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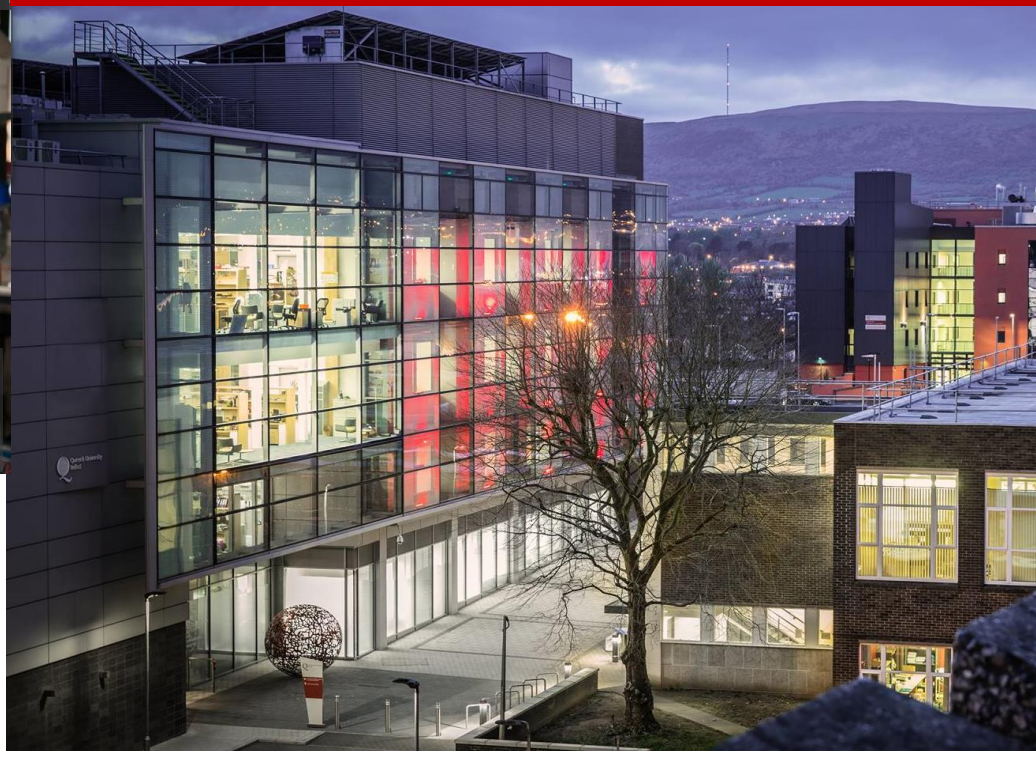
QUEEN'S UNIVERSITY BELFAST

WELLCOME-WOLFSON INSTITUTE FOR EXPERIMENTAL MEDICINE

Professor José Bengoechea
WWIEM Director



Welcome,

The academic year 2020/21 is getting to an end. It has been a year like no other. We all at the Institute worked to make it a safe place to continue delivering our research and teaching activities under strict health and safety measures.

We have made a special effort to secure access to our laboratories for the postgraduate students of our own Msc Experimental Medicine but also to students from the Msc of Parasitology and Pathogen biology (School of Biological Sciences). Our role in training these student cohorts in the WWIEM laboratories and facilities is key for their career development.

Like other parts of the University, we transitioned to an online delivery of our teaching activities. Despite the challenge, this proved to be a success as evidence by the positive feedback of the students. We are particularly proud of our engagement with the C25 medical curriculum established by our School. Helping students to unlock their potential during the discussions of the clinical cases has been a rewarding experience.

We are also contributing to revamp the Northern Ireland economy by providing additional training to those in our community who lost their jobs due to the pandemic, or who want to increase their employability. An example is our contribution to develop and deliver a PGCert programme in Biostatistics and Bioinformatics commissioned by the Department for the Economy as part of the response to the COVID-19 pandemic package. This has been a collaborative work with our colleagues of the Patrick Johnson Centre for Cancer Research.

Our research activity was recognized with a number of awards including the joint Team of the Year award in the Staff Excellence Awards to the COVID-19 Virology team.

We are proud of this recognition to our research excellence during COVID-19 but also to the outstanding role of our colleagues addressing the concerns of the general public during the pandemic.

WWIEM hosted the visit of the Prime Minister on March 12th. Boris Johnson visited Queen's as part of his visit to Northern Ireland. While at the Institute, we introduced Boris Johnson to the research carried out by colleagues of the Institute and the School of Pharmacy as part of the national efforts to tackle COVID-19.

Our long term collaboration with the Northern Ireland Science Festival had to be different this year. We enjoy opening our Institute to the public so that they can get to know our research and facilities, but instead, this year we shared our work in COVID-19 projects with the wider public in a series of online videos can still be watched online. More than 4000 views reflect the interest of the general public for WWIEM COVID-19 research.

This year we planned for a special new online summer student programme, iENGAGE. We considered the uncertainty over hosting summer students in the Institute as an opportunity to open our programme globally and opted for an online model for the first time. We thought this could better serve a wider population of students, but we did not anticipated the interest on the programme that we received. With nearly 280 applicants from 37 countries, iENGAGE promises to be a truly international meeting point for the next generation of experimental medicine scientists this summer.

