Welcome to the 4th Newsletter from TBSI. We present discoveries, events and prizes from the past few months. Please send any information to Caroline (clevis@tcd.ie) for the next Newsletter.

DISCOVERIES (To read more go to recent discoveries or to www.tcd.ie/biosciences)

Could table salt be used to make nano-wires? Scientists have discovered that crystals of sodium chloride could ‘grow’ tiny wires

Thorfinnur (Thorri) Gunnaugsson, co-authored a study about the findings in ACS Nano. (pdf here) http://pubs.acs.org/doi/pdfplus/10.1021/nn305813


The process they used to “grow” the wires offers insight into how to control crystal growth on the nano-scale, adds Prof Gunnaugsson, who worked with Prof John Boland from Crann on the project. “Wires of all kinds will enable us to miniaturise structures and possibly build functional structures on the nano-scale,” he says. “And being able to grow such wires in a systematic and controlled manner would be a revolutionary step.
New genetic mutation that helps explain the development of eczema

Professor Padraic Fallon, Chair of Translational Immunology in the School of Medicine at Trinity, who led the project, said: “We have identified a new gene mutation that leads to atopic dermatitis (AD) in mice, and have taken that work further to demonstrate that a variant of the human gene is associated with AD in patients.”


Scientists Discover New Cellular Process leading to Lung Fibrosis


NCRC and Trinity Join Forces to Investigate Inflammatory Diseases in Children

The National Children’s Research Centre (NCRC) at Our Lady’s Children’s Hospital, Crumlin and the School of Medicine at Trinity College Dublin have recently awarded €1.7 million in funding to support three new Assistant Professorship positions in paediatric immunology as part of a strategic partnership between the NCRC and Trinity’s School of Medicine to develop a research programme focused on immunologic mechanisms of disease in children.

First Meeting of the Board of TBSI
Took place 9th December

The first meeting of the TBSI Board took place on December 9th, with presentations from the Director and the Heads of the three Centres in TBSI. Our Board is Chaired by Tom Lynch and we have two outstanding externals, Jackie Hunter and Annette Doherty. Progress to date and future Strategy were discussed and we look forward to working closely with the Board in the future.

Visit to TBSI by Michael Collins

TBSI hosted a visit from Michael Collins, Chancellor of the University of Massachusetts medical School on October 3rd 2013. TBSI has a number of collaborations with UMass and further links were explored with the Dean of Medicine as well as the Provost.
PUBLICATIONS

It is widely recognised that interdisciplinary collaboration results in high quality research. A key goal of TBSI is to encourage collaborations between schools and it is good to see how much collaboration is taking place. A measure of the extent of this is the number of inter-school publications. Examples of recent joint work follow.


Nitric oxide-matrix metaloproteinase-9 interactions: Biological and pharmacological significance
NO and MMP-9 interactions
Shane O'Sullivan a, Carlos Medina a, Mark Ledwidge b, Marek W. Radomski a, John F. Gilmer a
a School of Pharmacy and Pharmaceutical Sciences, Trinity College Dublin, Ireland
b School of Medicine and Medical Science, University College Dublin, Ireland
Carcinogenesis vol.00 no.00 p.1 of 9, 2013  Aneta Radziwon-Balicka1, Maria J.Santos-Martinez1,2, J.Jose Corbalan1, Shane O'Sullivan1, Achim Treumann3,
John F.Gilmer1, Marek W.Radomski1 and Carlos Medina1,*
1Department of Pharmacology, School of Pharmacy and Pharmaceutical Sciences, 2School of Medicine, Trinity College Dublin, Dublin 2, Ireland
and 3Newcastle University Protein and Proteome Analysis, Newcastle, UK


MAJOR EVENTS

TBSI Entrepreneur Day 3rd December

A half-day event aimed to educate and inspire would-be science entrepreneurs, at which distinguished speakers discussed their own stories and provided advice.

Speakers from industry included Henning Steinhagen, Senior Vice President and Head of Global Drug Discovery at Grunenthal, and Martin Welschof, Chief Executive Officer of Opsona Therapeutics, which is one of Ireland’s most successful companies working in Immunology. Speaking as venture capitalists were Ena Prosser of the Irish venture capital fund Fountain Healthcare, and Jan Adams of EMBL Ventures, Heidelberg.

Seamus Mulligan, one of Ireland’s most successful entrepreneurs in therapeutics, also spoke, before Barry McMahon, Director of Trinity’s Innovation Academy, and Niamh McGuinness, an Innovation Academy Ambassador, held a panel discussion.

