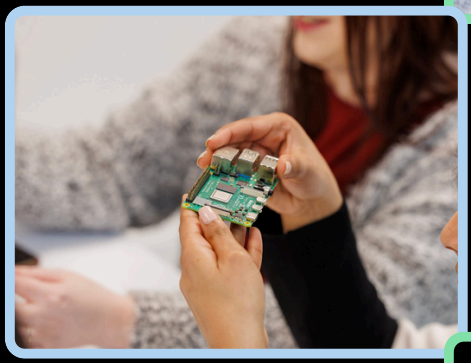
TUS



TUS RISE

PROJECTS & PARTNERSHIPS

TUS RISE is co-funded by the Government of Ireland and the European Union through the ERDF Southern, Eastern & Midland Regional Programme 2021-27.

Rialtas na hÉireann
Government of Ireland

Arna chomhchistiú ag an Aontas Eorpach
Co-funded by the European Union

Tionól Réigiúnach an Deiscirt
Southern Regional Assembly

HEA | HIGHER EDUCATION AUTHORITY
AN tÚDARÁS um ARD-OIDEACHAS

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INTRODUCTION TO TUS RISE

Structured as a four-year programme, TUS RISE is designed to support the development of innovative, high-value products and services, aligned with regional specialisms, strengths and expertise. It seeks to nurture and support enterprises, elevate the global competitiveness of Irish-based companies, expand export opportunities and ultimately lead to increased revenues and employment across key industry sectors.

TUS RISE will initiate, cultivate and operationalise targeted industry engagement and innovation services across our four specialist and targeted thematic areas of smart specialisation;

- **Advanced Manufacturing and Engineering**
- **Biopharma, Life Sciences and Food**
- **ICT and Creative Industries**
- **Sustainable Development**

TUS RISE INDUSTRIAL SUPPORTS

TUS RISE will support enterprise and entrepreneurship through initiatives such as:

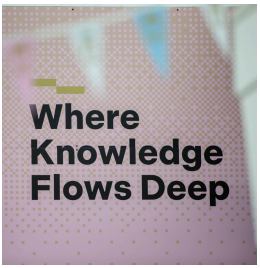
- TUS Works (entrepreneurship pre-accelerator programme for researchers in TUS)
- Specialised funding clinics and grant writing workshops
- Industrial immersion and mentorship programmes
- Workshops, talks, & industrial smart specialisation days
- Industrial workplace exchanges
- Expert-in-residence programme

TUS RISE SCHOLARSHIPS

The TUS RISE programme has awarded 34 industry-focused postgraduate research opportunities, comprising of 29 PhD, 3 MSc and 2 MA projects.

These projects showcase the extensive expertise available across TUS, with research topics spanning a wide array of fields. Projects include Developing Energy Communities, Successful Aging, Peer Assisted Breastfeeding, Biodegradable Stent Applications, Growth for Hospitality, Virtual Reality in Addiction Recovery, Bio-Oriented Compostable Packaging, and Statistical Power in Sports Science Research.

As part of their studies, postgraduate students will undertake a 12 to 14-week placement at their supporting enterprise. This will provide students with in-depth mentorship, opportunities to connect with industry leaders and operatives, and a comprehensive understanding of industrial needs and challenges, fostering the development of innovative solutions. The programme involves collaborations with SMEs, national bodies, local authorities, community and sports organisations, and large-scale industries.



ÉIRECOMPOSITES

TUS RISE 001

Industry Partner:
ÉireComposites

Advancing Environmentally Friendly Solid-State Hydrogen Storage through AI-enhanced Multiscale Modelling

Introduction

Hydrogen fuel holds immense promise as a cleaner alternative to fossil fuels, yet storing it efficiently remains a formidable obstacle. This research project focuses on pioneering solid-state hydrogen storage solutions through innovative material design.

Industrial Benefits

By integrating polymers with Carbon Nanotubes (CNTs) and Sustainable Carbon Materials (SCMs), the project aims to develop composite materials with enhanced hydrogen storage capabilities.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Develop a manufacturing process for blending polymer matrices with SCMs and CNTs.
- Characterise composite materials through microstructural analysis to assess factors such as nanoparticle dispersion, porosity, and structural integrity.
- Utilise multiscale modelling techniques to simulate polymer composite microstructures and predict hydrogen absorption and desorption behaviour.
- Implement machine learning algorithms.

Supervisors: Dr. Amit Haldar (TUS), Prof. Maurice Collins (UL), Dr. Tomás Flanagan (ÉireComposites).

Aerogen Pharma

TUS RISE 002

Industry Partner: Aerogen

Droplet Formation through an Alternative Cost-effective Material for an Active Vibrating Mesh of a Nebuliser (ALTNeb)

Introduction

Palladium (Pd) is the primary material used within the active vibrating mesh as part of a medical nebuliser, it aerosolise's medication to treat lung diseases. Due to a constant depletion in the Pd global supply and a steady increase in the Pd price, an alternative material is required.

