Programme & Abstracts

James Parsons Lower Lecture Theatre

28 May 2026

LIVERPOOL JOHN MOORES UNIVERSITY

School of Pharmacy and Biomolecular Sciences

WORD FROM THE DIRECTOR

Welcome Message from the Director of the School of Pharmacy and Biomolecular Sciences

It is a pleasure to welcome everyone to the Postgraduate Research Express Conference of the School of Pharmacy and Biomolecular Sciences. This event reflects the strength, ambition, and collaborative spirit of our research community. It brings together postgraduate researchers, supervisors, academic colleagues, technical specialists, and professional services teams who collectively shape the scientific identity of our School.

Research excellence depends on curiosity, discipline, and the willingness to explore questions that matter. Our postgraduate researchers demonstrate these qualities every day. Their work spans molecular mechanisms, therapeutic innovation, environmental resilience, analytical science, and the many other interdisciplinary areas that define modern biosciences. Their resilience, creativity, and determination are central to the progress of our School. Their achievements strengthen our research culture and contribute to the wider scientific community. The diversity of research represented in this conference illustrates the depth and breadth of PBS scholarship.

This event also highlights the essential role of our supervisors and research teams. Their guidance, expertise, and commitment ensure that our researchers are supported to grow with confidence and to develop the skills required for successful scientific careers. I am grateful for the dedication they bring to mentoring the next generation of scientists.

WORD FROM THE DIRECTOR

Our technical and professional services colleagues contribute in equally important ways. Their work underpins the smooth running of laboratories, facilities, and research processes, enabling high-quality research to take place every day. Their contribution is deeply valued.

I hope this conference provides with enjoyable opportunities to share research work, exchange ideas, and build new collaborations. Finally, I would like to thank the organizers (PGR students and School PGR Lead, Dr Mosharraf Sarker) for making this event happen.

Professor Satya Sarker
Director of School of Pharmacy and Biomolecular Sciences

PBS PGR RESEARCH EXPRESS PLANNING COMMITTEE

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School of Pharmacy and Biomolecular Sciences

28 May 2026
James Parsons Lower Lecture Theatre

09:30-10:00	Registration
10:00-10:20	Opening Address
10:20-10:30	Researcher Development Framework 2025
10:30-11:05	Full Steam Ahead Session 1
11:05-11:15	*Tea Break*
11:15-12:00	Full Steam Ahead Session 2
12:00-12:30	Endnote Workshop Session
12:30-13:30	*Lunch & Networking/Idea Interchange Poster Session*
13:30-14:15	Opportunities and Enterprising in Bioscience panel
14:15-14:30	Train of Thought Talk
14:30-14:40	Doctoral Academy
14:40-15:00	*Tea Break and Idea Interchange Poster Session*
15:00-15:20	PGR Experience Interactive Session
15:20-15:30	Thank you's
15:30-15:40	Concluding remarks & Prize giving

LIVERPOOL JOHN MOORES UNIVERSITY

SPEAKER SCHEDULE

09:30-10:00	Registration
10:00-10:20	Opening Address - Prof S. Sarker
10:20-10:30	Researcher Development Framework 2025 – Dr. M. Sarker
10:30-11:05	Full Steam Ahead Session 1 - Facilitated by Paul Riley • Lesley Sloan • Chika Eze • Kyle Tyler
11:05-11:15	Tea Break
11:15-12:00	Full Steam Ahead Session 2 - Facilitated by Dr Anish Gomatam • Callum Shepherd • Paul Riley • Alice Stevenson • Cherene de Bruyn
12:00-12:30	EndNote for Real Life Research: What I Wish I Knew Earlier – Dr. E. Habibi
12:30-13:30	*Lunch & Networking/Idea Interchange Poster Session*

SPEAKER SCHEDULE

13:30-14:15 Opportunities and Enterprising in Bioscience Panel – Dr. G. McStay

14:15-14:30 Train of Thought Talk - Facilitated by Ahmud Mubarak)

- Davood Fattahi
- Dr. Kavita Raikuvar
- Dr. Mosharraf Sarker

14:30-14:40 Doctoral Academy – Jo McKoen

14:40-15:00 *Tea Break and Idea Interchange Poster Session*

15:00-15:20 The Skin You're In – A Postgraduate Journey - Dr. K. Ralebitso-Senior

15:20-15:30 Thank you's – Evieva Ogbara and Cherene de Bruyn

15:30-15:45 Concluding remarks & Prize giving – Prof. L. Seton

School of Pharmacy and Biomolecular Sciences

09:30 - 10:00

Registration

10:00 - 10:20

Welcome and Opening Address – Prof. S. Sarker

10:20 - 10:30

Researcher Development Framework 2025 – Dr. M. Sarker

10:30 - 11:05

Full Steam Ahead

Lesley Sloan

ExoChase Study; Extracellular Vesicles as a tool for diagnostics

Chika Eze

Leveraging Artificial Intelligence and Infrared Spectroscopy for Precision Oncology in Breast Cancer

Kyle Tyler

Investigating the role of protein S-acyltransferase 14 in plant development and maturation

11:05 – 11:15

Tea Break

School of Pharmacy and Biomolecular Sciences

11:15 – 12:00

Full Steam Ahead

Callum Shepherd

Engineering regulatory modules for conditional expression of large serine integrases

