



GMIT

INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY - MAYO INSTITUTE OF TECHNOLOGY

Research and Innovation Strategic Endowment (RISE) Scholarships

2021 Call for Applications
and Guidelines



Galway-Mayo Institute of Technology invites applications for postgraduate research degrees at both Masters and PhD levels under its Research & Innovation Strategic Endowment (RISE) Scholarships.

The purpose of these scholarships is to undertake innovative, applied research to educate students, to develop talent and to enhance the economic, social and cultural wellbeing of our region. They will stimulate internal collaboration and enhance external cooperation with GMIT's prospective Technology University partners, industry, agencies and non-governmental organisations.



12 research scholarships are being offered across a number of disciplines to commence in 2021.

PROJECT AWARDS WILL INCLUDE:

- A student stipend (usually tax-exempt) valued at €15,000 per annum¹
- Annual waivers of postgraduate registration fees²
- Support for travel, consumables and dissemination expenses³

¹ Stipend instalments of €1,250 per month will be paid to fund the living costs of the postgraduate research student for a maximum of 24 months (Masters projects) or 36 months (PhD projects).

² Fee waivers will be partial for non-EU candidates. See the General Conditions of the Awards for details.

³ Funds for travel, consumables and dissemination expenses will be €2,000 (Masters projects) or €3,000 (PhD projects).



Marine & Freshwater Research Centre
Department of Natural Sciences
GMT, Galway Campus, Dublin Road, Galway.



For further details, contact:

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Project 1: PhD Aquatic Science

Project Title: Defining the role of seaweed aquaculture in marine biodiversity and ecosystem functioning

Project Description: Seaweed aquaculture is rapidly developing in Europe, boosting the Blue Biotechnology Economy (BBE). However, the industry is in its infancy with a need for streamlining and upscaling to satisfy market demands. In Ireland, for example, there were only three licenses in place for seaweed aquaculture in 2016 and, currently, the country lacks a specific regulatory framework to assess potential interactions with local ecosystems in the site selection process. Seaweed aquaculture could provide more environmentally friendly and socially acceptable alternatives to damaging and controversial wild harvesting methods e.g. mechanical harvesting, and potentially aid the recovery of impacted ecosystems. However, the evidence to support such an approach is lacking and restricted to a few desk-based studies. The proposed project will build up on previous field and laboratory investigations by the primary supervisor in collaboration with EU partners to quantify the effect of kelp aquaculture on marine ecosystems, especially their impacts on benthic communities, their role in food webs and as biodiversity reservoirs and nursery habitats for fish. This project will determine and quantify the interactions and the level of monitoring necessary to bring clarity to the licensing process and allow orderly upscaling in partnership with the seaweed aquaculture industry in collaboration with European partners.

Relevant Qualification Disciplines:

Biology; Zoology; Ecology; Environmental Science, or a related discipline.



Marine & Freshwater Research Centre
Department of Natural Sciences
GIT, Galway Campus, Dublin Road, Galway.



Project 2: PhD Aquatic Science

Project Title: An epidemiological study of reservoirs for avian influenza A viruses in Ireland

Project Description: Globally, avian influenza A viruses (AIV) occur naturally in wild waterbirds with potential for spillover to other birds, domestic poultry and humans. Therefore, these viruses pose risks to poultry production and public health. In Ireland, there is active surveillance for AIV in poultry farms and passive surveillance of wild birds reported sick or dead, however our knowledge of AIV ecology is limited. Wild waterbirds provide pathways of transmission and Ireland's position within a migratory flyway presents an opportunity for viral transmission to resident bird species and farmed poultry. Ireland, as with other counties, has seen multiannual incidents of AIV and while poultry farms carry out a range of biosecurity measures to reduce wildlife interactions, it is extremely challenging to eliminate AIV risks entirely. This project will investigate the interactions between waterbirds and domestic poultry. Waterbird diversity and abundance will be examined. Environmental and wildlife samples will be screened for AIV to examine potential reservoirs of AIV and the risks for AIV exposure in Ireland. Project outcomes will inform ongoing management of the economic and health related risks of AIV both within Europe and across the globe.

For further details, contact:

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Relevant Qualification Disciplines:

Biology; Zoology; Ecology; Environmental Science, or a related discipline.



Marine & Freshwater Research Centre
Department of Natural Sciences
GIT, Galway Campus, Dublin Road, Galway.