Industrial Benefits

Replacing Pd with a cost-efficient alternative will solve this problem and more importantly will contribute to a significant decrease in the market price of a nebuliser making it affordable globally.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Conduct literature reviews, numerical predictive simulation models and optimisation techniques using dedicated software packages, experimental testing, analytical models, and cost benefit analysis, to develop a new cost-efficient nebuliser using an alternative material.
- Validate expected outcomes including a novel predictive Computational Fluid Dynamics (CFD) droplet formation model that will replace the traditional trial-and-error methods, through a suite of dedicated experimental testing in collaboration with the enterprise partner.

Supervisors: Dr. Daniela Butan (TUS), Dr. Sean Cunningham (TUS), Dr. Lisa Henihan (TUS).

TUS RISE 003

Industry Partner:
Community Power

Exploration of Futures Thinking for Energy Communities

Introduction

Energy communities are a European priority (as highlighted in the revised EU Renewable Energy Directive), and are a potential solution to combatting resistance to renewable energy (RE) projects, helping in the adoption of RE technologies and supporting community, local and regional development.

Industrial Benefits

By developing energy communities which have the potential to generate and trade their own energy within local settings, further advancements towards a sustainable, circular ecosystem can be achieved.

Duration: 24 mths

Award: MSc

Key Responsibilities:

- Explore the application of innovation futures thinking methodologies and tools to support energy communities in the Just Transition regions of Offaly and Tipperary to formulate long term preferred future visions, informing an action plan.
- Develop research informed by intensive stakeholder engagement through surveys, interviews and workshops.
- Work collaboratively within Community Power, and maximise impact through identification of short-term actions for implementation, coupled with valuable opportunities for dissemination of research outcomes.

Supervisors: Seamus Hoyne (TUS), Francisco Puente (ESCAN).

water for good®

TUS RISE 004

Industry Partner: Water for Good

Humanitarian Operations Theory: Decision-making Practices in Sustainable Humanitarian Logistics

Introduction

A successful humanitarian operation is one that mitigates the urgent needs of a population with a sustainable reduction of their vulnerability in the shortest amount of time and with the least amount of resources.

Industrial Benefits

Delivering successful humanitarian operations is difficult due to challenging physical and bureaucratic environments and a need for collaboration amongst distinct autonomous organisations and stakeholders. This research aims to thoroughly explore past and current academic work in this space and garner the real-world experiences of humanitarian practitioners.

Key Responsibilities:

- Establish a comprehensive understanding of the research that has been done to date, and assess how theory can be extended in this field.
- Capture tacit knowledge in the humanitarian operations sector.
- Conceptualise the defining and distinguishing characteristics of humanitarian operations and map the implications of these for decision-making processes in the sector.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Paul Liston (TUS), Dr. James Byrne (DCU).

TUS RISE 005

Industry Partner:
Ross Polymer

InsuGuard: Transforming Insulin Vial Storage with PCM Aerogel Packaging for Accessibility and Energy Efficiency

Introduction

Over half a billion adults live with diabetes, a 16% increase since 2019, with 150–200 million relying on insulin therapy for their health. However, insulin needs to be kept cold to stay effective, refrigerating insulin poses challenges, including accessibility issues and high-energy use, risking patients' health and limiting effective treatment.

Industrial Benefits

The project aims to develop a temperature-controlled external packaging to regulate the storage conditions of insulin vials and safeguard against degradation due to temperature increases.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Fabricate phase change materials (PCMs) within a porous insulator aerogel structure to support the material.
- Stabilise PCMs within the porous aerogel, enhancing structural stability and thermal performance. This porous structure will be based on polymers currently used in packaging applications, which offer advantages such as thermal durability and recyclability for sustainable insulin storage solutions.

Supervisors: Dr. Golnoosh Abdeali (TUS), Dr. Declan Devine (TUS), Dr. Romina Pezzoli (TUS), Dr. Declan Colbert (TUS).

3D Technology Ltd
Design. Print. Apply.

TUS RISE 006

Industry Partner:
3D Technology Ltd

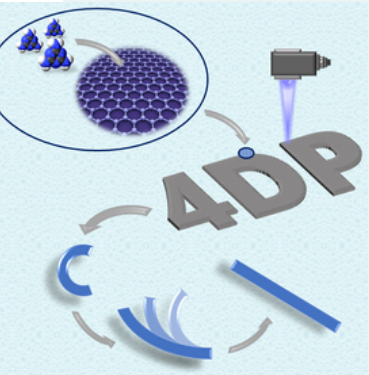
Investigating Mechanical and Viscoelastic Properties of 4D Printed Acrylate/epoxy dual-cure Blend System with Wide-ranged Switching Temperature for Smart Multipurpose Applications

Introduction

3D Printing (3DPg) as a sustainable manufacturing technique has been attracting increasing interest across virtually all industrial sectors, as well as the research and academic communities, due to multiple key advantages.

Industrial Benefits

3D printed objects will have a variety of mechanical properties and shape-switching temperatures and offer encouraging opportunities for use in sustainable applications like soft robotics, deployable space structures, flexible electronics and medical devices.



Duration: 24 mths

Award: MSc

Key Responsibilities:

- Investigate the shape memory and mixed-mode fracture toughness of the 3DPd acrylate/epoxy dual-cure blend system with wide-ranged switching temperatures.
- Prepare various blends of acrylate/epoxy in different concentrations, incorporating fumed nanosilica (finely powdered matter) to fabricate functionally graded polymer materials. Then printed by UV-based 3D machinery and thermally cured to achieve superior heat, mechanical and shape memory properties.