Paul Riley

Livestock worrying: A condensed update on research conducted

Alice Stevenson

Off the Beaten Track: Insights into Rural Crime and Illegal Off-Roading

Cherene de Bruyn

Computer vision for locating clandestine burial sites using UAV-image data

12:00 – 12:30

EndNote for Real Life Research: What I Wish I Knew Earlier – Dr. E. Habibi

12:30 – 13:30

Lunch

Idea Interchange Posters

13:30 – 14:20

Opportunities and Enterprising in Bioscience panel – Dr. G. McStay

School of Pharmacy and Biomolecular Sciences

14:20 – 14:30

Train of Though

Davood Fattahi

Using microRNA Nanomedicine Against Brain Cancer

Dr. Kevita Raikuvar

Screening natural products for managing overactive bladder in female rat model

Dr. Mosharraf Sarker

The role of bilirubin in the modulation of the bradykinin permeability response in rat cremaster microcirculation (Justin Gufan)

14:30 – 14:40

Doctoral Academy – Jo McKoen

14:40 – 15:00

Tea Break

15:00 – 15:20

The Skin You're In – A Postgraduate Journey – Dr. K. Ralebitso-Senior

15:20 – 15:35

Thank you's Evieva Ogbara and Cherene de Bruyn

Concluding remarks & Prize giving – Prof. L. Seton

School of Pharmacy and Biomolecular Sciences

RESEARCH EXPRESS WORKSHOPS

EndNote for Real Life Research: What I Wish I Knew Earlier

Dr. Emran Habibi

Lecturer in Cosmetic Science

In this 30-minute informal session, I'll share my personal experience using EndNote throughout my PhD journey. We'll talk about practical ways to organize papers, manage references efficiently, save time while writing, and avoid common mistakes. The session is aimed at helping PhD students use EndNote in a smarter and less stressful way during research and academic writing.

Dr. Emran Habibi holds both a Pharm.D. and a Ph.D. in Pharmaceutical Sciences. He has more than ten years of academic and research experience in the field. His work focuses on natural products chemistry, formulation and cosmetic sciences, phytochemical analysis, and biological assays. He has made significant contributions to the discovery and development of bioactive compounds from medicinal plants and fungi, as well as to botanical and cosmeceutical formulation. His technical expertise includes advanced extraction and isolation techniques, chromatographic methods (HPLC, TLC, and GC), and structural elucidation using spectroscopic tools such as NMR, MS, UV, and IR. Dr. Habibi has published more than 70 scientific articles, which have received over 1,500 citations, giving him an h-index of 21 and reflecting the international impact of his research. His research is primarily focused on drug discovery, particularly in the areas of cancer and immunomodulation. He employs molecular docking, in vitro, and in vivo approaches to investigate the therapeutic potential of natural products, as well as the application of botanical formulations in skin disorders. Dr. Habibi is currently a Lecturer at Liverpool John Moores University and is committed to contributing to research-informed teaching and pharmaceutical innovation.

School of Pharmacy and Biomolecular Sciences

RESEARCH EXPRESS WORKSHOPS

The Skin You're In – A Postgraduate Journey

Dr T. Komang Ralebitso-Senior BA [Pre-Medical] BSc(Hons) PhD FHEA

Reader in Microbial Ecology

This session will reflect on the opportunities, privileges, and challenges of pursuing a PhD and beyond. The audience will be invited to contribute with their perspectives as international and home PGRs.

Dr. Ralebitso-Senior is a Reader in Microbial Ecology whose interdisciplinary research has produced over 100 scholarly outputs. Her work uses advanced molecular techniques to investigate microbial communities in environments affected by pollution, waste, biochar, and decomposition, contributing to global sustainability goals. Alongside her scientific achievements, Komang holds significant leadership roles in climate action, editorial boards, and research networks, and has supervised multiple postgraduate students who have gone on to successful careers. She also leads in Equity, Diversity and Inclusion (EDI), having driven institutional initiatives, international collaborations, and strategic transformation in higher education.

School of Pharmacy and Biomolecular Sciences

Opportunities and Enterprising in Bioscience panel

Facilitator

Dr. Gavin McStay

Senior Lecturer and Associate Dean for Global Engagement for the HITS Faculty

Dr Gavin McStay is a Senior Lecturer in Biotechnology at Liverpool John Moores University with over 25 years of experience researching mitochondria and cell death across leading institutions in both the UK and the United States. His training incorporated placements in pharmaceutical and biotechnology companies. His current research focuses on mitochondrial biogenesis in disease contexts. Beyond the laboratory, Dr McStay is committed to building scientific communities and broadening access to research — he directs Biomed News, a free platform for biomedical literature discovery used by hundreds of researchers weekly and is actively involved in public engagement and science outreach by organising and participating in a wide variety of events.

School of Pharmacy and Biomolecular Sciences

Opportunities and Enterprising in Bioscience panel

Panel Members

Dr. Anish Gomatam

Post-Doctoral Research Assistant, PBS

Dr. Anish Gomatam is a cheminformatician and computational chemist specializing in the development of computational tools relevant to prediction of pharmacological and toxicological properties of chemicals. He holds a Ph.D. in Pharmaceutical Chemistry from the University of Mumbai and has held research positions at the National Institute of Pharmaceutical Education and Research, and Central Drug Research Institute in India. He is currently a Postdoctoral Researcher within the Cheminformatics Group at LJMU, where he is developing in silico tools toward implementation of New Approach Methodologies (NAMs) to support Next Generation Risk Assessment (NGRA) as part of the EU-funded RISK-HUNT3R project.

