

# UCD Diabetes Complications Research Centre Newsletter



2023 (January – June)



## Note from the DCRC Director

Dear Colleagues

It is great to have an opportunity to reflect on our consolidated achievements over the past 6 months. After the dismal days of the pandemic, it is fantastic to see momentum gathering new collaborations, publications, innovations and careers developing.

Congratulations are due to Professor Helen Roche on her appointment as UCD Vice President for Research, Innovation and Impact. It is wonderful to welcome new graduate students to the various groups at the DCRC and to note the progress of others as they complete their PhD research. You can read more about our new students, new graduates, research fellows and the many awards received thus far this year in this newsletter. Sincere thanks to Dr Martina Gogarty for its delivery. In a global context these are most exciting times with cellular therapeutics for  $\beta$ -cell replacement in diabetes in Phase 1/2 trials, the enhanced efficacy of anti-obesity medications becoming apparent and the renal and cardiovascular protection afforded by 'newer' treatments.



Ad Astra!  
Catherine

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## DCRC Runner-up in UCD Impact Case Study Competition

In January, the DCRC was a runner-up in UCD's Impact Case Study Competition with the study "*Changing the guidelines for treating type 2 diabetes*". The study was led by Prof Carel le Roux with Dr Werd Al-Najim, Prof Helen Heneghan and Prof Catherine Godson.

The study "*found that double-digit intentional weight loss (i.e., of more than 10%) can disrupt type 2 diabetes and even place it in remission*", The teams work "*highlighted how this substantial and intentional weight loss can now readily be achieved without asking patients to undergo major lifestyle changes, but rather by focusing on obesity as a biological disease that can be addressed by modern pharmaceutical and surgical therapies. This laid the foundation for more effective treatments, such as semaglutide and tirzepatide, to be developed and tested.*"

More information on the case study can be found at

<https://www.ucd.ie/research/impact/casestudies/changingtheguidelinesfortreatingtype2diabetes/>

## Prof Catherine Godson appointed Associate Dean for Research, Innovation & Impact Appointment

In February, Prof Catherine Godson was appointed Associate Dean for Research, Innovation & Impact, UCD School of Medicine. Prof Godson will take up her appointment for one year with Prof Cormac Taylor serving as deputy, following which the roles will reverse.



## Dr Clare Reynolds awarded Mid-Career Researcher Prize

In March, Dr Clare Reynolds received a Mid-Career Researcher Prize from the Experimental Physiology Journal. The award recognises "*mid-career researchers, a demographic soon to be the leaders of their respective fields in physiology*". As part of the award, Clare has been invited to submit a review article to the journal.







In March, Dr Shane Clerkin (Crean lab) defended his PhD thesis *“Tuneable Biophysical Hydrogel Scaffolds for Biomedicine: The Development of Designer Matrices for the Derivation of Stem Cell-Derived Kidney Organoids”*.



### UCD’s Rising Stars

In March, Dr Monica de Gaetano was named one of UCD Institute of Discovery’s Rising Stars. The Rising Stars Programme highlights and promotes exceptional early career researchers working within interdisciplinary fields. Monica spoke about how *“Atherosclerosis is the silent killer of the 21st century”* on the Rising Stars podcast.

*Monica said: “I felt really honoured and very proud to feature among the Rising Stars of UCD for the ‘Discovery & Innovation’ programme. This has been my very first time I was interviewed for a podcast in a real recording studio: it has been such an amazing experience, both at personal and professional level, giving me the opportunity to speak on a microphone about things I am passionate about and what I like of my job. I was also glad to share my career development history and research activity up-to-date and beyond, by also talking about my brand-new team and future plans”.*

The podcast is available at:

<https://www.ucd.ie/discovery/risingstars/atherosclerosisisthesilentkillerofthe21stcentury.html>





In April, Dr Niall Treacy (Crean lab) defended his PhD thesis “*The Growth and Differentiation of Human Induced Pluripotent Stem Cell-Derived Kidney Organoids Within Self-Assembling Peptide Hydrogels*”.

## UCD Student Medical Journal’s 2023 Image Competition Winner



In April, Ms. Mariam Marai’s image “*Broken Hearts: Investigating diabetic fibrosis in mice heart*” won UCD’s Student Medical Journal’s (SMJ) 2023 Image Competition. Mariam is a PhD student with Prof Catherine Godson and Dr Eoin Brennan. Mariam is pictured with the 10th edition of the SMJ where her image graced the front cover.

