

Issue

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CENTRE FOR  
**EXPERIMENTAL  
MEDICINE**

# theinvestigator



**Professor José Bengoechea**  
Centre Director

## Welcome

I am pleased to present the second newsletter of the Centre for Experimental Medicine. The last six months have been really busy but I am pleased to report that the Centre is thriving, and that we continue to recruit new groups. Supporting young group leaders is the most satisfying aspect of my job as Centre Director. I am particularly proud of the Centre's efforts supporting our postdoctoral community, indeed a talented group of young scientists. The Centre international leadership is exemplified by the two EU conferences we have hosted focusing on zinc biology and infectious diseases. One measure of our ongoing success is the significant increase in grant income over the last year, and the increase quality of the research we are publishing. It is worth highlighting our success in NIHR funding, which allows us to deliver translational impact locally and globally. However, in the current financial climate the support we receive from our benefactors is more important than ever. I do hope you will enjoy reading this newsletter which gives you further insight into the life of the Centre and our ongoing research.



**Queen's University**  
Belfast

Centre for Experimental Medicine  
School of Medicine, Dentistry and Biomedical Sciences  
Queen's University Belfast, 97 Lisburn Road, Belfast, BT9 7BL  
Tel: (+44) 028 9097 6460 Email: [cem@qub.ac.uk](mailto:cem@qub.ac.uk) Web: <http://www.qub.ac.uk/research-centres/CEM/>

# Meet our Researchers



**Dr Yvonne Dombrowski**

**Yvonne carried out her PhD in tumour immunology in the laboratory of Prof Joerg Wischhusen at the Julius-Maximilian University Wuerzburg in Germany.** She studied immune escape mechanisms of breast and ovarian tumours with particular focus on CD8 T and NK cells. For her postdoctoral training Yvonne moved to Munich to study the role of inflammasomes in skin autoimmunity at the Ludwig-Maximilian University under the guidance of Dr Juergen Schaubert. In 2012, Yvonne came to QUB to get advanced training in regenerative neuro-immunology in Dr Denise Fitzgerald's group. Subsequently, Yvonne was awarded a 3-year Early Career Fellowship from the Leverhulme Trust to start her independent research on inflammasomes in tissue repair and more recently, she was appointed as a Lecturer in CEM.

Yvonne's research program focuses on innate immune mechanisms in tissue repair. Her major interests are inflammasomes and their role in regenerative inflammation. During her Fellowship, Yvonne discovered that inflammasome activity promotes myelin repair in the brain and she is now expanding on this work by investigating the role of inflammasomes in tissue repair after infectious and sterile tissue damage at other anatomical sites. Her work will lead to a clearer understanding of the underlying immune mechanisms in tissue regeneration and will identify novel therapeutic targets that can be harnessed to direct functional tissue repair.



**Dr Imre Lengyel**

**Imre studied at University of Szeged in Hungary and completed his PhD at the at the Biological Research Centre of the Hungarian Academy of Sciences under the supervision of Profs Ferenc Joo and Botond Penke, studying the effects of phosphorylation and trace elements on the blood-brain barrier in health and disease.** This was followed by a postdoctoral position at the University of Newcastle in Australia under the supervision of Profs John Rostas and Peter Dunkley working on learning and memory processes and the involvement of activation of CaMK-II in the hippocampus. This work then continued when Imre returned to the Biological Research Centre in Hungary with increasing emphasis on pathological learning in Alzheimer's disease and drug addiction. In 2003 Imre was recruited to the UCL Institute of Ophthalmology by Prof Alan C Bird to apply his knowledge on neurodegeneration and zinc to the eye. In 2016 Imre was offered the opportunity to join CEM as a Senior Lecturer and he moved his laboratory from UCL to QUB.