QUEEN'S UNIVERSITY BELFAST

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Meet our Researchers

Prof Cecilia O'Kane

I have two main research areas of interest related to lung inflammation and injury. We study the pathophysiological mechanisms driving alveolar inflammation and injury in ARDS (acute respiratory distress syndrome), a devastating illness causing respiratory failure in the critically ill, and exploring new therapeutic interventions in clinically relevant human models, through to clinical trials. In addition to ARDS my groups work on non-tuberculous mycobacterial (NTM) lung infection. The NTMs are highly resistant organisms causing infection in persons with underlying structural lung disease or immunodeficiency. We work on mechanisms of clearance of these organisms in the lung, including host directed therapies to help supplement antibiotic regimens, and understanding how these organisms perpetuate damage to the lungs. My group's model systems include in vitro primary human cell work, ex vivo lung tissue slice culture, ex vivo whole lung perfusion (EVLP) models and modelling alveolar inflammation in healthy volunteers by LPS inhalation. These model systems provide proof of concept of mechanisms driving inflammation, injury and repair in human lung tissue and support the progression to clinical trials. Data from these model systems have led to clinical trials of statins, KGF and aspirin in patients with ARDS.

Prof Miguel Valvano

Our research involves an interdisciplinary approach using molecular genetics, biochemistry, cell biology, and structural biology to understand the pathogenesis of opportunistic Gram-negative bacteria at the molecular and cellular levels. Burkholderia, Pseudomonas aeruginosa, Enterobacter and Achromobacter species, are the primary model organisms we use in different aspects of our research program. Opportunistic infections pose a significant threat to human health, especially to those patients who benefit most from advancements in the treatment of genetic diseases, cancer, and organ transplantation, but who become immunosuppressed. Our main goals are to elucidate how these opportunistic pathogens interact with innate immune cells (e.g., macrophages) to promote or suppress inflammation, and the molecular basis of their extreme intrinsic resistance to antimicrobial agents, especially resistance to antimicrobial peptides and last resort antibiotics.

Dr Aurelie Mousnier

I am a molecular cell biologist specialized in host-pathogen interactions. I worked on the molecular mechanisms underlying the host subversion by several viral and bacterial pathogens: HIV (PhD at Institut Jacques Monod, Paris), pathogenic Escherichia coli, Legionella pneumophila and rhinovirus (post-docs at Imperial College London).

I joined the WWIEM in 2016 as independent fellow, funded by the Medical Research Foundation and Asthma UK, and became lecturer in 2018. In my group, we use a wide range of molecular biology, cell biology and virology techniques to understand how rhinoviruses hijack host cells, focusing on identifying host proteins essential for viral replication and the molecular mechanisms involved. I aim to exploit this work to develop antivirals to prevent or treat exacerbations of chronic respiratory diseases such as asthma, chronic obstructive pulmonary disease or cystic fibrosis, which can be triggered by rhinovirus infection.

Prof Heping Xu

I graduated in Medicine and trained in Ophthalmology in China. After my PhD, I undertook post-doc trainings in cell biology and biochemistry in Tokyo, Japan and Ocular Immunology in the University of Aberdeen. I joined Queen's University Belfast as a Senior Lecturer in 2009. In 2013, I was appointed Professor of Ocular Immunology. I am internationally known for my research in retinal immune response in autoimmunity and age-related macular degeneration (AMD). My theory of "dysregulated para-inflammation of AMD pathogenesis" has attracted huge international attentions and has become a hot-topic of research in immune mechanisms of various sight-threatening retinal diseases, including AMD, diabetic retinopathy, retinitis pigmentosia and glaucomatous retinopathy. My current research is focused on 1) retinal neuron-immune interaction under normal ageing and disease conditions, 2) immune response to retinal damage, and 3) mechanisms of retinal angiogenesis and fibrosis. The goal is to use the knowledge for designing novel and rational strategies for therapy.

WWIEM hosts the UK's Prime Minister to discuss the University's contribution to the fight against COVID-19



Prof Bengoechea, Prof Greer, Prof Elborn and Dr Simpson with Boris Johnson

The Prime Minister, Mr Boris Johnson, visited the Wellcome-Wolfson Institute for Experimental Medicine on 12 March 2021 to discuss our contribution to the fight against COVID-19.

The Prime Minister was welcomed by Professor Ian Greer, President and Vice-Chancellor of Queen's and Professor Stuart Elborn, Pro Vice-Chancellor of the Faculty of Medicine, Health and Life Sciences.

During his visit, the Prime Minister was introduced to the LAMP (loop-mediated isothermal amplification) COVID-19 testing conducted by our colleagues in the School of Pharmacy. The project is lead by Dr Deirdre Gilpin. Dr Ahmed Elkashif is part of this project.