Supervisors: Dr. Mohamad Alsaadi (TUS), Dr. Declan Devine (TUS).

TUS RISE 007

Industry Partner:
Rowing Ireland &
The Lundquist Institute
University of California

Longevity and Successful Ageing: Master Athletes' Physiology and Enhancing Elderly Health

Introduction

This project is poised to explore physiological mechanisms underlying health and longevity in master athletes, whom serve as exemplary models of successful aging. Importantly, much of the existing ageing research may be confounded by factors such as longitudinal sedentary behavior.

Industrial Benefits

Research will significantly enhance our understanding of healthy aging and offer evidence-based guidance to improve the lives of our aging population.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Conduct a systematic review with meta-analysis, analysis of open-source data in thousands of master athletes, a global questionnaire, and case series analysis.
- Investigate the physiological characteristics of world-calibre male and female master athletes, examining the training and nutritional practices which afforded these individuals such high psychophysiological functionality.
- Develop and implement a community-based pilot intervention informed by the project's preliminary findings.

Supervisors: Dr. Lorcan Daly (TUS), Prof. Harry Rossiter (UCLA), Prof. Sandra K Hunter (AHPRC), Dr. Ciarán O'Cathain (TUS), Dr. David T Kelly (TUS).

TUS RISE 008

Industry Partner:
Friends of Breastfeeding

Peer-Assisted Breastfeeding Success (PABS): The Impact of Peer Support on Mothers' Breastfeeding Goals

Introduction

Breastfeeding is the natural and biologically normal way of feeding infants and young children. This project will investigate various aspects of peer support, including its influence on breastfeeding duration, exclusivity, and maternal satisfaction.

Industrial Benefits

It will uncover barriers and facilitators to breastfeeding success, informing future interventions and breastfeeding policies. It will also advise the development of evidence-based breastfeeding support programs and training protocols for peer supporters.

Key Responsibilities:

- Survey new registrants for the Friends of Breastfeeding service and again 3 months later to determine their infant feeding status, information about their breastfeeding journey, their interactions with the Friends of Breastfeeding service, and their overall satisfaction with their experience.
- Conduct a nested qualitative study among 15 – 20 participants at the 3-month time point to gain a detailed insight into their experience with the early breastfeeding supports and their feelings about their breastfeeding goals and journey.

Duration: 24 mths

Award: MSc

Supervisors: Dr. Áine O'Connor (TUS), Dr. Liz O'Sullivan (TU Dublin).

TUS RISE 009

Industry Partner: TheraDep

Plasma Medicine for the Modulation of Inflammation and Cartilage Damage in Osteoarthritis

Introduction

The aim of this research is to investigate the potential of plasma technology to improve inflammation and reduce cartilage damage, as a potential treatment to prevent or slow down the development of osteoarthritis.

Industrial Benefits

Project results will lay the foundation for future translation between pre-clinical and clinical research and may potentially expand existing plasma technologies into a new market.

Key Responsibilities:

- Identify the most suitable conditions for plasma generation to support cell viability.
- Evaluate the immunomodulatory effects of CAP treatment towards macrophage phenotype and behaviour.
- Determination of the cartilage protective effects of CAP treatment.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Niamh Fahy (TUS), Dr. Emma Murphy (TUS), Dr. Declan Devine (TUS).

TUS RISE 010

Industry Partner:
Ona Wave Medical

Solid Dispersion of Mucoadhesive Hyaluronic Acid for the Prevention and Treatment of Intrauterine Adhesions

Introduction

This project serves to develop a solid dispersion device which would allow for the sustained release of Hyaluronic Acid (HA), which has been modified to coat the inner lining of the womb. In doing so, a protective barrier is formed which will prevent the formation of scar tissue and improve fertility.

Industrial Benefits

Produce a device capable of delivering therapeutic doses of mucoadhesive hyaluronic acid over a sustained period. This project has the potential to develop a product suitable for the commercial market that will significantly impact the reproduction health of individuals worldwide.

Key Responsibilities:

- Develop a solid dispersion device which would allow for the sustained release of HA which has been modified to coat the inner lining of the womb.
- Investigate the inclusion of antioxidants to reduce the oxidative damage of cells and improve the efficacy of the Intrauterine device (IUD).

Duration: 48 mths

Award: PhD

Supervisors: Dr. Ciara Buckley (TUS), Dr. Noel Gately (TUS), Dr. Declan Colbert (TUS).

TUS RISE 011

Industry Partner:
Gaelic Players Association

Supporting Athlete Health and Performance in Elite Gaelic Games

Introduction

In Ireland, there have been notable developments in the context of women in sport, including bespoke policy, funding streams, personnel, and resources, nationally and within sporting organisations. However, an adult gender gap exists in sports participation, drop out is higher among females than males and in team sports, there is a marked difference in the performance supports provided to elite male and female athletes.

Industrial Benefits

By pursuing gender equality in sport and delivering bespoke 'female' sporting environments, research will aim to support continuing development for women in sport.