Imre's research is focusing on the early molecular events of age-related macular degeneration (AMD) and how the eye could be used as a surrogate for detecting neurodegeneration in the brain. The Group is using high resolution molecular imaging in combination with imaging of live patient's eyes to gain a better understanding of how phenotype and molecular biology and biochemistry can be correlated. The work in Imre's lab is supported by grants from EU Horizon 2020, the ESRC, MRC and a long-standing collaboration with OPTOS Plc.



**Dr Gunnar Schroeder**

**Gunnar studied chemistry with a focus on biochemistry at the Philipps-University Marburg in Germany.** He then moved to the ETH Zurich in Switzerland to carry out his PhD in cellular microbiology in the group of Prof Hubert Hilbi. After a short postdoc at the ETH, Gunnar joined the group of Prof Gad Frankel at Imperial College London as postdoctoral fellow, where he worked on the molecular basis of host-pathogen interaction of a number of bacteria. In particular, he developed a new project focussing on Legionella pneumophila, the causative agent of Legionnaires' disease, a severe pneumonia. In August 2016, Gunnar joined QUB as a Lecturer in Microbial Pathogenesis at the Centre for Experimental Medicine.

Gunnar's group uses and develops functional genomics and proteomics tools to reveal the molecular processes at the host-pathogen interface. Employing Legionella spp. and other respiratory bacterial pathogens as model organisms his research aims to determine the function of virulence factors, identify common and pathogen specific infection strategies and define the molecular basis of predisposition and susceptibility to opportunistic infections, thus enabling the development of new treatment strategies and drugs to combat bacterial infections.



**Dr Chris Watson**

**Chris graduated from QUB in 2002 with a B.Sc. (Hons.) in Biomedical Science, and subsequently undertook and completed a Ph.D. in 2005 in the field of epigenetics and therapeutics.** Chris then joined University College Dublin for two years as a Newman Fellow in 2006 developing a work programme on heart failure prevention. In 2008 Chris then acquired a postdoctoral research fellowship in collaboration with the Heartbeat Trust. In 2010 Chris returned to UCD under an awarded 3 year Health Research Board of Ireland grant. Through the award of FP7 funding and Enterprise Ireland grants, in 2013 Chris became an independent PI and formed the Experimental & Clinical Cardiology group in UCD, with a research focus around novel diagnostic biomarkers & novel therapeutic strategies for cardiac disease. In 2015, Chris returned to QUB and took up an academic position as a Lecturer within CEM.

Chris' research programme at QUB is primarily focused on investigating the impact that cardiovascular risk factors such as diabetes, hypertension, and inflammation have on diabetic cardiomyopathy, cardiac fibrosis, and heart failure. This research is very translational and spans mechanistic work (fibrosis, hypertrophy, and epigenetics) right through to biomarker discovery programmes, clinical trials, and health services research. These research activities also span into low and middle income countries, particularly sub-Saharan Africa, through a Global Health (gHealth) Research consortium that Chris has developed.

# Awards and Prizes



Pictured (l-r) are co-founders of EpiCor Therapeutics, Dr Chris Watson (CEM, QUB), Dr Nadia Glezeva (UCD) and Dr John Baugh (UCD).

## Biotech Start-up Developing New Heart Disease Therapeutics Wins Start-Up of the Year Award in the UCD Venture Launch Accelerator Programme

### EpiCor Therapeutics wins €20,000 prize

Dr Chris Watson from CEM is a co-founder of EpiCor Therapeutics, an early-stage biotech start-up that won University College Dublin's 2016 Start-Up of the Year Award, after being declared overall winner of the 2016 Venture Launch Accelerator Programme on 17 November 2016. EpiCor Therapeutics is developing new disease-modifying treatments that target the mechanisms underlying the development of heart failure. The initial focus of EpiCor Therapeutics is to re-purpose an existing drug, 5-azacytidine, for the treatment of a devastating heart disease called hypertrophic obstructive cardiomyopathy (HOCM). The most extreme form of the disease currently affects around 175,000 people, with associated annual healthcare costs of over \$1 billion, in the US alone.