Miao Tang and Dr David Simpson with the PM, Boris Johnson

The Prime Minister visited the WWIEM laboratories and received information on the ongoing work on sequencing the virus genome as part of the COVID-19 Genomics UK Consortium (COG-UK). The leader of this project in WWIEM, Dr Simpson and PhD student, Miao Tang showed the PM their work. The consortium has been created to deliver large scale and rapid whole genome virus sequencing to local NHS centres and the UK government. Its data are helping Public Health Agencies to manage the COVID-19 outbreak and inform vaccine research efforts. Belfast is one of a network of centres throughout the UK which sequences samples from local confirmed cases of COVID-19. The COG UK Consortium is delivering large scale SARS-CoV-2 genome sequencing capacity to hospitals, regional NHS centres and the Government that, when combined with epidemiological and clinical information, is informing interventions and policy decisions to confront the COVID-19 epidemic.

Dr Deidre Gilpin and Ahmed Elkashif with the PM, Boris Johnson

Awards, Prizes and distinctions

Team of the Year Award WINNERS

WWIEM's COVID-19 Virology team were joint winners of the QUB Team of the Year Excellence Award, a well-deserved recognition of their outstanding work.

Because of their significant contributions, the Judging Panel decided to award this year's Staff Excellence Award to the Virology team together with the Estates Services Pandemic Support Team and Queen's Accommodation in recognition of their very different but critical contributions to the University's COVID-19 response.

- Professor Ultan Power
- Dr Connor Bamford
- Dr Lindsay Broadbent

Since the start of the pandemic, Ultan Power, Connor Bamford and Lindsay Broadbent have all played an important role in helping to improve public understanding of COVID-19. As well as making over 1,500 national and international media appearances, providing a clear and balanced commentary, they are leading Queen's research efforts on COVID-19 and have secured over £2m in funding.

Dr Fionnuala Lundy awarded the IADR Pulp Biology & Regeneration Award for outstanding contribution to the research field.
This is the first time a QUB's academic has won one of these awards. The award will be presented virtually at the IADR meeting at the end of July.

Prof **Noemi Lois has been included on The Ophthalmologist's Power List of the 100 Top Women in Ophthalmology for 2021.** The list celebrates 100 most influential female figures in ophthalmology https://theophthalmologist.com/power-list/2021

Dr Tom Waterfield won the Donald Paterson Prize (Royal College Paediatrics & Child Health) for 2021.
The prize has been running for over 50 years and is awarded to the author of the best article on any subject related to paediatrics published or accepted for publication within two years prior to 30 November 2020. The submitted articles are judged with respect to scientific content, clinical contribution and presentation, as decided by an adjudicating committee established by the Academic Board of the Royal College of Paediatrics and Child Health.

Awards, Prizes and distinctions

Professor Danny McAuley elected to the Academy of Medical Sciences, the independent body in the UK representing the diversity of medical science.

Professor Danny McAuley is one of 50 new Fellows who have been elected for the excellence of their science, contribution to medicine and society and the range of their achievements.
The Academy of Medical Science's Fellows are drawn from laboratory science, clinical academic medicine, veterinary science, dentistry, medical and nursing care, and other professions allied to medical science including ethics, social science and the law.

Dr Bronwen Connelly has been appointed as a Director of Research in the Intensive Care Society, the first, and so far only, non-medic in the role.

Dr Yvonne Dombrowski has been invited to serve on the Scientific Advisory Board of the Irish Society for Immunology

Research

Grants and awards

BBSRC
Investigating the thermal biology of inflammasomes – is NLRP3 a thermosensor?
PI: **Rebecca Coll**
Co-I: Andriana Margariti, Ben C Collins
Funded value: £442,864

Inflammation is an essential host response to infection and injury, but unregulated inflammation is highly damaging to the host and must be limited by negative feedback signalling. Inflammasomes are intracellular protein complexes that control the production of the pro-inflammatory cytokines IL-1beta and IL-18 and a lytic cell death programme known as pyroptosis. Inflammasome signalling is thus an extremely inflammatory process and inflammasome-dependent inflammation is associated with the pathogenesis of many common diseases including arthritis, Alzheimer's Disease and NASH. While clinical trials for NLRP3 inflammasome inhibitors were initiated in 2019, there remains a deficit in our knowledge of inflammasome regulation, that urgently needs to be addressed. The endogenous mechanisms that limit inflammasome activity are not understood and this research proposal will address this gap in our knowledge. Our novel preliminary data demonstrate that fever range temperatures can specifically limit inflammasome activity in mouse and human macrophages. Furthermore, we have identified that NLRP3 itself is highly sensitive to temperature and thus may function as a thermosensor. We will investigate the temperature-dependent mechanisms of inflammasome regulation using a range of pharmacological and biochemical approaches. We will employ cellular thermal shift assays and cutting-edge advanced quantitative mass spectrometry techniques to study NLRP3 protein-protein interactions as a function of temperature.
Mutations in NLRP3 cause familial cold autoinflammatory syndrome (FCAS) but how cold temperature triggers NLRP3 activation in FCAS is not understood. We will develop FCAS cell models including patient-derived iPSCs that will allow us to characterise FACS NLRP3 using a range of methods. This innovative proposal addresses fundamental questions in the biology of inflammation and our insights will help to advance inflammasome targeted therapies for human health.

