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Centre for
Applied Bioscience
Research

Biotechnology • Bioresources • Bioeconomy

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Bioscience For Business

CABR Research Colloquium (February 2026)

From marine biotechnology to sustainable agriculture: CABR research colloquium highlights.



On Tuesday, 3 February 2026, the Centre for Applied Bioscience Research (CABR) held its research colloquium at Munster Technological University (MTU) Kerry, bringing together CABR researchers from MTU and Technological University of the Shannon (TUS) to share insights on current and future research. The colloquium featured presentations on topics such as marine biotechnology, circular bioeconomy applications, animal health innovation, disease modelling and sustainable agriculture, highlighting CABR's diverse research portfolio.

Thank you to our presenters: Prof James Gaffey (Circular Bioeconomy (CircBio) Research Group at CABR), Dr Margaret Brennan-Fournet (TUS), Mr Ahmed Abdellatif (Circular Agriculture and Biotechnology (CircAB) Research Group at CABR), Dr Tielidy de Lima (Bioengineering Organ-on-Chip (BOOC) Research Group at CABR), Dr Anuma Singh (CABR), Dr Farrukh Raza Amin (CircAB at CABR), Ms Mariana Juca Silva (BOOC at CABR) and Ms Joanne Hanifin (CABR), as well as everyone who attended the colloquium.

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Celebrating CABR PhD Researchers' Graduations

Recognising research contributions to sustainable biorefining, vascular model innovation and marine biotechnology.



[From left] Dr Arnold Marisa, Dr Niall Burke (CABR) and Dr Wisdom E. Shadrach (CABR)



[From left]: Dr Patrick Murray (CABR, TUS), Dr Sushanta Kumar Saha (CABR), Dr Katie Shiels (CABR) and Prof Vincent Cunnane (TUS)

We are delighted to congratulate Dr Wisdom E. Shadrach, Dr Arnold Marisa and Dr Katie Shiels, who have completed their PhD research studies at CABR and graduated during the 2025 conferring ceremonies.

Dr Wisdom E. Shadrach and Dr Arnold Marisa's conferring ceremony took place at Munster Technological University (MTU), Kerry Campus, whereas Dr Katie Shiels' ceremony was held at Technological University of the Shannon (TUS), Moylish Campus.

Dr Arnold Marisa's PhD research, Characterisation of Willow Bark Bioactives for Skin Care Applications, was conducted as part of the BioWILL project, funded by Interreg Europe North-West Europe (NWE). His work focused on developing a zero-waste biorefinery using willow trees, contributing to sustainable innovation in the bioeconomy.

Dr Wisdom E. Shadrach's PhD studies, Developing a Three-Dimensional In Vitro Vascular Model for Preclinical Testing Applications (Bio-Vascular 3D), explored the creation of a 3D vascular model to improve preclinical testing methods. Dr Wisdom E. Shadrach is now working at CABR as a Postdoctoral Scientist.

Both Dr Arnold Marisa and Dr Wisdom E. Shadrach were supervised by Dr Niall Burke (Senior Business Development Scientist at CABR) and Dr Joanna Tierney (Lecturer at MTU and Principal Investigator at CABR).

Dr Katie Shiels' PhD research, Bioactive Compounds from Cyanobacteria and Microalgae for Human Health Applications - 'An Irish Marine Pharmacy', explored Irish marine cyanobacteria and microalgae as rich and untapped sources of bioactive compounds with potential benefits for human health.

Her work, supervised by Dr Sushanta Kumar Saha and Dr Patrick Murray at CABR, identified and characterised strains producing health-promoting lipids and amino acids with anti-inflammatory, antithrombotic and neuroprotective potential. During her PhD, Dr Shiels published multiple peer-reviewed papers in international journals, contributing to Ireland's growing reputation in marine biodiscovery and sustainable microalgal biotechnology.

We also extend our congratulations to Dr Ian Hodge, whose research, titled Investigating Essential Oils, Natural Compounds, and Marine-Based Rumen Buffers as Feed Additives for Enteric Methane Mitigation and Improved Ruminant Productivity, was funded by Marigot Ltd and supervised by Dr Shane O'Connell, Dr Tim Yeomans and Dr Patrick Quille.

Congratulations to all MTU and TUS graduates of 2025!



[From left] Dr Arnold Marisa, Dr Joanna Tierney (CABR, MTU) and Dr Wisdom E. Shadrach (CABR)

Regenerating Ireland's Wool Sector Through Partnership (REVEIRE Project)

Multi-institutional partnership transforming Ireland's wool sector.



Regenerative Value Systems for Irish Grown Wool in Ireland (REVEIRE) is a collaborative research project led by University College Cork (UCC), with project partners including CABR (MTU and TUS), Ulster University, Teagasc Athenry and the Irish Grown Wool Council.

