



research

MATTERS

08



INTERVIEW WITH PÓL Ó DOCHARTAIGH

VISICORT'S NEW €6M CORNEAL TRANSPLANT PROJECT

HEALTH BEHAVIOUR OF SCHOOL-AGED CHILDREN SURVEY

MICROWAVE IMAGING TECHNOLOGY DEVELOPMENT

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Welcome from the Vice President for Research



demonstrated through the spectrum of articles presented in this issue.

Each issue of Research Matters will focus on showcasing research highlights underpinned by our research agenda. Throughout the pages of this issue we have focused on the key interactions that academia has with industry and how our research is translating in terms of economic and societal impact.

Welcome to a new era of Research Publications at NUI Galway. The focus of Research Matters is to share highlights of our research excellence and experiences with you. NUI Galway is a thriving research driven University with highly relevant and impactful research priorities and themes,

Research at NUI Galway is exciting, ambitious and engaging. We look forward to sharing our research journey with you.

Lokesh Joshi
Vice President for Research

Guest Letter



"The emphasis on aligning third level education and training with the skills needs of employers is crucial and can only be achieved when both third level institutions and employers, particularly SMEs, work closely together. As we look to the future such collaboration is necessary to ensure the Greater Galway area's continued recovery and growth as an entrepreneurial and knowledge hub for the whole country. International evidence suggests that improvements in intermediate and higher-end skills can increase GDP by up to one percent through improved productivity.

"The skills gap can be closed by increased emphasis on STEM (Science, Technology, Engineering & Mathematics) education. Further, it can ensure that creativity, entrepreneurship and innovation skills are nurtured and embedded in enterprise for value-added products and services. It is crucial that we have enough qualified STEM graduates entering the work force to meet the demands of our growing technology-based and biomedical firms – an important industry cluster for the West.

"We believe Galway Chamber of Commerce, industry and NUI Galway enjoy a unique partnership which can help bring educators, entrepreneurs and business leaders closer together and give Galway the competitive edge in delivering a highly educated and skilled workforce."

Frank Greene
President, Galway Chamber of Commerce

From The Editor

Welcome to the all-new Research Matters. Issue 8 includes not just a new look for the publication but also the inclusion of additional multimedia material accessible through the online PDF version.

This time round our focus turns to industry and academia. NUI Galway has numerous links with organisations and enterprises, both large and small, through the Ignite Technology Transfer Office, as well as programmes like BioInnovate Ireland, and the many other individual projects and research areas being driven by enthusiastic researchers and academics across campus.

Industry and academia share many common goals and one frequently provides inspiration and focus to the other. That is what we hope to look at here.

We thank the President of the Galway Chamber of Commerce, Frank Greene, for being our first Guest Letter writer. In addition, we are also excited by the inclusion of a fascinating interview with newly appointed Registrar and Deputy President Pól Ó Dochartaigh. Those who would like to see more of that interview can do so through the online version where we have added additional video footage.

This is just the beginning of a new, more open approach to Research Matters and we hope that its reach will extend well beyond the NUI Galway campus into the future. As always, enjoy.

John Holden
Editor

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OPINIONS & PERSPECTIVES

THE APPOINTMENT OF PÓL Ó DOCHARTAIGH AS THE NEW REGISTRAR AND DEPUTY PRESIDENT SIGNIFIES A WELCOME RETURN TO GREATER BALANCE BETWEEN THE ARTS AND SCIENCES, WRITES JOHN HOLDEN.



Any Arts, Humanities or Social Science researchers out there might be forgiven for wanting to stick their heads in the sand in the

current economic and political climate. Science, Technology, Engineering and Maths (STEM) are the country's pets right now as government focuses much of its attention (and resources) on the premise that a STEM-based knowledge economy will be the foundation of economic recovery.

They may well be, but as newly appointed NUI Galway Registrar and Deputy President, Pól Ó Dochartaigh, suggests, such a policy emphasis creates a discourse hierarchy that subordinates the Arts & Humanities.

Ach a Mhalairt says the Belfast native, who believes Ireland's rich cultural and artistic heritage provides a wealth of benefits that extend far beyond simple distractions from more "serious" matters. Originally a German Literature BA graduate from University College



WATCH CLIP

Click to watch the video of Research Matters Editor, John Holden interview NUI Galway's New Registrar and Deputy President Pól Ó Dochartaigh or visit: <http://youtu.be/3ez2YtTtU30>

Cardiff, Ó Dochartaigh went onto to do a PhD in German Literature at Nottingham University, a Postgraduate Certificate in University Teaching at the University of Ulster (UU) and a BA in Irish Language and Literature, also at UU.

"My PhD was the first study of representations of Jews in East German fiction during the Communist era," he says. "It showed how monolithic politics could give way to greater diversity in culture, specifically on the subject of the legacy of Nazism and the Holocaust."

In all, Ó Dochartaigh spent six years in Germany in the 1980s and 1990s. Interestingly, he spent the first two years in West Germany, then two in East Germany and the final two years in the united Berlin.

In 1994, he got a job in UU as a lecturer in German where he resided for the last 20 years.

Over his two-decade tenure, he was key to a number of innovations at the institution. He was part of the team that introduced Film Studies to the university, was central to the creation of the Humanities Research Institute (and became its founding director), and in 2008 was appointed Dean of the Faculty of Arts, during which time he led a successful bid for the establishment of a Confucius Institute at UU in 2011.

Alongside his lectureship he also held a senior administrative post in student admissions and organised ten conferences over a ten-year period. He served on the UK's RAE Panel for German in 2008 and the REF 2014 Panel for

Modern Languages until his appointment in Galway. He was elected a Member of the Royal Irish Academy in 2010.

The Importance of Multi-Lingualism

With degrees in German and Irish Ó Dochartaigh is a language enthusiast, to put it lightly. "During my time as Chair of the Committee for Modern Languages at the Royal Irish Academy [2004-2008], I tried to inform policy around modern languages, something I'm passionate about," he says.

"The Anglophone World needs to move away from this idea that because everybody supposedly speaks English we don't need to bother about other languages. We absolutely *do* need to bother. If you don't understand other languages, you can never fully understand other cultures. It broadens the mind." Being from Belfast, he has tried to develop an understanding of difference.

There's an economic dimension to his argument too. "English is now spoken by more non-native speakers than native," he says. "So now and into the future it will increasingly become redefined by non-native speakers. But these non-native speakers are also comfortable with other languages.

"Language at the executive level may be English but if a company wants to break into a market where English is not the mother tongue, you still need people who can understand the local language and customs. So many of the top jobs will go to multi-linguists."



↑ Pól Ó Dochartaigh, newly-appointed Registrar and Deputy President, NUI Galway.

Not everything that is countable counts, and not everything that counts is countable

While no one would dispute that being bi- or multi-lingual is a tremendous advantage in work and life generally, languages are categorised within the Arts & Humanities, which do not receive the same amount of attention as other

"The Anglophone World needs to move away from this idea that because everybody supposedly speaks English we don't need to bother about other languages. We absolutely do need to bother."

disciplines, namely STEM subjects. Ó Dochartaigh would question the wisdom of this approach.

"Every country has to recognise that the strongest economies have a strong production side, and that's predominantly the realm of STEM subjects," he says. "No one is denying the absolute necessity to foster innovation in these areas. My concern with the STEM agenda, however, is that it has created a discourse which suggests the arts are somehow an indulgence. They aren't."

"To paraphrase Einstein: 'Not everything that is countable counts, and not everything that counts is countable.' This country has a tremendous cultural heritage that is of interest worldwide. Some of our writers are on curricula all over the world, their writings educating students as they develop as individuals. We have to put that at the centre of what we do, too. So STEM could become STEAM - Science, Technology,

Engineering, Arts and Maths. It's the Arts, Humanities and Social Sciences that give science and business a context in civilisation."

Does he have plans to make changes while in Galway? "Change is coming, regardless of my appointment," he says. "Some of it will be imposed from outside, but I believe there is an appetite for change inside too."

"I believe we need to address two things. Firstly, we have tremendous young talent coming through and we need

to look at how we cultivate that. The traditional academic way has been to leave academics to sort out their own career themselves. But I think we have to actively cultivate success and mentor youngsters. Give them pointers to help develop their own research profile so they know the best journals to target and the best international collaborators to work with. This can happen if our senior people actively mentor the next generation."

This practice is increasingly the norm elsewhere and it has forced people to think about how to up their game.