BBSRC
Characterization of *Klebsiella pneumoniae* T6SS nanoweapon and its role in the dissemination of antimicrobial genes and virulence factors.
PI: **Jose Bengoechea**
Co-I: Ben C Collins
Funded value: £527,236

Klebsiella pneumoniae has been singled out as a threat to human health due to the increasing number of multidrug resistant strains. Alarmingly, recent studies have recognized that K. pneumoniae strains have access to a mobile pool of virulence genes; enabling the emergence of a multidrug, hypervirulent species. Unfortunately, there are already reports describing the isolation of such strains. We have recently uncovered that *Klebsiella* exploits a type VI secretion system (T6SS) for contact-dependent killing of neighboring, non-sister bacterial competitors. T6SS activity possess a unique challenge to the dissemination of mobile genetic elements encoding virulence genes and antibiotic resistance via conjugation. Based on solid preliminary data, we will provide mechanistic insights into how *Klebsiella* resolves the conflict between transfer and acquisition of genetic material, and the function of the T6SS. This proposal will establish that bacteria switch the T6SS behavior from offensive to defensive to facilitate conjugation and the resulting dissemination of antimicrobial genes and virulence factors. We will also highlight previous unreported existence of distinct versions of the T6SS machinery, characterized by a specific set of Hvp-VgrGs pairs, to deploy effectors. By a quantitative proteomic approach, we will characterize the repertoire of T6SS effectors secreted by each assembly, and provide mechanistic insights into the antimicrobial function of T6SS effectors. In this project we will also establish a hitherto unknown link between the T6SS and the lipopolysaccharide (LPS). Our work will uncover the regulatory network connecting these two major structures of the envelope of Gram-negative bacteria, shedding new light into the inputs and outputs governing the bacterial cell wall. The findings of this project will establish basic principles of the T6SS while providing a global vision of *Klebsiella*'s T6SS-governed antimicrobial strategy.

Research

Grants and awards

MRC
***Klebsiella pneumonaie* anti-immunology: exploiting mTORC1 to control cell-intrinsic immunity.**
PI: **Jose Bengoechea**
Co-I: Adrien Kissenpfennig
Funded value: £563,131

Pneumonias due to multiple-drug resistant pathogens are an important public health problem and are major causes of morbidity and mortality worldwide. Of particular concern are the infections caused by *Klebsiella pneumoniae*. The isolation of *Klebsiella* strains resistant to "last resort" antimicrobials has significantly narrowed, or in some settings completely removed, the therapeutic options for the treatment of *Klebsiella* infections. Not surprisingly, K. pneumoniae has been singled out by the World Health Organization as an "urgent threat to human health" due to multidrug resistant strains. Less obvious, but central to pathogenesis, are the adaptations to the human immune system. However, our knowledge of the interface between *Klebsiella* and these pathways is still elementary, as it is our understanding of which of such responses benefit the host versus the pathogen. In this project, we will expose a *Klebsiella* immune evasion strategy based on hijacking the immunomodulatory functions of the cell master regulator mTORC1. We will use a multidisciplinary approach leveraging the power of biochemistry, cellular microbiology, proteomics and in vivo models. We will detail the signalling pathway exploited by *Klebsiella* to activate mTORC1, uncover how *Klebsiella* manipulates the localization of mTORC1 to the *Klebsiella* containing vacuole, identify the *Klebsiella* factors involved in mTORC1 activation, and dissect the effect of mTORC1 on *Klebsiella* infection biology. Finally, we also set out to provide compelling experimental pre-clinical evidence for host-directed therapeutics targeting this "covert" *Klebsiella* strategy. Altogether, this project will uncover a new angle of *Klebsiella* adaptations to survive in what should be a hostile environment. The findings of this project shall be the foundation for novel therapeutics based on enhancing innate host resistance to infection, and ameliorating pathophysiological tissue destruction.

NHR HTA
CHOICE trial: Changing Habits to Prevent Child Caries'
PI: Pauline Adair (QUB); Girvan Burnside (University of Liverpool)
Co-I: **Dr Ikhlas El Karim, Dr Fionnuala Lundy**, Ciaran O'Neill, Aidan Feeney (QUB);Cynthia Pine (QMUL); Sondos Albadri, Fadi Jarad, Carrol Gamble and Catherine Spowart, (University of Liverpool); Nick Barker (University of Essex); Sue Pavitt, Peter Day (University of Leeds); Muriel Bailey (Parenting NI).
Funded value: £2.6 Million

The CHOICE trial is a multi-centre psychology-led study, with a supportive talking intervention between the dental nurse and parent or carer, focusing on how families can address the causes of tooth decay. The intervention will support families to identify areas of their home life that can be changed to prevent tooth decay such as regular tooth brushing and limiting sugar in the diet and will guide them to set goals that will achieve this. As the clinical lead of N. Ireland Dental Practice Research Network, Dr Ikhlas El Karim will be the Senior Dental Co-Investigator for the Northern Ireland arm of the study.

Clinical Academic Fellows

WWIEM welcomes 2 new Academic Clinical Fellows (ACF)

Dr Eamon McCarron and Dr Dermot Linden will be will be joining WWIEM as Academic Clinical Fellows (ACF) in August 2021

The Northern Ireland Clinical Academic Medicine Training Programme at Queen's, offers opportunities at different levels to experience high quality research. This usually involves a combination of research, teaching and patient care.