Discover Research Night 27th September

Huge success! Discover Research Night, held on 27th September 2013. The event was part of an EU initiative (held concurrently in 300 cities across Europe). Members of the public were welcomed to TBSI to get a taste of what goes on behind the scenes.
Visit from Treasurer’s Office

Last year 11 members of the Treasurer’s Office enjoyed another visit to the TBSI Building as part of the Treasurer’s Office “Outreach Programme”. This programme was established in 2008 to offer staff the opportunity to gain a better understanding of the various aspects of College life and, on this occasion, the emphasis was on “A Day in the life of a PI” - hosted by Professor Cliona O’Farrelly. The visitors were introduced to Nigel Stevenson and Fernando Narcianidi who, along with Professor O’Farrelly, presented aspects of their research activity in the area of Comparative Immunology. Message received after the event: “Treasurer’s Office greatly appreciated Professor O’Farrelly’s generosity of time (and spirit) and that of her colleagues and are very much looking forward to the next visit to TBSI”.

POSTDOCs and PhDs students!

“Research Posters for the Public”

As part of TBSI Discover Research Night, Friday 27th of September 6pm-9pm
Terrifying Tales

Trinity College left a lasting impression on 200 primary school children and their parents on Tuesday, October 25 during an extraordinary evening of spooky stories, ghoulish drama enactments and arts and crafts. Approximately 200, 5th and 6th class children who are studying in schools which are linked with the Trinity Access Programmes

Luke O’Neill and Mathias Senge hosted the TBSI leg of the event.

FUNDING

Health Research Board (HRB) Award
Assoc. Prof. Lorraine O’Driscoll has recently secured a Health Research Board (HRB) Award of €320,000 to advance her teams’ breast cancer research in TBSI.

International Research Collaboration
Dr. Carsten Ehrhardt together with Dr. Daniela Traini and Prof. Paul Young from the Respiratory Technology Team at the Woolcock Institute of Medical Research (Sydney, Australia) have been successful in securing funding for the establishment of a project to study the implications of drug transporters in the lung on pulmonary drug disposition.

As part of a multi-institutional collaboration, Carsten will spend a sabbatical period at the Woolcock studying transporter expression in different lung cell types and their effect on drug absorption after inhalation of current lung therapeutics. This primer grant will support an initial study of healthy and diseased lung tissue from clinical patients and will result in a greater understanding of the mechanisms that underpin disease and the effectiveness of current inhalation medicines. The grant is worth 12,000 Australian Dollars under the International Research Collaboration Award scheme at the University of Sydney.
Arrival of the Mega Molecules

Thank you to IBEC for agreeing to let us install them in TBSI.
Spotted by Luke while walking through Terminal 1 at Dublin Airport who thought how good it would be to display them in TBSI.

About designer: Graeme Jones is chemical ecologist who has a passion for public science. In 2002 he led the team that built the Guinness World Record making model of DNA in Stoke. He now works with massive molecular models the size of houses, displaying and parading them at festivals and carnivals, even the Edinburgh Fringe Festival. In 2005 he was awarded a NESTA Dreamtime Fellowship to develop his talents as a science entertainer alongside being a Senior Lecturer at Keele University.

The rest of the Mega Molecules will find homes within TBSI over the coming weeks. A special thank you goes to Ryan Craig and Mili Litvajova from Chemistry who assembled them.
News from Bioengineering:

Danny Kelly (Associate Professor and Director of the Trinity Centre of Bioengineering, AMBER Investigator and Co-Chair WCB2018 with Fergal O’Brien (RCSI Professor of Bioengineering & Regenerative Medicine, AMBER Deputy Director and Co-Chair WCB2018) submitted a bid to host the 2018 World Congress of Biomechanics in Dublin. This bid has been successful! The conference takes place every four years and it is hoped to attract over 2500 delegates to Ireland. The event will take place in the Conventions Centre Dublin in August 2018.

News from Pharmacy

Lung cancer is the leading cause of cancer deaths worldwide and the third most common cause of death from all causes. This form of cancer includes small cell lung cancer (approx. 15% of cases) and NSCLC which includes adenocarcinoma (ADC; 40-45%), squamous cell carcinoma (30-35%), and large cell carcinoma (10%). The National Cancer Registry of Ireland (NCRI) predicts that by 2020 the incidence of lung cancer development will increase by 59% in men and 136% in women and ADC has been found to be the biggest killer of Irish cancer patients. A major factor in the high mortality of this disease is late diagnosis and so the presence of metastasis disease in the majority (>80%) of patients by that time, resulting in only 20% of those diagnosed surviving 1 year. Detection at an earlier stage (before the cancer has had time to spread), could dramatically increase survival rates. For optimum sensitivity and specificity of such detection, panels of reliable biomarkers—i.e. “in vitro diagnostics”—would be used—instead of single biomarkers—to avoid both false-positives and false-negatives. Unfortunately, no such panel of biomarkers has yet been developed.

