Key Fellowship Schemes get underway at Conway

Following UCD Conway Institute’s success in securing funding from PRLTI Cycle 4, two key scientific research and training initiatives have been put in place and are ready to begin.

The UCD (Bio)pharmaceutical and Pharmacological Sciences (BPS) Programme is a cross-institutional research and education programme under the leadership of the Conway Institute and with the CSCB. The aim of the programme is to provide high-calibre, trained researchers for the Irish biopharmaceutical industry through a thematic doctoral programme. With the aid of PRLTI funding, the Programme was able to advertise a series of PhD studentships. There were over 160 applicants, and out of the very strong field 10 studentships were awarded. These students will take up their fellowships in September 2008.

UCD Conway will also welcome 3 clinical scientist fellows when the Molecular Medicine Ireland Clinical Scientist Fellowship Programme commences in summer 2008. This cross-institutional initiative is designed with the aim of furthering the development of translational medicine in Ireland by providing world-class research training to those currently working in clinical positions. MMT is capitalising on the research and teaching strengths in its affiliated institutions, of which the Conway Institute is one. The other institutions involved are UCC, TCD, RCSI and NUI Galway.

19 clinical scientist fellowships have been awarded within this programme, and 3 of these have been appointed to the Conway Institute. Out of the many strong applicants, the following were appointed: Patrick Collier, Eoin Feneley and Aidan Ryan.

With these initiatives UCD Conway is continuing to develop ways of answering its core mission of promoting excellence in the translational sciences. We look forward to welcoming our new fellows over the coming months.

Director’s Message

You are all very welcome to this May edition of Conway Focus. The past number of months have been extremely busy within the Conway Institute, and you will be able to read about some of our many activities and achievements in these pages.

AccessScience '08 was a huge success on 3rd March, with an audience of over 600 people in attendance. Congratulations to Billy Fleming on winning 1st prize in this competition and on going on to represent UCD so successfully in the Intervarsity Science Speak event on 30th April, where he won 3rd prize.

During March and April the Conway Institute also hosted a number of key conferences and symposia, including the Biochemical Society meeting on Glucotoxicity, organised by Philip Newsholme; the 1st Irish Proteomics Research Meeting, organised by the members of the Proteomics Research Centre; and the International Neuroimmunology Symposium organised by the Marie Curie MINEST students. These meetings and others like them, have contributed significantly to raising the profile of UCD Conway Institute both here in Ireland and internationally, and I would like to take this opportunity to thank everyone involved in organising these events for their efforts in this regard.

This is also a good time to remind you of the upcoming Conway Festival of Research, which takes place on 25th September this year. The Festival committee have attracted a world-class group of keynote speakers: Prof Nicholas Turner of the Manchester Interdisciplinary Biocentre; Prof Ralf Baumeister of ZBSA Center for Systems Biology, Bioinformatics & Molecular Genetics, Freiburg and Prof Denis Noble of Oxford University. It promises to be an extremely interesting day, and I look forward to seeing you all there.

As you know, our Business and Finance Manager, Peter Mangan, left the Conway Institute at the end of April 2008 after almost eight years in this position. While we are sad to see him go, we wish him all the best as he takes up his new role at UCD Research.

We are also delighted to welcome our new Director of Imaging, Dimitri Scholtz, who comes to us from the Medical University of South Carolina. With this appointment we are continuing to drive innovative approaches to core technologies at the Conway Institute to underpin and support our high quality research.
1st International Neuroimmunology Symposium takes place

The International Symposium on Neuroimmunology, sponsored by the International Society of Neuroimmunology and under the auspices of the European Union 6th Framework programme, took place in UCD on the 13th and 14th of March 2008.

With more than 200 participants from around the world, the symposium was organised by PhD students from the Marie Curie Programme in Molecular Neuroimmunology as part of their career development.

Programme coordinator Dr. Clare O'Connor of the School of Medicine & Medical Science at UCD explains its background: “A little over a year ago when the students undertook to organise a symposium, they set their sights on bringing together an outstanding and diverse group of international and national scientists at the forefront of research in neuroimmunology. One glance at the Symposium Programme shows how well they accomplished this aim, and the two days of the conference were a tremendous success”.