"Secondly, it is no longer acceptable for researchers to only publish in local or national journals. For some niche subjects this may be entirely appropriate, but for those which it is not, we should be encouraging researchers to think big. It's not good enough for our ambition to be one of the best universities in Ireland. We have to think globally if we want to be competitive in terms of unlocking European research grants but also having a global reputation for strong scholarship. It's not all about money. It's also about reputation, international engagement and attracting and keeping the best staff."

By **JOHN HOLDEN**
Editor, Research Matters

Delivering Leading Research in Evolving Open Software Systems

THE EVOLVING OPEN SOFTWARE SYSTEMS (EVOSS) RESEARCH GROUP IS AT THE FOREFRONT OF SOFTWARE MANAGEMENT. WITH OVER €4 MILLION WORTH OF FUNDING FROM SCIENCE FOUNDATION IRELAND, ENTERPRISE IRELAND, THE IRISH RESEARCH COUNCIL, THE EU AND INDUSTRY THIS DYNAMIC GROUP OFFER UNPARALLELED EXPERTISE TO ACADEMIA, INDUSTRY AND POLICY MAKERS.



A

As organisations face increasing global competition, rapidly developing technologies and dwindling resources, being able to implement

dynamic practices and processes becomes increasingly vital. EVOSS at NUI Galway work at the cutting edge of software creation and management, giving unique insights into how software can benefit organisations and policy makers, whilst setting the research agenda for academia.

Research conducted by the team helps organisations evaluate existing practices and provides best practice solutions, which immediately create organisational efficiencies. It focuses on two key overarching themes: - (i) evolving software that examines contemporary (agile and lean) software management, portfolio management and decision making and (ii) open innovation practices and frameworks, which include research on software ecosystems, crowd sourcing, cloud technologies and design thinking.

EVOSS offer unparalleled expertise in a broad spectrum of research areas related to software management and implementation. For example, the tangible value of agile and lean practices in organisations has not been quantified to date. Dr Kieran Conboy, PI and research group leader along with Ken Power, doctoral researcher and Lean and Agile Consultant at CISCO, are addressing this by developing a metric-based assessment of the true agility and leanness of organisations. Further, scaling agile project management principles from small co-located software

development teams to large portfolios is a challenge faced by many organisations.

Such portfolios contain numerous projects with each one comprising multiple teams. Dr Orla O'Dwyer and doctoral researcher Roger Sweetman are developing evidence-based mechanisms to assist with the deployment of effective agile project management techniques to large complex portfolios. Dr Lorraine Morgan and doctoral researcher Eoin Cullina are devising ways in which crowd sourcing can be best adapted, applied and validated in environments traditionally unsuited to its use.

Research-Led Teaching

EVOSS take an integrated approach to teaching and research. The team contribute directly to a number of undergraduate and postgraduate programmes and modules within the School of Business & Economics. The MSc in Cloud Computing, introduced in 2012, is a specific example of a programme which draws heavily from research led by Dr Tom Acton and doctoral researcher Trevor Clohessy. This programme was recently shortlisted in three categories in the GradIreland Graduate Recruitment Awards 2014.

Industry Engagement and Impact

Underpinning the work of EVOSS is the ability to combine research expertise with applied industry experiences, which maximises impact on research, policy and practice. A core activity of the group is researcher-industry knowledge >>>



Click to watch this informative video from the EVOSS team or visit: <http://youtu.be/KFpYzBWtHe8>



Top: Research Team (L-R): Eoin Cullina, Dr Kieran Conboy (PI), Dr Lorraine Morgan, Dr Orla O'Dwyer, Roger Sweetman, Dr Tom Acton, Dr Sharon Coyle, Brendan O'Malley (Lero), Trevor Clohessy. Absent: Dr Niamh O'Riordan, Dr Eoin Whelan, Dr Garry Lohan, Ken Power.
Bottom: Representatives from IBM, Lumension, Ericsson, Aró, Fidelity, CSGI, SourceDogg and NUI Galway.

« exchanges which take place every three months. The aim of these is to share experiences, participate in hands-on activities, and work together towards creating practical and immediately applicable solutions to real industry problems.

This engagement provides evidence-based insight on key issues in software implementation and management, which enables EVOSS to create tangible research outcomes that are immediately applicable to organisational settings. The team work with SMEs - such as Lumension, SourceDogg and Information Mosaic, along with multi-national industry partners like Cisco, HP and Intel - to deliver solutions to varying software agility issues. For example, in Cisco Ken Power has applied modern lean approaches and metrics with teams from around the world, uncovering inefficiencies and improving overall team and organisational effectiveness. Further, in an effort to help industry partners improve decision-making, research conducted by Dr Sharon Coyle and Dr Garry Lohan examines the use of decision quality indicators and

the optimisation of data presentation for effective decision-making. Detailed, tailored feedback has been provided to industry participants in the study to show how they can improve decision-making. This has resulted in better quality decisions and greater efficiencies during the decision-making process.

EVOSS – Informing Funding Strategies and Structures

Dr Kieran Conboy and Dr Lorraine Morgan were recently awarded an Irish Research Council grant to evaluate the impact of national funding agencies and identify and validate new and improved funding mechanisms and strategies. This award is one of three grants bestowed nationally and is part of a long-term SFI strategy to improve funding structures. The project will identify ways that national agencies can optimise the inputs, processes, outputs and outcomes of crowd sourcing efforts and maximise participation of individuals and firms with themes

including gender and ethnicity, industry sector and location diversity. In addition to collaborating and shaping the funding structures of Irish funding agencies, such as the Irish Research Council, Enterprise Ireland and SFI, the team will collaborate with the Open Innovation Group at the University of California, Berkeley.

Cross Cutting Research

'Information Systems' is still a relatively young field with research examining the application of technology and its impact across a broad spectrum of social and business values. This means that rich collaborations are possible within medicine, science, engineering as well as mainstream management. Leveraging the success of an SFI Award in 2011 - the first such award to a Business School in Ireland - Dr Conboy commented that: "Traditionally, SFI grants have almost exclusively been awarded to researchers within Science and Engineering. The recognition by SFI of the strategic importance of our research demonstrates the value of business research." The team hopes to diversify their expertise by working in collaboration with other disciplines and areas where value can be added. As funding agencies look increasingly towards collaborative funding programmes with tangible commercialisation outputs, EvoSS is uniquely positioned given their size, scale and complimentary skillsets to work together in meaningful collaboration with University partners, industry and funding agencies.

EVOSS is part of the Lero national software research centre, the Enterprise Agility Cluster within the Whitaker Institute for Innovation and Societal Change, and the JE Cairnes School of Business & Economics. The research team consists of five academics, five doctoral and three post-doctoral researchers.

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PROFILES

MEET THE PEOPLE
BEHIND THE RESEARCH

DR MARK BRUZZI
Programme Director BioInnovate Ireland



I finished my PhD studies in Mechanical Engineering here at NUI Galway - specifically on the mechanical behaviour of metal alloys - in 2000, and started lecturing in the University immediately after that. Much of my early research activities were centred around the medical device industry, which is obviously strong here in Galway.

Then I did some work with a medical device start-up called Brivant Medical. That company started to grow and an opportunity for me to leave the University and join that team on a full-time basis arose so I took it. We specialised in the development and manufacture of cardiovascular guide wires. This company grew to over 60 people in the subsequent years.

In 2005, I decided to return to NUI Galway but continue doing research projects with the likes of Brivant Medical and others. At this time, much of my research focused on process development for medical technologies but soon led into product development.

Because of this existing collaborative activity within the University, I was frequently approached by medical doctors who had ideas for novel medical technologies but realised there was a gap for engineers to interact with clinicians.

In 2011 the chance to do a sabbatical at Stanford University came up and so

I joined their BioDesign programme for six months. This programme was already ten years in existence at that point, and focused on developing early stage medical technologies through embedding engineers, medical doctors, and business people within the hospital environment who could then identify unmet clinical needs and develop solutions.

During my time in Stanford, I simultaneously helped launch the BioInnovate programme here in August 2011, lead by Dr Pat Morgan, and working with a team that included Sandra Ganly, Dr Faisal Sharif, Dr Fabio Quondametto and Dr Kathryn Cormican.

It was clear to us that there was a need here for something similar to BioDesign. This was all in the context of economic doom and gloom but the University were quick to commit to a programme and fund its initial development phase. In addition, Enterprise Ireland gave pilot funding to fellows that would undertake the programme, and medical technology provider, Medtronic, also supported us from the start.