## British Heart Foundation Northern Ireland award

Dr Andriana Margariti and her team received the £190,000 award to help the fight against heart disease by turning skin cells into blood vessel cells and investigating their ability to improve the damage caused by the condition. Dr Margariti said: "By developing these cells we hope to help the heart repair and re-establish blood flow after a heart attack."



## Dr Sorcha Finnegan receives Fight For Sight Award

Dr Sorcha Finnegan has been awarded a Fight for Sight Small Grant Award for her work on "Human ciliary body/iris autoantibodies and uveitis in juvenile idiopathic arthritis (JIA)". Through this research, Sorcha, a postdoctoral researcher in Professor Madeleine Rooney's lab in CEM, will investigate novel antibodies that could predict the development of uveitis in children with JIA. This project could have important implications for the diagnosis of juvenile arthritis-related uveitis by enabling identification of those patients at risk; resulting in earlier diagnosis and more cost effective management.



*"...This could have huge potential to restore lost functions and improve the quality of life of people with MS."*

## £2M research programme to reverse the damage caused by Multiple Sclerosis

Dr Denise Fitzgerald was recently awarded Northern Ireland's first Wellcome Trust Investigator Award. In conjunction with BBSRC funding, Denise's research programme aims to understand how myelin, the insulating layer that surrounds nerves in the central nervous system, can be repaired. The funding of over £2M makes it the biggest MS research study currently underway in Northern Ireland. Speaking about the research, Denise said: "If we are successful...this could have huge potential to restore lost functions and improve the quality of life of people with MS. We are very grateful to the Wellcome Trust and the BBSRC for their generous grants which makes this research possible, so that we may advance knowledge and change lives."



## 5th Fincham Medal Award

Professor Alan Stitt was recently awarded the 5<sup>th</sup> Fincham Medal (City of London's Livery Companies) in recognition of his research on diabetic retinopathy and neovascular events in diabetes.

# Awards and Prizes



## Sir Howard Dalton Young Microbiologist of the Year 2016

Dr Lindsay Broadbent, a postdoctoral researcher in Dr Ultan Power's lab, was awarded first prize in the Sir Howard Dalton Young Microbiologist of the Year competition for her work on respiratory syncytial virus (RSV). Lindsay was presented with her award by Society President Professor Neil Gow at the Microbiology Society's Showcase and Annual General Meeting, which was held on Thursday 8<sup>th</sup> September in London.

## Presentation Prize

Dr Declan Doherty, a postdoctoral researcher in Dr Sinéad Weldon's lab, was awarded the Best Selected Oral Presentation Prize at the 10<sup>th</sup> UK Mesenchymal Stem Cell meeting in York on Monday 5<sup>th</sup> December 2016. This anniversary meeting showcased basic and clinical MSC biology and applications and provided a retrospective look at MSC research over the last decade

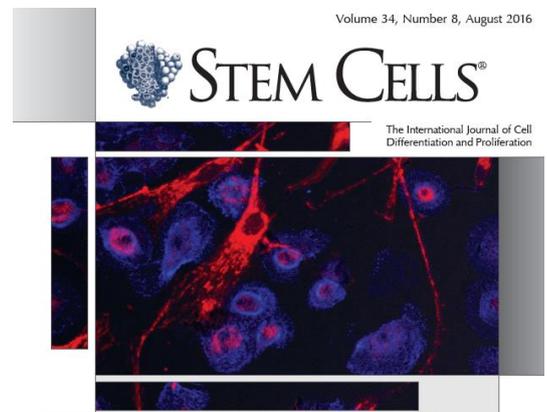
## CEM PhD students success at SMDBS Postgraduate Education and Research Forum

The annual SMDBS Postgraduate Education and Research Forum took place on Friday 21<sup>st</sup> October in Riddel Hall. The Forum featured a series of poster and oral presentations from 2<sup>nd</sup> and 3<sup>rd</sup> year PhD students from research centres across the School. Congratulations and well done to the CEM prize winners for Best Oral Presentations: **Helen Groves, Simon Carlile, Claire Kelly** and Best Poster Presentations: **Michael O'Hare, Rachel Caines**.