Indeed, the two-day symposium included leading researchers of outstanding calibre and international reputation with expertise spanning a wide range of topics from neurodegenerative and autoimmune diseases to HIV-related dementia and mind-body interaction.

Dr. Sieghart Sopper of Göttingen University, Germany, renowned for his research on the neuroimmunological aspects of HIV infections, opened the first day by exploring the role of the microglia in the pathogenesis of HIV-induced neurological disease. He was followed by Prof Paul Moynagh, Director of the Institute of Immunology at NUI Maynooth, who provided molecular insights into regulation of neuroinflammation. Prof Marina Lynch, Director of the Institute of Neuroscience at Trinity College Dublin, brought the first day to a close by examining the relationship between neuroimmunology and aging.

On the second day Special Guest Prof Michal Schwartz, holder of The Maurice and Ilse Kartz Professorial Chair in Neuroimmunology at the Weizmann Institute of Science, Rehovot, Israel, discussed the unique role of autoimmune cells in recovery from spinal cord injury while Prof Angela Vincent, consultant in immunology at the Department of Clinical Neurology, University of Oxford, UK explored the general mechanisms of autoimmune diseases in the brain.

The symposium was closed by a presentation from Special Guest Prof Hartmut Wekerle, Professor of Neurobiology and Director at the Max Planck Institute of Neurobiology in Munich, Germany. Prof Wekerle is also President of the International Society of Neuroimmunology and one of the foremost researchers working in the area of the pathogenesis of autoimmune diseases. His lecture was entitled: “A long way to Tipperary: Autoimmune T cell migration into the brain”.

Each of the PhD students organising the event also added their own contributions with oral and poster presentations of their work. This conference displayed more than 100 poster presentations and short oral communications from Irish scientists and researchers around the world highlighting the crucial work being done in this growing field of scientific endeavour.

By Marie Catherine Mousseau (Scientific journalist)

Dublin-Oxford Glycobiology lab hosts international workshops

The Dublin-Oxford Glycobiology Lab relocated to the Conway Institute last year from the Glycobiology Institute at Oxford University to join the National Institute for Bioprocessing Research and Training (NIBRT). NIBRT is a consortium involving UCD, TCD, DCU and IT Sligo which is funded by IDA, Ireland with a mandate to support the development of the biopharmaceutical industry in Ireland.

The importance of glycobiology is demonstrated by the fact that approximately 60% of naturally occurring proteins are glycosylated. Every cell is covered with glycosylated proteins and secretes many more. Recent analytical developments have revealed the crucial role played by glycans (sugars) in almost every essential biological process, including reproduction, signalling, cell differentiation, immunity, and diseases such as cancer, autoimmunity, and microbial infections. Many new biopharmaceuticals such as erythropoietin, pituitary hormones and monoclonal antibodies are glycoproteins, which themselves require their glycans for appropriate functional activity. Most of the receptors that are targets for these drugs are also glycoproteins.

The Dublin-Oxford Glycobiology laboratory has developed unique technologies for glycan analysis that is required for both basic research and to underpin bioprocessing (www.nibrt.ie). In the past four months 7 international guest researchers have visited the Dublin-Oxford Glycobiology Laboratory to learn advanced glycobiology techniques. Together with NIBRT, the laboratory has recently run a one day glyobiology course and a three day international glyobiology course with expert guest lecturers from Oxford University, NUI Galway, and the Dublin-Oxford Glycobiology laboratory. A group of some 30 principal investigators working in the field, came together last year in Galway to establish GlycoScience Ireland (www.GlycoScienceIreland.ie), which was officially launched by an international glycobiology conference in April. Lecturers came from leading biopharmaceutical companies in both the USA and Ireland as well as university laboratories in Ireland and Oxford University. The inspiring guest speaker was Professor Raymond Dwek, director of the Oxford Glycobiology Institute who discussed novel glycan related strategies for combating viral diseases.

