Our Cover Image: Research in Focus

Prof. Michel Destrade (Applied Mathematics, NUIG) has combined modelling with experiments to produce an intriguing picture (tropical forest? surreal painting?), published in Physics Today and on the New Scientist website. Destrade worked with Prof. Michael Gilchrist and Dr Badar Rashid (Mechanical Engineering, UCD) to model the mechanical behaviour of brain under rapid impacts, as it is crucial to the understanding of traumatic brain injury. “Badar decided to find out what brain matter looked like when blown up 3,500 times, using Scanning Electron Microscopy”, says Destrade, “and it resulted in a beautiful rendering of neuron bundles.” Destrade then teamed up with Prof. Sean Leen (Mechanical and Biomedical Engineering, NUIG) to develop new testing standards for biological soft tissues and was invited to a recent Symposium on Brain Mechanics at Oxford University, which brought together clinicians, engineers and mathematicians working in this exciting field.
VP Letter

Welcome to the fourth issue of Research Matters, my last issue as Vice President for Research. It has been a privilege and pleasure to lead the Research Support teams, and to work closely with the broad academic research community at NUI Galway. I would like to offer my thanks and personal gratitude to the excellent staff within the Research and Technology Transfer Offices for their fantastic work, dedication and commitment to the NUI Galway research community.

As my term as Vice President draws to a close at the end of 2012, I look back over the many research achievements and successes that NUI Galway has enjoyed over the last number of years, and I am proud to have been associated with these successes. The highlights for me include, in particular, NUI Galway’s historic success in securing over €70 million in funding, from public and private sources, through the PRTLI Cycle 5 programme, which will result in the provision of significant dedicated research facilities for a range of major research programmes across the University. The restructuring of the Centre for Innovation and Structural Change (CISC) and the ongoing strategic review of the Moore are other notable developments that will impact very positively on NUI Galway’s research performance and reputation going forward.

We continue to face significant challenges as a research driven university in the new and very different economic landscape, and it will be even more essential than ever to work smarter, harder, and collaboratively, in order to maintain and enhance NUI Galway’s research performance and reputation internationally. I look forward to returning to research myself, and to continue to work with many colleagues, with whom new research relationships and opportunity have been established or identified. I would like to wish all my colleagues at NUI Galway the very best wishes for continued success in your research endeavours.

Professor Terry Smith,
Vice President for Research

From the Editor

Welcome to another issue of Research Matters. As always we strive to deliver a collection of stories about which we, as a community, can be proud of. That’s why we’re so excited on NUI Galway’s research performance and reputation going forward.

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Lindsay Deely,
Editor
Improved access to healthcare for rural and remote communities

This connected health project will remove the burden of a long distance commute for therapy and treatment and will broaden access to health promotional activities.

To be discipline of General Practice, NUI Galway, a founding member of Galway Connected Health, has joined with the University of Aberdeen and several internationally renowned Telehealthcare Centres across Scandinavia in an EU project which will implement 10 telemedicine and connected health technology projects in rural and remote communities in the West of Ireland. Dr. Liam Glynn is a principal investigator and is leading the NUI Galway team on Implementing Transnational Telemedicine Solutions (ITTS) a €2.3 million European Union Northern Periphery Programme project (fig 1.) Each partner country will be involved in importing and exporting existing services and supporting the roll out of services transnationally.

Proven high quality internet connectivity is the key to a successful outcome to the projects. The services which will be implemented will include: tele-monitoring for patients with multimorbidity; video conference technology for speech therapy (fig 2), renal services, remote emergency psychiatry services, remote diabetes services and remote pulmonary rehabilitation for COPD as well as the use of smartphones as a platform to promote physical activity, to provide internet support for diabetes and for monitoring of inflammatory bowel disease.

“Smart Move” – Using smartphones to promote physical activity

There is increasing evidence linking sedentary and physically inactive lifestyles to higher risk of obesity, diabetes, coronary heart disease and lower quality of life. In an attempt to understand what motivates people to begin exercising and sustain activity a team of GP’s and researchers at NUI Galway are leading a Randomised Control Trial on motivational health promotion.

The trial is based on author BJ Fogg’s concept of Captology (computers as persuasive technology) and how people are motivated by computers and specifically smartphones. As mobile phones are never far from their owners, smartphones with powerful on board computing abilities are now an ideal device for assessing physical activity.