Figure legend: Photo of fibrosis in mice heart. Picosirius red staining on 4  $\mu$ M fixed section of ApoE<sup>-/-</sup> diabetic mice heart (myocardium). This image was acquired using 4X/0.2 Plan Apo objective on a Nikon E80i polarized light microscope at 90 degrees and a Canon EOS 600D digital camera.







### Congratulations to Dr James White on his Thesis Defense

Dr James White joined Assoc Prof Neil Docherty's group in September 2019. His PhD thesis "*Characterisation of Changes in the Adipose Tissue Proteome in Pre-clinical and Clinical Studies of Surgical and Medical Approaches to Obesity Therapy*" was submitted in March of this year. James defended his thesis on 2<sup>nd</sup> June and celebrated his success with family, friends, and colleagues in the UCD Conway Institute. James is pictured with his proud parents.

Highlights of James's research included being part of a collaboration with the University of Helsinki, where he undertook a unique and comprehensive assessment of changes in the human adipose tissue proteome arising subsequent to bariatric surgery.

Neil said: "*James was a meticulous and dedicated team member who balanced delivering first class laboratory work, alongside providing excellence in teaching as an Anatomy Demonstrator. James was also a leading light in GRAM, the School of Medicine Postgraduate Research Association and also made a huge contribution to science communication initiatives at The UCD Conway Institute.*"

### Prof Helen Roche appointed UCD Vice-President for Research, Impact and Innovation



Congratulations to Prof Helen Roche on her appointment as Vice-President for Research, Innovation and Impact on an interim basis. Prof Roche took up her new position in May. In addition to being a DCRC PI Prof Roche is Director of the UCD Conway Institute, and Full Professor Nutrigenomics (Nutrition & Omics) at the UCD School of Public Health, Physiotherapy and Sports Science. All Prof Roches DCRC colleagues wish her the very best in her new role.

President of UCD, Prof Orla Feeley said: *"I am very proud of the achievements UCD has made in research, impact and innovation. And I am delighted to have Professor Helen Roche take up the role of interim Vice-President for this portfolio. Helen has all of the attributes we seek in research leadership. She is a scholar and principal investigator of international renown in an area of global need. She understands the research arena and places a strong emphasis on supporting early career academics. And she connects with society so that her own expertise is shared for the wider good."*

### Prof Catherine Godson appointed to Board of the Medical Council

In June, following a nomination from the Royal Irish Academy Prof Catherine Godson was appointed to the Board of the Medical Council by the Minister for Health, Stephen Donnelly.





# UCD Ad Astra Research Fellows

The DCRC has welcomed five Ad Astra Fellows since the inception of the program in 2019. Here some of these exceptional researchers tell us about their background and ongoing research within the DCRC.

## UCD Ad Astra Fellow Dr Eoin Brennan

I am an Ad Astra Assistant Professor in the UCD Diabetes Complications Research Centre, School of Medicine. I graduated from University College Cork in 2004 with an honours degree in Genetics and in 2008 completed my PhD at Queen's University Belfast, studying the genetic and epigenetic mechanisms of diabetic kidney disease. In 2009, I moved to the UCD Diabetes Complications Research Centre to study the genetics and signalling pathways implicated in diabetes and microvascular complications of diabetes. In 2014 I was awarded an ELEVATE Marie Curie Fellowship to continue my research at the Baker IDI Heart and Diabetes Institute, Melbourne, Australia. During this time, I investigated endogenous lipids and non-coding RNA therapeutics in complications of Diabetes. In 2018 I established my research group at UCD. We are interested in understanding the complex mechanisms underpinning the pathophysiology of diabetes-associated vascular complications, and the development of novel therapies targeting these complications. These represent significant burdens on individuals with long-standing diabetes mellitus.

Ongoing research projects in my group include:

***Dark-side of the genome: non-coding RNA drivers in CVD.*** An estimated 97% of the human genome consists of non-protein-coding sequences. For many decades, this genetic 'dark matter' was written off as junk sequence. However, a major shift in our understanding of genome regulation has emerged. This has led to the characterization of a diverse array of non-coding RNA (ncRNA) genes. We are now beginning to unravel the role of ncRNAs as important regulators of pathophysiological cellular effects in CVD. My lab is interested in mapping global coding/non-coding RNA responses in human carotid plaque lesions and investigating the role of ncRNA genes in modulating vascular smooth muscle



cell plasticity, a key pathogenic driver of atherosclerosis.