The project responds to key challenges in the Irish-grown wool sector, such as low wool value and lack of local scouring capacity, by developing regenerative value systems that enable local processing, improve product value and support evidence-based decision-making.

REVEIRE will provide evidence to inform policy, enable scalable and sustainable scouring and processing, and support the development of new applications for Irish-grown wool across sectors such as packaging, insulation and textiles.

Project Aims:

- Evaluate the environmental impact of Irish-grown wool, including biodiversity footprint and handprint
- Investigate the feasibility and business models for novel, scalable scouring within a cascading biorefinery
- Evaluate the socio-economic benefits of processing Irish-grown wool in Ireland
- Perform Life Cycle Sustainability Assessment (LCSA), integrating environmental, social and economic indicators
- Inform policy, initiatives and investments required to regenerate the Irish-grown wool industry

CABR Role in the Project

At CABR, REVEIRE assesses innovative, scalable wool-scouring methods, including ultrasound, enzymes and supercritical CO₂, within a cascading biorefinery. The work optimises lanolin extraction and valorises wastewater via anaerobic digestion to produce renewable gas and biofertiliser. The research supports feasibility, business model development and socio-economic assessment for local Irish wool processing.

Ms Ameera Butt (CABR, TUS) is working on the REVEIRE project as part of her PhD studies. Her research is supervised by Dr Yin Zhu and Dr Catherine Collins at CABR, TUS; Dr Archishman Bose at University College Cork (Project Coordinator); Dr Tim Keady at Teagasc; and mentor Dr Tim Yeomans at CABR (Work Package Leader).

Project Details:

- Project Coordinator: Dr Archishman Bose (UCC)
- Project Timeframe: 2025-2028
- Funding: Environmental Protection Agency (EPA) Research Programme 2021-2030

Transforming Grassland into High-Value Products (Rural BioReFarmeries Project)

A Horizon Europe project developing small-scale, decentralised green biorefineries to boost rural economies and environmental sustainability.



[From left] Mr Adam Mulcahy (CircBio at CABR), Dr Joanna Przyborska (CircBio at CABR), Dr Jagdeep Kumar Nayak (CircBio at CABR), Prof James Gaffey (CircBio at CABR), Mr Paddy Fitzgerald (Premier Green Energy (PGE))



Over 90% of Ireland's agricultural land is used for growing grass, which is primarily utilised for feeding livestock. The Rural BioReFarmeries project aims to extract additional value from grass through the production of bio-based products including protein ingredients for human consumption, flavours for the food and beverage sector, antimicrobial additives with health and sustainability benefits, packaging materials and fertiliser, while still providing the animal feed required by farmers. The residue from the production process can also be used to produce biogas to generate renewable power.

"If even a small amount of our grasslands were devoted to this activity, it will make a large impact in areas such as greater food and feed resilience, improved economic competitiveness, reduced environmental emissions and an increase in local enterprise activity and jobs," says Prof James Gaffey.

Project Details:

- Coordinator: Munster Technological University (MTU), CircBio at CABR
- Project Coordinator: Prof James Gaffey
- Total Funding: €8.7 million
- EU Funding: €7.35 million
- Project Timeframe: December 2024 - December 2028
- Partners: 19 entities from 9 European countries, including Aarhus University, Carbery Group, University College Dublin, Barryroe Cooperative, Wageningen University, Carhue Piggeries, MTU Australo Alpha Lab, NuaFund, University of Galway and Trinity College Dublin



[From left] Dr Jagdeep Kumar Nayak (CircBio at CABR), Prof James Gaffey (CircBio at CABR)

Turning Food Industry By-Products into Bio-Based Products (CircleBio-P Project)

Industry-academia partnership for circular bioeconomy innovation.



The CircleBio-P is a Circular Biobased Pilot Scale Demonstration delivered in collaboration with industry and is one of the ongoing circular bioeconomy projects focused on scaling innovative bioprocessing technologies. It is led by the Circular Agriculture and Biotechnology Group (CircAB) at the Centre for Applied Bioscience Research (CABR), based at the Technological University of the Shannon (TUS).

The CircleBio-P project shows how two eco-friendly processes for production of biopharma and bioplastic products as well as, anaerobic digestion and biochar production. The project is designed to move from research concept to real-world demonstration, starting at CircAB facilities at CABR and later at the National Bioeconomy Campus. This project marks an important change from traditional linear methods to more sustainable, circular approaches.

The goal of this project is to drive innovation and create opportunities for building relationships and partnerships that enable circularity. The project will demonstrate how Ireland can address the growing need for sustainable processes.