To date 60 participants have enrolled in the trial with a total number of 80 required to substantiate initial pilot results. As some participants are returning to exercise after a number of years it was decided that walking, due to low impact self-regulated pace was to be the intervention of choice. By downloading a pedometer application called “Accupedo” fig 1., onto the participant’s smartphone researchers can obtain a total step count on weekly, daily, or monthly basis (fig 2) with 2000 steps being the equivalent of 1 mile.

“Smart Move” if successful, may become an unobtrusive method for GP’s to measure adherence to prescribed exercise. This project is part of a larger ITTS (Implementing Transnational Telemedicine Solutions) European telemedicine programme.

By Patrick S Hayes, Discipline of General Practice

Bridging the ‘digital disconnect’ – using technology to promote young people’s mental health and wellbeing

Bridging the Digital Disconnect is engaging with parents, teachers, health professionals, youth workers and young people to determine how to use technology to improve the mental health and wellbeing of young people.

Dr Aleisha Clarke and Professor Margaret Barry of the Health Promotion Research Centre at NUI Galway are working in partnership with Inspire Foundation Ireland and international partners at the Young and Well Co-operative Research Centre for Young People Technology and Wellbeing in Australia. A three year programme of research is being conducted in Ireland linked to this international project, which is being led by the Inspire Foundation Australia and funded by the Australian Department of Innovation, Industry and Science.

The internet is the first place that many young people will turn to for support but sometimes a focus on risk prevails in public discourse around this internet and mental health. This project is focused on addressing this disconnect between young people’s information and help-seeking preferences and adults’ anxieties about technologies. The research will inform how best to embrace the opportunity that technology affords to support and promote youth mental health.

The nature and extent of the digital disconnect varies from adult to adult, and the motivation, needs and knowledge base of parents differs from those of, for example, mental health professionals. In order to explore these different needs, under Bridging the Digital Disconnect we are conducting a structured needs assessment for adult stakeholder group, followed by in-depth group interviews – starting with the group closest to young people: their parents. This research will then guide the development of tailored online resources that connect adults with the promotion of youth mental health in meaningful ways.

From a research perspective, parents’ responses to the Bridging the Digital Disconnect project have been extremely positive and have given everyone involved in the project increased belief in the importance of the work we are undertaking.

A number of leading statutory and voluntary organisations are participating on the project’s National Advisory Group and they will help facilitate access to respondents for the needs assessment research.

Most importantly young people will be centrally involved, ensuring the project remains focused on producing meaningful outcomes for young people in Ireland and beyond.

To ensure the widespread dissemination of the project’s outputs and new knowledge we are featuring ongoing collaboration and discussion with our international partners in Australia and beyond as the project develops.

Further project details from: Dr Aleisha Clarke and Professor Margaret Barry of the Health Promotion Research Centre.

By Margaret Barry, Professor of Health Promotion and Public Health
New Patient Safety Centre at NUI Galway Announced

It has been estimated that medical error affects approximately 10% of hospitalised patients. The report of the Irish Commission on Patient Safety and Quality identified a need for an active research programme on patient safety and quality issues in healthcare for Ireland. The recently formed Irish Centre for Patient Safety at NUI Galway has been established to meet this need.

The Centre is inter-disciplinary and draws upon expertise from the Medical School, Engineering, Medical Physics, the Whitaker Institute, and the Galway and Roscommon University Hospital Group. To date, the research has focused on three specific domains of healthcare.

- **Radiology**: Research is focused on the application of Systems Engineering practices to this branch of medicine. This work is funded by the Health Research Board.
- **Surgery**: Research in surgery has examined attitudes to team-working and communication, and the use of a checklist designed to prevent wrong site surgeries. A number of specific surgical procedures are also being examined from a human factors perspective.
- **Interns**: Internship is the first year of a doctor’s working life. The research in this domain has taken an evidence-based approach to identifying specific areas in which interns have difficulty (e.g. practical skills such as assertiveness and ordering tests correctly), and the design and evaluation of interventions to improve future performance.

Patient safety education is also an important goal of the Centre. Input is being provided as part of the West North West Intern Training Programme, the final medical year module, and for students on the NUI Galway Masters course in Medical Physics and the MCh in Surgery. We would be very interested in hearing from anyone who is working in this area, or would be interested in becoming involved in patient safety research in the future (please contact Dr Paul O’Connor, Whitaker Institute paul.oconnor@nuigalway.ie).