Project 3: PhD Aquatic Science

Project Title: Disentangling genetic structure and adaptive potential of mussels (*Mytilus* spp) in Irish waters to understand native vs invasive species dynamics and enable sustainable seafood production

Project Description: The blue mussel (*Mytilus edulis*) is an ecologically and economically important marine bivalve that plays key roles in coastal ecosystems as well as the seafood industry. This species is found around the entire Irish coast, where it co-occurs and hybridizes with the non-indigenous Mediterranean mussel (*Mytilus galloprovincialis*). Understanding population structure within species and the extent of hybridization between species are critical aspects for assessing the impact of invasive species on native stocks. Furthermore, elucidating the underlying ability to respond to changes in environmental and climatic conditions (adaptive potential) of distinct species and stocks is key to formulate accurate predictions in view of climate change as well as future aquaculture practices. Thus, the main aim of this PhD project is to train a strong PhD candidate while significantly advancing knowledge on genetic structure and adaptive potential of *Mytilus* species in Irish waters. The work will be structured in Work Packages focusing on soft skills development such as project management and dissemination of findings, and state-of-the-art molecular and ecological techniques, including population structure, hybridization and adaptation / performance studies. This research will provide essential data on marine biological invasions and provide vital baseline information enabling sustainable seafood production.

For further details, contact:

Dr Luca Mirimin

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Relevant Qualification Disciplines:

Biology; Zoology; Ecology; Environmental Science, or a related discipline.

Department of Sport, Exercise & Nutrition GMIT, Galway Campus, Dublin Road, Galway.



Project 4: MSc Natural Sciences

Project Title: Uncovering an epidemic? Validation of RTP (return to play) protocols for concussion in female sports

Project Description: Concussions are difficult to diagnose. Unlike a visible injury such as a fracture or sprain, these mild forms of traumatic brain injuries are invisible brain “deficits” that don’t normally show up on CT scans or MRIs. This means that many concussions may be both under-reported and undiagnosed. While concussion in sport has gained more research interest over the last few years, the majority of reported research is from studies focused on male participants only. Female athletes experience concussion differently from their male counterparts, the reasons for this are not clear. Recent research suggests that female athletes are not only more likely to sustain a concussion in any given sport; they also tend to have more severe symptoms, and to take longer to recover. Given that many female sports are played at an amateur level only, many concussions in female athletes are currently undiagnosed as there is no expertise on the sideline or medical support team present. This project seeks to investigate concussion knowledge and awareness in female sports and to compare return to play (RTP) protocols across three different female sports (soccer, gaelic football and rugby). The project also seeks to validate a new objective measure of concussion (Eye Guide) against current RTP protocols in female sport.

For further details, contact:

Dr Lisa Ryan

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Relevant Qualification Disciplines:

Sports Science; Biomedical Science, or a related discipline.

Department of Natural Sciences GMIT, Galway Campus, Dublin Road, Galway.



For further details, contact:

Dr Éadaoin Tyrrell

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Project 5: MSc Natural Sciences

Project Title: The Effects of Ignitable Liquids on the Pyrolysis Profiles of Common Polymers and Resulting Implications for Forensic Investigations of Fires

Project Description: Analysis of debris from the scenes of fires is a well-established, if troubled, practice in forensic investigation. One form of analysis is examination for the presence of remaining traces of ignitable liquids (ILs). During the course of a fire, incomplete combustion occurs, and traces of ignitable liquid may remain if it was present during the fire. During incomplete combustion a process called pyrolysis also occurs – the breakdown of material in the absence of oxygen. This is also known to produce traces of ignitable liquids and it is recognised that they must be identified during analysis of the debris material to exclude them from evidence. Currently this practice is carried out through separate analysis of background materials and ignitable liquids. This practice has been shown inadequate during preliminary investigations by the supervisory team. Certain classes of ignitable liquids react with common polymers and produce a profile of products which is not additive of the pyrolysis products from materials in separation which can lead to incorrect conclusions about the presence of ILs during investigation. This project will elucidate these interactions and improve current understanding of IL residue analysis of fires. The results will inform future and retrospective examination of fire scene evidence.

Relevant Qualification Disciplines:

Forensic Science; Analytical Chemistry, or a related discipline.

Department of Biopharmaceutical
& Medical Science
GMIT, Galway Campus, Dublin Road, Galway.