Key Responsibilities:

- Understand the sex-specific female athlete considerations in a Gaelic games context and the nature of the 'gendered' environment that exists for these female athletes.
- Develop, deliver and evaluate a female athlete education programme and supports for Gaelic Games athletes, coaches, and practitioners.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Aoife Lane (TUS), Dr. Niamh Ní Chéilleachair (TUS).

TUS RISE 012

Industry Partner:
Bedford Row Family Project

The Natural World of Child Protection

Introduction

This research will examine the service response to families affected by imprisonment, including but not limited to; prison and probation services, law enforcement agencies and voluntary and statutory community services.

Industrial Benefits

The project enquiry focuses upon design, particularly how to inform the creation of a systemic response to children and their families affected by imprisonment, with the goal of influencing compassionate, creative and trauma informed care.

Key Responsibilities:

- Better understand existing theories of change, highlight gaps and strengths of this current body of literature.
- Develop a more inclusive theory of change in support of the wellbeing of children, their families, their communities and families and those who work in this field.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Lorcan Byrne (TUS), Dr. Cathy Jones (TUS).

TUS RISE 013

Industry Partner:
Athlone Town Association Football Club

Strategies to Increase Statistical Power in Sports Science Research

Introduction

Underpowered designs are common within applied sports science research. This project will investigate the feasibility of a variety of strategies to increase statistical power such as manipulating trial size; utilising a "big team science", and a "portable lab" approach.

Industrial Benefits

Increasing statistical power will help to improve participant recruitment; increase the efficiency of physical performance testing methods (speed and strength measures); and reduce variability within outcome measures. Improving sports science research throughout Ireland and internationally particularly in the female athlete population that has traditionally been underrepresented within sports science literature.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Investigate strategies to increase statistical power in applied sports settings by i) improving industry-standard performance test efficiency, ii) developing a national network for sports science research, and iii) reducing variability within performance metrics.
- Apply successful strategies to answer an applied research question developed in conjunction with Athlone Town AFC.

Supervisors: Dr. Robin Healy (TUS), Dr. Ciarán Ó Catháin (TUS), Dr. Eoghan McNeill (TUS).

Veryan

TUS RISE 014

Industry Partner: Veryan

Development of Smart Polymer Nanocomposites for Biodegradable Stent Applications

Introduction

Coronary heart disease is caused when plaque build up inside the coronary arteries over time. Stents are placed in the body to prop open blood vessels healing from procedures like a balloon angioplasty, which widens arteries blocked by plaque.

Industrial Benefits

The study will develop a high-strength biodegradable smart polymer nanocomposite using 'Halloysite Nanotubes' HNTs and a supercritical fluid-assisted processing approach, allowing the stent to withstand the pressures observed in the coronary arteries and will provide a platform to deliver therapeuticdrugs to the site of the blockage.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Understand how HNTs be utilised to enhance the mechanical properties of biodegradable polymers to withstand the cardiovascular environment.
- Develop methods to control the degradation rate of the stent and optimise the release profile of active pharmaceutical ingredients to improve post-surgical outcomes and stent integration.

Supervisors: Prof. Austin Coffey (TUS), Prof. Clem Higginbotham (TUS), Prof. Bhaskar Murari (SETU).

TUS RISE 015

Industry Partner:
Laois Offaly ETB
Offaly Local Development Company
Offaly County Council

Navigating Innovative Growth for Hospitality, Tourism, and Astronomy in Local Landscapes - Developing Dark Sky Tourism in Co. Offaly

Introduction

Dark Sky Ecotourism takes place in ecologically sensitive, remote areas which have low levels of light pollution and clear night sky views. The project will develop and implement a framework which builds community knowledge and skills in the sector in a disadvantaged region in transition.

Industrial Benefits

Develop 'Dark Sky Ecotourism' destination status and associated tourism products in the Midlands region, particularly in Co. Offaly, while creating a sustainable tourism offering which benefits the environment, community and economy.

Photo: Courtesy of Sheikh Haaris

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Assess the potential for the development of dark sky ecotourism in Co. Offaly.
- Critically analyse stakeholder awareness, understanding and attitudes towards dark sky ecotourism, including light pollution, nighttime tourism, and infrastructure development.
- Assess tourist knowledge, awareness and demand for dark sky ecotourism.
- Disseminate knowledge to influential stakeholders and engage in critical dialogue with them in the region.

Supervisors: Dr. Anthony Johnston (TUS), Dr. Noëlle O'Connor (TUS), Prof. Vania DaCosta (IPCA).

TUS RISE 016

Industry Partner: Aiséirí Treatment Centres

How Virtual Reality can be used as a Therapeutic Tool in Addiction Recovery

Introduction

This project will address a gap in the addiction recovery sector by designing, developing and piloting a Virtual Reality (VR) environment for people with addiction. New VR technology will be presented at the national meeting of Treatment Directors (of which Aiseiri is a member). In addition to Hazelden in the US which has a longstanding relationship with Aiseiri.

Industrial Benefits

By exploring the immersive nature of VR and its therapeutic potential, the study aims to advance understanding of how VR can effectively address addictive behaviours.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Work with clients of Aiseiri as research participants to explore what they need in recovery and how they find using Virtual Reality technology.
- Identify what specific part of recovery VR can help with before creating a VR environment that the participants can then test.
- Improve and refine the VR environment before rolling it out at all 4 Treatment Centres.

