

# Collaboration

## TBSI Postdoctoral Society First Annual Research Day

The TBSI Postdoctoral Society was initiated with the aim of promoting cross collaboration and discovery between the five schools – Biochemistry and Immunology, Medicine, Pharmacy, Chemistry and Engineering – members of the Institute. The Society aims to promote a sense of community within the Institute to provide a network of support for scientific and career growth for postdoctoral researchers. The Society held its first annual research day in September. The day consisted of poster and oral presentations selected from almost 40 abstracts submitted by postdocs across the five schools. Our School was well represented and Dr Annie Curtis of Professor Luke O'Neill's lab scooped the top prize, sponsored by Roche Diagnostics, for the best talk. The judges were Professor Fergal O'Brien from Royal College of Surgeons in Ireland and Professor Paul Hertzog who was visiting from the TBSI partner organisation, the Monash Institute for Medical Research, Australia.



Professor Paul Hertzog, Dr Kiva Brennan and the winner of the prize for the best talk, Dr Annie Curtis

## Nobel Laureates Become Honorary Professors in the School



Professor Luke O'Neill (centre) with Professor Jules Hoffmann (left) and Professor Peter Doherty

Three Nobel Laureates have recently agreed to become honorary professors in the School of Biochemistry and Immunology. They are: Professor Peter Doherty, Professor Jules Hoffman and Professor Bruce Beutler. Professor Peter Doherty and Rolf M. Zinkernagel were awarded the Nobel Prize in Physiology or Medicine in 1996 "for their discoveries concerning the specificity of the cell mediated immune defence". Professor Jules Hoffman and Professor Bruce Beutler were awarded a share of the Nobel Prize in Physiology or Medicine 2011 "for their discoveries concerning the activation of innate immunity". They will visit the School three times a year to give seminars to postgrads and postdocs. We are delighted to have them on the staff of the School and their contribution will undoubtedly be invaluable.

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## School of Biochemistry & Immunology



The TCD School of Biochemistry and Immunology is a major hub for biomedical research in Ireland and is recognised internationally as a place of excellence for top quality teaching and research. We have a rich history in educating students from science, medicine and pharmacy and have made many major breakthroughs in biomedical research over the years.



Head of School, Dr Gavin Davey

Our primary research objective is to discover the fundamental mechanisms that underlie human disease which will ultimately lead to innovative therapies. The School has recently invested heavily in recruiting dynamic scientists who have developed research groups in the areas of cancer, brain diseases, infection and immunological diseases. Our

researchers have attracted major resources from funding agencies and industry throughout the world. We are constantly looking for new partners to invest in our students and research scientists and to help us make more discoveries that will benefit society. Here are some of the recent successes that we would like to share with you.

## Professor Caffrey's Contribution to Nobel-Prize Winning Research



Professor Martin Caffrey

Professor Martin Caffrey's group works on membrane protein structure and function with a particular focus on lipid metabolizing and signalling proteins including GPCRs. They have optimized a technique called the lipid cubic phase or *in meso* method which is particularly suited to the crystallization of membrane proteins. This was the method used by Professor Caffrey's collaborator Brian Kobilka to elucidate the complete three-dimensional structure of an activated GPCR — the  $\beta$ 2-adrenergic receptor ( $\beta$ 2AR) in a complex with its G protein. Professor Caffrey and his group helped to guide the relevant lipid phase science and cubic mesophase crystallization and oversaw automated lipidic cubic phase crystallography screens. This work was the culmination of many decades of research and contributed to the awarding of the 2012 Nobel Prize in Chemistry to Brian Kobilka and Robert Leftkowitz.

## New Ways Viruses Affect Human Immune Response

An international collaborative study, including Professor Andrew Bowie's group, has discovered new ways in which viruses manipulate the human immune response. This multi-disciplinary, multi-centre study involving immunologists, virologists, biochemists and bioinformaticians from across Europe published the results of their research in *Nature* recently\*. This work is the most comprehensive study to date analysing strategies used by over 30 viruses to target defence networks in human cells and provides many new insights into how viruses seek to avoid and weaken the immune response. The research findings could ultimately lead to the development of broad and specific antiviral therapies and new ways to treat patients with infectious diseases. Professor Bowie's research was funded by Science Foundation Ireland.

\*Pichlmair, A. et al. 2012. Viral immune modulators perturb the human molecular network by common and unique strategies. *Nature* 487, 486-490.

# Education

## New M.Sc. in Immunology

We are delighted to welcome the first enrolment of students to our new M.Sc. in Immunology which was launched in September 2012. Great interest was shown in this degree and the 18 successful applicants represent the very best of Irish and international students. This exciting M.Sc. provides academic, laboratory and research training in immunology for graduates pursuing careers in research, medicine, veterinary science or pharmaceuticals. With teaching expertise from world-renowned immunology researchers, clinicians and the pharmaceutical industry, students will gain a broad understanding of basic, clinical and therapeutic immunology. Students will access state-of-the-art core facilities, including flow cytometry, confocal microscopy, tissue culture and computer suites before carrying out a 12-week research project. The course director is Professor Cliona O'Farrelly and the co-ordinator is the newly appointed lecturer in Immunology Dr Nigel Stevenson.