For further details, contact:

Dr Orla Slattery

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Project 6: MSc Biopharmaceutical & Medical Science

Project Title: An Analysis of the Expression of Recombinant Atlantic Salmon β -Defensin Antimicrobial Peptides in Yeast

Project Description: One of the greatest challenges that face both humans and animals is the growing emergence of antimicrobial resistance. Alternative treatments are the much-needed focus of recent research. Antimicrobial peptides (AMPs) are molecules produced by almost all living organisms as part of their first line of defence against pathogens. These AMPs have been shown to be potent killers of bacteria, viruses, fungi and parasites. Isolating them from native sources is time consuming and does not yield high quantities. Producing them recombinantly (i.e. in alternative host cells) using recombinant DNA technology can produce high quantities of fully functional peptides for the purposes of characterisation and eventual commercial production. However, finding the correct host cell is critical to the success of the production process. This project aims to explore the production of novel marine AMPs from Atlantic salmon in baker's yeast (*Saccharomyces cerevisiae*). The supervisory team will combine their experience in recombinant AMP production, protein functional characterisation and yeast molecular biology to fully evaluate the aforementioned approach for AMP production as well as establishing recombinant protein production protocols in GMIT that will be of benefit to the larger research community in the Institute.

Relevant Qualification Disciplines:

Biomedical Science; Biotechnology, or a related discipline.

Department of Biopharmaceutical
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GMIT, Galway Campus, Dublin Road, Galway.



For further details, contact:

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Project 7: MSc Biopharmaceutical & Medical Science

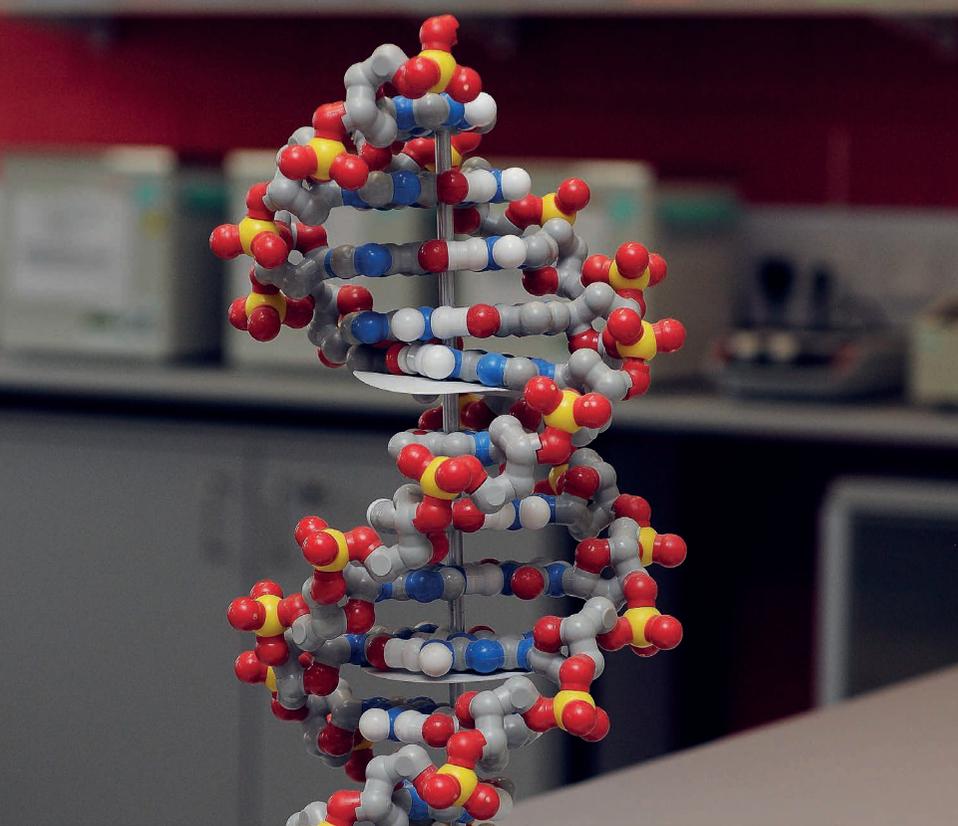
Project Title: Characterisation of interactions at the thrombus-endothelial interface that affect endovascular interventions in AIS