Now in our third year we've expanded to three teams and have groups in University College Cork (UCC), University of Limerick (UL) and here in Galway. [See Galway team's profiles on following page]

Since then Stanford have invited us to be formally affiliated under their Global

Affiliates Programme, which will lead to more fluid connectivity between Silicon Valley and Ireland. We recently organised the first European meeting for programmes of this kind where we hosted 18 universities from 11 different countries who participate. These included: Northwestern University Illinois, John Hopkins University Maryland, Imperial College London, Karolinska Institutet Sweden, Stanford University California, and Biocat Institute Barcelona, etc.

In terms of my own career, I get more excited by the growth and possibilities of BioInnovate each year I'm involved. The programme gives me the opportunity to help create real impact by translating technologies that meet medical needs, and which provide economic value as well as more traditional academic metrics.

I'm very happy with our progress. After three years, we've had seven new technologies developed, and created several external linkages, including the recent \$16 million agreement between Enterprise Ireland and the Mayo Clinic in Rochester, Minnesota, which we are facilitating.

By JOHN HOLDEN
Editor, Research Matters

PROFILES 

THE GALWAY BIOINNOVATE TEAM

www.bioinnovate.ie
Eoin Bambury

Eoin has over 12 years experience in R&D roles of medical device new product development. Having graduated from Dublin City University in 2000 with a BEng in Mechatronics engineering he joined Caradyne Ltd in Galway as systems engineer, working on design and development of non-invasive continuous positive airway pressure (CPAP) respiratory equipment. In 2004 he was awarded an MSc in Bioengineering from the University of Limerick having completed his studies on a part-time basis. He transferred to Respironics Inc California, USA after Respironics acquired Caradyne in 2004. At Respironics, he worked as senior engineer in the R&D team developing non-invasive multi-therapy respiratory equipment. In 2006 he returned to Ireland to join Crospon Ltd working as principal engineer in the R&D group on gastro-intestinal hollow organ functional imaging and transdermal drug delivery applications. Eoin has contributed to the development of five electronic medical devices currently on the market and is a named author on six patent filings. In 2012 he was named "Chartered Engineer of the Year" by Engineers Ireland.

Dr Kyle Halligan

Kyle has experience in both frontline and clinical medicine, bench to bedside clinical research, and product development. He graduated in 2003 from the University of Connecticut (CT, USA) with a BSc in both Molecular Cell Biology & Physiology and Neurobiology. He worked as a Chemist in the Research and Development lab of Spartech Polycast (CT, USA) which included original patentable ideas and medically implantable plastics.

He furthered his science background with an MSc in 2006 in Cellular and Molecular Biology from the University of New Haven (CT, USA). He continued the work of his novel research proposal at Yale Medical Center (CT, USA) in the Breast Cancer Research Unit. His lab work included identifying genetic biomarkers of disease in preserved samples previously thought to be unusable.

A UCD medical graduate, his undergraduate training took place in numerous US hospitals as a visiting medical student including Massachusetts General Hospital, Shriners Hospital for Children in Boston, Thomas Jefferson University in Philadelphia and the Yale-affiliated Bridgeport Hospital in Connecticut. He aims to utilize the BioInnovate programme to develop exciting tools to aid the clinical fields of Emergency, Medicine and beyond. He enjoys the outdoors and travelling to new places.

Ms Michelle Tsai

Michelle graduated from UC Berkeley with a degree in Bioengineering, and pursued a Masters Degree in Bioengineering at Stanford University. Michelle has always been passionate about healthcare and really enjoys working on engineering design projects. Her goal is to get more involved in medical technology and help design/develop new technology that will help improve the health of people around the world.

Mr Moshe Zilversmit

Moshe has been developing medical devices for eight years. He was one of the founding members of Chest Innovations where he led the company in the development of thoracic surgical devices for the treatment of lung cancer and emphysema. Prior to Chest Innovations he held R&D positions at academic and early stage medical device companies where he was responsible for the development of innovative medical technologies in the urology, anaesthesia, orthopaedic, gynaecology and cardiovascular arenas.

Upon returning from a trip to Tanzania along with his passion to bring healthcare to those residing at the bottom of the pyramid, Moshe cofounded Evolving Technologies, which develops medical devices to meet the needs of patients and physicians practicing in emerging markets.

FBM Ltd.

Electronic Design Expertise



FBM Ltd is based in NUI Galway's Business Innovation Centre, centrally located on the thriving third level campus. The company offers a range of services related to the electronic side of product development. This could be

anything from a short investigation to define a specification, the design of a prototype for "proof of concept," or a complete design to production readiness.

Clients range from very early start-ups to large multinationals in various sectors: basically anyone who needs electronic design expertise.

The Smart Battery Analyser

FBM was successfully awarded an Innovation Voucher from Enterprise Ireland and engaged with NUI Galway's Ignite Technology Transfer Office (TTO) in relation to the inspection of a block of IP that had been developed by Prof Ger Hurley and his team at the Dept of Electrical and Electronic Engineering. The collaboration with Prof Hurley and his team, made possible by the use of the Innovation Voucher, meant that FBM were able to avail of expertise, facilities and equipment as well as gaining an understanding of the technology.

The IP relates specifically to the area of battery analysis. Prof Hurley's team have developed and successfully patented a process whereby the state of health of a battery can be determined very quickly. Up to now, to accurately measure this figure relating to the battery's actual performance ability required the battery to be disconnected and put through a range of time-consuming tests – such as a complete discharge/charge cycle.

Short-Term Investigative License

During the lifetime of the Innovation Voucher, the TTO work with FBM on a fixed term license which gives them access and permission to use the IP which had been developed by Prof Hurley's team. The purpose of this agreement was simply to allow the company to examine the practicalities of developing a device which could be used to implement the IP. The project was a success and they have now developed a platform on which further product development and customisation can take place.

Full Commercialisation License

Leading on from the success of the investigative phase of the project, NUI Galway and FBM have agreed terms and put in place a comprehensive license to commercialise the IP. This will result in the spinning out of a new company (Pulse Battery Management) dedicated to the development of a range of products to be brought to the market.

The FBM Smart Battery Analyser evaluates the State Of Health (SOH) of a battery in less than a minute. SOH testing is the only true measure of a battery's worth.

Built on patented technology which was developed from years of intensive research carried out at NUI Galway, the FBM Smart Battery Analyser is the result of a true symbiosis between NUI Galway and private enterprise.

This has been a very successful collaboration all round and FBM and NUI Galway look forward to continued research and development together. The company is delighted to be housed in the NUI Galway Business Innovation Centre availing of the super business supports offered by Ignite TTO.

For more info go to:
www.fbm.ie
 Tel: +353 91 86 29 17
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Or you can contact Fiona Neary
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RESEARCH IN FOCUS

A CLOSER LOOK AT RESEARCH ACTIVITY
ON AND OFF CAMPUS

Minister for Education visits NUI Galway



Minister for Education Ruairí Quinn TD officially opened two new buildings at NUI Galway on the 1st of May 2014; the Hardiman Research Building for research in the humanities and social sciences, and a new home for the University's School of Psychology. With a combined investment of €23 million, the new buildings offer world-class teaching, learning and research facilities for staff, students and the public. The Hardiman Research Building will house NUI Galway's unique collection of more than 350 literary, theatrical, political and historical archives from the digitised Abbey Theatre Archive, the world's largest digital theatre archive, which has been in development since 2012. The €15 million Hardiman Research Building project was partially funded under the Programme for Research in Third-Level Institutions (PRTL) and co-funded under the European Regional Development Fund. €10 million of funding was provided by the Dept of Jobs, Enterprise and Innovation through PRTL Cycle 5 and the balance from private sources through the Galway University Foundation.

« TOP: NUI Galway Librarian John Cox shows Minister Ruairí Quinn and NUI Galway President Dr Jim Browne some photographs of 19th century Connemara from the Arthur J Balfour Album, a volume in the James Hardiman Library's special collections, housed in the new Hardiman Research Building. The Balfour Album of photographs was originally created in 1893-1895 by the Belfast photographer, Robert John Welch.

LEFT: The 'Performing Ireland 1904-2014' exhibition currently on show at NUI Galway.

Cell EXPLORERS - a model for sustainable public engagement by third level institutions

Cell EXPLORERS is a science outreach programme based in the School of Natural Sciences that promotes biological and biomedical sciences. With its sister programme, Eco-EXPLORERS, it is at the heart of the SNS EXPLORERS initiative.

Since its inception, Cell EXPLORERS has leveraged funds of over €84,000 from national and international funding bodies, recruited over 130 volunteer students and staff, visited 69 schools, hosted 12 workshops and has directly engaged 3,800 children, parents, teachers and the general public.