New wiki-type database of instruments for Social Sciences

The Measurement Instrument Database for the Social Sciences (MIDSS) is a new online wiki-type database of instruments that are used to collect data in the social sciences. The MIDSS Database was funded by the Irish Social Sciences Platform, which is part of the Programme for Research in Third Level Institutions (cycle 4) and is administered by the Whitaker Institute, NUI Galway. The MIDSS Database already contains almost 250 instruments concerned with a wide range of topics from across the social sciences from Walkability in Cities to Psychological tests.

The database can be accessed at www.midss.ie. As we are in a growth phase, we would strongly encourage social sciences researchers to submit any instruments they have developed to MIDSS. For more information, please contact Dr Paul O’Connor at the Whitaker Institute paul.oconnor@nuigalway.ie.

Overcoming the Barriers to Well-Being in Ireland

Scientists, community organizations and policy-makers come together to discuss the latest advances in well-being research and policy. Helen Johnson, author of the Well-being in Ireland Report (NESC, 2009) and Alex Zautra, Arizona State University, delivered keynote papers on well-being.

In advance of the workshop, conference participants also reflected on the broad issue of well-being in Ireland and generated a list of barriers to well-being in Ireland. Interactive Management, a software supported collaborative design process, was used to structure interrelationships between barriers (see Figure 1). In response to critical drivers of negative influence in the system (i.e. the barriers in the left of Figure 1), including Lack of trust/dissatisfaction with the system, government, and decision-makers in general, and A national sense of gloom due to emphasis on austerity, conference participants agreed that high-impact, feasible options that could help to overcome these barriers include:

- (a) Focus on what can be done despite the economic environment;
- (b) Encourage people to get involved in (take control of well-being initiatives); and
- (c) Build on community spirit through organising support groups and local initiatives.

In response to the absence of a holistic approach to health-care, some of the highly ranked options participants generated and selected included:

- (a) Change the way physical education is taught in primary schools to include a more holistic approach to health and well-being;
- (b) Encourage mental health promotion initiatives in schools and workplaces;
- (c) Promote help-seeking as a skill (amongst young people in particular); and
- (d) Implement evidence-based education and behaviour change interventions to improve health and well-being.

In response to the Lack of education about the importance of well-being in schools, participants propose:

- (a) Implement well-being modules across the education system, from primary to third level;
- (b) Create a national well-being committee responsible for policies, training and sustaining interventions etc.;
- (c) Promote help-seeking as a skill (amongst young people in particular); and
- (d) Define what well-being is from a national perspective.

In response to the leadership barrier (including no charismatic leader to advance the well-being of the nation) participants propose:

- (a) Promote awareness of the importance of well-being in one’s own community and be a leader on a small scale first;
In Brief

UN launches CDLP Report On Structural Funds

The Centre for Disability Law and Policy was recently commissioned by the UN Office of the High Commissioner for Human Rights to author a report, Getting a Life – Living Independently and Being Included in the Community. The report is a legal study of the EU Structural Funds and their ability to contribute to the achievement of Article 19 of the United Nations Convention on the Rights of Persons with Disabilities. It was launched at, and formed the basis of, a colloquium in Brussels on 7 May 2012, at which Professor spoke. The aim of the colloquium was to explore the legal implications of the Convention on the rights of persons with disabilities (CRPD), particularly its Article 19, on the use of European Union Structural Funds in EU Member States. It was attended by representatives of Bulgaria, Croatia, the Czech Republic, Estonia, Latvia, Malta, Poland, Romania, Slovakia and the European Commission as well as by representatives of civil society organizations.

Two Law School Members Appointed To Law Reform Commission

The Government has appointed two members of the School of Law to the Law Reform Commission. Dr. Conor O’Connell was originally appointed in February 2012 to serve out the term of a member who had been appointed to the Supreme Court. In July, he and Tom O’Malley were appointed by the Government on the nomination of the Attorney General for full terms commencing in September 2012. O’Connell is the former Dean of Law and specialises in Constitutional Law and European Human Rights. O’Malley is a recognised authority in Criminal Law and Administrative Law. Both will serve as part-time Commissioners while continuing to teach in the School of Law.

Research Group Receives Valuable Donation

An Irish company specialising in laboratory equipment, Chemical Systems Control, has donated high-tech equipment to the University’s Multiple Sclerosis and Stroke Research Group led by Dr Una Fitzgerald to help in the battle against multiple sclerosis. The cabinet will be used to decipher the molecular mechanisms underlying nerve damage in multiple sclerosis and to develop novel ways of achieving nerve repair. Dr Fitzgerald and her team are currently conducting a research project funded through MS Ireland. The project is looking at the role of a particular type of cellular stress has on myelin loss.