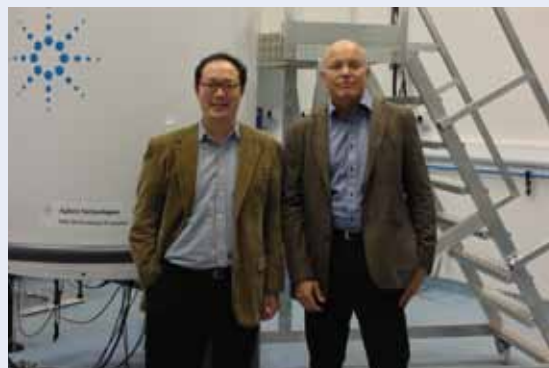


Professor Cliona O'Farrelly and Dr Nigel Stevenson

## NMR Facility

The School of Biochemistry and Immunology and Trinity Biomedical Sciences Institute (TBSI) are now the home of the strongest bioresearch magnet on the island. With €1.5million in strategic funding from the Programme for Research in Third Level Institutions (PRTLII) and College, installation of the new Nuclear Magnetic Resonance (NMR) Spectrometer began with the delivery of the 3.5-tonne superconducting magnet in February, followed by the arrival of a series of probes and electronic hardware. NMR is a high-resolution, atomic-level methodology for the determination of chemical and biochemical structures of molecules, including proteins,

nucleic acids, sugars, lipids, and the drugs that interact with them. The high-resolution NMR facility is open to users from all universities and pharma-, nano- and food-related industries in the Republic of Ireland and Northern Ireland, and will significantly increase our capacity to realise novel drug development, analyses and profiling of large-scale biobanks through NMR metabolomics, and the atomic-level structural elucidation of nano-scale inorganic and biological molecules. The facility is coordinated by Dr K.H. Mok, who has more than 15 years of experience in the area of biomolecular NMR and methodology development. A grand opening of the NMR facility is planned in 2013.



Dr K H Mok (left) and Professor Göran Karlsson, Director of the Swedish NMR Centre, who visited the facility to forge links with the School.

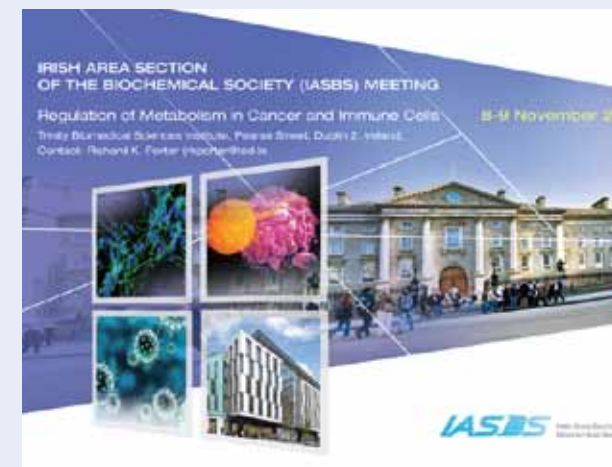
# Conferences

## IL17 and Related Cytokines International Conference

A major international meeting held at the Trinity Biomedical Sciences Institute in June 2012 showcased recent breakthroughs in treating immune-mediated diseases such as psoriasis, rheumatoid arthritis and Crohn's diseases. Cutting-edge research was presented on IL-17 and related cytokines – from basic biology to clinical applications' under the auspices of the International Cytokine Society. The meeting, co-organized by Professor Kingston Mills from the School of Biochemistry and Immunology, focused on significant advances in our understanding of the role of IL-17 and related cytokines in host immunity to infection and cancer, and how these cytokines have been successfully targeted for treating autoimmune diseases. Many of the world's leading immunologists from academia and industry presented papers, including the first disclosure of recent clinical data demonstrating that targeting the IL-17 cytokine family can be very effective in treating certain human diseases.

## Regulation of Metabolism in Cancer and Immune Cells Meeting

The Irish Area Section of the Biochemical Society (IASBS) is one of the thematic areas of the Biochemical Society (UK) and hosts its own annual meeting. This year The Biochemical Society has endorsed the IASBS Meeting as an Independent Meeting entitled: "Regulation of metabolism in cancer and immune cells". The meeting is organized by Dr Richard Porter and takes place in the Trinity Biomedical Sciences Institute this November. Metabolism, once thought to be modulated simply to maintain homeostasis, is now known to be a highly regulated process and this regulation is central to many cellular responses from immune activation to cancer development.



## Biomedical Frontiers: Public Lecture Series

It was standing room only at the inaugural lecture of the Biomedical Frontiers public lecture series on 3rd October when Professor Luke O'Neill gave an informative and entertaining talk about inflammatory diseases to an appreciative audience. In these lectures leading academic researchers from the School describe their research and how it has increased our understanding of human health and disease. The lectures provide an opportunity for the College community and the general public to learn about the research carried out in the School of Biochemistry and Immunology and demonstrate how this work has contributed to major discoveries in the biomedical field. Topics covered in the series include inflammatory diseases, vaccination, obesity, diabetes, cancer, stem cells, neurodegenerative disorders and mental health. For more information please visit [www.biochemistry.tcd.ie/news/publiclectures.php](http://www.biochemistry.tcd.ie/news/publiclectures.php).