Supervisors: Dr. Marie Walsh (TUS), Adrian Fielding (TUS).

COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL

TUS RISE 017

Industry Partner:
Clare County Council

Embedded Cultural and Curatorial Research Investigation in the context of Clare County Council Arts Office

Introduction

It is challenging and complex time for the contemporary curation and development of new gallery spaces, including Súil. This embedded research opportunity fulfils the need for new and innovative curatorial strategies that strive to create meaningful trans-cultural dialogue between artworks and artefacts produced across different contexts and chronologies.

Industrial Benefits

The broad range of potential research investigations is designed to comprehensively reflect the remit of Clare Arts Office. It will support learning and research in programming contemporary exhibitions, digitising the County Art Collection, creating a curatorial, programming and educational policy, while developing an Arts Council funded Creative Places Programme in Shannon.

Duration: 24 mths

Award: MSc

Key Responsibilities:

- Expand curatorial practice within the context of Irish arts practice.
- Identify a curatorial project based in the Súil Gallery in consultation with supervisors that will expand curatorial thinking around Clare Arts.
- Experience a range of activities within cultural management and curation to expand the researcher's experience and curatorial practice.

Supervisors: Dr. Robert Kilroy (TUS), Dr. Tracy Fahey (TUS).

SATORE STUDIO

TUS RISE 018

Industry Partner:
Satore Studio

A Quality of Experience Evaluation a Multisensory Virtual Reality Art Exhibit for Individuals with Visual Impairment

Introduction

In recent years, museums have become more interactive and immersive through the adaptation of technology within large scale art exhibitions. This PhD project will design, develop, and evaluate novel interactive eXtended Reality (XR) 2.5D art experiences that include multisensory components. As part of the project, 2D paintings will be transformed into 2.5D virtual objects.

Industrial Benefits

The project will extend the 'state the art' in terms of both technical contributions as well as to further develop our understanding of user perceptual quality of experience of such novel 2.D experiences. Allowing individuals to engage and interact with an artwork museum experience presented in Virtual Reality (VR).

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Extend the state the art in terms of both technical contributions as well as to further develop our understanding of user perceptual quality of experience of such novel 2.D experiences.
- Create a novel evaluation methodology to experimentally evaluate and understand the factors that influence the user perceived Quality of Experience (QoE) of the 2.5D experience.

Supervisors: Dr. Conor Keighrey (TUS), Dr. Niall Murray (TUS).

IRISH BOAT RENTAL ASSOCIATION

TUS RISE 019

Industry Partner:
Irish Boat Rental Association

Sustainable Shannon Boats Initiative

Introduction

At present there are more than 200 cruise boats for hire on the River Shannon, in addition to large numbers of privately-owned boats. However, they rely on older diesel technology engines, despite recent adoption of hydrogenated vegetable oil (HVO) fuel, their environmental impact on a delicate ecosystem is clear.

Industrial Benefits

The aim of this project is to support the greening of the cruise boating and hire on the River Shannon. It will identify a clear roadmap for the future sustainable development, diversification and greening of the sector over the next 10 years, identifying future market potential, both nationally and internationally.

Key Responsibilities:

- Conduct literature review of good practice case studies.
- Critically analyse the consumer behaviour of current cruise boat sector providers and tourists in relation to environmental sustainability on the River Shannon.
- Develop and test new cruise boat tourism products and services which have positive environmental impacts on the biodiversity of the River Shannon.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Anthony Johnston (TUS), Dr. Noëlle O'Connor (TUS), Dr. Lucia Tomassini (NHL Stenden).

Galway University Hospitals
Ospidéil na h-Ollscoile Gaillimh
UNIVERSITY HOSPITAL GALWAY
MERLIN PARK UNIVERSITY HOSPITAL

TUS RISE 020

Industry Partner:
University Hospital Galway

Mesenchymal Stem Cell-derived Antimicrobial Peptides for Antimicrobial Resistance

Introduction

Sepsis is a major cause of mortality worldwide, with antimicrobial resistance posing a growing threat to global health. Mesenchymal stem cells (MSCs) have been identified as a promising solution to this problem, as they possess both antimicrobial properties and immune-enhancing abilities.

Industrial Benefits

By optimising the direct effects of MSC transplantation while mitigating associated risks, this study hopes to leverage the potential of MSCs to address the issue of increasing antimicrobial resistance and improve the treatment of sepsis.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Optimise the production of antimicrobial peptides from MSC's in culture, developing an effective antimicrobial therapeutic for clinical use.
- Evaluate the antimicrobial activity of secreted peptides from pre-activated mesenchymal stem cells on isolated clinical bacteria.
- Investigate the potential of mesenchymal stem cells to enhance the immune system's ability to fight off infections and to reduce inflammation.
- Isolate and characterise the antimicrobial peptides produced by mesenchymal stem cells

Supervisors: Dr. Emma Murphy (TUS), Dr. Patrick Murray (TUS), Prof. John Laffey (NUI Galway), Prof. Emanuele Rezoagli (UNIMIB).

TUS RISE 021

Industry Partner:
Taghleef Industries

Development of Bioriented Compostable Packaging Films

Introduction

Home compostable flexible food packaging has been identified as one promising alternative to mitigate the environmental impact of plastic waste worldwide. Bi-oriented polypropylene (BOPP) are widely used in packaging various food products due to their excellent barrier properties, transparency, printability, reasonable cost and recyclability.