## CEM Research Featured on Front Cover of Stem Cells (August 2016)

Congratulations to **Dr Megan Jackson**, a postdoctoral researcher in Dr Anna Krasnodembskaya's lab, whose research describing mesenchymal stem cell mitochondrial transfer via tunnelling nanotubes is featured on the front cover of a recent issue of Stem Cells.

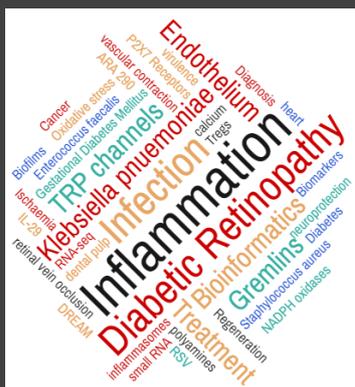
**Jackson MV et al., Stem Cells, Volume 34, Issue 8: 2210–2223.**



# CEM Annual Summer Student Research Symposium

Our 2016 Summer Student Programme culminated in the highlight event which was the Annual Summer Student Research Symposium on Thursday August 11<sup>th</sup>.

Well done to everyone who presented on the day and congratulations to the prize winners - **Hannah Gardiner**, (Brazil Lab), **Adam Wilson** (Grieve Lab) and **Xuedi Liu** (Hobley Lab). The event was a great success and the quality of the student talks was commended by audience members at all levels. The continuing success of our programme is due to the hard work and dedication of the participating students, host research teams, the CEM administration and technical team, funders and the School of Medicine, Dentistry and Biomedical Sciences.



1<sup>st</sup> Prize – Hannah Gardiner

2<sup>nd</sup> Prize – Adam Wilson

3<sup>rd</sup> Prize – Xuedi Liu

# Outreach



Conference attendees pictured outside Riddel Hall

## INBIONET/Infect-ERA Conference

The joint final conference of the EU programme **INBIONET** (coordinated by CEM's **Professor José Bengoechea**) funded by the Marie Skłodowska-Curie actions, and **Infect-ERA ERA-NET** took place at Queen's on September 14-15<sup>th</sup>. Delegates from 14 European countries (pictured above) gathered to discuss the latest findings from the INBIONET Programme and the first and second call of Infect-ERA. The event proved a huge success as experienced and early stage researchers contributed to discussions on some of the most deadly infectious diseases. New therapeutics against multidrug resistant bacteria were discussed and exciting pre-clinical results presented. Keynote speakers included Professor Erzsébet Nagy, Editor of the "anaerobe" journal, and Professor Paul Moynagh of QUB and the National University of Ireland Maynooth. In addition to the many scientific discussions which took place during this 2 day event, conference delegates also had the opportunity to sample some of the local hospitality and in particular embraced the traditional Irish Céilí which entertained all during the gala dinner which took place in The Great Hall at QUB.

## Raising Awareness of Rare Disease - Belfast Behçet's Syndrome Conference

**Professor Heping Xu** was invited to speak at the Behçet's Syndrome conference held in Belfast on October 8<sup>th</sup> 2016. At the meeting, lead investigator Heping discussed the outcome of the Northern Ireland Behçet's Disease Mapping project which was initiated by the Northern Ireland Branch of Behçet's Syndrome Society and funded by the **Behçet's Syndrome Society**. The mapping project uncovered a shocking fact, approximately 230 people live with Behçet's Syndrome in the Northern Ireland and the prevalence is 12 times higher than the national average. The Behçet's Syndrome Society UK attaches great importance to the result and recommends further investigations. Approximately 70 people from the north and south of Ireland attended the conference, including patients and their carers/family members, health professionals and politicians.