***GENIE Consortium: unravelling the genetics of diabetic nephropathy (DN).*** Inherited variation in DNA sequence contributes to individual risk of DN. In a global collaboration, we founded the GENetics of Nephropathy—an International Effort (GENIE) consortium, which discovered several associations with DN. Our group is using cell models, human stem cell-derived kidney organoids and *in vivo* model organisms such as zebrafish to understand how these genes contribute to DN.

***Development FPR2 agonists targeting vascular complications of diabetes.*** In collaboration with Prof Catherine Godson (UCD School of Medicine) and Prof Patrick Guiry (UCD School of Chemistry) we have designed and tested a series of pro-resolving medicines called synthetic lipoxin mimetics (sLXMs), which act to suppress the inflammatory response. Our findings, and those of our international network of collaborators have demonstrated a potentially important therapeutic role for sLXMs in targeting inflammatory disorders

## UCD Ad Astra Fellow Dr Monica de Gaetano

I am an Assistant Professor in the School of Biomolecular & Biomedical Science, based at UCD Conway Institute. My growing team is currently hosting a SFI Pathway-funded PhD student, with a new Ad Astra-funded PhD student starting soon. My education comprises a BSc (Hons) in Pharmaceutical Chemistry ('La Sapienza', Italy). I then moved to Ireland to pursue a PhD in Molecular Biology at UCD, followed by a 6-years postdoctoral training to study the Macrovascular Complications of Diabetes, at the UCD DCRC, where I am a new PI. During this time, I was awarded a 2-years postdoctoral fellowship from the IRC/Government of Ireland.

My research focuses on investigating pathogenetic and regressive mechanisms of coronary artery diseases. The inflammatory component of such multifactorial diseases is the key-aspect of my investigations, which aims to elucidate how to prevent, pre-empt or regress established atherosclerosis (an inflammatory and dyslipidemic condition characterising the major arteries and underlying the majority of cardiovascular diseases) by tackling the so-called 'residual inflammatory risk', by combining gold-standard therapies with novel pro-resolving agents.

**What got you interested in being a researcher?** My family history of diabetes and associated-cardiovascular complications has always driven my passion for such an important health-related topic, with a vision towards personalized interventions, for better care and quality-of-life of patients.

**Why is your research important?** It is currently estimated that approximately 500 million people worldwide are affected by diabetes (of which almost 300,000 are in Ireland) and the global figure will rise to about 700 million, in just 20-years time. And if we include also those affected by the complications of diabetes (mainly affecting the cardiovascular system, the kidney, and the retina), those figures are passing the billion of people around the globe, thus having a huge economical impact and enormous societal burden.

**What are the challenges in your research area?** Atherosclerosis is a "silent killer", because it generally remains asymptomatic for decades while developing, until becoming clinically evident only during the 5<sup>th</sup> or 6<sup>th</sup> decade of life.



Unfortunately, there is no current treatment that would reverse the development of a pre-established atherosclerotic plaque (accumulated lipids and cell debris in the vessel wall), BUT there is evidence from research demonstrating that the "regression of a plaque" is actually possible to achieve, reducing plaque size and the associated-inflammatory burden. Such regression mimics the mechanisms that normally our body activates to simply fight against a cold, clearing the inflammatory trigger. Over the last couple of decades, these homeostatic mechanisms have been observed, and it has been shown that they are governed by a series of small molecules, which our body produces to physiologically resolve inflammation. We are now aiming to mimic the action of such small molecules in a pathologic cardiovascular context.

**How will/has the Ad-Astra Fellowship help(ed) your career?** The past year, becoming both an academic and a PI, has been challenging, yet extremely exciting and massively rewarding, finally harvesting what has been seeded and nurtured during over a decade of training!

The Ad Astra fellowship scheme is an incredible springboard towards achieving independence and leadership in your own research-field, providing financial resources, access to state-of-the-art facilities, a PhD scholarship and unique career-development opportunities, as well as the possibility to teach what you are passionate about and are researching on (in my case *Cardiovascular Pharmacology*) through the highly research-driven teaching as Assistant Professor at UCD.