In the last year Cell EXPLORERS has received funding from the Science Foundation Ireland (SFI) Discover Science and Engineering Award, which allowed it to expand its activities and to visit schools outside of Galway City, and from the Wellcome Trust People Award, which permitted the pilot integration of outreach projects into the undergraduate curriculum. Programme director, Dr Muriel Grenon, was also honoured with the SFI 'Outstanding Contribution to STEM' award and Cell EXPLORERS represented Ireland Outreach at the 2014 Malta Science EXPO. Cell EXPLORERS is working towards impacting science education nationally by developing a Continuous Professional Development module in collaboration with the NUI Galway School of Education and the Galway Education Centre.

The Cell EXPLORERS model represents a unique, sustainable method of performing outreach activities, while simultaneously promoting NUI Galway research. A high demonstrator to pupil ratio, interactive hands-on activities and a core of enthusiastic volunteer students underpin the success of the programme. Integration of outreach into the curriculum contributes to sustainability by ensuring novel activities are created and by training the next generation of science communicators.

The Cell EXPLORERS model can be piloted within the School of Natural Sciences and has the potential for growth within the College of Science and the University at large, allowing NUI Galway to be at the forefront of science outreach both nationally and internationally.

You can follow Cell EXPLORERS on Facebook: www.facebook.com/Cellexplorers, and Twitter: [@cellexplorers](https://twitter.com/cellexplorers)



» Top: 1st class students learn about the cells in our bodies with Cell EXPLORERS. Middle: Cell EXPLORERS volunteers are awarded their ALIVE certificates with programme director Dr Muriel Grenon at centre. Bottom: Cell EXPLORERS activities include visits to science festivals, open days, and schools.

RESEARCH IN FOCUS

Youth Academy

In 2012, NUI Galway established the Youth Academy. Its goal is to inspire entry to the university by introducing children and their families to university life. The Youth Academy works with high ability 4th, 5th and 6th class primary school students to support their learning and academic development and works in partnership with primary schools across the Western region. Since 2012 almost 800 students have graduated from a range of specially designed courses, in a variety of subjects, across numerous disciplines. Courses range from "Idea Detectives: Exploring the World with Philosophy" to "Map Adventures and the World in 3D". The Youth Academy runs for a seven-week period on Saturday mornings from 10am-12.30pm. On the final day of the Youth Academy a graduation ceremony takes place where students receive certificates of participation, from the President of NUI Galway, and their families and friends are invited on campus to share in the celebrations.

For further information you can contact Geraldine Marley, the Youth Academy Coordinator at: youthacademy@nuigalway.ie or www.nuigalway.ie/youthacademy



Over 200 students are presented with certificates of participation from the President of NUI Galway at the graduation ceremony in February 2014.



NUI Galway Fulbright Awardees (back row l-r) Dr Emer Mulligan and Prof Fidelma Dunne. Front row (l-r) Dr Gavin Collins, Alena Yuryna Connolly, Julianne Murphy and Colm Mac Fhionnghaile.

Fulbright Scholarships Galore!

A total of 40 new Irish Fulbright Awardees were announced this year at the U.S. Ambassador's Residence. For over 50 years, The Fulbright Awards have been given annually by the Irish and U.S. governments to provide Irish students, scholars, and professionals with the opportunity to study, lecture, and research at top universities and institutions throughout the United States. In 2014, a staggering six out of 40 were awarded to NUI Galway academics and researchers:

Dr Gavin Collins is a lecturer in microbiology and European Research Council Fellow at NUI Galway, and a British Science Association Media Fellow at The Irish Times. As a Fulbright Scholar at the University of California Berkeley, Dr Collins will investigate microbial genomics in bioenergy production and enhanced oil-recovery processes.

Prof Fidelma Dunne is the Head of the School of Medicine at NUI Galway. Prof Dunne will research alongside Prof Mary D'Alton at Columbia University in New York. She will compare and contrast the screening and clinical outcomes for women with Gestational Diabetes in both states to include a cost benefit analysis.

Colm Mac Fhionnghaile is an MA candidate in Modern Irish at NUI Galway. Colm will be a Fulbright Foreign Language Teaching Assistant in the University of Connecticut.

Dr Emer Mulligan is Head of the School of Business and Economics at NUI Galway. As a Fulbright-CRH Scholar at the Harvard Kennedy School of Government, Dr Mulligan's research activities will focus on taxation in practice in US multinational corporations and US tax policy and administration.

Julanne Murphy completed a Professional Diploma in Education at NUI Galway in 2012 and is currently a secondary school teacher at Ardscoil Rís, Limerick. Julianne will be a Fulbright Foreign Language Teaching Assistant at the Catholic University of America, Washington D.C.

Alena Yuryna Connolly is currently undertaking a PhD in Information Systems Security at NUI Galway. While at the University of California Berkeley, Alena will research socio-cultural measures that promote security-cautious behaviour of employees in organisational settings.

VISICORT

VISICORT

NUI GALWAY TO LEAD NEW €6 MILLION EU PROJECT
TACKLING CORNEAL TRANSPLANTATION FAILURE



due to immunological and other biological reasons, a large proportion of corneal transplants fail.

Corneal transplantation is the most common transplant carried out worldwide with over 100,000 procedures each year. It is often the only treatment available to restore sight to people who have lost vision due to diseases of the cornea. Unfortunately,



Prof Matthew Griffin and Dr Thomas Ritter.

Researchers at the Regenerative Medicine Institute (REMEDI) have come together with NUI Galway spin-out company Orbsen Therapeutics, and the Centre for Cell Manufacturing Ireland (CCMI), to lead a €6 million EU Framework Programme 7-funded project aimed at better understanding the adverse immune responses to corneal transplants. The researchers also aim to improve corneal transplant outcomes using a stem cell therapy to modify the immune response in high-risk corneal transplant recipients.

Known as "VISICORT" (Adverse Immune Responses and their Prevention in Corneal Transplantation), the five-year project is being jointly coordinated by Prof Matthew Griffin and Dr Thomas Ritter in partnership with 11 other academic and industry-based partners from France, Germany, Denmark and the UK.

Speaking at the launch of the project, Prof Griffin said, "It is extremely exciting to have the opportunity to collaborate with such an outstanding group of researchers from different parts of Europe. Our common goal of further improving the results of corneal transplantation through a better understanding of the immune response can only be achieved by combining the skills and resources of all the partners."

Dr Thomas Ritter added, "In recent years, our Immunology research programme at REMEDI has focused at a basic level on understanding the immune response to transplanted tissues such as the cornea as well as on the immune altering effects of stem cells. VISICORT now gives us the chance to apply this research to people with severe eye disease who can benefit from new tests and cellular therapies."

The Galway teams will be building on an existing model system which shows that stem cells can have a positive effect on the immune system during transplantation leading to an improvement in the overall success of corneal transplantation. The final year of the project will involve a clinical trial testing the usefulness of stem cells in corneal transplant, using cells manufactured at NUI Galway in the CCMI.

By **DR KIERAN RYAN**
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FROM CHILDHOOD TO ADOLESCENCE, EXPLORING
THE SOCIAL DETERMINANTS OF HEALTH

The Health Behaviour of School-aged Children (HBSC) Survey



A pioneering cross-national study on young people's health and health behaviour is underway within the Health Promotion Research Centre (HPRC) at NUI Galway. Drs Saoirse Nic Gabhainn, Michal Molcho and Collette Kelly were successful in securing funding from the Dept of Health to collect and analyse data on health and health behaviours from representative samples of school children in Ireland.

This research collaboration with the WHO Regional Office for Europe is conducted every four years in 43 countries and regions across Europe and North America. With child and adolescent health a key priority in Ireland and globally, the HPRC uses its findings to inform policy and practice to improve the lives of young people.

The Health Behaviour of School-aged Children (HBSC) Survey is not only about health behaviours such as tobacco and alcohol use. Its remit is wide and aims to explore the social determinants of health, with emphasis on family, friends, school and community networks and how they may influence health and wellbeing. The HBSC study dates back to 1982 when only a handful of countries were involved, with Ireland joining in 1994. Today, the research collaboration across 43 regions brings together individuals with a wide range of expertise in areas such as clinical medicine, epidemiology, human biology, paediatrics, pedagogy, psychology, public health, public policy, and sociology. This diverse range of

perspectives strengthens the study and ensures that adolescent health is considered holistically.

The HBSC Ireland team collect data from children and young people aged 9-18 years every four years. Internationally, data is collected and compared for adolescents aged 11, 13 and 15 years. These years mark a period of increased autonomy that can influence how their health and health-related behaviours develop.