Industrial Benefits

Develop new innovative blends and laminates of biodegradable polymers to create a home compostable polymer blend suitable for the replacement of BOPP, as flexible food packaging with the required technical properties to fill the gap in the food packaging industry. Preventing polymer packing waste leaking into the environment.

Key Responsibilities:

- Develop of home compostable bi-oriented polymer films to replace BOPP, increasing circularity and contribute towards national sustainability goals.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Declan Devine (TUS), Dr. Romina Pezzoli (TUS), Dr. Ian Major (TUS).

Comhairle Contae Thiobraid Árann
Tipperary County Council

TUS RISE 022

Industry Partner:
Tipperary County Council

Embedded Cultural and Curatorial Research Investigation in the context of Tipperary County Council Arts Office

Introduction

The aim of this research project is to investigate strategies for enhancing cultural engagement and infrastructure development within community arts centres, with a focus on the programmes and initiatives offered by Tipperary Arts Office, Nenagh Arts Centre, and The Source Arts Centre.

Industrial Benefits

Data will contribute to a more holistic understanding of the role of community arts centres in fostering cultural engagement and infrastructure development.

Duration: 24 mths

Award: MA

Key Responsibilities:

- Analyse public art's impact on community in Tipperary.
- Assess collection policies and structures in arts centres.
- Examine planning for a library arts space with community input.
- Evaluate exhibition strategies with national and local partners.
- Identify ways to enhance visual arts at Nenagh Arts Centre.

Supervisors: Lucina Russell (TUS), Dr. Tracy Fahey (TUS).

Clare Local Development Company
Comhlacht Forbartha Áitiúil an Chláir

TUS RISE 023

Industry Partner:
Clare Local Development Company

Enhancing Local Community Partnerships at the Interface Between State and Civil Society through the Development and Implementation of Impact Measurements

Introduction

Community development in Ireland seeks to stimulate and inform our locality and broaden sustainable development activity. This study will assess the interplay between state and community in the achievement of sustainable development goals by examining the relationships between local stakeholders and development organisations.

Industrial Benefits

Resulting research will contribute to communities, to both gauge the impact of their sustainable development activity and to inform their strategic plans going forward.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Assess the challenges and opportunities facing the community development agency and volunteer partnership in positively impacting sustainable community participation, empowerment, and resilience in Ireland.
- Develop and implement impact measurement tools to assess the contribution of the community development agency and volunteers in the delivery of community development activities / initiatives within various geographical contexts.

Supervisors: Dr. Catríona Murphy (TUS), Dr. Shane O'Sullivan (TUS).

HABIC
HAIR AND BEAUTY INDUSTRY CONFEDERATION IRELAND

TUS RISE 024

Industry Partner:
Hair and Beauty Industry Confederation Ireland

Occupational Identification, Stigma, and Self-esteem: Hair and Beauty Industry Perspectives

Introduction

A factor of an individual's social economic status, is occupational prestige – the amount of status accorded to them based on their occupational identify which relate to concepts of occupational stigma and self-esteem. This study seeks to examine and measure low occupational prestige in Ireland's hair and beauty industry and present intervention strategies to mediate the negative impacts of low occupational prestige, stigma, and self-esteem.

Industrial Benefits

Using a multi-approach to develop an assessment framework for measuring perceived low occupational prestige, the study will design intervention strategies to address negative occupational perceptions in the hair and beauty industry.

Key Responsibilities:

- Develop a framework to assess the role of perceived occupational stigma, low occupational prestige and self-esteem in the hair and beauty industry.
- Design intervention strategies to mediate the formation of negative occupational perceptions.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Catríona Murphy (TUS), Dr. Frank Houghton (TUS).

TUS RISE 025

Industry Partner:
Teagasc

Nurturing Nature: The Maternal Role of Cows in the Technological Advancements and Sustainability of the Irish Diary Industry

Introduction

Integrating scientific research into farming practices has significantly influenced global food production, especially amid the escalating challenges of climate change and environmental degradation.

Industrial Benefits

Collaborating with Teagasc and affiliated institutes, the study will produce innovative artwork addressing challenges within the Irish dairy industry. By integrating art into agriculture and science, it will stimulate discussions on sustainable food systems and culture, enriching knowledge production and public interaction at the intersection of art, agriculture, and technology.

Key Responsibilities:

- Create body of artwork that captures the complexity of the Irish dairy sector and the role of the consumer.
- Produce a survey and thesis exploring the experiences of an artistic researcher embedded within a scientific agricultural development agency.
- Develop engagement methods with scientific researchers that encourage creativity. In addition to a public engagement programme to foster understanding and collaboration between research and the public.

Duration: 24 mths

Award: MA

Supervisors: Dr. Ciara Healy (TUS), Dr. Donagh Berry (Teagasc).

DONEGAL YARNS
THE GENUINE DONEGAL

WOVEN IN THE BONE
Artisan cloth made in Scotland

TUS RISE 026

Industry Partner:
Donegal Yarns
Woven in the Bone

'This Will See Me Out'; Localism, Emotional, Longevity and Craft Heritage

Introduction

Innovation from Tradition is a new approach to creative production that includes the past in the creation of present and future opportunities, particularly in terms of new ideas. This project will trace the path back to the values and relationships our ancestors had with nature, and re-imagining this in the fashion and textiles industry today.

