

Issue

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CENTRE FOR
**EXPERIMENTAL
MEDICINE**

theinvestigator



Professor José Bengoechea
Centre Director

Welcome

I am pleased to present the Centre for Experimental Medicine newsletter. The last six months have been marked by the sudden death of Queen's Vice-Chancellor, Professor Patrick Johnston. Paddy's vision and hard work together with other colleagues made possible the development of the Centre. He strongly supported our research vision and efforts to make the Centre an international hub of research excellence while challenging us to work at the very highest level. Certainly, we will not be "the second best"! I am proud that we continue to deliver excellent postgraduate supervision and training, which has been recognized with the Faculty Supervisory Award (two in a row!). I want to highlight the Centre's outreach activities, chiefly our fantastic contribution to the NI Science Festival. We are planning new activities for next year and we aim to further engage with the community to showcase the relevance of our work. In this regard, we are pleased that the EU Commission selected one of our projects to exemplify the extraordinary impact of our research on antibiotic resistance. I do hope you will enjoy reading this newsletter which gives you further insight into the life of the Centre and our ongoing research.



Meet our Researchers



Professor José Bengoechea

I received training in Bacterial Pathogenesis as a PhD student under the supervision of Prof. Ignacio Moriyón and Prof. Ramón Díaz (University of Navarra, Spain). Then I started a postdoc in Prof. Mikael Skurnik's lab (University of Turku currently at University of Helsinki, Finland) to learn state-of-the-art bacterial genetics. In 2002, after obtaining a "Miguel Servet" contract funded by the Spanish Ministry of Health, I started my research group at University Hospital Son Dureta (Palma de Mallorca) and from 2005 at Fundación Caubet-CIMERA/CSIC (Palma Mallorca). In 2007, I obtained a position as associate Prof (with tenure) of Microbial Pathogenesis in the Spanish Research Council (CSIC). In 2013, after 12 years in Spain, I accepted an offer from Queen's University Belfast to a Chair of Molecular Microbiology.

My research has been influenced by the dual need to decipher infection as microbe-cell cross-talks, and to analyse infectious diseases in an integrative dimension encompassing host responses. The long term goal of my laboratory is to decipher the network of interactions between pathogenic bacteria and various cell types contributing to the onset of the innate immunity responses by applying a multidisciplinary approach interfacing immunology, cell biology, and molecular microbiology. This knowledge should speed up the development of new tools to control infectious diseases, the discovery of new antibacterial targets as well as the development of novel immunoadjuvants.



Dr Guillermo Lopez Campos

I have developed my scientific career in the area of clinical bioinformatics and biomedical informatics, applying these methods and techniques in different areas such as clinical microbiology or cancer. I started my scientific career in 1998 at the Bioinformatics Unit of the Spanish National Institute of Health "Carlos III" where I participated in the set-up of the first microarray lab in Spain and in different national and international research projects and I earned my PhD in 2009. In 2012 I joined the University of Melbourne as a Biomedical Informatics researcher and I recently moved to Belfast to take up a Lectureship in CEM.

During my career my interest has been mostly focused on improving the understanding of molecular mechanisms of disease, and it covered a broad area of research topics and include genomic and transcriptomic analyses, integration of clinical and molecular (including genetic) databases, clinical microbiology, systems biology and more recently the "exposome" and how environmental factors alter and interact with the individuals and their genomes. The final aim of my research interest is to foster and advance in what is currently understood as precision medicine. In this context, I consider the use of self-monitoring approaches as a window to the individual "exposome" and therefore a relevant and challenging piece of information to be included towards a more precise and personalized medicine as well as for a better understanding of the mechanisms of disease.



Dr David Grieve

After being awarded a BSc honours degree by the University of Dundee in 1995, I completed a PhD on "The role of dietary lipoproteins in the initiation of atherosclerosis" at The Royal Veterinary College, University of London, in 1998. I then worked as a post-doctoral researcher in the laboratory of Professor Ajay Shah in the Cardiovascular Division at King's College London for almost 7 years. In 2005, I took up an academic position within the School of Medicine, Dentistry and Biomedical Sciences at Queen's University Belfast where I am now a Reader with an established independent research programme.