EU Marine Economy Project Launched in NUI Galway

The Socio Economic Marine Research Unit (SEMRU) at the Whitaker Institute, NUI Galway together with The Border,Midland and Western Regional Assembly, recently launched the MARNET Project (Marine Atlantic Regions Network). MARNET is a 2.5 year collaborative transnational project which will map the value of the Atlantic marine economy through the development of reliable and comparable socio-economic data, and involves maritime regions from the Basque country to Spain, Brittany in France, Stirling in Scotland, Porto in Portugal, as well as the Border Midlands and West region of Ireland. The €1.5m project is part funded by the ERDF through the EU Interreg Atlantic Area Programme, and involves the participation of marine researchers as well as Regional Authorities across the Atlantic area. In Ireland the expertise of SEMRU at NUI Galway will be crucial in developing a framework from which new added value activities within the marine sector can be developed to add to the 17,000 jobs already supported by marine related activities in Ireland.

Lecturer Appointed to Royal Historical Society

Dr. Marie-Louise Coelho, Lecturer in English, was elected Fellow of the Royal Historical Society (UK) in May 2012. This election comes in acknowledgement of her contribution to the field of early modern history and literature. Dr. Coelho’s work centres on the production and reception of women’s writing in the sixteenth and seventeenth centuries. Her monograph, “Women, Writing, and Language in Early Modern Ireland” (Oxford University Press, 2010) was awarded Honourable Mention in the Society for the Study of Early Modern Women Book Prize (2011). She was awarded a Research Fellowship at the Folger Shakespeare Library, Washington D.C., in March 2012.

A large number of marine species have the ability to stick to a surface, and while it might seem quite commonplace that barnacles and mussels can attach themselves really well to rocks in the ocean, it’s actually a process that has so far eluded us poor humans, despite all of our amazing technology. We do have glues that work well underwater and there are many instances where glue with underwater capabilities would come in really useful. One such example would be for surgical applications, where structures inside a wet, body must be repaired and switched. The search for technology to fill this gap has led scientists to investigate underwater glues that are produced by marine animals, in the hope that one day we will be able to mimic these substances. Barnacles produce a very strong natural adhesive that can adhere to virtually every substrate unimaginable. While some processes involved in the adhesion of mussels and tube worms have been elucidated and even successfully mimicked, scientists still have no idea how barnacle adhesive works. The recent interest underway began by taking a morphological (body) approach, and investigating the tissues and structures that produce the adhesive. The results showed clearly that the adhesive gland of the barnacle is incredibly different to the glands that produce adhesive in other animals. Jamie Leigh Jonker, a PhD student in Dr. Power group working on barnacles, explains “In the barnacle there are many very large secretory cells that are located in the connective tissues, which all seem to be producing all of the components that make up the adhesive. Which makes this particular adhesive very mysterious – if everything is all produced in the same place, why does it not begin to interact and become solid right there inside the barnacle? How does it retain cohesion when it is released, and quickly form a bond between the substrate and the barnacle?”

To answer questions such as these, the team moved on to chemical and molecular investigations. However, in order to continue the research fresh samples were needed. This species being studied, the goose barnacle, Lepas anatifera, is octopus and only rarely washes ashore. Thus, over the last summer, an appeal to the public was made to inform them of this interesting work and to bring in more samples. A social media campaign was begun with Facebook and twitter and a range of newspapers, science magazines and radio stations helped to spread the word. Many people responded with information on particular locations or species, giving researchers (which they were kind enough to be barnacles) and finally fresh samples began to wash ashore at autumn arrived. For now the search for barnacles has paused for a bit, but with more samples, their results will be published in Nature.
Research In Action: Using theatre, dance and song to teach women lifesaving health solutions

This participatory Action Research was recognized as one of the top 10 educational initiative ideas and solutions for improving the lives of girls and women worldwide by Women Deliver, a global advocacy organization.

As part of my PhD in Health System & Policy in NUI, I designed and conducted an Innovative Participatory Health Education Project ‘IPHE’ where I brought together a team of researchers, health educators, development workers, and local volunteers in Renk County, South Sudan to educate communities about women’s health through theatre performances, singing and pictograms. Working together, the team identified pressing maternal and child health issues and developed a live song and theatre program to educate those in the hardest-to-reach rural Renk County communities. Through the tradition of song, IPHE helped influence traditional views on maternal health and educated communities about women’s health through theatre performances, singing and pictograms.