His research interests include computer aided drug design, ADME/Tox modelling, and the development of quantitative structure-activity and property relationships and structural alerts to support animal-free risk assessment.

School of Pharmacy and Biomolecular Sciences

Opportunities and Enterprising in Bioscience panel

Panel Member

Dr. James Firman

Post-Doctoral Research Assistant, PBS

Since 2017, I have worked as a postdoctoral researcher within the LJMU Chemoinformatics Group, under the leadership of Professor Mark Cronin. Broadly, the focus of this field lies within the construction of quantitative and qualitative models, allowing for the properties of untested chemicals to be estimated by reference solely to their molecular structure. We turn this approach towards the prediction of toxicological characteristics – an area within which data gaps are often extensive and experimental protocols costly and time-consuming,

Having acquired an MChem in organic chemistry and pharmacology from the University of Liverpool, I went on to complete a PhD within the MRC Centre for Drug Safety Science (Liverpool) and MRC Toxicology Unit (Leicester). A further period within the wet laboratory preceded a switch to my present role within computational research.

School of Pharmacy and Biomolecular Sciences

Opportunities and Enterprising in Bioscience panel

Panel Member

Kiran Riasat

Regional Account manager for Nogovene Europe

Kiran is a Regional Account manager for Nogovene Europe, where she works closely with researchers and industry partners to support advanced genomics and sequencing projects. Their interests focus on next-generation sequencing applications, including genomics, transcriptomics, and metagenomics, with particular emphasis on helping researchers translate complex biological questions into effective sequencing strategies. She is passionate about enabling scientific discovery through high-quality data generation, collaborative problem solving, and making sequencing technologies more accessible to the research community.

School of Pharmacy and Biomolecular Sciences

Opportunities and Enterprising in Bioscience panel

Panel Member

Liz Gillies

Molecular Development Manager, Mast Group Ltd

Liz is the Molecular Development Manager for Mast Group Ltd. She has worked for Mast Group Ltd for over 15 years.

Research Development Framework 2025

Dr. Mosharraf Sarker

Senior Lecturer in Bioscience & PBS PGR Progression Tutor

Closing and Prize Giving

Professor Linda Seton

Associate Dean, Research and Knowledge Exchange for the HITS Faculty / Professor in Chemistry Education and Crystallisation

Off the beaten track: Insights into rural crime and illegal off-roading

Alice Stevenson

Sites of Special Scientific Interest (SSSIs) are protected areas in the UK, designated under the Wildlife & Countryside Act (1981). Despite their legal protection, these sites often suffer environmental damage from off-roading and other criminal activities. Addressing and preventing illegal off-roading has been identified as an urgent regional issue requiring targeted interventions including forensic support.

Soil analysis has significant forensic potential for investigating incidences of illegal off-roading. The diverse chemical, biological, and physical properties of soils can offer powerful circumstantial evidence, enabling provenance estimations and reconstructions of criminal activities via sample comparisons and exclusions. However, the application of soil analysis to rural crime investigations, particularly to incidences of SSSI damage, has not previously been considered within the research or UK casework. Therefore, this project aims to develop sampling recommendations and inform evidence collection and analysis protocols for illegal off-roading vehicles through empirical testing in forensically relevant environments.

Results from a recent survey will be presented. The purpose of this survey was to understand the scope, challenges, and opportunities to address rural crime and illegal off-roading offences across the UK and Ireland. Participants including active and retired police, landowners, land managers, academics, and government and non-government agencies working in/around rural and protected landscapes were recruited to understand their background, knowledge and experience of rural crimes and illegal off-roading in SSSIs.

Engineering regulatory modules for conditional expression of large serine integrases

Callum Shephard

Rationale: Large Serine Recombinases (LSRs) are site-specific DNA recombinases that catalyse unidirectional DNA recombination at two short, highly specific attachment sites. These properties make LSRs valuable tools for genome editing and synthetic biology. Our work focuses on developing systems that enable temporal control of LSR activity through tethered regulatory modules responsive to user-defined external stimuli.

Methods: In one approach, we aim to develop light-controlled conditional split inteins to reconstitute a split LSR protein into a catalytically active enzyme. Building on this, we divided TG1 integrase into two fragments, fused each to Gp41-1 intein modules, and expressed them under pBAD and pTET promoters in E. coli.

Results: We first demonstrated that a mutant TG1 integrase, containing the sequence expected after intein-mediated splicing with split Gp41-1, retains activity comparable to the wild-type protein. Successful trans-splicing of the TG1 fragments by Gp41-1 restored attP × attB recombination in a reporter system, highlighting the potential of this strategy as a component of genetic AND logic gates.

Conclusions: The combination of Gp41-1 split intein and split TG1 integrase is orthogonal to existing technologies in both intein and integrase systems, enabling integration with other systems for more sophisticated synthetic biology applications. Furthermore, this work lays the foundation for conditional integrase systems by attaching a regulatory module to Gp41-1. The dual-induction assay we developed also provides a versatile system for advanced LSR research, allowing distinct induction of individual components within a single system.