On 7th April 2008, Michéal Martin, Minister for Enterprise, Trade and Employment announced details of a new collaboration between NIBRT and the biologics research and development organization of the pharmaceutical giant Eli Lilly. Ireland now has the opportunity to become centre stage in the field of glycoscience research, which is based on interdisciplinary collaborations between glycoscientists, biologists, chemists, engineers, information scientists and clinicians, both in Europe and beyond.

Submitted by Prof P. Rudd and Dr. D. Chatterton
PhD Student wins prestigious Chinese Scholarship award

3rd Year PhD student, Chen Ding, working in Geraldine Butler’s group, was recently the recipient of a Chinese National Outstanding Scholarship for Studying abroad. This award was presented on 5th May at the Chinese Embassy in Dublin. The scholarship is highly competitive and is presented only to qualifying Chinese students who are doing PhDs abroad. 301 such scholarships were awarded across 31 countries in 2008.

Chen was awarded the scholarship on the basis of his work on the fungal pathogen Candida parapsilosis, which is a disease-related fungus that infects people with weak immune systems such as HIV patients, transplant patients, and premature babies. Candida parapsilosis is capable of forming biofilms on different organs of patients. A biofilm is composed of millions of extremely ‘sticky’ killer cells that can destroy the host organs. Chen’s work in the Butler group is geared towards trying to understand which gene is in charge of the biofilm formation in Candida parapsilosis. They have successfully identified a Candida parapsilosis gene called BCR1, which plays a pivotal role in biofilm formation in the fungus. A BCR1 mutant, in which BCR1 gene has been removed, forms much less sticky cells so that cells are not able to clump together to form biofilms — and so the research team have identified a way to regulate the biofilm growth. The results of this research were featured in Microbe (the magazine of the American Society of Microbiology) in October 2007.

Identifying biomarkers for ovarian cancer

Some of the advances in glycobiology at the Dublin-Oxford lab described on the opposite page involve identifying biomarkers for ovarian cancer — the 4th most common cancer in the western world. Dr Radka Saldova explains further.

In cancer factors such as altered expression levels/activities of glycan processing enzymes, levels of monosaccharide nucleotide donors and loss of organisation of cellular organelles lead to alterations in glycan processing. Our strategy for identifying biomarkers is based on our recently developed high throughput glycan analysis platform that is linked to computer assisted data interpretation. The aim is to segregate and quantitate glycans from the total serum pool or individual glycoproteins, identify disease associated glycoforms and correlate these with disease progression/pathology. We have now applied this approach to ovarian cancer.

Serum CA125 is the only biomarker that is used routinely and there is a need for complementary markers to improve both sensitivity and specificity. In a pilot study scale, we found significant changes in the total serum glycome in ovarian cancer patients comparing to controls. Using combination of proteomics (2D gels) and glycan analysis we found that these changes coming from the acute-phase proteins (haptoglobin, 1-acid glycoprotein and 1-antichymotrypsin) and IgG heavy chains. There was a preliminary indication that combinations of these changes in the serum glycome might help to distinguish between ovarian cancer and benign tumours. The next stage will be to conduct a larger study using data receiver operating characteristic curves to allow the team to draw firm conclusions.

UCD Conway hosts 1st Irish Proteomics Workshop

The 1st Irish Proteomics Workshop was held at the UCD Conway Institute on 17th April 2008 with the aim of bringing together researchers working in Ireland who are interested in proteomics. Over 100 delegates from across Ireland and representatives from life science companies were in attendance at the event which was organised as a regional meeting of the British Society for Proteome Research (BSPR).

The Workshop was opened by Professor Janet Allen who gave the official welcome on behalf of the Conway Institute whilst Professor Mike Dunn (UCD Conway Institute and Vice-President of BSPR) welcomed the delegates on behalf of the BSPR and the local Organising Committee (Prof. Mike Dunn, Prof. Giuliano Eilai, Prof. Steve Pennington, Dr. Jules Westbroek and Ms. Ashling Gantly). The Workshop featured eight specially invited speakers from across Ireland and beyond who presented a series of entertaining and informative talks describing the highlights of their current proteomic research activities and demonstrating the range and breadth of proteomic research in Ireland. The keynote speaker was Professor David O’Connor (University of Southampton).