The senior officers said that this approach helped them to identify the maternal health issues through the eyes of the local population which will influence their future decision making. This approach effectively advocated for maternal health, strengthened the capacity for researchers and policy makers, and engaged the community. The approach enhanced the contributions of marginalized communities to identifying needs, planning and designing future health services in a post conflict setting.

http://www.youtube.com/rcrutv

By Khadile El-Musharaf and Diarmuid O’Donovan
School of Medicine

Creating smarter patient health records

It has been estimated that medical error affects approximately 10% of hospitalised patients. The report of the Irish Commission on Patient Safety and Quality identified a need for an active research programme on patient safety and quality issues in healthcare for Ireland. The recently formed Irish Centre for Patient Safety at NUI Galway has been established to meet this need.

The addition of chemicals to agricultural wastewater could help solve water quality problems associated with the landspreading of wastewater, researchers at NUI Galway have found. A research project, lead by Dr Mark Healy, has proven that the runoff of harmful nutrients and sediment can be abated if farmers add chemicals to slurry prior to landspreading. This finding could have major implications for practitioners, as well as policy makers.

In a 3 year study, funded by Teagasc, PhD researcher, Raymond Brennan, found that in addition to the mitigation of short-term losses from agricultural wastewater, chemical amendment could also have a positive long-term impact on the release of nutrients from soil. Speaking at NUI Galway recently, Dr Healy said, ‘This is a significant finding and could potentially represent substantial savings to farmers as nutrients would be held within the soil not be lost to surface waters.’ The researchers are currently investigating greenhouse gas emissions associated with this treatment process, in addition to its impact on soil health.

Related on-going research within Dr Healy’s group include chemical amendment to pig slurry and dirty water, and the use of biofertilisers as a soil fertiliser. The results of the present work have recently been published in Science of the Total Environment (409: 5111-5118).

By Dr. Mark Healy,
Civil Engineering

Chemical amendment to agricultural effluent could help solve environmental pollution

The goal for our research is to engage with patients and their caregivers to evaluate these technologies in a meaningful way. In the DHERI HCLS group we are also working on other projects paving the way for the reuse of patient information in clinical research, which will ultimately integrate with the remote patient, providing better, more personalised, clinical decision support.

By Ronan Fox PhD
Health Care and Life Sciences Leader
Digital Enterprise Research Institute (DERI)
A prescription for better health: The UTI-C Project

Researchers in the Discipline of General Practice, School of Medicine are currently working on an intervention to improve antibiotic prescribing in general practice, with a focus on urinary tract infections (UTI). The UTI-C team is multidisciplinary and includes experts in microbiology, epidemiology, social marketing and health economics and primary care.

‘Antibiotic resistance is an increasing problem in the modern world, largely due to the fact that antibiotics are over-prescribed,’ explains Prof. Martin Cormican, School of Medicine and Director of the Ryan Institute’s Centre for Health from Environment. “Currently, microbes are developing resistance to antibiotics faster than new antibiotics are being discovered. If this problem isn’t dealt with, we will face a day when there isn’t medicine available to treat simple infections.”

The UTI-C team is working together to develop and deliver a complex intervention involving GPs and patients in the west of Ireland. The intervention will include providing easier access for GPs and patients to relevant information concerning the right antibiotics in the appropriate situations. However, the main challenge for the UTI-C project remains convincing everyone that antibiotic resistance is a problem that affects us all; only by collaborative action from patients, GPs and the public, can a difference be made. The message remains, use antibiotics carefully.

The UTI-C project is a three year research project, funded by the Health Research Board in Ireland, under an Interdisciplinary Capacity Enhancement (ICE) award. NUI Galway was awarded three out of the six available ICE awards in 2011. A national ICE networking event, funded by the Health Research Board, will be hosted by NUI Galway in January 2013 to facilitate networking of postdoctoral researchers, encourage future collaborations and showcase current research.

By Dr. Sandra Galvin, Discipline of General Practice, School of Medicine, Centre for Health from Environment, Ryan Institute

Every year, 1.2 million people are killed in traffic accidents, and more than 30 million more suffer non-fatal injuries. Many of these accidents occur because a driver simply didn’t see a victim – ‘he came out of nowhere!’ Researchers in the Connaught Automotive Research (CAR) Group in Electrical & Electronic Engineering are developing new camera-based technologies to assist drivers in gaining greater situational awareness of their environment.