Project Description: Acute ischaemic stroke (AIS) is caused by the sudden blockage of the blood vessels supplying the brain, caused by a thrombus/clot. The current approach to the treatment of AIS includes the use of a thrombolytic (clot bursting) drug and/or mechanical thrombectomy. Stent retrievers (mechanical thrombectomy) are the device of choice for treating AIS. This type of treatment however is not without its limitations. One of the difficulties associated with attempts to remove the clot by mechanical thrombectomy is the resistance of some clots to removal; multiple attempts may be required before successful removal. The reasons for this are unclear but may be related to the composition of the clot as well as interactions that occur between the blood vessel wall and the clot. To date there appears to be a lack of understanding of the interactions that occur between the clot and the blood vessel wall. These interactions may be influenced by either the composition of the clot itself or by the state of activation of the endothelium (vessel wall) at the site of the blockage in the brain. This study will examine vessel wall-thrombus interactions that contribute to clot adhesion using previously described clot replicates developed by the investigators of this project.

Relevant Qualification Disciplines:

Biomedical Science or a related discipline.

Department of Biopharmaceutical
& Medical Science
GMIT, Galway Campus, Dublin Road, Galway.



Project 8: MSc Biopharmaceutical & Medical Science

Project Title: Outcome of acute psychosis and its relationship with cytokines and neurotrophins

Project Description: Psychosis is a common symptom of many psychiatric and neurological disorders. Symptoms of psychosis include delusions, hallucinations and disorders of thought. Cytokines are cell signalling molecules that function to regulate immunity and inflammation. There is increasing evidence that inflammation plays a role in the pathophysiology of psychosis and especially in cognitive function during the psychotic episode. In support of this hypothesis, altered expression of several inflammatory markers have been reported in patients with psychosis, however their precise role or function is currently unknown. This project aims to determine the levels of selected cytokines and other inflammatory markers in patient serum samples during a longitudinal study using advanced biochemical techniques. Inflammatory biomarker assay development, optimisation and validation will also be conducted. Data from this project will lead to the identification of a set of biological markers predictive of recovery from cognitive deficits in acute psychosis.

For further details, contact:

Dr Karen Finn

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Relevant Qualification Disciplines:

Biomedical Science; Biotechnology, or a related discipline.

Department of Computer Science
& Applied Physics
GMIT, Galway Campus, Dublin Road, Galway.



For further details, contact:

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Project 9: MSc Computing

Project Title: Application of Machine Learning Algorithms & Mathematical Modelling to Optimise CUA Learning Analytics

Project Description: This research will investigate how machine learning algorithms and mathematical modelling can enable digital and learning transformation in Higher Education by identifying the factors affecting learner's success. There are two aspects to this project, (1) data mining and analysis and (2) visualization and insights. This project will extend the field of Learning Analytics (LA) by performing sophisticated analysis of learners' engagement in our interconnected learning environments. Establishing a protocol for assessing and relating student data will transform data to information, facilitating the second part of the project: visualization and insights. In this part, the project will quantitatively explore non-linear relationships between factors affecting student success. Using anonymised historical data, this project will apply machine learning algorithms to develop models to predict a student success score and identify factors contributing to student success. Machine learning algorithms can then be applied on a multi campus level (CUA partners) with real time data monitoring to allow for identification of trends and optimisation of resource allocation. The adoption of a data-science approach enhanced by machine learning, will offer stakeholders greater insight, enhance student engagement improving student outcomes, and facilitate operational improvements through real time access to key performance indicators.

Relevant Qualification Disciplines:

Computing; Mathematics; Statistics, or a related discipline.



Project 10: PhD in Machine Learning for Biomedical Application

Project Title: Predicting clinical outcomes for treated stroke cases using Deep Learning Techniques

Project Description: This PhD project has a cross cutting disciplinary nature. It aims to develop PhD project has the cross cutting disciplinary nature aims to develop and apply a deep learning algorithm to assist in predicting the clinical outcomes for treated stroke cases. Randomized control trials (RCT) can be limited when assessing the next generation of medical devices due to the length of time and associated costs. The introduction of machine learning can improve the surveillance of medical devices and lead to profound changes in the practice of running clinical trials. Medically acquired data is inherently unbalanced and require deep learning networks to address this. Therefore, there is a need for virtual studies using more advanced computational algorithms. 200 acute stroke treated cases from various medical centres in Europe will be made available through international collaboration. This data consists of a simple CT scan with a resolution 512x512x 40 data points (>10 Mln) and size of 1-4 GB per case. This data will be mapped to new representations and used to make predictions using deep learning algorithms. Deep learning algorithms have been effectively applied in many fields and have outperformed many machine learning methods. They are particularly suitable to counteract class imbalance problem through augmentation and non-linear data representation. All code will be developed using Python deep learning frameworks and libraries.