Computer vision for locating clandestine burial sites using UAV-image data

Cherene de Bruyn, Dr. Komang Ralebitso-Senior, Dr. Kirstie Scott, Dr. Heather Panter and Dr. Frederic Bezombes

The search for missing victims, particularly those associated with suspected violent and traumatic deaths, is often prolonged due to limited case information, unreliable witness statements, and the passage of time. These challenges make it difficult for investigators to identify potential burial locations and solve forensic cases. Unmanned Aerial Vehicles (UAVs) provide a high-resolution, bird's-eye perspective of landscapes and can help police rapidly narrow down large search areas. Recent advances in Artificial Intelligence and Deep Learning now enable automated location, detection, and identification of objects within image datasets.

This study aims to develop and evaluate a computer vision model for identifying grave-like anomalies, such as soil disturbance, thermal signatures, and changes in vegetation in UAV-derived imagery.

A UAV survey was conducted using two DJI Mavic 3 platforms: the Mavic 3T Thermal and the Mavic 3 Multispectral. Flights were performed at 70 m altitude to acquire thermal, multispectral, RGB imagery, and video footage. The burial ground provided controlled but realistic conditions, as the deceased are interred in an environmentally friendly manner without plastic or embalming, which emulates clandestine burials. Image datasets were pre-processed and annotated to train a preliminary computer vision model. Feature maps were generated using multiple approaches, including edge detection, colour and spectral-difference mapping, thermal anomaly extraction, and shape-based feature analysis.

This work provides a preliminary study for integrating UAV imaging with computer vision to support police searches for missing persons. By rapidly narrowing search areas and more reliably identifying potential clandestine graves, this approach has the potential to reduce search times and improve resource allocation. This can enhance the recovery of missing victims in complex forensic investigations and provide justice and closure to families.

Social leveraging artificial intelligence and infrared spectroscopy for precision oncology in breast cancer

Chika Eze

Breast cancer remains a major global health burden, and improved tools are needed to refine risk stratification, predict treatment response, and support timely clinical decisions. Current pathology and molecular assays provide valuable information, but they can be costly, time-consuming, and limited in their ability to capture the biochemical complexity of tumour tissue. This PhD project investigates whether Fourier transform infrared (FTIR) spectroscopy, combined with artificial intelligence and metric-based machine learning, can provide rapid, label-free biomarkers for breast cancer prognostication.

The central hypothesis is that infrared spectral signatures from formalin-fixed paraffin-embedded breast tissue contain discriminating information linked to three clinically important endpoints: ductal carcinoma in situ (DCIS) progression, response to neoadjuvant therapy (NAT), and HER2 status. To test this, archival tissue samples are sectioned sequentially for haematoxylin and eosin annotation and FTIR imaging on CaF substrates. Matched regions of interest are then analysed using a patented machine-learning workflow to identify spectral biomarkers, which are further refined through pre-processing, feature selection, and neural-network optimisation. Preliminary findings are encouraging. In an initial DCIS feasibility study, the approach identified a small set of discriminating infrared biomarkers that separated progressing from non-progressing cases with promising sensitivity and specificity. In a pilot NAT cohort, the method achieved approximately 82.6% sensitivity, 81.2% specificity, 81.9% accuracy, and an AUC of 0.9 for distinguishing incomplete from complete pathological response. Early analyses also support the potential of FTIR-based classification for HER2-associated tissue differences. Together, these results suggest that infrared spectral patterns capture clinically relevant biochemical variation informing the development of a breast-specific variant of the Liverpool Diagnostic Infrared Wand for potential integration into histopathology workflows. If validated in larger cohorts, this technology could complement existing diagnostic methods by enabling faster, more cost-effective, and more explainable breast cancer assessment.

Investigating the role of protein S-acyltransferase 14 in plant development and maturation

Kyle Tyler

Protein S-acylation, catalysed by a family of Protein S-acyltransferases (PATs), is a reversible post-translational lipid modification that regulates protein localisation, stability, and signalling, with important roles in plant growth, development, and stress responses. Despite increasing understanding in model species such as Arabidopsis thaliana, S-acylation remains unexplored in cassava (Manihot esculenta), a globally important staple crop feeding 800 million people worldwide. One of the main issues in cassava production is its year-long growth cycle, limiting its availability and yield. Therefore, understanding molecular mechanisms controlling developmental timing may provide new opportunities for engineering earlier-maturing cassava varieties.

Previous research in the model plant Arabidopsis by our group discovered that Protein S-acyltransferase 14 (AtPAT14) is a key regulator of senescence and maturation, where loss-of-function mutants display early senescence and maturity with reduced plant size. To see if the homologous PAT14 in cassava has similar function in order to create early maturity cassava varieties we first carried out comparative genomic analysis and found 33 PAT family members in cassava, including four putative MePAT14 homologues. Functional complementation studies in yeast and Arabidopsis verified that all four MePAT14s have PAT activity. To assess MePAT14 function in cassava, CRISPR/Cas9-mediated knockout mutants were generated, with several edited lines displaying dwarf phenotypes and early senescence suggestive of altered developmental regulation. Next, we wanted to understand the molecular mechanism how PAT14 function in plant by identifying its substrate proteins in Arabidopsis. For this, a renovated TurboID biotin ligase mediated proximity-dependent biotinylation coupled with mass spectrometry strategy was employed, identifying 182 high confident PAT14-interacting proteins and potential substrates. Several promising substrate candidates have been further verified for their biological roles in senescence.

Together, these findings provide the first insight into S-acylation networks in both cassava and Arabidopsis and support a conserved role for PAT14 in regulating plant growth and maturation. This work establishes a foundation for understanding lipid-mediated developmental regulation in plants and highlights PAT14 as a promising target for engineering improved cassava varieties with accelerated maturation and enhanced agricultural productivity.