Queen's University Belfast in partnership with the Northern Ireland Medical and Dental Training Agency and the Health and Social Care Trusts provide Clinical Academic Training opportunities in research and education. These posts offer candidates a comprehensive experience in clinical academic medicine alongside internationally recognised clinicians and researchers.

The ACF post is normally for 2 years. During this period it is expected that the ACF will participate in clinical training with an integrated period of 25% of whole time equivalent academic research training in the specialty to which they are appointed. Clinical training offers a wide range of opportunities in programmes that have a strong track record in specialty training and academic activities.

Dr Eamon McCarron is a Specialist Registrar (ST3) in Chemical Pathology and Metabolic Medicine. He will develop a project focussed on defining cardiovascular risk associated with familial hypercholesterolaemia which is currently difficult to predict. Eamon will specifically investigate early effects of LDL-cholesterol in familial hypercholesterolaemia on the coronary microvasculature. He will design a prospective cross-sectional study to assess coronary artery calcification in primary prevention hypercholesterolaemia atients and correlate with conventional biomarkers and novel biomarkers, combined with in vitro and in vivo analyses using relevant experimental models to define underlying mechanisms, with the overall goal of informing more effective clinical management. Eamon's ACF project will be supervised by Dr Chris Watson, Professor David Grieve (WWIEM) and Dr Paul Hamilton (CME).

Dr Dermot Linden will focus on the role of viral infection in the airways of individuals with chronic obstructive pulmonary diseases (COPD). Specifically, he will delineate mechanisms of epithelial dysfunction caused by viruses known to be present in the COPD lung. In addition, he will help to develop the follow-up study to the EViSCo (Epstein-Barr virus suppression in chronic obstructive pulmonary disease) clinical trial which will evaluate anti-viral therapies for the treatment of inflammation in the COPD airways. Dermot's project will be supervised by Professor Cliff Taggart

WWIEM Seminar series 2021

The Wellcome-Wolfson Institute for Experimental Medicine hosts research seminars from a range of renowned international experts. During lockdown they continued virtually. It was the best option to keep scientific discussions ongoing. Although the face to face interaction was missed, in it resulted in a great seminar season, as online sessions allowed us to bring in some of the best researchers in the world.
Our Seminars take place on Tuesdays at 1pm. They are open to all QUB staff and students and to members of the general public.

January

- Professor Ingrid Fleming, Goethe University, “The identification of new lipid mediators and contribution to angiogenesis and vascular integrity”
- Professor Simon A Jones, Cardiff University, "STAT transcription factors as determinants of chronic disease progression"

February

- Professor Alice Prince, Columbia University Medical Centre "Fueling infection – ST258 K. pneumoniae metabolic activities promote immunotolerance in the lung“
- Professor Fiona Powrie, Oxford Univesity "Translating immunology into new therapies for Inflammatory Bowel Disease“
- Dr Ganesh Manoharan, BHSCT, "Recent Advances in Cardiology"

March

- Professor Maria Moosajee, The Francis Crick Institute, "On the path to clinical translation- Insights from patients and disease models with genetic eye disease"
- Professor Majlinda Lako, Newcastle University, "Making retinal organoids: a voyage of discovery!”

April

- Professor Anna Randi, Imperial College London, “Haemostasis meets angiogenesis: the VWF story”
- Professor Paul Kaye, University of York, "Developing new tools to control leishmaniasis: from models to clinical trials"

May

- Professor Sandosh Padmanabhan, University of Glasgow, “Hypertension - The road to precision medicine”
- Professor Matthew Avison, University of Bristol, “Functional genomic dissection of complex antibacterial resistance phenotypes in Gram-negative bacteria allows personalised therapy”
- Dr Jelena Bezbradica-Mirkovic, University of Oxford, "Molecular control of NLRP3 inflammasome pathway activation"

June

- Dr Derek Brazil, WWIEM, “Mechanisms and Models of GREM1 Signalling in Health and Disease”
- Professor Deirdre Devine, University of Leeds
- Dr David Courtney, WWIEM
- A. Prof Suzanne Cloonan Trinity College, Dublin
- Prof John Simpson Newcastle University

WWIEM Students

PhD students

The 3rd year symposium took place in March, we had 14 students taking part and prizes were awarded to Timothy Shaw, Sinead Ryan and Sarah Kuhn. The 2nd year symposium took place in May, we had 25 students taking part and prizes were awarded to Rachael Kee, Gemma Mcilwaine, Carole Daly and David Butler. Over the year we have run a number of social events on Microsoft teams including a first year icebreaker event at the start of the year, several quizzes and monthly coffee morning meetings.

In addition, we run a weekly mindfulness session which is led by Gillian Cruickshank. Finally, in February we hosted a career's event where we had a number of postdocs giving 5 minute talks on their career path followed by a panel discussion.

MSc in Experimental Medicine

The MSc Experimental Medicine students have all conducted face to face research projects in WWIEM, after completing the taught Modules in the First semester. The training then included face to face and online Lectures, Tutorials and Workshops.