Industrial Benefits

In collaboration with Donegal Yarns and Woven in the Bone, research will present a new vision for the future of the industry, while preserving important knowledge about how our ancestors respected and made their clothing in the past, bringing this skill into a contemporary design project and have it recorded for the education of future generations.

Key Responsibilities:

- Explore innovation through tradition, by reconnecting to old values we have lost in the relationship between nature, fashion and textiles.
- Develop new and innovative sustainable practices for the fashion and textile industry, through conducting interviews as cultural probes in rural areas in Ireland and Scotland on age demographic of 60+ .

Duration: 48 mths

Award: PhD

Supervisors: Dr. Adam de Eyto (TUS), Dr. Fiona Woods (TUS), Dr. Else Skjold (Royal Danish Academy).

WRITECH
Fire Protection Engineering

TUS RISE 027

Industry Partner:
Writech Industrial Services

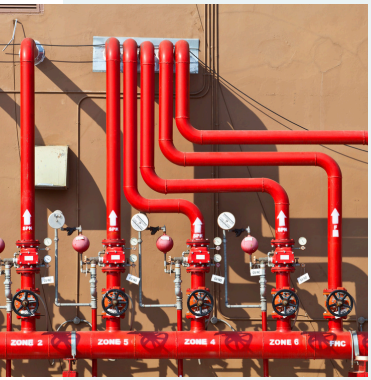
Autonomous Optimisation Framework for Interconnected Network Models within Construction Industry for Industry 4.0

Introduction

The introduction of Industry 4.0 into the construction industry has created enormous growth within smart manufacturing. However, even with this big leap forward there has been very little development towards the automation of the design process.

Industrial Benefits

This project will consider a use case, in which data received from real construction models (buildings) is used in conjunction with a data-driven workflow modelling system, to automate the insertion of sprinkler piping and wiring into those models. If successful, the research itself could play a key role in 3D CAD software design, reducing manufacturing waste and improving performance.



Duration: 48 mths

Award: PhD

Key Responsibilities:

- Investigate if it is possible to automate the process of inserting 3D network models such as plumbing/sprinklers/ducting/wiring into empty 3D architectural models using a generalised AI based 'engine'.
- Create a realistic design environment, where the effect of changing the building model requires a response from the network model.

Supervisors: Dr. Roger Young (TUS), Dr. Peter Vargovcik (TUS).

EVA INTERNATIONAL
IRELAND'S BIENNIAL

TUS RISE 028

Industry Partner:
Eva International

Unveiling Artistic Dynamics: A Study of Local and Global Assemblages in Limerick City

Introduction

By focusing on two active case studies, this research will explore the intricate interplay between the international and local artistic scenes in Limerick City, through the lens of assemblage thinking.

Industrial Benefits

Research will gain a practical understanding of the role of curators in Limerick and how they operate as an emergent presence in the current context of the city. Addressing the gap in knowledge and contributing to a more comprehensive awareness of contemporary art practices. It will offer practical insighs informing policy-making and strategic planning within the arts sector.

Duration: 24 mths

Award: MA

Key Responsibilities:

- Investigate the operational dynamics and challenges faced by emergent curators in Limerick.
- Examine the relationship between the local art scene and an international art institution in the same city.
- Analyse the interactions and dependencies between the local art scene and an international art institution.
- Explore the impact of socio-economic factors on the sustainability and growth of the local art scene.

Supervisors: Dr. Michael McLoughlin (TUS), Dr. Tracy Fahey (TUS).

Comhairle Cathrach & Contae Luimnigh
Limerick City & County Council

TUS RISE 029

Industry Partner:
Limerick City and County Council

Embedded Cultural and Curatorial Research Investigation in the context of Limerick City and County Council

Introduction

Achieving milestones towards the greater Limerick cultural strategy, this project will deliver active engagements and contribution towards ongoing events and drivers within the Limerick City and County Council (LCCC), relating to placemaking and the public realm.

Industrial Benefits

In collaboration with LCCC, data will offer sights into new possibilities for cultural development in other regions nationally and internationally.

Duration: 24 mths

Award: MA

Key Responsibilities:

- Examine current cultural placemaking practices within LCCC.
- Explore community engagement in shaping urban spaces and enhancing placemaking initiatives.
- Identify opportunities for improving placemaking strategies through innovative approaches and inclusive community involvement.
- Develop recommendations for LCCC to strengthen its placemaking efforts and foster more vibrant and resilient communities.

Supervisors: Lucina Russell (TUS), Dr. Tracy Fahey (TUS).

TUS RISE 030

Industry Partner:
Animal Health Labs

AMR-Phageout: Bacteriophage Technology in Disrupt Carbapenemase Producing Enterobacteriaceae (CPE) in Slurry for Irish Farms as an Option for Reducing the Spread of Antimicrobial Resistance in Environment

Introduction

As the public health threat of antimicrobial resistance (AMR) reaches a crisis, the future of routine antibiotic use in humans and animals nears an end. The project will test CPE from cattle slurry in Ireland against specific bacteriophages to determine whether phage-based biocontrol could be considered a viable and safe option for reducing the spread of CPE.