ExoChase Study; Extracellular Vesicles as a tool for diagnostics

Lesley Sloan

Introduction: Congenital heart disease (CHD) is the most common birth defect and affects almost 1% of pregnancies. Prenatal diagnosis improves outcomes yet almost 50% of cases remain undiagnosed until birth. Extracellular Vesicles (EVs) have been identified as a novel communication system between the foetal and maternal circulation and the presence of foetal EVs in maternal blood has been well documented. Circulating EVs offer a promising source of non-invasive biomarkers for improving congenital disease diagnostics, but robust assays for their detection are lacking. We are developing methods to isolate EVs from blood and to identify CHD diagnostic biomarkers in the EV cargo (miRNA) and on the surface (glycans).

Methods & Results: We collected blood samples from women carrying CHD pregnancies at Liverpool Women's Hospital, along with healthy pregnant and non-pregnant controls. We isolated EVs from plasma using size exclusion chromatography. miRNA was prepared from EVs and profiled using Nanostring nCounter. To profile surface biomarkers we used two methods: flow cytometry and plate reader based arrays. Glycans were detected using carbohydrate binding proteins. Preliminary results suggest we can identify specific biomarkers in the CHD condition.

Conclusion: Our work suggests that EVs could be useful non-invasive prenatal diagnostic biomarkers for congenital disease.

Livestock worrying: A condensed update on research conducted.

Paul Riley

This condensed overview addresses what livestock worrying is and who is affected by this crime and the existing legal framework in place. All research conducted across the last four years and the benefits this research offers to forensic practitioners investigating livestock worrying cases will be covered. The areas of DNA quantification, inhibition, mixture analysis and recovery methods, key findings from each piece of research and how each area can be improved through alternative methodology based on these key findings will be presented in appropriate detail. Finally, further work that could be conducted or areas for future investigation will be highlighted to address where the research is progressing moving forward.

Using microRNA Nanomedicine Against Brain Cancer

Davood Fattahi

Glioblastoma is one of the most aggressive forms of brain cancer and remains very difficult to treat. One major challenge is delivering therapies into the brain effectively. My research explores the use of tiny delivery systems called nanoparticles to carry microRNA, a small molecule that can help control cancer-related genes, into tumour cells. The nanoparticles protect the microRNA and help it enter the cells more efficiently. In this project, I investigate how these systems affect glioblastoma cells and whether they can promote cancer cell death. This work combines nanotechnology and molecular biology to explore new possibilities for future brain cancer treatments.

Screening natural products for managing overactive bladder in female rat model

Dr Kavita Raikuvar and Dr *Yousif A. Shamsaldeen*

Introduction: Overactive bladder (OAB), also referred to as a hyperactive bladder, is a condition in which the bladder muscles contract involuntarily, leading to a sudden and difficult-to-control urge to urinate. Although anticholinergic drugs such as oxybutynin are commonly prescribed for OAB, recent studies have linked their long-term use to an increased risk of cognitive impairment and dementia, particularly in elderly patients. Therefore, alternative therapies are being explored, and this study aims to identify potential natural alternative treatments for OAB.

Methods: Wistar Han female rats (150-250g) were euthanised and dissected using schedule-1 procedures involving CO_2 exposure followed by spinal dislocation (Ethics approval: LS0270226.01). The urinary bladder was dissected and divided into four longitudinal strips, with each strip tested separately in an organ bath system. Tissues were bubbled with oxygen maintained in oxygenated Krebs solution throughout the experiments. Bladder contractions were induced using 100 µM acetylcholine and subsequently challenged with varying concentrations of natural extracts supplied by JUDE Company. Contractile responses were recorded and analysed using LabChart (V8.1.16).

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Results: Some natural products demonstrated significant relaxation of acetylcholine-induced bladder contractions, with enhanced (synergistic) effects observed when combined.

Discussion and Conclusion: Natural products may offer promising therapeutic potential for the management of overactive bladder in females. These findings suggest their possible use as adjuncts to enhance current pharmacological and non-pharmacological treatment approaches.

GRAVES: A framework to guide research in victim identification and location

Cherene de Bruyn, Dr. Kirstie Scott, Dr. Heather Panter, Dr. Frederic Bezombes, Dr. Komang Ralebitso-Senior

Identifying and locating missing victims requires scalable, operationally relevant methods. This research presents GRAVES, a structured framework, developed during a doctoral project at LJMU, designed to guide the development of scalable, operationally relevant methods for locating and identifying victims of crimes, mass conflicts, disasters, and migrant fatalities. The framework integrates relevance, feasibility, sustainability, and early translational planning to ensure that research aligns with real investigative needs.

The doctoral project uses a complementary methodological approach combining UAV based remote sensing with forensic ecology approaches to narrow search areas, enhance location of clandestine graves, and estimate the post-burial and post-translocation intervals. Data were collected across South Africa, Australia, and England using forensically inspired graves, with UAV imagery analysed for surface anomalies and soil samples sequenced (16S rRNA V3/V4) to characterise microbial community change over time.

The GRAVES framework provides a transferable research pathway that embeds multidisciplinary input and supports phased validation, enabling more efficient, targeted, and ethically grounded investigations. This poster demonstrates how the GRAVES framework can accelerate translation of scientific advances into real-world forensic and humanitarian practice.