For further details, contact:

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Relevant Qualification Disciplines:

Computing; Mathematics; Statistics, or a related discipline.

Department of Enterprise & Technology
School of Business
GMIT, Galway Campus, Dublin Road, Galway.



Project 11: MSc Economics

Project Title: Analysis of product traceability in the fishery value chain: A case study from Ireland

Project Description: Consumer demand for fish and fish products in Ireland has experienced strong growth for decades. This trend in consumption has been accompanied by an increasing demand for information on the sustainability of the fish consumers are buying, in terms of origin and preservation status along the fish supply chain. Seafood producers need to take action to address increasing consumer demands and trust issues. Blockchain technology has been proposed as a suitable tool to facilitate this, by registering all chain activities in a distributed, transparent, secure and trustful manner. The objective of this research is to investigate seafood traceability in Ireland in a holistic manner, by outlining the different perspectives and opinions of all fish supply chain stakeholders and by identifying the factors that determine the adoption of a blockchain enabled sustainable seafood standard traceability system. A lack of mature and profitable business models is currently hampering the adoption of blockchain technologies along the food supply chain. This research will examine the potential business model value that can be derived by fish supply chain stakeholders. Specifically, companies are struggling to develop horizontal multi-party business models which leverage the interoperable and open nature of block-chain technologies this research will investigate how real time data which is under-pinned by blockchain technologies can be integrated securely and anonymously across the fish supply chain.

Relevant Qualification Disciplines:

Business; Commerce; Computing, or a related discipline.

For further details, contact:

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Department of Creative Education
School of Design and Creative Arts
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Project 12: MSc Education (Social Sciences)

Project Title: Framework for Action Research on School Placement (FARSP)

Project Description: In recent years, the Teaching Council (TC) has driven significant reform in teacher education, not least in the area of School Placement; the reform has included embedding practitioner research within School Placement. The TC roadmap for practitioner-based teaching, is promoted by CROÍ, and is firmly based on a model of a mutually beneficial HEI-school partnership. This study proposes to develop a model of practitioner research, based on a mutually beneficial, collaborative research framework, for design and technical education. Furthermore, since School Placement occurs over four years, an incremental and sustainable delivery of practitioner research will be an output from this study. This research will critique models of practitioner/action research by pre-service teachers, internationally, and include original primary research with 10 partner schools in the field of design and technical education. The output of the research will be a best practice School Placement Practitioner-Research Model for GMIT pre-service teachers, developed in consultation with all stakeholders, and underpinned by a philosophy of mutual benefit. Members of the research supervisory panel include education experts from NUI Galway and partnering post-primary schools.

Relevant Qualification Disciplines:

Education, or a related discipline.

PLEASE NOTE:

Candidates from outside the EU are eligible to apply but may be expected to provide evidence of sources of additional funds to cover excesses associated with Non-EU fees.

If either English or Irish is not the applicant's first language, evidence of English language proficiency is required for registration.

Please refer to web link:

[English Language Requirements | GMIT](#)
to view the minimum English language proficiency standards for entry to GMIT.

Requirements / Qualifications:

An Honours Degree (minimum 2.2, but 2.1 or higher is desirable) in the relevant disciplines listed beneath each project description.

Project Duration:

36 months (PhD) / 24 months (Masters)

Applications to **ResearchOffice@gmit.ie** only using the application form which incorporates the following items:

- Curriculum Vitae (to include 2 referees)
- a copy of transcript of results and
- a two-page Personal Statement that should explain:
 - How you meet the requirements of the position
 - Why you would like to pursue this PhD / Masters research programme

Please collate all documents to be submitted into a single Word or PDF file.

Application Form / Terms of Conditions can be obtained on the website:

<https://www.gmit.ie/research/research-vacancies>

The closing date for receipt of applications is **12 noon, (GMT)**
Wednesday, 7th April 2021.