The involvement of Video gives particular commercial relevance to the Group’s research, and the company has appointed a member of its technical staff to act as liaison with the Group. Current projects include pedestrian detection at night, lane departure warning, and developing “3D” models of the environment around the vehicle. The Group is also looking at the practical issues relating to transporting large volumes of video around a vehicle, while maintaining good quality images. The academic staff members involved in the Group are Edward Jones, Martin Glavin and Liam Kilmartin, along with one post-doctoral researcher and five PhD students.

To learn more, go to http://car.nugalway.ie

By Dr. Edward Jones, Electrical & Electronic Engineering

The Human Touch: Trauma in the Townships

Global Awareness award winner, Katherine Lydon contributes to the fight against HIV and AIDS in South Africa. The 23 year old NUI Galway medical student completed an eight week volunteer programme in a township outside Cape Town.

3 million people are estimated to be living with HIV and AIDS in the world and South Africa has one of the highest prevalence rates. Katherine’s programme was supported by the United Nations and Irish Aid. During her eight weeks Katherine worked in the Anti-Retroviral (ARV) Clinic and Trauma unit in Mitchell’s Plain day hospital where she assisted doctors and counsellors in educating HIV positive patients. She also completed a number of outreach programmes educating school children about the HIV epidemic. The objective of the Global Awareness Programme is to raise awareness in Ireland about the HIV and AIDS crisis in South Africa. “I want to very much participate in this programme” Katherine says, “to make sure no victim is left in the dark to ensure that everyone has access to the support they need, to remove society’s stigmatisation of this condition and to take HIV/AIDS out of the closet so sufferers don’t feel isolated”.

Work began every day at 7am. Katherine spent the first few hours talking to patients learning about their experiences of HIV and AIDS. “Some of the stories were heart-wrenching, but the patients are so brave,” she explained. The ARV clinic is open five days a week and managed by Sister Tina along with her colleagues, counsellors and doctors. Patients are weighed at every visit after which they see the counsellor, ensuring they are compliant with their medication and are given the opportunity to ask any questions.

As resources are limited, patients will only see the doctor if they have medical complications, which is a stark contrast to the system in Ireland. In the absence of doctors, nurses provide advice and can prescribe medication. In the afternoon Katherine worked in the Trauma Unit (Emergency Department). The average waiting time is approximately three hours but there are only two doctors for the entire population of Mitchell’s Plain (approximately two million people). The majority of patients are assault victims. Although the Trauma Unit is open 24 hours a day, the Day Hospital has no overnight facilities, and patients requiring additional care are transferred to Groote Schuur hospital or Josie, both in Cape Town, depending on the case. The majority of patients have no transport and therefore wait for ambulance transfer which can take up to four hours.

Katherine received training on “Understanding HIV & Development” run by Deelk, prior to her departure. This helped her deal with the culture shock and was “highly beneficial and a real eye-opener” which centred on the stigma associated with HIV and AIDS and possible mechanisms that could be employed to end this scenario in the Manenberg area. Open Heart House in Joburg, which is Ireland’s largest peer support network of HIV positive people and runs with representatives of Dublin AIDS Alliance. While in Cape Town, Katherine also completed a course in Stellenbosch University entitled “Basic HIV and Gender Facilitation” along with other volunteers and students from South Africa. She will now be involved in a series of events around Ireland in the lead up to World AIDS day on December 1st.

By Katherine Lydon, School of Medicine
Developing Rapid Diagnostic Tools

T he diagnostic products for the rapid diagnosis of Respiratory Tract Infections, specifically pneumonia, will be based on a novel ‘sample-in, result-out’ technology platform.

"There is an urgent need for rapid diagnostic tests capable of identifying the large range of microorganisms and antibiotic resistances involved with infection," explains Dr Thomas Barry of the Molecular Diagnostics Research Group at NUI Galway. "Speed and accuracy are key to appropriate therapy and survival of the patient. The ultimate objective is to develop new-cost effective, user-friendly products that will be routinely used in hospitals. This could replace time-consuming and labour-intensive methods so that a diagnosis can be achieved within a couple of hours, rather than days or weeks."