## UCD Ad Astra Fellow Dr Clare Reynolds

### What got you interested in being a researcher?

Growing up in rural Ireland provided plenty of opportunities to explore nature and spark an interest in science. My Dad worked in the local mine and would bring home cores with fossils and mineral deposits which got me interested in the natural world. Growing up in the countryside and being emersed in nature (from collecting frogspawn to watching cows calve) was enough to get me hooked on biological science from an early age.

Getting involved in developmental programming research was a bit more accidental. While researching the role of inflammation on the pathogenesis of insulin resistance and diabetes in Prof Roches group, I was lucky enough to attend a symposium where Professor David Barker, one of the researchers who originally identified the links between early life and long-term health outcomes, was the main speaker. The DOHaD concept was something I had not encountered prior to this and I was fascinated by the role of developmental exposures on obesity and metabolic disease. As a direct result of this, I moved to the Liggins Institute, Auckland, New Zealand, shifted my research focus and began studying the relationship between maternal diet and obesity mediated inflammation in the offspring.

### Why is your research important?

In the UK and Ireland up to two-thirds of individuals of reproductive age are classified as overweight and obese. Excess adiposity is associated with low-grade chronic inflammation. While the metabolic consequences of increased inflammation are well known, there is now emerging evidence to show that reproductive health, both male and female, can also be impacted, which not only leads to fertility issues but also complications for women during pregnancy which can adversely impact their growing foetus. These developmental responses can then increase the risk for obesity, cardiometabolic disease and other non-communicable diseases in the offspring. My lab focuses on identifying dietary agents (such as artificial sweeteners) which may have an adverse effect on paternal fertility (sperm parameters and offspring outcomes) as well as



maternal/offspring health. We are also interested in examining potential dietary anti-inflammatory strategies that can be implemented either pre-conception or during pregnancy to improve maternal and offspring health in the long-term.

### What challenges are in your research area?

My work is predominantly in the pre-clinical area so a major challenge is finding opportunities to translate our findings to a population/clinical setting. Identifying early life cohort studies with appropriate dietary data to validate what we see in our rodent models.

### How has the Ad-Astra Fellowship helped your career?

The Ad Astra fellowship has enabled me to return to Ireland and establish a new research group focusing on reproduction and developmental programming. Moving back to Ireland has enabled me to establish collaborations with other European researchers (such as Prof Hanna Lagstrom, University of Turku, Finland; Prof Dominique Siguado-Roussel, University of Lyon; Prof Sue Ozanne/Prof Amanda Sferruzi-Perri, University of Cambridge) as well as reestablish networks and collaboration in UCD. Moving back to the Conway has also given me access to support/equipment which has improved the overall quality of my research.

## UCD Ad Astra Fellow Dr Martina Wallace

**Background:** I completed my PhD with Dr. Lorraine Brennan's group here in UCD, in the area of metabolomics-based biomarker discovery in assisted reproductive technologies. In 2013, I joined the lab of Dr. Christian Metallo at University of California San Diego where my work primarily focused on adipose tissue metabolism, and sphingolipid metabolism in a rare eye disease called macular telangiectasia type 2. I came back to UCD as an Assistant Professor in the Nutrition and Food Science section in the School of Agriculture and Food Science in 2020.

**Research:** My general area is focused on how metabolic dysregulation drives dysfunction in adipose and liver in people with obesity and type 2 diabetes. Metabolism has always been an important target for the treatment of obesity related diseases but in the last 15 years with the rapid development of mass spectrometry technology, we now have a much greater understanding of the metabolic network and how diverse metabolites can act as important signaling molecules within the body. The main tools I use for my research are stable isotope tracers and mass spectrometry, along with general molecular biology approaches. The use of stable isotope tracers allows us to understand how the flow of metabolites is changed and identify new nodes of metabolism where we can intervene to improve cell function. The interventions we look at to shape metabolism include pharmacological approaches or targeted nutrition where for example supplementation of particular amino acids can be beneficial. This interest in targeted or personalised nutrition is what brought me back to the Nutrition section in UCD. Our ongoing projects in the lab at the moment are focused on how impaired branched chain amino metabolism increases the propensity for fibrosis development in liver and adipose tissue.