The MSc Experimental Medicine program had accommodated the research projects in WWIEM. The students received appropriate training following all the Health and Safety COVID-19 related regulations, which allowed them to conduct their research projects in the labs.

The Institute, the Program and Module Co-ordinators, and the PGT office provided all the support to the MSc students to conduct their research facilitating all the requirements in line to the current Health guidelines.
The students also received theoretical and practical training sessions on advanced imaging facilities in WWIEM, which equipped them with high specialised skills and knowledge.
All the 15 MSc in Experimental Medicine projects for 2020/21 are ongoing and being conducted in a fully supported environment to allow the students to complete their projects and degree successfully.

WWIEM Students

Undergraduate teaching

WWIEM contribution to the C25 medicine curriculum

The new C25 Medical curriculum was launched in 2020 and has just completed it's first year of delivery. The new C25 curriculum is built around case-based learning, with a series of facilitator-led cases at the centre of the curriculum. WWIEM has played a significant role in delivering the inaugural Year 1 C25 curriculum. WWIEM contributed 23 % (26/116) of the facilitators, delivering 28 % (99/351) of the group facilitation.

This high level of participation clearly identifies enthusiasm and engagement in the new C25 curriculum in our research centre. Feedback from the students has been very positive about C25 case-based facilitation, and feedback from WWIEM staff has also been very positive. Currently, recruitment for 2021-22 is underway, and WWIEM colleagues are signing up for both Year 1 and 2 C25 case-based teaching.

New PGCert programme in Biostatistics and Bioinformatics

The new PGCert programme was co-coordinated by Dr Guillermo Campos (WWIEM) and Dr. Jayne Blaney (Patrick Johnson Centre for Cancer Research). The programme was announced in November 2020 as part of a package of eight fully funded courses funded by the Department for the Economy as the response to the COVID-19 pandemic. The aim of the programme was to provide upskill in key technological areas of relevance in Northern Ireland and was offered to individuals who were furloughed, made redundant or unable to gain employment in their field as a result of the COVID-19 pandemic. A total of 13 students were enrolled.

The aim of the programme was to provide to the participants a strong foundation in biostatistics and bioinformatics, with completion of the programme providing as well key transferable skills in statistics, data analytics and scripting. The certificate consisted in four modules shared with the MSc in Bioinformatics ensuring the recognition of the modules and the possibility of progressing to the full MSc programme if successfully completed for further professional development. The modules included: "Introductory Cell Biology", "Biostatistical Informatics", "Health and Biomedical Informatics and the Exposome" and "Scientific Programming and Statistical Computing". All the modules were delivered online between the 25th of January and March 2021, totalling 60 CATS, and the first students are expected to graduate in June.

WWIEM
Postdoctoral Development Committee

Postdoc Annual Research Symposium (January 2021)

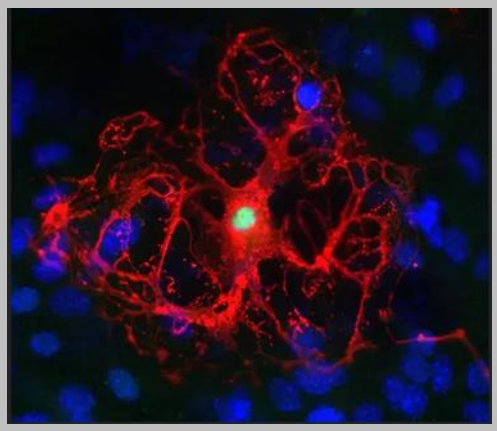
The postdoc research symposium was held virtually this year, a first for the centre. The symposium took place over 2 half-days. The PCDC attracted high calibre external keynote speakers, Dr. Annie Curtis (RCSI), Dr. Luke Garret (University of Western Australia) and Prof Tony Wyss-Coray (Stanford University).

The poster session was modified this year, with all postdocs providing a short pre-recorded powerpoint presentation of their work (3-4 slides, 3 minutes) that was uploaded onto Slack. PDRAs were encouraged to visit as many posters (Slack channels) as they could over the week of the symposium, with everyone asked to be 'live' on their slack channel during designated poster session times. Again, feedback from PDRAs indicated that Slack Poster sessions were an excellent addition to the symposium (79% agreed that the poster session was highly interactive) and feel should remain a feature of future symposiums, even if not virtual.

Although a virtual event, the PCDC still managed to engage industry sponsors. Sponsors included Leica, Thermo, VWR, Brennan & Co, Medical Supply and Premier Scientific.

Postdoc Career Away Day

The annual postdoc career away day has been scheduled for Friday June 4th. This will take place virtually again this year. The content has been designed based on feedback from WWIEM PDRAs. The Away day will also include networking activities and a town-hall session facilitated by the PDC.