Data collected from children in schools this academic year will be analysed, interpreted and disseminated widely, with consultation from the Dept of Health on what the data show for young people living in Ireland today. Cross-national comparisons will also enable us to compare policies and practices in other countries and how these may apply or inform our work in Ireland. HBSC member countries and stakeholders at national and international levels can also use our data to monitor young people's health, understand the social determinants of health, and determine effective health-improvement interventions.

For more info go to: www.nuigalway.ie/hbcs, www.hbcs.org
Colette.kelly@nuigalway.ie
www.nuigalway.ie/hprc

HPRC is a designated WHO (World Health Organisation)
Collaborating Centre for Health Promotion Research

RESEARCH BYTES

A ROUND UP OF SOME OF THE OTHER BIG RESEARCH NEWS AT NUI GALWAY

Dr Conor O'Byrne travels to Umeå, Sweden, for cutting edge research

Located on the Baltic coast some 600km north of Stockholm, and at a latitude of 64 degrees North, the University of Umeå, Sweden is one of the most northerly universities in Europe. NUI Galway microbiologist Dr Conor O'Byrne recently worked in the lab of Prof Jörgen Johansson in the Dept of Molecular Biology, which is an exciting environment with a strong reputation in Infectious Disease Microbiology. Prof Johansson's group focuses on understanding the molecular mechanisms that determine virulence gene expression in the bacterial food-borne pathogen *Listeria monocytogenes*.

While there O'Byrne worked with his team to develop new approaches aimed at understanding how this pathogen senses and protects itself from the harsh conditions encountered when it enters the human host, something his own group



Dr Conor O'Byrne visiting Lapland.

at NUI Galway - the Bacterial Stress Response Group - has been studying for many years. This collaboration led

to some exciting new results which demonstrate a strong link between stress sensing and virulence in this bacterium.

School of Nursing & Midwifery research paper wins at Royal Academy of Medicine in Ireland

A paper published by the Pulmonary Rehabilitation in Nurse-led Community Environment (PRINCE) research team won the General Practice category at the Royal Academy of Medicine in Ireland (RAMI) Doctor Awards on 24th April 2014. The winning paper examined, "The effectiveness of a structured education pulmonary rehabilitation programme for improving the health status of people with moderate and severe chronic obstructive pulmonary disease (COPD) in primary care." The study was funded by the Health Research Board, and consisted of a two-armed randomised cluster trial. In one arm (intervention group), persons with COPD received a structured education pulmonary rehabilitation programme, while the other arm (control group) received usual care. The study found that people who



(L to R) Dr Dympna Casey, Prof Andrew W Murphy and Prof Kathy Murphy.

attended the structured programme were significantly better able to manage their breathing difficulties than those who did not attend.

The study was led by Prof Kathy Murphy and Dr Dympna Casey, from the School of Nursing & Midwifery NUI Galway, but also involved collaboration with other researchers from NUI Galway, the HSE and the UK. The authors were Dympna Casey,

Kathy Murphy, Declan Devane, Adeline Cooney, Bernard McCarthy, Lorraine Mee, John Newell, Eamon O' Shea, Carl Scarrott, Paddy Gillespie, Collette Kirwan and Andrew W Murphy.

The winning paper is available from the following link:
<http://thorax.bmj.com/content/early/2013/06/09/thoraxjnl-2012-203103.long#aff-5>

NUI Galway Pain Researchers Win Prize for Best Research Paper

For the second year running, Prof David Finn of NUI Galway has been awarded the Royal Academy of Medicine in Ireland's (RAMI) Doctor Award for best paper published in an indexed journal in 2013 in the Pain/ Anaesthesia category. Prof Finn, Lecturer in Pharmacology, Co-Director of the Centre for Pain Research and Leader of the Galway Neuroscience Centre, received the award at a ceremony held in the Royal College of Surgeons in Dublin.

The first author of the winning paper was Dr Kieran Rea, a postdoctoral researcher in Prof Finn's laboratory. RAMI's Doctor Awards are presented each year to Irish or Irish-based researchers who are judged to have published the best research papers in international, peer-reviewed journals.

The winning paper confirmed the key role of a brain region called the basolateral amygdala in the suppression of pain behaviour by fear (so-called fear-induced analgesia).

An increased understanding of the biological mechanisms involved in fear-induced analgesia is important from a fundamental physiological perspective and may also advance the search for new therapeutic approaches to the treatment of pain.

This research was funded by grants from Science Foundation Ireland, the Health Research Board and the Irish Research Council.

Irish Association for Cancer Research Annual Meeting at NUI Galway

The annual meeting of the Irish Association for Cancer Research (IACR) was recently held in Galway. This is the primary scientific meeting for cancer research in Ireland and attracts individuals from all disciplines including Basic Science, Translational Science, Oncology, Haematology and Surgery.

The goal of this meeting is to bring excellent international speakers to the country in order to give our scientists-in-training the opportunity to hear from experts in cancer research and to allow them to present their science to

prominent national and international scientists.

This year over 260 attendees were present and 148 submitted abstracts. The best of those were selected to give oral presentations and NUI Galway came home with one of the major honours by winning the best oral poster presentation.

All the posters were judged by the IACR council members and NUI Galway came out well on top of all other Irish institutions by securing five out of

the 10 available prizes. Also of note was that the former NUI Galway PhD graduate, Triona Ní Chonghaile, was conferred with the prestigious EACR Young Scientist Award (senior category).

The contributions of new IACR council members, Prof Afshin Samali and Dr Emer Bourke, to the organisation of the event must be recognised, as well as the NUI Galway Foundation, the College of Science, the School of Medicine and the Research Office for supporting the meeting and the participation of NUI Galway researchers.



PhD student wins CN Davies Award

Áine Broderick, PhD student in the School of Physics at NUI Galway, has recently won the CN Davies Award, a scholarship allocated annually by the Aerosol Society to a PhD student studying in a British or Irish University. The Aerosol Society is a UK-based scientific organisation that promotes the science of airborne particles by organising conferences, educational training and student awards. Áine competed for the CN Davies Award, which has a monetary value of €2000, by writing an essay on the subject of her PhD project, which was reviewed by leading aerosol experts in the UK. Áine's PhD research is supervised by Dr Miriam Byrne and Dr Marie Coggins in the School of Physics, and is funded by the Environmental Protection Agency. The work is focused on assessing indoor air quality in homes that are retrofitted for improved energy efficiency.

This is highly topical research: the adverse effects of indoor air pollution on human respiratory health are well documented, but little is known about the influence on indoor air pollution levels of reduced building ventilation rates that are dictated by energy conservation directives.

COST Actions at the Whitaker Institute

COST is one of the longest-running European frameworks supporting cooperation among scientists and researchers across Europe. It is an intergovernmental framework allowing the coordination of nationally-funded research on a European level. COST enables breakthrough scientific developments leading to new concepts and products and thereby contributes to strengthening Europe's research and innovation capacities.

Researchers at the Whitaker Institute for Innovation and Societal Change are currently involved in four diverse COST (European Cooperation in Science and Technology) Actions.

Prof Kevin Leyden recently hosted a

meeting of the COST Action - People Friendly Cities in a Data Rich World.

Dr Gerard Turley is a member of the management committee of the COST Action - Local Public Sector Reforms: An International Comparison.

Dr Srinivas Raghavendra recently hosted a workshop on Data Visualisation and Analytics as part of the COST Action - Analysing the Dynamics of Information and Knowledge Landscapes - KNOWeSCAPE.

Drs James Cunningham and Garry Lohan are part of the COST Action - Expert Judgment Network: Bridging the Gap Between Scientific Uncertainty and Evidence-Based Decision Making.

BOC Postgraduate Award



◀ Eamonn Glynn (BOC), Mark Farrell, Shane Gough (BOC) and Peter Ó Conghaile.

The BOC Award is supported by BOC gases and recognises research achievements, in terms of published work and impact as well as outreach, and contributions to the School and University, of PhD candidates.

Congratulations to Peter Ó Conghaile from the School of Chemistry for winning

the BOC Postgraduate Award for his work on: tailoring surfaces and supports for enzyme electrodes with application to biopower device development.

Likewise, congratulations to Mark Farrell who was also awarded for his research into the anomerisation of glycosidic linkages.

Happy Birthday! 20th Anniversary of the Ryan Institute's Irish Seaweed Research Group



◀ Researchers at the Ryan Institute's Irish Seaweed Research Group. Back L-R: Maeve Edwards, Aimée Walls, Benoît Quéguineur, Svenja Heesch, Néstor Robinson (visiting student; Mexico). Front L-R: Jessica Ratcliff, Alex Wan, Jyotsna Mishra, Anna Soler-Vila, Anne-Sophie de Crane (visiting student; France), Richard Walsh, Jazmin Hernández-Kantún (recently appointed to the Smithsonian Institution in Washington,DC).