**Challenges and opportunities in my area:** With the advent of single cell technology in RNA sequencing and proteomics, one of the main driving areas in metabolic research is to bring this increased resolution to metabolite measurements. Spatial metabolomics and spatial isotope tracing has made important strides in this area but due to the rapid turnover and chemical heterogeneity of metabolites, this is a really challenging area. In our own work, we are really interested in how shifting metabolic reactions between the cytoplasm and mitochondria impacts cell phenotype and we use metabolites with labels on specific atoms to help distinguish the cellular compartment of these reactions.



# DCRC Research Funding Recipients



## Dr Chris Shannon Award Recipient of The Physiological Society

Dr Chris Shannon received a Research and Knowledge Exchange Award from The Physiological Society for his project *“Role of the mitochondrial pyruvate carrier in diet-induced adipose remodelling.”* This project will investigate how mitochondria shape the (mal)adaptive responses to dietary stress in adipose tissue. Specifically, it will explore the role of the mitochondrial pyruvate transporter (MPC) in coordinating adipose tissue nutrient storage, by studying fat depots from adipose-specific MPC knockout mice fed high fat or high sucrose diets. The findings will shed light on the molecular drivers of adipose dysfunction and may lead to new therapeutic avenues for the treatment of obesity-related disease.

Chris said: *“I’m delighted to receive the award, which bridges the gap with my prior postdoctoral work, establishes important collaborations between investigators at UCD and the USA, and will hopefully serve as a stepping-stone towards future funding opportunities.”*



## Dr Neil Docherty UCD Academic Health Science System Award Recipient

Dr Neil Docherty received the UCD Academic Health Science System (AHSS) Award for his project *“Renal Functional Reserve Assessment in Obesity”*. The co-applicants on the award are Prof Carel le Roux, Prof John Holian, Prof Patrick Murray and Dr. William Martin.

The aim of the study is to establish a reliable means of assessing renal functional reserve (RFR-amount of kidney function available beyond basal level) in the clinic such that an individual's RFR can be assessed and factored into the assessment of risk for longer-term renal decline.

Neil said, *“The award provides a great opportunity for linking basic research focus at the DCRC to translational research activity at the UCD-Clinical Research Centre.”*



# DCRC Research Funding Recipients Cont.

## Prof Catherine Godson & Dr Eoin Brennan US-Ireland R&D Award Recipients

Prof Catherine Godson, Dr Eoin Brennan and Prof Peter Maxwell (Queen's University Belfast) received the co-funded Science Foundation Ireland & Health Research Board US-Ireland Research & Development Award for their project "A Functional Genomics Pipeline for Genetic Discovery in Diabetic Kidney Disease". Prof Godson and Prof Maxwell have received three US-Ireland awards to date with both being the recipients of the first ever US-Ireland award in 2008, leading to the establishment of the GENIE (Genetics of Nephropathy, and International Effort) Consortium. Their US partners on the project include Dr Jose C. Florez and Dr Joel Hirschhorn (Broad Institute). This GENIE Consortium project will search for genetic and epigenetic molecular changes associated with the development of diabetic kidney disease (DKD), a devastating microvascular complication of both type 1 (T1D) and type 2 diabetes (T2D). DKD has been shown to have a heritable component, but prior searches for the genetic determinants of this condition have had limited success. The consortium will perform additional genetic screens to discover shared and distinct risk factors for DKD in T1D and T2D, and to use computational tools and experimental models to derive biological insights into DKD pathogenesis.

Catherine said: "We were delighted to have received this funding to continue our efforts with the GENIE Consortium. This ongoing close collaboration of multidisciplinary and synergistic research groups should advance our knowledge of the molecular determinants of DKD, identify potential molecular targets for therapeutics, and facilitate clinical prediction."



## Dr Jessica Davis UCD SPARK Award Recipient



Dr Jessica Davis received a UCD School of Biomolecular and Biomedical Science SPARK award for her project "Induced pluripotent stem cell (iPSC)-derived human cerebral organoids as a powerful model of prenatal cocaine exposure".