My research programme is mainly focussed on investigating mechanisms underlying cardiovascular remodelling and dysfunction, with a particular interest in the role of oxidative stress, novel peptide hormones, endothelial progenitor cells, and the influence of diabetes. Combining transgenic technology with models which mimic human disease states associated with cardiovascular complications provides a powerful tool for the investigation of the mechanisms underlying these conditions. My group employs a wide range of laboratory techniques, from in vivo physiology to molecular biology and tissue culture, to investigate mechanisms which may underlie the adaptive and ultimately detrimental changes that occur in various cardiovascular disease states and how these may be modulated for potential therapeutic benefit.



Dr Bettina Schock

I have been actively researching respiratory infections and immunity in acute and chronic pulmonary diseases since 1996 when I started my PhD with a Scholarship from the German Academic Exchange Service. My PhD research showed for the first time the presence of oxidative stress in children with asthma and the kinetics of oxidative stress in preterm neonates with Bronchopulmonary Dysplasia (BPD) over the first days of life. As a postdoctoral fellow at UC Davis, California, I worked with Profs. CE Cross and MG Traber and studied the pro-inflammatory responses during vitamin E deficiency. I returned to Queen's at the end of 2003 and have since then developed my expertise in modulation of the innate immunity in chronic airway diseases such as Cystic Fibrosis (CF), Asthma and BPD.

I have developed Raman Microscopy to image the distribution of tocopherols and phospholipids in lung tissue. In my group, we currently extend this methodology to investigate novel chromanol-derived compounds with anti-inflammatory activity in lung inflammation and the role of sphingolipids in airway inflammation. Current research is investigating pathogen-host interactions in the CF airways and its relation to persistent NF-κB activation. Additionally, we have identified deregulated activity of the RNF11/A20 complex in the CF airways and also epithelial cells from different chronic lung diseases, which may be associated with TGF-β induced airway remodelling and fibrosis. I am committed to interdisciplinary research with a major focus on translational work to improve diagnosis or therapies for chronic airway diseases.

Awards and Prizes



Postgraduate Supervisory Excellence Award for Professor Miguel Valvano

Professor Miguel Valvano was the recipient of the 2017 Supervisory Excellence Award for the MHLS Faculty at the 3rd Annual Supervisory Excellence Awards, which took place at the Graduate School on May 23rd. Professor Valvano (left) is pictured receiving his award from by Pro-Vice-Chancellor Professor James McElnay (right).

Poster Presentation Prizes for CEM Researchers



Rebecca Delaney, a PhD student in Professor Cliff Taggart's lab, received a Distinguished Poster Presentation Award at the 15th European Respiratory Society (ERS) Lung Science Conference in Estoril, Portugal on March 23rd – 26th.

QUB's Graduate School held its 3rd Annual Researcher Poster Competition on June 5th – 12th with 5 prizes awarded in total. Congratulations to **Helen Groves**, a PhD student in Dr Ultan Power's group, the winner for the MHLS Faculty.

"...address key health challenges..."

Queen's Secures EU Funding for Fight Against Lung Disease

QUB has secured €2.4 million funding under the European Union's INTERREG VA Programme for a pioneering cross-border research project, designed to better understand and alleviate the impact of lung disease. The project will involve a strong cross-border partnership between scientists and clinicians from the School of Pharmacy and CEM (QUB), the Smooth Muscle Research Centre (Dundalk Institute of Technology), and the Institute of Biomedical & Environmental Health Research (University of the West of Scotland).

The 'BREATH' (Border and Regions Airways Training Hub) project will help address the causes, treatment and potential prevention of chronic obstructive pulmonary disease (COPD). Dr Lorraine Martin, School of Pharmacy, Queen's University is leading on the project along with colleagues, **Drs Lorcan McGarvey and Fionnuala Lundy** from CEM. She explained: "We are delighted to receive this funding to support an ambitious, collaborative research partnership that will address key health challenges in COPD...Through BREATH, we have an opportunity to harness complementary resources and expertise across the partners to enable a greater understanding of disease mechanisms which will facilitate the identification of novel targets and the development of therapeutic interventions."

