed meal samples were collected as a by-product from the crude oil production after the oil pressing and hexane extraction process3. The proposed protein extraction process is ecofriendly, easy to scale up, and lead to the production of two protein isolates with good protein recovery yield. Further, the rapeseed meal was processed by pression molding and chemical reactions have been performed to form cross-links between protein chains in order to modulate the material thermo-mechanical properties. In addition, the enzymatic hydrolysis of rapeseed protein isolates and rapeseed meal lead to hydrolysates that will be employed as additives in protein-rich materials with the goal to obtain a fully sustainable material. The achieved results will contribute to the green transition achieving the goals of the European Green Deal.

Biography

Sara Aquilia received her bachelor's degree in chemistry and Material Chemistry with final grade of 105/110 in 2018 at University of Bologna, Italy. She then received her master's degree in chemistry with honors in 2021 at the University of Bologna, Italy. She carried out the curricular internship at the Institut Européen de Chimie et Biologie of Bordeaux, France. Afterwards, she moved to Padua to join the group of Prof. Formaggio at University of Padua, where she worked as research fellow from June 2021 to December 2021. She is now a PhD student in Chemical Science at University of Florence, Italy, working in collaboration with the company SpinPet on the development of macromolecular and cross-linked materials based on proteins/peptides from vegetable or animal source.

UPCOMING CONFERENCES

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October 25-26, 2023 | Tokyo, Japan

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https://scholarsconferences.com/nursing-healthcare/

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October 25-26, 2023 | Tokyo, Japan

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nanotek@scmeet.org

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6th Edition World Congress on Advanced Chemistry

March 25-26, 2024 | Barcelona, Spain

dileep@scholarsconferences.com

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March 25-26, 2024 | Barcelona, Spain

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