Evaluation of Egyptian Figs for Cancer Chemopreventive Potential

Gamal Abdelfattah[1,2], Kenneth J. Ritchie[2] and Lutfun Nahar[1,2]

[1]Laboratory of Growth Regulators, Palacký University and Institute of Experimental Botany, The Czech Academy of Sciences, Šlechtitelů 27, Olomouc, Czech Republic
[2]Centre for Natural Products Discovery, School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Byrom Street, Liverpool L3 3AF, UK

Egypt has a rich flora of medicinal plants. Some of these plants offer both medicinal and nutritional benefits. Among them are various types of figs, such as Ficus carica (common fig), Opuntia ficus indica L. (Barbary fig), and Ficus sycomorus (sycamore fig), all belonging to the family Moraceae. These figs are known to be rich in bioactive natural products, including antioxidant compounds. Based on their traditional uses and phytochemical diversity, as reported in the literature, it was hypothesised that these figs may support cancer chemoprevention. This approach is considered one of the most promising strategies in the fight against cancer. The selected figs were collected in Egypt, shed-dried, ground, and extracted using Soxhlet extraction. The process involved sequential use of n-hexane, dichloromethane (DCM), and methanol (MeOH). The resulting extracts are being tested for their ability to activate Nrf2, a key regulator of cellular defense, using MTT and luciferase assays. These tests aim to evaluate their potential in cancer chemoprevention. Currently, reversed-phase high-performance liquid chromatography (HPLC) is being used to chemically profile the extracts. This will be followed by preparative HPLC to isolate active compounds. Their structures will then be elucidated using one-dimensional (1D) and two-dimensional (2D) nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry (MS).

DNA origami and their application in biosensors

Iqra Salim

Biosensors have evolved significantly since their invention in the mid-twentieth century. From a simple electrochemical device to the now inclusion of AI, these sophisticated tools are capable of label-free, real-time multiplex detection. To make these sensing systems even more powerful, the incorporation of DNA origami has allowed this technology to become extremely precise, recognisable, and programmable to a range of molecules. This poster systematically summarises the incorporation of DNA origami with biosensors such as fluorescence, surface-enhanced Raman spectroscopy (SERS), surface plasmon resonance (SPR), and electrochemical sensors as well as approaches that are used to design DNA origami nanostructures. These tools allow a range of targets to be detected, ranging from small molecules to larger biological species. Collectively, these studies demonstrate that DNA origami-based biosensors provide high sensitivity, precise spatial control, and rapid, modular detection capabilities. Furthermore, their versatility enables applications across a diverse range of sectors. However, key challenges including limited reproducibility, structural instability, photobleaching, and non-specific binding, continue to hinder their widespread adoption. This presentation proposes future directions aimed at overcoming key limitations, including enhancing biocompatibility and structural stability, to support the development of more advanced and clinical point-of-care applicable biosensors.

The role of bilirubin in the modulation of the bradykinin permeability response in rat cremaster microcirculation

Justin Gufan

Introduction and aim: The antioxidant and anti-inflammatory properties of bilirubin are directly linked to its chemical structure. Bradykinin increases vascular permeability during inflammation. The bilirubin and bradykinin interaction involves bilirubin modulating intracellular mechanisms that are activated by bradykinin. The aim is to determine whether bilirubin modulates bradykinin-induced microvascular permeability in the rat cremaster muscle.

Methodology: Rat cremaster muscle was isolated and perfused using St. Thomas' cardioplegic and Krebs solution. Intravital microscopy visualised post-capillary venules using Evans blue albumin and Rhodamine dye. Drugs (100 µM) were topically applied, images were captured using ImageHopper 2014 and heat maps. Statistical significance assessed using t-tests ($p<0.05$).

Results: Bradykinin (100µM) significantly increased vascular permeability in Krebs-treated cremaster muscle. Pre-treatment with bilirubin (100µM for 10 minutes) reduced bradykinin-induced permeability, although this was judged as not statistically significant. Permeability heat maps confirmed vascular leakage along the microvessel and the reduced leakage with pre-treated bilirubin. In acute application experiments, acute bilirubin exposure initially decreased permeability, but subsequent bradykinin application significantly increased vascular permeability. This was confirmed by a t-test.

Conclusion: Bilirubin may exert chronic protective effects rather than acute anti-inflammatory effects. Future studies should use physiological concentrations and larger sample sizes.

Insights into Biochar-Based Remediation: Disentangling Matrix Chemistry and Bioavailability Controls on Naphthalene Attenuation in Soil Systems

Evieva F. Ogbara, Jason R. Kirby, Alistair Fielding, and Komang Ralebitso-Senior

Biochar is widely proposed as an amendment for contaminated soils because of its capacity to retain hydrophobic organic pollutants. However, reduced extractable contaminant concentrations may reflect sorption, altered release or reduced bioavailability rather than contaminant degradation. This study investigated how biochar altered the chemical interpretation of naphthalene attenuation in soil microcosms. Naphthalene behaviour was examined over 120 days in replicated 7 g destructive microcosms comparing soil + naphthalene with soil + biochar + naphthalene. Chemical interpretation focused on the refined 80 mg kg^{-1} spiking protocol, equivalent to 0.56 mg naphthalene per microcosm. Environmental monitoring measured pH, temperature and relative humidity. FTIR spectral overlays assessed matrix-level chemical change, while GC–MS assessed the recoverable naphthalene fraction at T0 and T120.