Annual Postgraduate Student Research Symposia

We celebrated the work of our PhD students at the recent CEM Postgraduate Student Research Symposia in April and May 2017. The symposia, which were organised by postgraduate students, were a great success, and many thanks to session chairs, sponsors, and the Invited Speakers — Dr Paul Lavender (King's College London), Professor John Pickup (King's College London) and Dr Heather Wilson (University of Aberdeen).

Congratulations to the Best Presentation Prize Winners — Year 1 Symposium: (1st) **Daniel Storey**, (2nd) **Pietro Bertelli**, (3rd) **Xuan Du**; Year 2 Symposium: (1st) **Rachel Caines**, (2nd) **Michael O'Hare**, (3rd) **Callum McGrenaghan**; Year 3 Symposium: (1st) **Helen Groves**, (2nd) **George Eleftheriadis**, (3rd) **Jamie Toole**.



CEM Professor Re-Elected President of the European Federation of Critical Care Nursing Associations

Congratulations to **Professor Bronagh Blackwood** who was re-elected President of the European Federation of Critical Care Nursing Associations (EfCCNa, 2017-2020). The federation includes membership of 28 national associations representing approximately 25,000 critical care nurses across Europe.

Awards and Prizes



Postdoc Research Symposium

CEM's first Postdoc Research Symposium was organised by the Postdoctoral Development Committee (PDC) and took place on May 26th 2017. In addition to an outstanding lecture by Dr José Iborra from the National Center for Biotechnology-CSIC, Madrid on the role of mitochondria in nuclear gene expression, 10 selected postdocs presented their work orally, 37 presented posters and 9 submitted an image for our science image competition.

Prizes were awarded to **Dr Alice Dubois** for the Best Oral Presentation (A), **Dr Rosana Penalva** for the Best Poster (B) and **Dr Gema Esquiva** (C) for her image entitled "Network vision" (D). It was a great day of science and social interactions within the Centre and will be the first of many brilliant symposia within CEM!

Queen's and Belfast Trust lead major respiratory failure trial

Professor Danny McAuley (CEM) and Dr James McNamee (Belfast Health and Social Care Trust) are co-leading a landmark trial in one of the biggest clinical trials in the world in the area of respiratory failure. Central to the study, which involves over 1,000 critically ill patients in 40 different hospital sites across the UK over the next four years, is a new technology called 'extracorporeal carbon dioxide removal' which could save thousands of lives in Intensive Care Units.

The £2.1m research project is being funded by the National Institute for Health Research (NIHR) Health Technology Assessment Programme. Dr Janice Bailie, Assistant Director of the Public Health Agency's Health and Social Care R&D Division in Northern Ireland said: "I am delighted that Northern Ireland will lead this UK-wide research study that has the potential to improve the management of patients in critical care worldwide."

"...has the potential to improve the management of patients in critical care worldwide."



Professor Danny McAuley

5th Annual REMERGE Symposium

On June 26th, CEM was the proud host of the 5th Annual REMERGE Symposium. The symposium, organised by Regenerative Medicine Research groups (REMERGE) at QUB, brought together leaders in regenerative medicine and cell therapeutics. Speakers included Professors Paul Sharpe (Kings College London), Dan Weiss (The University of Vermont), Yvonne Alexander (Manchester Metropolitan University), Fraser Buchanan (School of Mechanical and Aerospace Engineering, QUB), Dr Adriele Prina-Mello (Trinity College Dublin), and CEM researchers **Drs Ikhlas El Karim, Anna Krasnodembskaya and Yvonne Dombrowski**. Following a moderated poster session and competition, the Best Poster Prize was awarded to **Dr Karla O'Neill**, with Runner-Up Prizes awarded to **Daniel Crooks** and **Declan Doherty**. The REMERGE group gratefully acknowledge support from CEM, HSC Public Health Agency, Research & Development Office, Aquilant and Randox.

EU Research Project Makes Huge Steps in Tackling Global Health Challenges

The European Commission has highlighted the significance of a multimillion pound research project, led by **Professor José Bengoechea**, in tackling multidrug resistant infections. In recognising the urgency to address this global threat, the European Commission provided €4 million in funding to Queen's to coordinate **INBIONET** (Infection Biology Training Network). INBIONET brings together leading scientists across Europe from a range of disciplines including microbiology, immunology, cellular biology and biochemistry to tackle infections in its whole complexity. The study was selected by the European Commission from several projects funded by the European Commission to exemplify the extraordinary impact this research has made in advancing our understanding of microbial strategies and its potential to shape the future treatments of infections. The project, which has now come to an end, has led to significant advances in understanding how different microbes evade our defences.