Prenatal exposure to cocaine causes abnormalities in foetal brain development, which is linked to later development of anxiety, depression and cognitive dysfunction. Previous studies in rodent models have indicated that prenatal cocaine exposure affects proliferation, differentiation and connectivity of neural cell types. Due to limited access to developing human foetal tissues, cocaine-induced molecular and cellular changes in the developing human brain are still not well understood. This study aims to establish a novel model of prenatal cocaine exposure using cerebral organoids derived from human induced pluripotent stem cells. We propose to investigate cocaine-induced changes of the regulatory landscape at the level of both gene expression and chromatin accessibility leveraging recent advances in single cell technologies. These findings will offer new insights into the cellular mechanism underlying the adverse effects of cocaine exposure on neuronal development and the pathomechanisms of cognitive functions.

The project is in collaboration with Dr. Keith Murphy and Dr. Gary Brennan.





# DCRC Research Funding Recipients Cont.

Dr Stephen Fitzsimons

Marie Sklodowska-Curie Actions Global Fellowship Recipient

DCRC alumnus Dr Stephen Fitzsimons received a Marie Sklodowska-Curie Actions Global Fellowship for his project *“CADASIL-iMATTR: Investigation of Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL) using induced pluripotent stem cell modelling and targeted therapeutic research”*.

CADASIL primarily affects the blood vessels of the brain and can cause migraines, strokes and cognitive impairment. It is caused by a mutation in the NOTCH3 gene and there are currently no therapeutics approved for this rare disease. Through this global fellowship, our aim is to combine the expertise at the Icahn School of Medicine at Mount Sinai and at the DCRC in UCD to achieve the following aims:

- To establish iPSC-derived in vitro and in vivo models of CADASIL. This will allow us to validate our findings from patient samples (plasma and brain tissue) and identify novel therapeutic targets.
- To trial existing and novel therapeutics (including Synthetic Lipoxin Mimetics) in the established CADASIL models.



Stephen said: *“I would like to thank Professor Catherine Godson and Assistant Professor Fanny Elahi for their support with this fellowship. In addition, I would like to thank all my previous academic colleagues and mentors including Dr Claire McCoy at RCSI, Professor Breandán Kennedy and especially Professor Orina Belton who was a fantastic mentor throughout all my years in the DCRC. I very much look forward to returning to the DCRC to complete this project and I am excited to collaborate with old and new colleagues”*.



# First Year DCRC Postgraduate Students

## Mr Hesborn Obura – PhD Candidate



I am Hesborn Obura, I hold a Bachelor's in Biomedical Sciences from Egerton University and a Master's in Bioinformatics from Pwani University in Kenya. I worked on the deployment of deep learning in image analysis and modeling.

I attended the University of Galway for 4 months for pre-doctoral training on the fundamentals of genomic data science, data science and science communication under the SFI-CRT program.

In 2023, I joined Prof John Crean's lab in Conway Institute, my research focuses on multi-omics data integration to determine the regulatory elements that drive diabetic kidney disease. My research targets the role of enhancers and super-enhancers that promote fibrotic gene expression using ScRNA-seq and scATAC-seq data. We hypothesize that the perturbation of super-enhancers linked to fibrotic genes using genome editing tools would slow/ stop the processing of renal fibrosis.

Supervisors: Prof Brendan Loftus, Prof John Crean & Dr Michele Carrey

## Ms Sive Duncan – PhD Candidate

I am Sive Duncan and I graduated from Trinity College Dublin in October of 2021 with a BA in Biochemistry. In August 2021, I started as a graduate formulation chemist in cosmetics for Oriflame R&D Dublin. However, it became very apparent to me that my passion lay in biochemistry & nutrition and more specifically in researching human health & disease. Therefore, I began the search for a PhD position in this area of research.

My PhD title is 'Immunometabolic Reprogramming in Various Physiological States'. Broadly speaking, I will first be investigating the role macrophages play in non alcoholic fatty liver disease (NAFLD). Secondly, I will be looking at de novo lipogenesis in NAFLD patients, pre- versus post-intervention of time-restricted eating. Thirdly, I will research the effect of plant protein &/or physical activity intervention on macrophage function in community-dwelling older persons. My project supervisors are Prof. Helen Roche and Dr. Martina Wallace.

I am from Skerries, Dublin! I love to run, and I have really enjoyed the past 11 months here at UCD working with both the Roche & Wallace group.