The contaminated treatments began at the same pH of 8.1, but later diverged: biochar-amended soil reached pH 9.7 at T90 and 9.1 at T120, compared with pH 8.2 in unamended contaminated soil at both timepoints. Temperature and relative-humidity profiles remained broadly comparable between treatments. FTIR spectra showed incubation-associated changes in both matrices. Matched refined-protocol GC–MS comparisons showed decreased recoverable naphthalene in soil-only microcosms, while biochar-amended soil displayed a contrasting temporal recovery pattern. Under comparable monitored incubation conditions, biochar generated a distinct later-stage chemical environment and altered naphthalene recoverability. The integrated chemical evidence supports interpretation through matrix retention and altered bioavailability rather than a simple removal or degradation claim, providing a defensible framework for evaluating biochar-based remediation of contaminated soils.

Investigating regulation of cytokines by sulfated carbohydrates in the context of epithelial biology

Leonie Saffy

Cytokines are often in the news regarding infections, chronic diseases or immunotherapies. They are important proteins, which mediate communication between cells helping immune defence against harmful microbes and repair of damage to the body from injury or infection. Their flipside is they can help cause chronic diseases (inflammation or even cancers) if dysfunctional, so we need to deeply understand their behaviour.

Cytokines act by docking onto cell surface receptors. These surfaces also display numerous carbohydrates, which regulate cytokine actions. We aim to decipher rules governing this regulation, focussing on a particular family of carbohydrates, alongside a small group of specific cytokines and their behaviour in the upper layer of the skin.

The skin is our largest organ and a critical barrier to external threats, such as microbes. Its upper layer, the epidermis, is continuously renewed when undamaged and repaired if damaged, and is the first line of immune system defence to infection when damage occurs. Cytokines are key in fighting skin infections like those from ‘superbug’ bacteria, which cause skin conditions, such as superficial impetigo prevalent in infants from disadvantaged backgrounds and poorer countries. However, if dysfunctional, cytokines associate with skin diseases such as psoriasis and eczema, or skin cancers.

Our carbohydrate family includes heparins used as blood thinners in surgery and hospitals and hyaluronic acids in skin cosmetics. By investigating the regulation of chosen cytokines by such carbohydrates in our epidermis context, we hope to help develop sophisticated carbohydrate immunotherapeutics to counter skin infections or diseases.

Investigating the Immunoregulatory Functions of Lactobacillus rhamnosus GG-Derived Proteins p40 and p75 in Macrophage-Driven Vascular Inflammation

Tazmin Nahar

Macrophages are central orchestrators of innate immune responses and regulate inflammation, endothelial dysfunction and leukocyte recruitment through the release of cytokines, chemo-kines, reactive oxygen species, nitric oxide and vascular mediators. Although probiotic-derived postbiotics are emerging as promising immunomodulatory agents, the mechanistic roles of Lactobacillus rhamnosus GG-secreted proteins p40 and p75 in macrophage-mediated vascular inflammation remain largely undefined. This study aims to characterise the immunoregulatory and vasculoprotective effects of recom-binant p40 and p75 in activated macrophages and downstream endothelial responses. Recom-binant proteins will be produced using a heterologous bacterial expression platform, purified by affinity chromatography, and validated by SDS-PAGE, immunoblotting, endotoxin analy-sis and stability profiling. THP-1-derived macrophages will be stimulated with LPS in the presence or absence of p40 and p75. Cytokines, chemokines, ROS, nitric oxide and specialised pro-resolving mediators will be quantified using ELISA, multiplex assays, fluorescence-based methods and LC-MS/MS. Macrophage polarization and signalling will be assessed through qPCR, immunoblot-ting, flow cytometry and analysis of NF-κB, MAPK, Akt and TLR pathways.

For the examination of Vascular inflammatory crosstalk macrophage-conditioned media will be applied to endothelial cells to assess ICAM-1, VCAM-1, E-selectin, barrier integrity and leukocyte migration. We hypothesise that p40 and p75 reprogram macrophage responses to-wards a pro-resolving phenotype, attenuating endothelial activation, vascular leakage and leu-kocyte trafficking. The findings may provide translational insight into next-generation postbi-otic therapeutics for chronic inflammatory disorders characterised by macrophage dysfunc-tion, endothelial injury and excessive leukocyte infiltration.

DNA A narrative review of the uptake of pharmacogenomic and genetic testing in children of ethnic minorities