CEM Researcher in the News

Dr Denise Fitzgerald has been interviewed by BBC News following publication of a paper that reveals a major discovery in the fight against Multiple Sclerosis.

Read the full article, "**Paralysis inspires MS discovery**" on the BBC News website @ <http://www.bbc.co.uk/news/health-39256584>, and the paper "**Regulatory T cells promote myelin regeneration in the central nervous system**", published in the journal Nature Neuroscience (<http://www.nature.com/neuro/journal/v20/n5/full/nn.4528.html>).



Dr Denise Fitzgerald

CEM hosts NI Science Festival Open Day

On Sat Feb 18th, CEM again hosted the 'Know Your Enemy: Disease-Focused Research at Queens' showcase as part of the 2017 Northern Ireland Science Festival. The event, which was coordinated by **Dr Sinéad Weldon**, saw hundreds of people visit CEM to find out more about us and our research. Throughout the day, members of the public of all ages had the opportunity to meet over 60 CEM researchers and take part in a wide array of hands-on experiments, activities and building tours, which highlighted the breadth of research taking place in CEM.

Visitors could find out about how the brain repairs itself, diabetes and preeclampsia, how different diseases affect the eye, the heart and the lung, how viruses and superbugs make us sick, as well as stem cell research taking place in CEM. Feedback was overwhelmingly positive with Gory Corner and the DNA Kitchen proving a hit with children of all ages. Congratulations to Ellie, Mia and Naser on their prize-winning Glowing Bugs drawings.

We would like to thank the Faculty of Medicine, Life and Health Sciences for their support and all the fantastic volunteers whose hard work made this event such a success.



Research Experience Day

CEM took part in this year's SMDBS Undergraduate Research Experience Day on Jan 19th, which provided 1st year Biomedical Science students with the opportunity to hear about various research themes in CEM such as Cystic Fibrosis, diseases of the heart and eye, preeclampsia and stem cells as well as a range of imaging and biochemical techniques used by CEM researchers. The event was designed to provide students with the opportunity to meet scientists within the context of a range of informal talks, demonstrations and practical activities, and to facilitate discussion of our research, techniques we employ and potential career paths in science. Overall, the day was a great success and many thanks to everyone involved.

Global Thinking Locally

A team of CEM researchers took part in the QUB Interactive Showcase 'Global Thinking Locally' in Belfast City Hall on May 30th. Many thanks to **Laura Hobley, Kora Przybyszewska, Anna Krasnodembskaya, Thomas Morrison, Derek Brazil, Sinéad Weldon, Peter Barabas and Lajos Csincsik** for hosting the CEM stand, which featured a range of interactive demonstrations and activities to promote CEM research. There were over 30 exhibitors from across the University at the event showcasing their work under the themes of Future Cities, Healthy Citizens, and People and Places to highlight the impact we make on our city.

Soapbox Science

The second **Soapbox Science** Belfast event took place on June 24th 2017 in Belfast City Centre's Victoria Square. Soapbox Science is supported by L'Oréal, is based on the idea of Speaker's Corner in London's Hyde Park and aims to promote women working in the field of STEM (science, technology, engineering, medicine and mathematics) across the UK and Ireland. **Dr Lana McClements** was amongst those helping to raise the profile, and challenge the public's view, of women in science.

CEM Welcomes 2017 Summer Students

Our 2017 Summer Student Programme kicked off on Monday June 19th and we would like to take the opportunity to welcome this year's students and visiting researchers to CEM - Aisling Ault, Chloe Spence, Gokulramana Lakshmipathy, Curtis Neely, Tamara Mc Erlain, Sarah Stewart, Rachel Wong, Yaldasadat Hashemipour, Megan Low, Lena Glaser, Michael Moseneke, Ivan Kwek, James McKenna, Holden Koo, Samuel Moore, Stacey McNutt, Caitlin Hull, Yash Bansod, Lasse Hansen Olesen, Aya Akhras, Christopher Walker, Natasha White, Michael Breen, Jasmine Ross, Aisling Rafter, Lucy Keenan, Broghan Allen, and Alice Hurst. We gratefully acknowledge funders of 2017 summer student placements including the School of Medicine, Dentistry and Biomedical Sciences, CF Trust, British Microcirculation Society, Inspire, John Ford Lynas Studentship/School of Pharmacy and the Nuffield Foundation/Sentinus.