The year 2014 marks not only the return of the British Phycological Society (BPS) to NUI Galway for its 62nd Annual Meeting, but also the 20th anniversary of the Irish Seaweed Research Group (ISRG), which is hosting the conference. This research group was founded in 1994 by Prof Michael Guiry to promote the development of Ireland's seaweed sector, including scientific research on Irish seaweeds.

The group first operated under the name,

the Irish Seaweed Industry Organisation (ISIO), then became the Irish Seaweed Centre in 1998, and was rebranded as the ISRG in 2010. As Ireland's seaweed and biotechnology sector is currently research worth over €20 million per year, industry-appropriate research is more important than ever before. With around 570 recorded species of red, green and brown seaweeds, the coastlines of Ireland harbour a high seaweed biodiversity, offering huge potential for basic and

applied research on these fascinating organisms.

Based at the Ryan Institute under the leadership of Prof Mark Johnson, the ISRG comprises five postdoctoral researchers, four PhD and MSc students and continues to host a number of visiting researchers, interns and students from all over the world.

For further information on the group, visit: www.irishseaweed.com

'Bug Run School Days' - an 'Antibiotic Awareness' iPad App

In May, the Discipline of General Practice at NUI Galway launched Bug Run, a free iPad app that combines a game and an educational video to educate children and adults on the issue of antibiotic resistance.

Funded by the Health Research Board (HRB), the game teaches children between 4-10 years about the importance of staying healthy and that taking antibiotics comes at a price. The accompanying short video developed for adults highlights the issue of antibiotic resistance and provides suggestions on how to discuss this with their General Practitioner.

The development of Bug Run is part of a bigger research project, the SIMple study: Supporting the Improvement and Management of Prescribing for urinary tract infection. In this study, Dr Akke

Vellinga from the Discipline of General Practice, School of Medicine, and her team have integrated prescribing guidelines with the generic software package a GP uses on a daily basis when diagnosing patients and prescribing medicines.

Bug Run recently received the 2014 Crystal Clear MSD Health Literacy Award, which recognises and rewards excellence in health literacy in the healthcare sector. The research and concept for the app were led by Dr Vellinga, along with Prof Andrew Murphy and Post Doctorate Fellows, Sinead Duane, Sandra Galvin and Aoife Callan.

Bug Run is free and can be downloaded from the App store to any iPad: <https://itunes.apple.com/gb/app/bug-run-school-days/id860440510?mt=8>



◀ The 'BugRun School Days' iPad app Team, from the Discipline of General Practice, School of Medicine at NUI Galway, (clockwise from left) Post Doctorate Fellows Sinead Duane, Sandra Galvin and Aoife Callan, and the project leader Dr Akke Vellinga.

RESEARCH PUBLICATIONS

REVIEW OF BOOKS, ARTICLES
AND ALL OTHER PUBLICATIONS

Significant output of six textbooks over one year

NUI Galway researchers on biofuels have been behind a remarkable output of six leading textbooks on biofuel, enzyme and fungal technologies in little over one year. Dr Maria G Tuohy, Dr Vijai K Gupta and Dr Anthonia O'Donovan of NUI Galway's School of Natural Sciences and Ireland's national Technology Centre for Biorefining & Bioenergy (TCBB), have authored and co-edited a significant body of work that is an asset to researchers and industry development.

Following publication of *Laboratory Protocols in Fungal Biology: Current Methods in Fungal Biology Series and Biofuel Technologies*, the publisher of both texts, Springer, approached Drs Tuohy and Gupta to develop a book series in both areas/ fields and to act as editors of these over the next few years.

New Registrar and Deputy-President of NUI Galway, Prof Pól Ó Dochartaigh, who took formal receipt of copies of the textbooks for NUI Galway's James Hardiman Library, commended Dr Tuohy, Dr Gupta and Dr O'Donovan on their significant output of high-

value material for the biofuels and biotechnology sectors. "NUI Galway is world-leading on energy and environmental research and in formally accepting copies of Dr Tuohy's, Dr Gupta's and Dr O'Donovan's work for the University, I commend and congratulate them for their contribution to further enhancing the University's reputation in the biofuels, enzyme and fungal technologies areas."

Dr Tuohy in turn thanked NUI Galway, her colleagues Dr Gupta, Dr O'Donovan and all the Molecular Glycobiotechnology Group team, Enterprise Ireland and other funding agencies who have supported the group's work, Dr Michael Carty (Head of Biochemistry), Prof Vincent O'Flaherty (Head of School) and her colleagues from the School of Natural Sciences and the national Technology Centre for Biorefining & Bioenergy. Dr Tuohy also thanked their international colleagues and co-editors and their publishers, Springer, Springer Science + Business Media, Springer-Verlag, Elsevier, CRC Press, and Nova Science Publishers Inc. One of the textbooks, *Biofuel Technologies: Recent Developments (2013)*, edited by Dr Tuohy and Dr Gupta, will soon be published in Chinese.



« (L to R) Dr Martina Wernecke; Mr Bart Bonsall, Technology Leader, Technology Centre for Biorefining & Bioenergy; Dr Vijai K Gupta; Dr Anthonia O'Donovan; Dr Maria G Tuohy, Lecturer and Head of the Molecular Glycobiotechnology Group, NUI, Galway and Principal Investigator, TCBB; Mr William Organ; Dr Mary Shier and Dr Barry Glynn - all NUI Galway.

Research Impact

In outlining the environmental and industrial benefits of the research carried out by her team, Dr Tuohy said that: "In practical terms, from the kind of fungi that are found on mouldy bread we have developed enzyme technologies that speed up the process of producing biogas fuel. In fact, brown-bin type wastes in themselves, such as kitchen waste and vegetable peelings, can be a very valuable source of biofuel production rather than it going to landfill.

"Our enzyme technologies can pre-treat and break down more quickly a number of organic wastes ranging from brown-bin waste to dairy and farm wastes, thereby speeding up the process for producing biomethane for transport," she added. "With European Union and global emission and renewable energy targets on the horizon, these developments offer significant potential for biofuels."

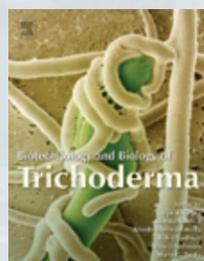
www.tcbb.ie

Textbooks for formal presentation to NUI Galway:



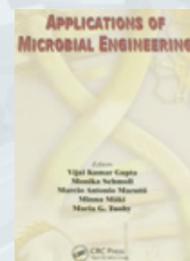
Bioenergy Research: Advances and Applications (2014)

Eds. V.K. Gupta, C.P. Kubicek, J Sandler, F Xu, M.G. Tuohy, 1st Edn; Elsevier, (release date: 29 March 2014)



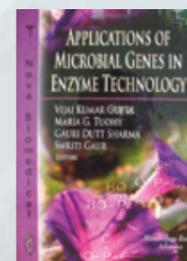
Biotechnology and Biology of Trichoderma (2014)

Eds. V.K. Gupta, M. Schmöll, A. Herrera-Estrella, R.S. Upadhyay, I. Druzhinina, M.G. Tuohy, 1st Edn; Elsevier, (release date 01 April 2014)



Applications of Microbial Engineering (2013)

Eds. V.K. Gupta, M. Schmöll, M.A. Mazutti, M. Mäki, M.G. Tuohy, CRC Press, Taylor & Francis Group, Bacon Raton, Florida



Applications of Microbial Genes in Enzyme Technology (2013)

Eds. V.K. Gupta, M.G. Tuohy, G.D. Sharma, S. Gaur, Nova Biomedical Microbiology Research Advances, Nova Science Publishers Inc, New York



Biofuel Technologies: Recent Developments (2013)

Eds. V.K. Gupta, M.G. Tuohy, Springer-Verlag, Berlin Heidelberg



Laboratory Protocols in Fungal Biology: Current Methods in Fungal Biology Series. (2013)

Eds. V.K. Gupta, M.G. Tuohy; Assoc. Eds. A. Manimaran, K.M. Turner and A. O'Donovan, Springer Science + Business Media, LLC, New York

International Ageing Conference

The 8th International Conference on Cultural Gerontology was co-hosted by ICSG and the School of Political Science and Sociology at NUI Galway in April. Bridging social science and humanities disciplines, this conference has become an important international focal point for interdisciplinary gerontological research. With over 250 delegates from more than 20 nations, the conference challenges more traditional, biomedical perspectives which tend to focus on ageing as a period of burden and decline. The conference placed NUI Galway at the forefront of cutting-edge debates on the meanings and values associated with demographic change. Keynote talks were given by Prof Harry Moody (US), Prof Stephen Katz (Canada) and Dr Aagje Swinnen (The Netherlands).