# First Year DCRC Postgraduate Students Cont.

## Ms Lauren Lythgoe – MSc Candidate

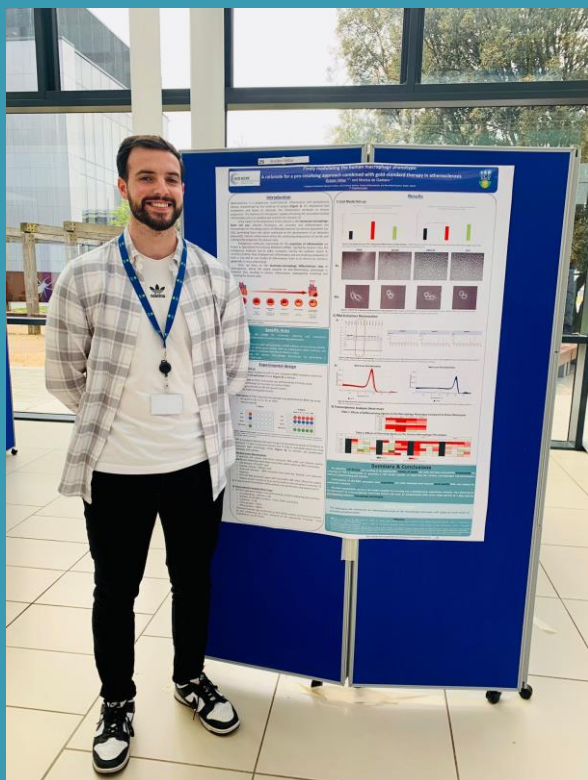
Hi! I am Lauren Lythgoe and I am a postgraduate student at UCD. I have a BSc in Anatomy and Human Biology from the University of Liverpool.

I am currently conducting research for my Masters in Research degree in Medicine. My project surrounds the impact of time-restricted eating on glucose homeostasis in rats with experimental metabolic syndrome and healthy human volunteers. Following on from completing my Master of Research degree by the end of this summer, I have secured a position as a trainee cardiac clinical scientist.

Supervisor: Assoc Prof Neil Docherty



## Mr Braden Millar – PhD Candidate



I am Braden Millar, a new PhD in Dr Monica de Gaetano's lab since October 2022, researching novel therapeutic approaches to target residual inflammatory risk in Atherosclerosis-associated Diabetes Complications (AADC) with the use of synthetic lipoxin mimetics (sLXms).

I completed my BSc Biomedical Sciences in NUI Maynooth in 2021, and received my MSc Biotherapeutics in UCD in 2022, wherein I first heard about this PhD position. I have always had a keen interest in cardiovascular diseases/health, and drug discovery/development, so this PhD seemed to be a perfect fit with the direction in which I wanted to progress in my career.

We have a number of aims in the lab:

1. To identify biomarkers of atherosclerosis for early detection, as it currently manifests and develops sub-clinically.
2. To assess the efficacy of these aforementioned novel molecules of inflammation resolution (sLXms) both alone, and as an adjuvant to current gold-standard therapeutics (i.e. statins).
3. To take a stem cell-based approach to tissue regeneration *via* a collaboration with Professor Mario Romano in the University of Chieti, Italy.

I've thoroughly enjoyed my first 9 months here and getting to know some of the people around Conway and in the DCRC, and I'm looking forward to the future!

# DCRC PhD students lead the way in Education & Public Engagement



Ms Rianna McElroy (PhD student – Roche lab) volunteered at the Conway stand for the UCD festival which took place in June. She showed both kids and their parents how to use a pipette. Using food colouring and filter paper, the kids could learn how to change a pipette to the correct volume and the proper technique needed for the lab. This activity drew quite the crowd and no doubt inspired some future scientists. This activity was kindly organised by Ms Anna Wedderburn to engage with festival attendees and showcase some of the talent in the Conway institute.



Ms Ericka Bonifacio (PhD student - Crean Lab): Earlier this year I volunteered as a STEM Judge for the ESB Science Fair which took place in the RDS from the 27th of February to the 2nd of March. ESB Science Fair is a programme for primary school children from 3rd to 6th class, which aims to encourage scientific curiosity in young minds. Each class forms a question, and attempts to answer this question by applying the scientific method. The children then exhibit their work through a format of their choice. While I expected the projects to be presented as an all too familiar poster, I was met with a selection of presentation formats ranging from a live demonstration, a movie, a PowerPoint presentation, and even a mini-dissertation. As a volunteer for the ESB Science Fair, I was tasked with judging the success of the science projects based on not only the design of their experiments and how the children collated their data, but also on how the class exercised teamwork and communication. It was really interesting to talk to these young minds and enquire about their projects, and overall witnessing the enthusiasm for science at such a young age!