Industrial Benefits

Research in this area is expected to directly influence policy on antibiotic development and use, including viable alternatives.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Isolate field strains of CPE from Irish cattle faecal.
- Identify targeted bacteriophages.
- Conduct in vitro testing to assess bacteriophages' effectiveness against CPE.
- Test survival rates and persistence of selected bacteriophages in simulated environmental conditions in vitro.
- Inform the potential of phage-based biocontrol against AMR for future discussions and policy.

Supervisors: Dr. Lisa Murray (TUS), Dr. Cormac O'Shea (TUS).

TUS RISE 031

Industry Partner:
National Cancer Control Programme
UCD Cancer Trials Cluster

The Implementation and Evaluation of a Physical Activity Model of Care within Irish Clinical Cancer Care

Introduction

Regular exercise can significantly reduce cancer recurrence, improve rates of survival and help in the management of treatment-related side-effects. Despite this, physical activity (PA) promotion within cancer care is limited. This project seeks to address this by testing a PA model of care (PAMoC) that could be integrated into Ireland's routine cancer care pathway.

Industrial Benefits

Results from this study will be used to refine the model which will be implemented and evaluated as part of a larger effectiveness trial in future research. Upon which the model would have the potential to be integrated into routine cancer care in Ireland.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Seek consensus from key stakeholders regarding how a PAMoC can be adapted to support its effective integration into Irish clinical cancer care.
- Conduct a study in a hospital setting which adopts a two arm non-randomised comparison design to assess the feasibility of the PAMoC.

Supervisors: Dr. Mairéad Cantwell (TUS), Prof. Niall Moyna (DCU).

Offaly Local Development Company

TUS RISE 032

Industry Partner:
Offaly Local Development Company

Planting the Seeds: An Analysis of how Productive Green Space Social Enterprises Contribute to Promoting Social Inclusion, Sustainable Practices, and Community Wellbeing.

Introduction

Rooted in local development and playing an important role employing those most removed from the labour market, both spatially and socially, social enterprises can address societal shortfalls in sustainability and wellbeing practices.

Industrial Benefits

Research will explore the synergies between social enterprise, productive green space and the wellbeing of communities across Offaly, serving as a benchmark for further implementation.

Duration: 48 mths

Award: PhD

Key Responsibilities:

- Increase awareness of green space benefits within certain cohorts of the population in Offaly.
- Establish productive green space social enterprises, or community gardens, as conduits for community sustainability and wellbeing.
- Develop a code of practice and operational guidelines for social enterprises generating trading income from the management of productive green space, based on best practice and research.

Supervisors: Dr. Shane O'Sullivan (TUS), Dr. Marie Taylor (TUS).

TUS RISE 033

Industry Partner:
Cavan Sports Partnership

The Development, Implementation and Evaluation of a Teen Dance Programme Incorporating Irish Dance for Adolescent Girls in both a Rural and Urban Setting.

Introduction

Worldwide and in Ireland, there remains a significant imbalance between male and female youth and their participation in sport and physical activity.

Industrial Benefits

This research study aims to tackle the low levels of physical activity participation among adolescent girls by developing and assessing the feasibility, acceptability and initial effectiveness of a Teen Dance program that incorporates the 8 principles for success outlined in the Adolescent Girls Get Active Report.

Key Responsibilities:

- Develop and lead a dance programme, creating an environment where girls feel no pressure to perform, but simply be active.
- Invoke a sense of exhilaration, experience a sense of achievement. Establish an image of sport that simply never existed for young adolescent girls.

Duration: 48 mths

Award: PhD

Supervisors: : Dr. Clare McDermott (TUS), Dr. Fiona Skelly (TUS), Dr. Aoife Lane (TUS).

TUS RISE 034

Industry Partner:
Cork GAA

A Performance Centred Approach to Monitoring and Reducing Hamstrung Injury Risk in GAA

Introduction

Sprinting is a key factor when determining performance in team sports, and is associated with both successful attacking and defensive play. However, sprinting also appears to be a predominant injury mechanism, accounting for ~70 % of hamstring strain injuries in elite Gaelic Football. This project aims to examine the implementation of a novel injury monitoring and prevention intervention in Cork GAA.

Industrial Benefits

Through regular observation and tracking, this project will implement a novel system of monthly monitoring of sprint characteristics, with the goal of using the information to implement injury prevention strategies.

Key Responsibilities:

- Develop and establish a robust injury monitoring process.
- Provision of regular data to Cork GAA in a user friendly structure.
- Continue engagement with Cork GAA to improve sprint performance and reduce hamstring injury occurrence.

Duration: 48 mths

Award: PhD

Supervisors: Dr. Ciarán Ó Catháin (TUS), Dr. David Kelly (TUS), Dr. Robin Healy (TUS), Dr. Siobhan O'Connor (DCU), Dr. Niamh Ni Cheilleachair (TUS).

TUS RISE

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Tionól Réigiúnach an Deiscirt
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HEA HIGHER EDUCATION AUTHORITY
AN ÚDARÁS UM ARD-OIDEACHAS

Let's get in touch

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