Postdoc coffee mornings have been ongoing despite the pandemic and turned into Virtual coffee mornings are now being held on teams once a month

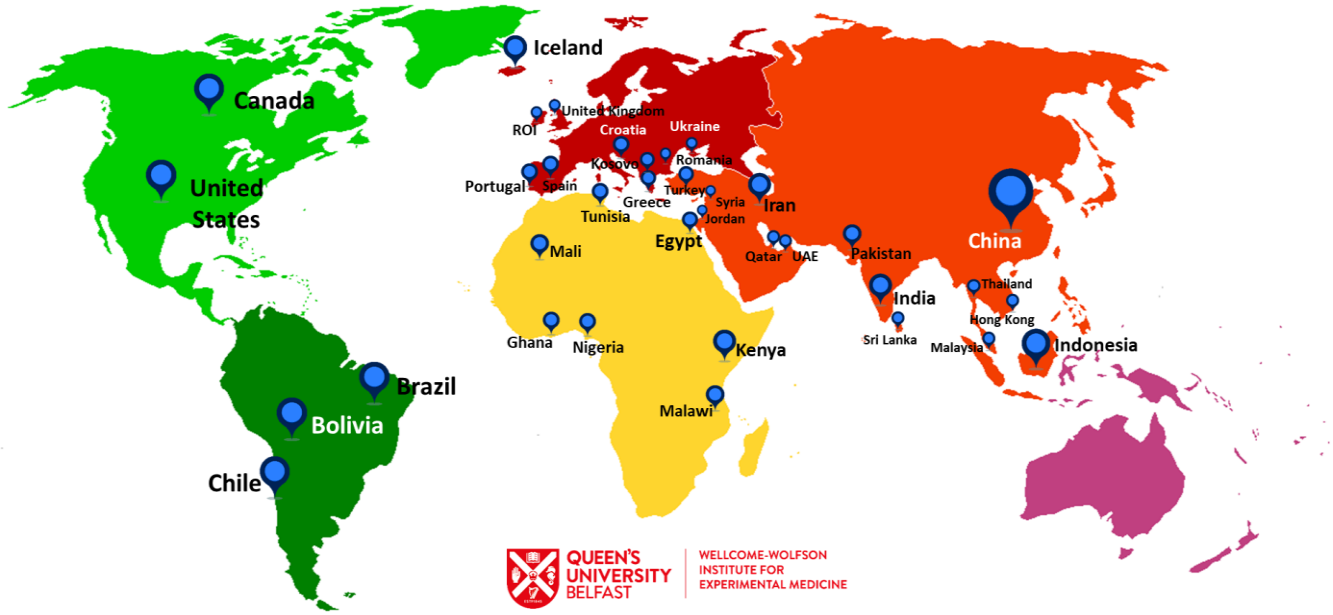
The Buddy Scheme is continuing to run well, with new PDRAs being welcomed either virtually or with a socially-distanced meeting in the centre: this continues to be one of our most impactful ongoing activities, welcoming new postdoctoral staff to the WWIEM. The feedback from the postdoc buddies shows it is an interesting/enriching experience and provided a networking opportunity.

PDRA representatives are now a part of the WWIEM Seminar Series committee

WWIEM Summer Student Programme

iENGAGE –ONLINE SUMMER STUDENT PROGRAMME 2021

The WWIEM summer student programme for 2021, **iENGAGE** has had a large worldwide demand**.** After receiving 277 applications from 37 countries, 101 students were selected for the first round of iENGAGE .



iEngage Summer Students Nationalities 2021

iENGAGE Summer Student Programme

Every year, the Institute runs an annual Summer Student Programme for undergraduates who would like to experience a research environment. The programme, supported by the School of Medicine, Dentistry and Biomedical Sciences, provides students with the opportunity to achieve hands-on research experience during the summer months. With the aim of training the next generation of scientists, this programme supports our goals of sharing our research whilst inspiring scientists of the future.

We have designed **iENGAGE** to expand the reach of our widening participation efforts to as many students as possible, and to facilitate the access to our Summer Student Programme to students from low and middle income countries, for the summer of 2021.

Including seminars, roundtables, tutorials and project design modules, the programme will run as a virtual programme for 6 weeks during summer 2021.

This new online summer student research programme will:

- Provide remote interactions with WWIEM researchers, designed to develop scientific skills
- Offer high-level insight and experience into world-class research
- Deliver remote technical training in a range of cutting-edge experimental techniques

The programme will be delivered via Microsoft Teams over a period of 6 weeks 28th June - 6th August.

Queen's University students who complete iENGAGE are eligible for Degree Plus accreditation.

Outreach

WWIEM at the Northern Ireland Science Festival 2021 – Virtual edition

As every year, the NI Science Festival took place in February. WWIEM contributed to this year's virtual Festival of Science with a showcase of the breath of the research on COVID-19 that the Institute is undertaking. From the role of co infections, to sequencing of SARS-CoV-2 for lineage tracing, and mutation detection; clinical trials and drug repurposing, WWIEM's contribution to the research effort was captured in a series of short documental videos: "Spotlight on COVID-19 Research at WWIEM" . Click each image to watch the video.

Ep 1. Spotlight on COVID-19 Research at WWIEM - Professor Jose Bengoechea explains the role of coinfections and drug repurposing in COVID-19

Ep 2. Spotlight on COVID-19 Research at WWIEM – Dr David Simpson details his role in the COVID-19 Genomics UK (COG UK) Consortium in sequencing SARS-CoV-2.