CABR Role in the CircleBio-P Project

The Circular Agriculture and Biotechnology Group (CircAB) at the Centre for Applied Bioscience Research (CABR) is a core partner in CircleBio-P. CircAB leads sustainable process development, pilot-scale demonstration, and life-cycle assessment. The group ensures scientific rigor, supports technical upscaling, and engages stakeholders to facilitate the adoption of circular bioeconomy practices in Ireland's food-processing industries.

Dr Lena Madden (Group Lead, CircAB) and Dr Patrick Murray (Head of Research, TUS) are coordinators of the CircleBio-P project, contributing to the project's innovation and demonstration goals.

Project Details:

- Project Coordinators: Dr Lena Madden (CircAB at CABR) and Dr Patrick Murray (TUS)
- Funding: €1.25 million from the Department of Agriculture, Food and the Marine (DAFM) 2022 Policy & Strategic Studies Research Call (Grant No: 2022PSS142)
- Project Timeframe: May 2024 - April 2027
- Partners: Technological University of the Shannon (TUS), University College Dublin, Trinity College Dublin, Irish Bioeconomy Foundation, Tirlán, Dawn Meats, Arigna Fuels, Green Generation Ireland

Meet CABR Team

Joanne Hanifin

TU Rise PhD Scholar, Centre for Applied Bioscience Research (CABR), MTU

Ms Joanne Hanifin is a TU Rise PhD Scholar at CABR, MTU Kerry campus, under the supervision of Dr Joanna Tierney, Dr Bridget Breen, Dr Ashley Sullivan and Dr Venkata Vamsi B Yallapragada. Her project 'MAPBIO-MILK' focuses on the use of marine and plant bio-extracts with biosensors for bovine udder health in mastitis.

Joanne was awarded her Bachelor of Agricultural Science (BAgrSc) in Animal Science from University College Dublin in 2024.

During her undergraduate studies, Joanne had the opportunity to study abroad at Iowa State University (USA), where she gained a global perspective of the agricultural industry whilst learning about animal physiology, genetics and nutrition. Joanne also completed over 20 weeks of professional work experience across various agricultural enterprises in Ireland and Scotland, and completed a placement at Teagasc Moorepark. During her time at University College Dublin, Joanne achieved various academic awards, including an Excellence award in Health, Welfare and Safety, a Stage Four Scholarship and the Kepak Best in Class Animal Science Award.



Meet CABR Team

Dr Farrukh Raza Amin

Postdoctoral Research Scientist, Circular Agriculture and Biotechnology Group (CircAB) at CABR, TUS

Dr Farrukh Raza Amin is a Postdoctoral Research Scientist with the Circular Agriculture and Biotechnology Group (CircAB) at CABR, TUS. At CABR, he is involved in research on circular bioprocesses for valorising industrial by-products, focusing on the development of scalable, zero-waste and low-emission solutions.

Dr Farrukh Raza Amin holds a PhD in Chemical Engineering and Technology from Beijing University of Chemical Technology, specialising in microbial pretreatment of biomass to improve biomethane production.



An accomplished scholar, Dr Amin has published in high-impact journals on topics such as anaerobic digestion, biochar, syngas conversion and sustainable biomanufacturing. Previously, Dr Amin held academic appointments as Assistant Professor at COMSATS University Islamabad (CUI), Pakistan, and postdoctoral and leadership roles (PI) at the Tianjin Key Laboratory for Industrial Biological Systems and Bioprocessing Engineering, Chinese Academy of Sciences, China, under the prestigious Belt and Road Fellowship Initiative.

Meet CABR Team

Dr Wisdom E. Shadrach

Postdoctoral Scientist, Centre for Applied Bioscience Research (CABR), MTU

Dr Wisdom E. Shadrach is a Postdoctoral Scientist at the Centre for Applied Bioscience Research (CABR). Dr Shadrach completed his PhD at CABR, with research titled 'Characterization of mammalian and insect cell performance in laboratory and pilot scale bioreactor for biopharmaceutical applications', under the supervision of Dr Niall Burke and Dr Joanna Tierney.

Dr Wisdom E. Shadrach graduated from the University of Benin (UNIBEN) in Nigeria in 2017 with a Bachelor's and Doctor of Pharmacy degree. In his final year undergraduate thesis, he carried out a project on 'Antimicrobial susceptibility pattern of bacterial isolates from ulcers'.



Meet CABR Team

Mariana Juca Silva

PhD Researcher, Bioengineering Organ-on-Chip (BOOC) Research Group,
CABR, MTU

Ms Mariana Juca Silva is a PhD researcher in the Bioengineering Organ-on-Chip Research Group (BOOC) at CABR, under the lead supervision of Dr Emma J. Murphy, co-supervision of Prof Emanuele Rezoagli, Prof John Laffey, Dr Gustavo Fehrenbach and Dr Patrick Murray.