As well as hearing the many presentations, delegates also had the opportunity to visit the Workshop sponsors’ trade stands and catch-up on the latest developments in proteomic techniques and technologies. In attendance were: Applied Biosystems/MDS Sciei (Premier Sponsor), Mason Technology, Waters, GE Healthcare (Life Sciences division), ThermoFisher Scientific, and Agilent Technologies.

It is hoped another Workshop will be produced in 2009 given the success of this inaugural event. (Submitted by Dr. J. Westbrook)
This year’s AccesScience event, held in O’Reilly Hall on 3rd March, was extremely successful, with over 600 people in attendance. Students from schools throughout Ireland made the trip to hear six Conway Institute postgraduates explain their research without hiding behind technical jargon, and there was also interest from staff and students throughout UCD itself.

Pat Kenny was competition host again this year and we are extremely grateful to him for his continued support of the AccesScience initiative. The celebrity judging panel comprised Lucinda Croghton (FG TD for Dublin SouthEast), Derry Clarke (L’Ecrivian Restaurant), Sinister Pete (Phantom FM), and Mairead Farrell (Today FM and RTE 2). Their job was a tough one as the six speakers were of an extremely high calibre and presented on topics as diverse as environmentally friendly chemistry, advances in cardiac health and surgery, and the genetics behind body shape.

Together with the audience the judging panel selected CCB student Billy Fleming as the winner for his presentation on how work done to manufacture catalysts in the chemistry lab can help in the synthesis of drug therapies for a variety of diseases, thereby reducing the pressure on natural resources while at the same time safeguarding the future of global healthcare.

Second place was awarded to Belinda Maher for her illustration of how statins—familiar to those concerned with lowering cholesterol—are now also seen to have benefits in reducing the rate of rejection of transplanted hearts. Shane Kenny—winner of 3rd prize—was also concerned with the environment and spoke about using chemistry to create biodegradable plastics. The three highly commended runners up were Jennifer Hickey, Marco Monopoli, and Jane Ferguson. Podcasts of all the presentations are now available on iTunes or through the Conway website.

Billy Fleming also went on to represent UCD in the national intervarsity Science Speak competition on 30th April 2008. This event took place in the RDS and saw finalists from seven Irish universities compete. Billy won 3rd prize in this event, while 1st place was awarded to Suzanne McEndoo from UCC for her presentation on the super-cold world of quantum whirlpools.

The date for AccesScience’09 is already set for 26th March 2009. Following the success of this year’s final, and the level of interest from other UCD Schools we will be working to broaden the scope of the competition next year. It promises to be a very exciting final, so put the date in your diaries now!

Understanding diabetes at UCD conference

Finding answers to the ever increasing problem of diabetes was the focus of a recent Biochemical Society conference here in the UCD Conway Institute, organised by Dr Philip Newsholme and his team.

The focus of the conference ‘Molecular Mechanisms of Glucotoxicity’, held on 25th & 26th March 2008, was that glucotoxicity is not restricted to pancreatic beta cells but may occur in many other cells and tissues affected by diabetes. The pancreatic beta cell, skeletal muscle, liver, kidney, blood vessels and other tissue systems appear to be damaged by chronic exposure to elevated glucose, fatty acid and hormone concentrations typical of the Type-2 diabetic state.

Conference awards for posters went to Ms Marta Michalska, Mr Kalyana Venneti and Ms Deirdre Keane.

Art on the Dart: Science Track ’08

AccesScience ‘08 (see above) wasn’t just about the spoken word. There was also a poster competition to identify winning visual interpretations of the theme ‘Science in Our Lives’ which was open to schools throughout the country.

The many entries were judged on the day of the AccesScience final by the celebrity judging panel and three winners from both the primary and secondary school categories were selected.

During April these winning posters were displayed on DART trains and at DART stations throughout the Dublin area as part of annual Science Track initiative—a collaboration between Iarnród Éireann and UCD Conway Institute. Up to 100,000 commuters each day got to enjoy the imaginative depictions of science in the world around us from the young artists.

The winners can be seen below at Killiney DART station for the launch of the event on 22nd April.

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