Presenting the class of **Our Lady Queen of the Apostles NS** with their award. Provided with permission from Ms. Paula Frances Galvin, their teacher.



# Awards at National & International Conferences

## 59<sup>th</sup> Irish Association for Cancer Research (Athlone, Co Westmeath; 22-24 February 2023)

- Ms Kathleen Mitchelson (Roche lab) was awarded the Highly Commended Display Poster Prize for her poster *“Fatty acids and adipose depot functionality with respect to obesity-linked colorectal cancer progression”*

## Irish Nephrology Society Meeting 2023 (Maynooth, Co. Kildare; 12-13 May 2023)

- Ms Mariam Marai, (Godson/Brennan lab) won the JP Garvey Award (Best Student/Intern Poster) for her poster *“The FPR2 agonist AT-01-KG targets IL-6 to suppress inflammation in diabetic kidney disease”*.
- Dr Darrell Andrews (Godson lab) won the Best Moderated Poster Award for her poster *“Investigating the role of FPR-2 agonists in tissue repair and regeneration”*.

## 4<sup>th</sup> International Conference on Precision Nutrition and Metabolism in Public Health and Medicine (Ioannina, Greece; 25-30 June 2023)

- Mr Rory Turner (Wallace Lab) won the Aegean Conferences Student Travel Award. Rory delivered an oral presentation on his PhD research, *“Targetting Branched Chain Amino Acid Metabolism as a Potential Treatment for Liver Fibrosis”*.

# Research Funding Awarded

**The Physiological Society**, Research and Knowledge Exchange Award - Dr Chris Shannon (Roche lab) received €11,660 for his project *“Role of the mitochondrial pyruvate carrier in diet-induced adipose remodelling”*.

**UCD School of Biomolecular and Biomedical Science**, SPARK Award - Dr Jessica Davis (Crean lab) received €10,000 for her project *“Induced pluripotent stem cell (iPSC)-derived human cerebral organoids as a powerful model of prenatal cocaine exposure”*.

**UCD Academic Health Science System (AHSS) Award** - Dr Neil Docherty received the €24,700 for his project *“Renal Functional Reserve Assessment in Obesity”*.

**Science foundation Ireland & Health Research Board US-Ireland Research Award** - Prof Catherine Godson & Dr Eoin Brennan received €908,860 for their project *“A Functional Genomics Pipeline for Genetic Discovery in Diabetic Kidney Disease”*.

**Enterprise Ireland** – Prof Helen Roche & Dr Fiona McGillicuddy received €12,460 for EU Proposal Coordinator Support.

**Marie Skłodowska-Curie Actions Global Fellowship** - Dr Stephen Fitzsimons awarded for his project *“CADASIL-iMATTR: Investigation of Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL) using induced pluripotent stem cell modelling and targeted therapeutic research”*.

# Publications

Abdul Wahab R, Cohen RV, le Roux CW. **Recent advances in the treatment of patients with obesity and chronic kidney disease.** *Ann Med.* 2023;55(1):2203517. PMID:37086110.

Alabduljabbar K, Al-Najim W, le Roux CW. **Food preferences after bariatric surgery: a review update.** *Intern Emerg Med.* 2023;18(2):351-8. PMID:36478323.

Al-Ozairi E, Irshad M, Taghadom E, Sojan L, Al Kandari J, Alroudhan D, et al. **Glucagon-like peptide-1 agonists combined with sodium-glucose cotransporter-2 inhibitors reduce weight in type 1 diabetes.** *Obesity (Silver Spring).* 2023;31(3):716-23. PMID:36811241.

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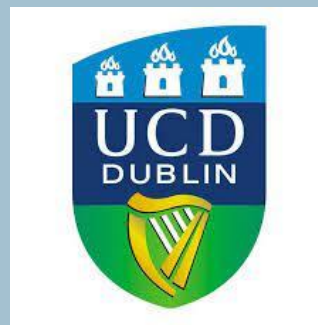
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