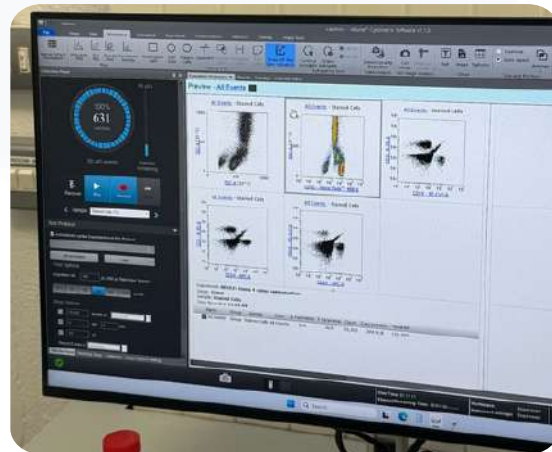
Her doctoral research is centred on investigating the potential of mesenchymal stem cell-derived antimicrobial peptides (AMPs) to combat antimicrobial resistance for the treatment of sepsis modelled in organ-on-chips.

Mariana Juca holds a bachelor's degree in biomedical sciences, with a primary focus on molecular biology, particularly the study of circular RNAs. Her academic and research background extends across diverse fields, including genetics, bioinformatics, public health and clinical haematology, where she has developed a robust set of laboratory and analytical skills.



Combining AI-Driven Imaging with Flow Cytometry (CABR Equipment Spotlight)

Identifying unique cell subsets through AI-enhanced analysis.



Attune CytPix Flow Cytometer

- Manufactured by Thermo Fisher Scientific
- Funded by Enterprise Ireland
- Available at CABR for industry collaborations

The Attune CytPix Flow Cytometer is an imaging-enhanced flow cytometer that combines AI-driven morphology analysis with traditional flow cytometry data. This integration enables highly reproducible population changes and identification of unique subsets that standard fluorescence and scatter parameters alone cannot reveal.

As samples are acquired, the high-speed brightfield camera captures and stores images of detected events at up to 6,000 images per second, depending on flow rate and image size.

How can this equipment benefit your business?

- Rapid quality control of cell cultures for research and product development
- Identification of rare or unique cell subsets for advanced screening
- Enhanced characterisation of cell populations for cosmetics and nutraceuticals
- And more

Interested in exploring how CABR's Attune CytPix Flow Cytometer can support your business? Contact us via our website: www.cabr.ie/contact-us

How CABR Validated the Antioxidant and Anti-Ageing Properties of Bánór's Sheep Milk Skincare Products



Case Study Highlights

- Company: Bánór
- Funding: Enterprise Ireland Innovation Partnership Programme
- Goal: Scientifically validate the antioxidant and anti-ageing properties of Bánór's sheep milk skincare products
- Staff Involved: Dr Ashley Sullivan (Postdoctoral Scientist at CABR), Dr Niall Burke (Senior Business Development Scientist at CABR)

About the Company

Bánór was founded by Nicola Lyons and Elaine Crosse. The company manufactures natural body care products using Tipperary sheep milk, which has nourishing and revitalising properties. Their product line includes items like lanolin body oil, cream wash, and milk lotion. Bánór also emphasises sustainability, using natural ingredients and a blend of lavender, geranium, and ylang-ylang essential oils.

Project Problem

Bánór collaborated with CABR to perform antioxidant and anti-aging testing of their products to scientifically validate their efficacy and differentiate them from competitors.

Project Solution

CABR's research team evaluated Bánór's sheep milk products (Milk Lotion and Cream Wash) to determine their benefits to the skin, including their ability to reduce oxidative stress, promote collagen production and protect the skin barrier.

Research by CABR showed that Bánór's sheep milk products (Milk Lotion and Cream Wash) exhibit antioxidant and anti-ageing properties, increase collagen production and enhance skin barrier protection.

Testimonials

"Bánór partnered with the Centre for Applied Bioscience Research (CABR) to research the benefits that sheep milk can have in skincare. Our sheep milk body care products were tested for their antioxidant and anti-ageing properties in isolated human skin cells (epidermal and dermal cell lines), and then compared to two leading competitor brands. Awareness of sheep milk is very low, so the strong results support the claimed benefits of sheep milk. The results also provide the third-party credibility we need as a new brand with a unique ingredient in a busy marketplace. We were professionally guided through the process and would recommend the Centre for Applied Bioscience Research's expertise to any business looking to scientifically validate their offering. The team at the Centre for Applied Bioscience Research provided invaluable expertise and support, making the entire experience seamless and rewarding."

- Nicola Lyons, Founder & Elaine Crosse, Founder (Bánór)



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