Northern Ireland MS Research Network Inaugural Symposium and Open Evening

On May 10th, **Dr Denise Fitzgerald** and her group were the proud hosts of the NI MS Research Network Inaugural Symposium and Open Evening for patients. It was a very successful event with a laboratory tour, demonstrations and speakers from California - Dr Ari Green, Wales - Dr Owain Howell, Dublin - Dr Claire McCoy and CEM - **Dr Denise Fitzgerald** and **Dr Yvonne Dombrowski**.



CEM Postdoctoral Development Committee

1 Year On!

The CEM Postdoctoral Development Committee (PDC) was established in July 2016 with the goal of improving postdoctoral training and development within our Centre. Thanks to financial support from the Centre and the energy of **Dr Denise Fitzgerald** (Head of the PDC), PI (**Drs Anna Krasnodembskaya, Beckie Ingram, Bettina Schock, Cecilia O’Kane, Derek Brazil, Laura Holey, Yvonne Dombrowski**) and postdoc committee members (**Drs Alice Dubois, Declan Doherty, Donna Small, Jaime Lindsay, Jose Romero, Lindsay Broadbent, Paul Canning**), it has improved the sense of support felt by postdocs in the development of their career plan as well as their sense of community within the centre (according to a PDC survey – results to be published soon!).

Over the past 12 months, the PDC has organised a career development and networking day, 4 career development seminars (Working in Industry: GSK; CV clinic; A Guide to Fellowships; Clinical Trials Management) and 4 technical seminars (Single Cell Western Blot; Cell ID and Authentication; iPSC/Stem Cell Research; CRISPR/Cas9) open to all in CEM, as well as the recent CEM Postdoc Research Symposium (see page 4). In addition, the PDC has created

several support programs including a very successful Buddy Scheme to help new postdocs starting in CEM and a Fellowship Support program.

In addition to the interactions created at those events, the building of the CEM postdoc community is strengthened by monthly coffee mornings and communication via the PDC’s workplace group (post doc community), Facebook page (QUB CEM Postdocs) and LinkedIn group (QUB CEM Postdocs).

The success of the CEM PDC has encouraged the Faculty to create a Postdoctoral Development Centre, for which the post of Director is currently advertised. The CEM PDC is very proud to have contributed to improving the development of postdocs not only in the Centre but also in the Faculty and intends to do even more next year!

Contact us: d.fitzgerald@qub.ac.uk

[f QUB CEM Postdocs](#) [in QUB CEM Postdocs](#)

Upcoming Events — Save the Date!



If you have an event, research announcement or news you would like to see featured in the next CEM Newsletter, please email Sinéad Weldon at s.weldon@qub.ac.uk.

2017 CEM Summer Student Research Symposium

Our annual Summer Student Research Symposium will take place on Wednesday August 9th. Come along, support our students and hear about their research.

BALR Summer Meeting



The annual summer meeting of the British Association for Lung Research (BALR) ‘Discovery to Recovery: still lost in translation?’ will be held at CEM, QUB from August 30th - September 1st 2017, hosted by **Dr Bettina Schock**. The fantastic scientific programme, registration and abstract submission details are available @ <https://www.balr.co.uk/meetings>.



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If you would like to donate to any of the research programmes within CEM, please contact **Alice O’Rawe**, Development Manager (Health), Queen’s University Belfast; Tel: (+44) 028 9097 5233; Email: alice.orawe@qub.ac.uk. Alternatively, go to **Queen’s Foundation - Donate Now @ <https://darqub.ac.uk/make-a-gift-to-queens>**. 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 CEM. 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://darqub.ac.uk/file/QUB_fundraising_Guide.pdf or contact Alice O’Rawe for more information.