ICSG Researcher Awarded Marie Curie Fellowship

Dr Áine Ní Léime has been awarded a Marie Curie International Outgoing Fellowship to explore the gendered impact of extended working life policies for older workers. This prestigious fellowship, worth over €300,000, will involve a three-year comparative research study between the US and Ireland, and will hold significant learning for policy in both jurisdictions. Áine will spend two-years working with Prof Dale Dannefer, who is an international expert on ageing and life course studies, at Case Western Reserve University, before returning to ICSG for the third year.

Dementia Research Programme

Prof Eamon O'Shea has recently been awarded a grant of €500,000 from Atlantic Philanthropies to undertake an evaluation of their overall Dementia

Programme in the Republic of Ireland. Prof O'Shea has also just completed the first of three annual evaluations of the Genio Dementia Programme and has been working with the health and social care authorities in Northern Ireland on developing dementia impact indicators for people with dementia. He is also a co-author of a two year HRB Cochrane Fellowship on interventions to improve end of life care in dementia. He recently gave the keynote address at the II International Symposium on the Advancement of Psychosocial Care and Research in Dementia, in Salamanca, which was hosted by Queen Sofia of Spain.

The Need to Measure Old-Age Exclusion Highlighted in New Report

An All-Island report on "Measuring Old-Age Social Exclusion in a Cross-Border Context" was recently launched at ICSG. Funded by the Centre for Ageing Research and Development in Ireland (CARDI), the report measures exclusion amongst older people in Ireland and Northern Ireland, and provides a crucial first step in creating a more informed evidence-base for practice and policy development.

Canadian Scholar as ICSG Rural Ageing Fellow

Prof Mark Skinner, from Trent University, is the new visiting Rural Ageing Fellow at ICSG. Mark, who is visiting the Centre from May to July 2014, is a health geographer with expertise in rural ageing, voluntarism and health care. He will be working with ICSG colleagues on linking exclusion and voluntarism in later life and the consequences for ageing in rural communities. Mark's visit is part of the continued development of the international research programme at ICSG's Rural Ageing Observatory.

By **DR KIERAN WALSH**
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⤴ L to R Roger O'Sullivan (CARDI) with authors Kieran Walsh (Deputy Director), Thomas Scharf (Director), Padraic Ward (researcher).

⤴ L to R Chris Phillipson (Manchester University), Aagje Swinnen (Maastricht University), Thomas Scharf, Ricca Edmondson (both NUI Galway), Harry R Moody (formerly AARP Washington).

A Busy Year for the Irish Centre for Social Gerontology

ALREADY 2014 HAS BEEN A PRODUCTIVE YEAR FOR THE IRISH CENTRE FOR SOCIAL GERONTOLOGY (ICSG), WITH KEY DEVELOPMENTS IN RELATION TO DISSEMINATION AND INTERNATIONAL COLLABORATION ENHANCING THE CENTRE'S RAPIDLY GROWING NATIONAL AND INTERNATIONAL PROFILE.



THE INSTITUTE FOR LIFECOURSE AND SOCIETY AND MCGILL UNIVERSITY

Collaboration through Research



« NUI Galway and McGill University, Montreal, Canada.

This Summer, Joseph Mooney, a first year doctoral student at the UNESCO Child and Family Research Centre (CFRC), will travel to McGill University, Montreal, to conduct a month-long placement within the Laboratory on Sexual Abuse and Trauma located in McGill's Centre for Research on Children and Families.

The research trip has been organised by the student himself; his supervisor Prof Caroline McGregor, who is Director of Social Work at NUI Galway and Senior Research Fellow at the CFRC, and Dr Delphine Collin-Vézina, Associate Professor of Social Work at McGill University and Tier II Canadian Research Chair in Child Welfare.

The placement will create a valued link between NUI Galway's structured PhD programme in Child and Youth Research, the CFRC, the wider Institute for Lifecourse and Society (ILAS) and the Centre for Research on Children and Families (CRCF) at McGill University. The trip is directly funded by the structured PhD in Child and Youth Research programme and marks the beginning of a number of future collaborations between NUI Galway and McGill University.

Joseph is a qualified social worker with a background in law and his PhD research concerns the referral of adult's experiences of childhood sexual abuse to child protection services.

The research will employ a biographic narrative interviewing methodology to utilise the voices of adult survivors to critically inform the process of disclosing to child protection services. It is envisaged that this research will contribute to making this process safer, more understanding and structured; leading to clarity and support for social workers and survivors alike and better protection for current children.

Joseph's work directly relates to, and is influenced by, the work of Dr Collin-Vézina, which includes research examining services for victims of sexual violence and how those services fit with the profile of victims of sexual abuse. One specific project included interviews with victims of sexual abuse and the social services they interacted with, while another project specifically explored factors that facilitated or inhibited their disclosure process.

From 2008 to 2013 Dr Collin-Vézina was Principal Investigator on a project entitled "Invisible Victims of Sexual Abuse." This project included the development of a data lab on sexual abuse and trauma in collaboration with various health-service providers and community organisations across Canada. It is proposed that Joseph will be integrated into this Laboratory on Sexual Abuse and Trauma located in the CRCF. This centre, and specifically the work of Dr Collin-Vézina, can provide practical and methodological techniques in relation to working with survivors of childhood sexual abuse, how to approach data collection with such a

vulnerable population and how to overcome the ethical issues that arise when commencing work with such a population.

The CRCF, located within McGill University (ranked 35th in the most recent Times Higher Education World University Rankings), houses the most important collection of child welfare research datasets in Canada, including the three national cycles of the Canadian Incidence Study of Reported Child Abuse and Neglect, and a Québec-wide administrative database tracking over 400,000 children who have received youth protection services over the last twenty years. Research activities have had program and policy impact at all levels, from local agencies, to departments of social services in several provinces, to federal agencies and NGOs.

The CRCF emphasises its commitment to both national and international collaboration and to developing the research capacity of its researchers and students alike. The Centre frequently facilitates visiting students as a way to establish connections with other scholars and research institutes. Further to this the CRCF has a strong commitment to the goal of developing social environments where children and young people can achieve their developmental potential and therefore strongly echoes the proposed aims of the emerging Institute for Lifecourse and Society (ILAS). The ILAS encompasses the CFRC, within which Joseph conducts his research, and it is currently under the interim directorship of

Prof Pat Dolan at NUI Galway and due to be officially launched in its custom-made building in Spring 2015.

In addition to Dr Collin-Vézina's work being specifically relevant to Joseph's own research, the wider research staff and activities of the CRCF focus on issues such as social policy, parenting, disability, homelessness in late life, gender and mental health. These reflect the direct research interests of other members of the ILAS such as the Centre for Disability Law and Policy (CDLP) and the Irish Centre for Social Gerontology (ICSG). For any researchers in these fields, or any area of social policy, collaboration with McGill University can offer access to vast links with policy makers, government bodies and community organisations both Canada-wide and internationally. Research centres within the ILAS, in addition to the CFRC itself, therefore stand to benefit from future collaborations that will add to the international expertise in both institutes.

This research placement promises a vibrant and active research environment in which Joseph can develop his research while also offering the potential to explore the possibility of further exchanges and collaborations between both centres and institutes.

By **JOSEPH MOONEY**
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RESEARCH INTERSECTION

ELAINE JENNINGS

Early Career Researcher

Education background and why you decided to pursue area of Research. Why NUI Galway?

I received my BSc in Pharmacology from NUI Galway in 2011. During my BSc I participated in a summer research programme. The experience of working in a lab and contributing to a research project really cemented my ambition to become a research scientist. I felt doing a PhD was the right step in my career path. NUI Galway's strong research ethos really appealed to me and of course to be part of the very welcoming Discipline of Pharmacology. I found Prof David Finn's research very interesting so I am glad to be part of his research group.

Career Highlights and Achievements

- Participating in the European College of Neuropsychopharmacology Workshop for Young Scientists.
- I received 1st Prize and the Pain Research Medal at the Irish Pain Society 12th Annual Scientific Meeting, Galway.
- Attending and presenting a poster at the 6th European Workshop on Cannabinoid Research, Dublin, where I met the world's top cannabinoid research experts.
- Attending and presenting a poster at the 8th Congress of the European Federation of IASP® Chapters in Florence, Italy.

What Next?

I am now entering the final year of my PhD so this is something I have to think about. I love research so I want to continue in a research lab setting. However, I have yet to decide on the academic or industry route.