Assoc. Prof. Lorraine O’Driscoll and her research group in the School of Pharmacy & Pharmaceutical Sciences have been collaborating with Kathy Gately at TCD’s School of Medicine to address this problem. From extensive molecular profiling and comparing blood serum specimens from patients and healthy volunteers they have discovered that people with ADC have substantially larger amounts of a set of short RNAs (known as microRNAs) circulating in their blood, compared to healthy individuals. This panel of microRNAs may offer minimally-invasive blood tests for ADC diagnosis and can be co-analysed in tiny volumes of blood serum using a PCR approach. This work has resulted in a patent, publication in a peer-reviewed journal and it has been the topic of an invited talk at an international cancer conference.

Prof. Mary Meegan and her team at the School of Pharmacy & Pharmaceutical Sciences have designed and synthesised a series of microtubular-destabilising agents that possesses potent anti-tumour and anti-vascular properties both in vitro and in vivo. In collaboration with Dr. Daniela Zisterer, School of Biochemistry and Immunology, TCD, these tubulin-depolymerising β-lactam compounds have been shown to potently induced cell cycle arrest and apoptosis in a variety of cancerous cell lines (including those displaying multidrug resistance) and ex vivo patient samples, whilst exerting only minimal toxicity to normal cells. The effect of the β-lactam
compounds on both tumour vascularisation and tumour cell migration, two critical elements that occur during the growth and metastatic progression of tumours has also been demonstrated. The Meegan group established that representative β-lactam compounds, exerted both anti-endothelial effects [G2/M arrest and apoptosis of primary human umbilical vein endothelial cells (HUVECs)] and anti-angiogenic effects [inhibition of HUVEC migration and reduced vascular endothelial growth factor (VEGF) release from MDA-MB-231 breast adenocarcinoma cells]. In addition, they established that lead analogue halted the migration of MDA-MB-231 cells indicating an anti-metastatic function for these compounds. The results to date demonstrate that these compounds may prove to be useful alternatives in the treatment of cancer.

TBSI DIGITAL SIGNAGE
The lift lobby screens on each of the floors can be used by all areas within TBSI to upload information. Contact Caroline if you require information on this at clevis@tcd.ie

PRIZES & AWARDS

The Irish Laboratory Awards 2013:

Congratulations to Sarah Whelan who won first prize for this poster at the 39th New England Immunology Conference in Wood’s Hole in November

Congratulations to Evanna Mills, who received the Award for Best Presentation at a meeting at a meeting on Diabetes and Inflammation, Nijmegen, Holland, 10th October 2013
EVENTS IN TBSI (snapshot since last newsletter)

European Federation of Immunology Society Committee
Virus workshops with Science Gallery
Immunology Research Day
NMR Training
Alumni Weekend: TBSI welcome for former graduates
Smith & Nephew Training Day
Staph GBI Conference
Bordetella 10th Symposium
International Anatomical Society Meeting
Emergency Medicine Student Society of Ireland
Friends of Medecins Sans Frontieres
RIA Hamilton Lecture
B&I Graduate Reception
Chemistry Careers showcase
Town Hall Meeting: Infection and Immunology
Fund Raising Bake Sale
Anatomy, 'Art of Plexus Anaesthesia Workshop,
TCBE Winter Symposium

Upcoming Events

- **TBSI** is proud to welcome **Prof Sir John Walker** FMedSci, FRS (university of Cambridge, UK) Nobel Laureate in Chemistry (1997) who will deliver a lecture entitled: Generating the fuel of life at 12noon on Wednesday 12th February, in the Tercentenary Hall. All Postgraduates and Postdoctorates are also invited to “a conversation” and Questions & Answers session, with Prof Walker at 10:00 hrs on that date, in the Knowledge Exchange.
- **TBSI annual symposium on May 9th** is being organised by Danny Kelly and will be an interdisciplinary event.
- **Major conference on Inflammation and Cancer on July 28th and 29th** which will be held jointly with the Weizmann Institute - we are establishing a strategic link with this Institute, which is a superb model for any biomedical research institute. 4 Nobel Laureates have agreed to speak so far as part of this so this will be a great event - details will follow.

FEEDBACK

There are many challenges at this stage of TBSI’s development and we are working through them. Please provide us with feedback, ideas and also news (apologies for any omissions) as we aim to establish TBSI as an Institute of which we can all be proud.