Udeme Ohio

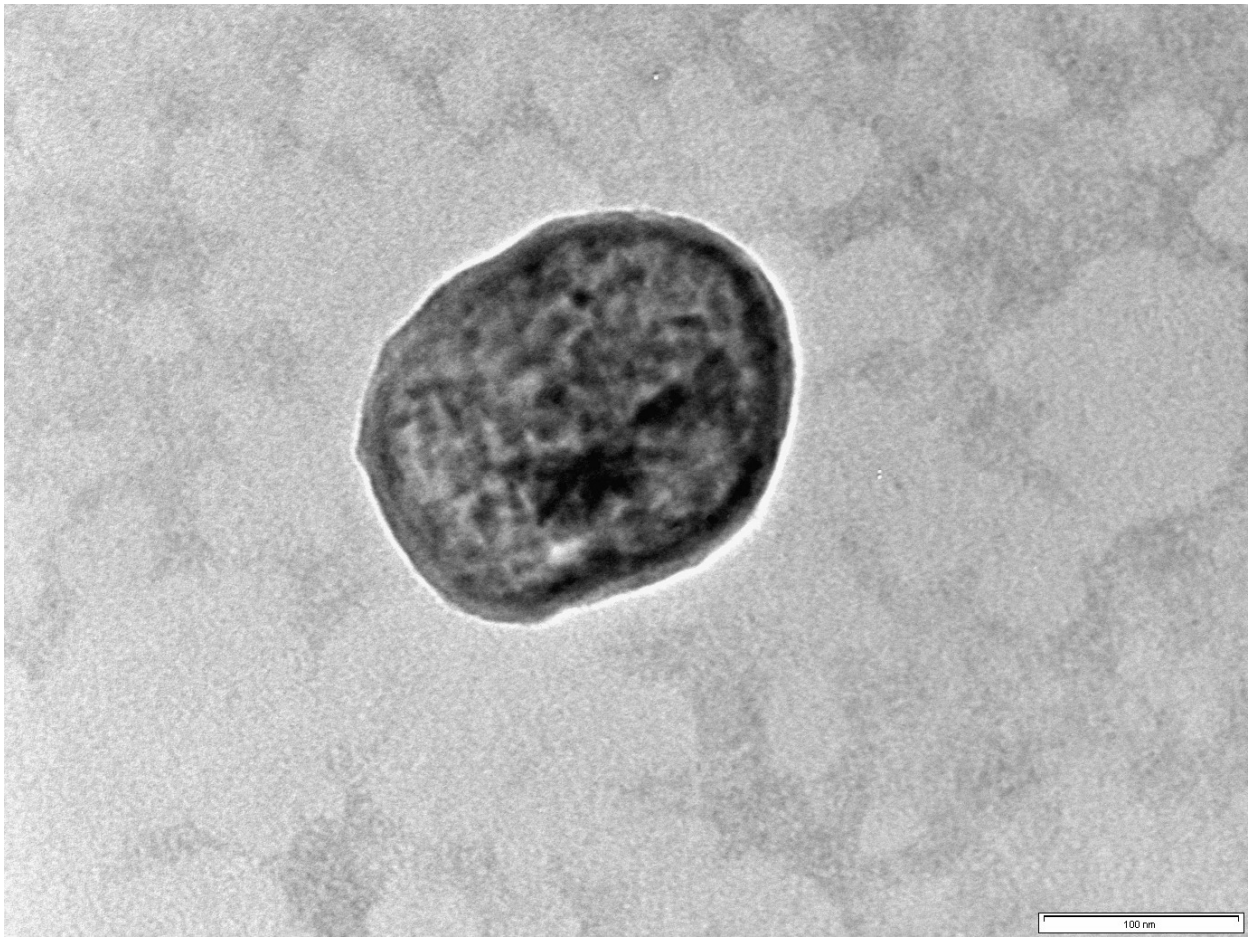
This narrative review explores uptake of pharmacogenomic (PGx) and genetic testing in children from ethnic minority groups, focusing on barriers and research gaps. PGx testing helps optimise drug efficacy and safety by accounting for genetic differences, which may be more prevalent in some minority populations. However, its use in paediatric care remains limited. A systematic search of literature was conducted using Medline, Embase, Emcare, and CINAHL. Studies were included if they involved participants under 18 years and published in English. After screening titles, abstracts, and full texts, 21 studies were included. Data collated and analysed to identify common themes, followed by narrative synthesis. Findings show that parental perception plays a key role in determining uptake. Common barriers include lack of knowledge, language difficulties, limited access to services, and cultural or religious differences. Perceived discrimination and low awareness of benefits also contribute. Few studies specifically addressed PGx testing, highlighting a gap in research.The review concludes that improving uptake requires culturally sensitive personalised genetic counselling, better communication through translation services, and improved access to care. Building trust with families is essential. Further research is needed to strengthen evidence on PGx testing in paediatric populations and reduce disparities among ethnic minority groups.

MOMENT IN MOTION PHOTOS

Focus and precision in the lab "There it is“

Lesley Sloan

TEM image of a plasma-derived Extracellular Vesicle (EV) This image shows a 230nm vesicle isolated from rat plasma using Size Exclusion Chromatography (SEC). I titled this "There it is!" because I had been using this method for almost three years before I had this visual evidence of the presence of EVs. I had started to worry that I was just transferring PBS between different tubes!



MOMENT IN MOTION PHOTOS ABSTRACTS

Gangsters in the hood

Davood Fattahi

Behind every scientific breakthrough is a group of exhausted researchers surviving on caffeine, determination, and questionable sleep schedules. *Gangsters of the Hood* presents a humorous yet relatable portrayal of life inside the modern biomedical laboratory, where PhD students transform from ordinary researchers into “lab gangsters” armed with spray bottles, pipettes, centrifuge tubes, and an unhealthy level of confidence.

Set within a real research environment, the image playfully reimagines laboratory culture through dramatic poses inspired by action films and street-gang aesthetics, while maintaining the unmistakable reality of academic science. Safety goggles replace sunglasses, Falcon tubes become ammunition belts, and disinfectant spray becomes the weapon of choice against contamination. Beneath the comedy lies a genuine reflection of research life: long hours, experimental failures, survival-mode energy, and the strong friendships formed through shared scientific struggles.

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