## Zinc-Net/Zinc-UK Conference

On November 21-22<sup>nd</sup>, CEM was the proud host of a European conference on zinc biology which was a combined meeting between **Zinc-Net** and **Zinc-UK**. In 2014 **Dr Imre Lengyel**, a recently appointed senior lecturer at QUB, received COST Action TD1304 The Network for the Biology of Zinc (Zinc-Net) from the European Union with colleagues from Universities at Central Lancashire, Aachen and Queen Mary University of London, to harmonize research activities from soil chemistry, food fortification and nutrition through medical research on zinc. The conference in Belfast was attended by over 90 participants from 26 different countries in Europe, showcasing recent developments in the field of zinc. Professor Wolfgang Maret from King's College London, one of the leading figures in zinc biology, said: "The feedback from all participants of this meeting about the hospitality from CEM was fantastic...We hope to be back at CEM in the future."

## Celebrating European Researchers Night at the Ulster Museum

A number of CEM research groups took part in 'Science Uncovered' which took place in the Ulster Museum on Friday 30<sup>th</sup> September as part of European Researchers Night. CEM researchers presented short talks and/or demos in areas such as diabetes, the eye, stem cells, superbugs and multiple sclerosis. The event had over 400 visitors. European Researcher's Night is a Europe-wide initiative, in which thousands of researchers all across Europe meet the public and share their work in a social setting. A short video of the event can be viewed [here](#), courtesy of the event organisers National Museums Northern Ireland.



# CEM Postdoctoral Development Committee

Contact us:

d.fitzgerald@qub.ac.uk



QUB CEM Postdocs



QUB CEM Postdocs

The CEM Postdoctoral Development Committee (PDC) was created in summer 2016 to help postdocs develop their careers. It is led by Dr Denise Fitzgerald and is composed of a group of CEM postdocs and PIs distributed in 6 sub-committees. Since its creation, the PDC has provided resources for career development to the postdocs of the centre via its monthly bulletin and its facebook page, as well as through a series of career development and technical seminars. The buddy scheme aiming to facilitate the integration of new postdocs in CEM has benefited 7 postdocs since September and 3 postdocs have also signed up to be mentored by professionals in their field of interest. A fellowship application support programme is in place and will be launched by a seminar on fellowships early in 2017.

A Postdoctoral Career Development and Networking day took place on October 17th at the Malone Lodge Hotel in Belfast (pictured below). Postdocs participated in 3 workshops on Individual Development Plans, Informational Interviews and Networking led by Dr Lisa Kozlowski (Associate Dean for Student and Postdoctoral Affairs, Thomas Jefferson University) and Dr. Zoë Fonseca-Kelly (Assistant Dean for Science, Harvard University). CEM Postdocs also had the opportunity to get to know each other, identify the challenges they face in their career development and brainstorm for solutions as a community. The event received extremely positive feedback and increased the sense of community for CEM postdocs.



2016 CEM Postdoctoral Career Development and Networking Day

## 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](mailto:s.weldon@qub.ac.uk).

CEM will host an NI Science Festival event entitled “Know Your Enemy: Disease-Focused Research at Queen’s”, which will take place in the Wellcome-Wolfson Building on Saturday February 18<sup>th</sup> between 1-5pm. This admission-free, open-to-the-public event will showcase some of the ongoing areas of research within the Centre. Come and meet some of our leading medical researchers. There will be several activities and exhibits specifically designed to appeal to kids of all ages, so everyone welcome!



### 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 CEM, please contact Alice O'Rawe, Development Manager (Health), Queen's University Belfast; Tel: (+44) 028 9097 5233; Email: [alice.orawe@qub.ac.uk](mailto:alice.orawe@qub.ac.uk). Alternatively, go to **Queen's Foundation - Donate Now**. Within the donation form, you can specify how you would like your gift to be used.