Ep 3. Spotlight on COVID-19 Research at WWIEM - Professor O'Kane describes the REALIST trial , a UK-wide Cell therapy clinical trial, part of the UK response to COVID-19.

Ep 4. Spotlight on COVID-19 Research at WWIEM – Dr C. Tonry and C. Roarty O'Kane explain Dr T Waterfield and Dr C Watson project on seroprevalence of SARS-CoV-2 antibodies in children.

Ep 5. Spotlight on COVID-19 Research at WWIEM – Professor Ultan Power, Dr Connor Bamford and Dr Lyndsey Broadbent detail their research in COVID-19 pathogenicity, interaction with pulmonary tissue, and inflammatory response and their search in drug repurposing for COVID -19 treatment.

Ep 6. Spotlight on COVID-19 Research at WWIEM – Dr Johnny Stewart introduces the Novavax trial, led in Northern Ireland by Professor Danny McAuley and Professor Judy Bradley.

Outreach

Barcroft medal 2021 - Professor Sarah Gilbert, leader in the development of Oxford vaccine

The Barcroft Lecture is an annual public event organised by the School of Medicine, Dentistry and Biomedical Sciences in honour of Sir Henry Barcroft, former Dunville Chair of Physiology at Queen's and a Wellcome Trustee.

Professor Gilbert led the development of the led Oxford/AstraZeneca vaccine against SARS-CoV-2 which is currently being rolled out successfully across the world.

The Barcroft medal was presented to Professor Gilbert in recognition of her outstanding achievements in medical research. Throughout her career, Professor Gilbert has made and tested vaccines for malaria, influenza, and emerging pathogens, such as Nipah and MERS. Several of the vaccines developed in her laboratory have progressed into clinical trials.

On Wednesday 10 March Professor Gilbert presented the annual Barcroft Lecture on the topic 'Vaccine platform technology and planning for pandemics' , in an online event, attended live by 393 people. Prof Gilbert outstanding lecture was followed by questions from the audience. Afterwards, Prof Gilbert also attended a roundtable discussion with ten of PhD students and Postdocs from WWIEM. Dr Rebecca Coll is the academic lead who chaired the session and coordinated the event.

Upon receiving the award, Professor Gilbert, said: "I am honoured to receive this award today, and look forward to discussions with Queen's colleagues."

Commenting on Professor Gilbert's award, Professor Pascal McKeown, Head of School and Dean of Education from the School of Medicine, Dentistry and Biomedical Sciences at Queen's, said: "The School is honoured that Professor Gilbert has accepted the Barcroft medal. This award acknowledges the outstanding contribution made by scientists in medical research and it is only fitting that Professor Gilbert is this year's recipient. We recognise and celebrate her inspiring success over the last 12 months in leading the development of the life-saving Oxford / AstraZeneca vaccine."

Professor Jose Bengoechea, Director of the Wellcome-Wolfson Institute for Experimental Medicine , School of Medicine, Dentistry and Biomedical Sciences at Queen's, said: "We are delighted to acknowledge Professor Gilbert's incredible contribution to medical research with the award of the Barcroft medal.
"Professor Gilbert is one of the key scientists at the forefront of the fight against the SARS-CoV-2 pandemic and today we rightly celebrate her achievements in the field of medicine and her positive contribution to society."

Queen's Foundation

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DR DAVID WRIGHT – BELFAST ASSOCIATION FOR THE BLIND OPHTHALMIC DATA SCIENCE LECTURER

Dr David Wright was recently appointed Belfast Association for the Blind Lecturer in Ophthalmic Data Science, in the School of Medicine, Dentistry and Biomedical Sciences (MDBS) at Queen's.

Scholar Coleen Magill

£100k Gift to Support Cardiac Arrhythmia Research

A philanthropic donation of £100k has recently been given to support cardiac arrhythmia research at Queen's. The gift will be used to fund Post-Doctoral Research Fellow Claire Tonry in Cardiac Arrhythmia — Phase two within the Wellcome-Wolfson Institute for Experimental Medicine.

MacQuitty Experimental Medicine Scholarship

Coleen Magill was awarded the MacQuitty Experimental Medicine Scholarship in the School of Medicine, Dentistry & Biomedical Sciences to study an MSc in Experimental Medicine.

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Help support the pursuit of world-class education and life-changing research

If you would like to donate to any of the research programmes within WWIEM, please contact **Sarah-Jayne Cassells**, Development Manager (Health), Queen's University Belfast; Tel: (+44) 028 9097 5073; Email: S.Cassells@qub.ac.uk. Alternatively, go to

Queen's Foundation - Donate Now @ https://daro.qub.ac.uk/DonateNow.

Within the donation form, you can specify how you would like your gift to be used.

Queen's Foundation have launched a new online fundraising guide for people who would like to raise money directly for WWIEM. The simple guide provides helpful tips on planning and promoting a fundraising event, using JustGiving and it includes poster / flyer templates and a sponsorship form. Check it out online at @ **https://daro.qub.ac.uk/file/QUB_fundraising_Guide.pdf** or contact Sarah-Jayne Cassells for more information**.**