PROF DAVID FINN

Mentor/Research Leader

Education background and why you decided to pursue area of Research. Why NUI Galway?

I graduated with a BSc in Biotechnology from NUI Galway in 1997 and a PhD in Neuroscience from the University of Bristol in 2001. From 2001 to 2004, I was a Post-doctoral Research Fellow at the Institute of Neuroscience, University of Nottingham. From 2004-2014 I held lectureships in Physiology and Pharmacology at NUI Galway and am now Professor of Pharmacology and Therapeutics. My love of pharmacology and neuroscience was ignited during my final year BSc research project at NUI Galway and it has been a privilege to be able to return and establish my own research group at the University where I was first inspired myself!

Career Highlights and Achievements

- Personal Professorship in Pharmacology and Therapeutics, NUI Galway
- Co-Founder and Co-Director of the Centre for Pain Research, NUI, Galway.
- Leader of the Galway Neuroscience Centre, NUI, Galway
- President-Elect of the Irish Pain Society (2013-2015)
- Royal Academy of Medicine in Ireland's Doctor Award for best papers published in 2012 and 2013 (Pain/ Anaesthesia category)
- Wyeth Award for Outstanding Research in Preclinical Psychopharmacology by the British Association for Psychopharmacology.
- President of Ireland Young Researcher Award from Science Foundation Ireland.

What Next?

PhD student training is very dear to my heart and I look forward to mentoring the next generation of young neuroscientists. One never quite knows for sure where the experimental results will take us – and that's the joy of science! I look forward to a future of interesting and exciting datasets and the opportunity to further establish NUI Galway as a leader in Pharmacology, Neuroscience and Pain research and teaching.

IN THIS NEW SECTION WE LOOK AT HOW DIFFERENT RESEARCHERS AT VARYING STAGES IN THEIR CAREERS ARE DRAWN TOGETHER AT NUI GALWAY. THIS ISSUE WE TALK TO PHD STUDENT **ELAINE JENNINGS** AND **PROF DAVID FINN**.



Our Research

The overall objective of our research is to increase understanding of the neurobiological mechanisms underlying the development and treatment of pain, inflammation, mood disorders and impaired cognition. This work is concerned with elucidating the role of a number of different receptor types (e.g. cannabinoid, vanilloid, PPARs, opioid, adrenoceptor, imidazoline, serotonin) in mediating and modulating behavioural, neurochemical and neuroendocrine responses relevant to pain, anxiety, depression and cognition. An integrative, whole systems neuroscience approach is employed, combining behavioural models with *in vivo* and *ex vivo* measurement of neurotransmitters, lipids, proteins or genes.

We are particularly interested in the impact of stress, anxiety and depression on pain. Our work focuses on the brain regions and neurobiological mechanisms that underpin the very complex relationship between pain and psychiatric disorders. A particular focus over the years has been the body's own marijuana-like signalling system, the so-called endocannabinoid system, and its role in regulating the central nervous system. We aim to make a significant contribution to the knowledge-base on pain and stress-related psychiatric disorders and support the development of novel therapeutic agents for their treatment. With that in mind, we have a number of active collaborations with Industry.

NUI Galway at the Forefront of Microwave Imaging Technology Development



⤴ Above Left: First meeting of the "MiMed" COST Action, held in Lisbon in April 2014. The audience contains the world's leading researchers in microwave imaging and therapeutics. Centre: Dr Martin O'Halloran. Right: Mr Adnan Elahi.

Dr Martin O'Halloran is a Science Foundation Ireland (SFI) Principal Investigator based in Electrical and Electronic Engineering, and is developing a microwave-based Breast Imaging System for the early detection of breast cancer. The unique advantage of the technology is that it is completely non-invasive, non-ionising, comfortable for the patient and is potentially very low cost. Last year, Dr O'Halloran, in collaboration with Dr Raquel Conceicao from the University of Lisbon, applied and was awarded funding for a four-year European COST Action to "accelerate the optimisation, clinical evaluation and translation of microwave-based medical imaging and therapeutic technologies." The COST Action, now co-chaired by Dr O'Halloran and Dr Conceicao has grown to include over 140 researchers from 21 countries, with a similar number of industrial and clinical partners, putting NUI Galway at the very forefront of microwave imaging technology development. Significantly, Dr O'Halloran and Dr Conceicao were the youngest ever successful proposers of an EU COST Action in the 40-year history of the COST office, and aim to use the Action as a springboard for Horizon 2020 funding applications.

In 2013, Dr O'Halloran was also awarded the AP-URSI Young Scientist Award (an award he previously won in 2011), a Royal Irish Academy mobility grant to support collaborative research with the University of Lisbon, and an IARIA "Best Research Paper" award. He has also been asked to Chair convened sessions at the two leading conferences in electromagnetics: EuCAP 2014 and AP/URSI 2014, and a mini-symposium on microwave imaging at the EUSTM conference on translational medicine. More recently, Mr Adnan Elahi (a PhD researcher within the group and supervised by Dr O'Halloran) was awarded the "Best Research Poster" award at the Royal Irish Academy's Research Colloquium on "Communications and Radio Science into the 21st Century", and took second prize for best PhD Research project at the UL-NUI Galway Research day. This microwave imaging research involves both clinical and technical collaborators and is co-managed by Dr Martin Glavin and Dr Edward Jones (Electrical and Electronic Engineering).

By **DR MARTIN O'HALLORAN**
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Neanderthal Man from Galway

THIS YEAR MARKED THE 150TH ANNIVERSARY OF THE PUBLICATION OF THE SCIENTIFIC NAME FOR OUR CLOSEST EVOLUTIONARY RELATIVES, THE NEANDERTHAL PEOPLE, BY WILLIAM KING, PROFESSOR OF GEOLOGY AT THE THEN QUEEN'S COLLEGE GALWAY.



Galway's contribution to cutting-edge science is not a new phenomenon. In May 2014, NUI Galway scientists from the College of Science proudly marked the 150th anniversary of the publication of the term *Homo neanderthalensis* by William King, Professor of Geology at Queen's College Galway. Apart from making an important early contribution to the understanding of human evolution, King also enjoys the accolade of being the first scientist ever to formally name a new species of human.

In May, President Michael D Higgins attended an international symposium to mark this remarkable achievement. The event, held here at NUI Galway, was dedicated to the life and times of William King and outlined details of his research, as well as the contribution his work still makes a century and a half on.

The symposium brought together some of the world's leading authorities on human evolution, a gathering never before seen in Ireland. This was a fitting tribute to a pioneer in the field of human evolution, who never received the scientific recognition he deserved in his own time.

"Prof King's work represents a scientific milestone in the history of our understanding of human origins," says paleontologist Dr John Murray, one of the symposium organisers. "The term 'Neanderthal' is globally recognised and understood, but had King not coined this phrase during his time in Queen's College Galway, they would most probably be known by a completely different name today."

William King proposed in 1863 to formally designate Neanderthal people as a separate species from ourselves (*Homo neanderthalensis*) - the idea appeared in print the following year (1864). His suggestion was both extraordinary and revolutionary for its time - Charles Darwin's masterpiece '*Origin of Species*' had been published a few short years beforehand. William King remains the first to name a new fossil human species; a privilege afforded to very few scientists.



⤴ NUI Galway palaeontologist Dr John Murray shows President and Sabina Higgins the plaster skull-cap replica acquired by Prof William King that prompted his naming of *Homo neanderthalensis* in the then Queen's College Galway some 150 years ago.

Prof Svante Pääbo, Director of the Dept of Evolutionary Genetics at the Max Planck Institute in Leipzig and the first person to sequence the DNA of Neanderthal people, delivered the main keynote address of the symposium. This particular talk was open and free to the general public and a capacity crowd of over 300 filled the O'Flaherty Theatre for the presentation. At the end of the lecture, a specially commissioned Neanderthal bust carved from Galway granite to underscore the link between these prehistoric people and the west of Ireland, where they received their scientific name, was presented to the President of Ireland. The entire event was filmed and is available on the NUI Galway YouTube channel.

The meeting was made possible with the assistance of: The Quaternary Research Association, The Irish Research Council, Roche, NUI Galway, Galway City Council, Bord Fáilte, The Geological Survey of Ireland, The Geological Survey of Northern Ireland, The Institute of Geologists of Ireland, Beta Analytic Limited, Connemara Marble Industries Limited and the Burren Geopark.



To view a video of Prof Svante Pääbo's keynote speech, click on the video above. This will launch in a new application.

For more info you can contact: john.murray@nuigalway.ie

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