Also in development by the group is a new diagnostic DNA test to help in the global effort to control tuberculosis (TB). The rapid laboratory test allows for the identification of the exact bacteria causing a patient’s TB which will give valuable information for their treatment.

In humans, TB is caused by a group of eight bacteria collectively known as the Mycobacterium tuberculosis complex (MTC). National University of Ireland Galway’s Molecular Diagnostics Research Group has developed and validated a new assay or laboratory test called sSeqTB to identify all members of the MTC.

Dr Thomas Barry at the University, along with his colleagues Dr Justin O’Grady and Dr Kate Reddington, realised there was a need to rapidly and accurately detect and identify each member of the MTC for better treatment of TB. The optimal patient treatment can be different, depending which of the eight bacteria are causing the TB, as some of these bacteria are naturally resistant to a commonly used anti-TB drug,” explains Dr Barry.

By Dr Thomas Barry, Director, MDHG

Launch of Galway Diabetes Research Centre

T he Centre for Disability Law Policy and the Galway Diabetes Research Centre (GDRC) is November will bring together an interdisciplinary research consortium of active researchers and clinicians who have a track record in the field of diabetes. The GDRC, based at NUI Galway, will link researchers from a diverse range of disciplines across all Colleges together with clinicians from Galway University Hospital and the hospitals linked to the NUI Galway regional Medical Academies.

In Ireland the number of people with type 2 diabetes is growing as a result of an increase in obesity, a lifestyle change associated with obesity and an increase in sedentary activity. The Institute of Public Health have revised their figures again (2012) and now conclude that 12.9% of the population have Diabetes. Figure is again 2012 and now conclude that 13.6% of the population have Diabetes.

Diabetes is a chronic condition associated with significant morbidity and mortality. It is the commonest metabolic illness globally with 346 million people worldwide having the condition (WHO 2010). It is estimated that this figure will increase to 550 million by 2030. About 90% of all diabetes is type 2. The prevalence of type 2 diabetes is increasing at an alarming rate in tandem with rising obesity rates.

In Ireland the number of people with diabetes mellitus diagnosed and those at risk of developing diabetes mellitus by creating the treatments of the future through research, providing state of the art clinical care and developing the carers of the future through education.

By Dr Ashish Murthy, College Research Development Office, College of Medicine, Nursing and Health Sciences

Developing Rapid Diagnostic Tools & Launch of Galway Diabetes Research Centre / Autumn 2012 / Issue 4
The 2011 Census shows that more than two out of every five people aged 65 and over live in a rural community. Surprisingly, relatively little is known about the situation of this important demographic group. The Rural Ageing Observatory at the Irish Centre for Social Gerontology is seeking to fill some of the gaps in knowledge on rural ageing. In July 2012 the observatory launched the first two reports in a series that, in time, will provide vital information about the ageing population in rural Ireland. The first of the short reports focuses on key demographic trends and issues facing rural older people. The second report summarises evidence relating to income, poverty and deprivation of Ireland’s older rural population.

Launching the reports, Professor Thomaz Scharf, Director of the Irish Centre for Social Gerontology said: “More than 200,000 people over the age of 65 live in rural communities across Ireland. In the autumn, the government will be launching its National Positive Ageing Strategy. It’s important that this is a strategy for older people wherever they live - in rural as well as in urban communities. Greater awareness of the circumstances of older rural people, in particular, is essential if the right policy measures are to be adopted.” Both reports are available online at www.icsg.ie.

A new book, jointly edited by Prof. Scharf and Norah Keating of the University of Alberta, Canada, was recently published. Bringing together leading international experts on ageing issues, From exclusion to inclusion in old age: a global challenge casts light on patterns and processes that either place groups of older adults at risk of social exclusion or are conducive to their inclusion. See www.policypress.co.uk for further details.

...Keeping the winds of change blowing in the right direction...

...Profile: Dr. Martin O’Halloran...

Breast cancer is one of the most common cancers to affect women. In Ireland alone, almost 2500 new cases of the disease are diagnosed each year. The current standard screening method for detecting non-palpable early stage breast cancer is X-ray mammography. Despite the fact that X-ray mammography provides high resolution images using relatively low radiation doses, its limitations are well documented. In one U.S. study, up to 75% of all malignancies identified by X-ray mammography were later found to be benign after biopsies. These false positive conclusions result in unnecessary biopsies, causing considerable distress to the patient and an unnecessary financial burden on the health service. However, much more worrying is the fact that up to 25% of all breast cancers present at the time of screening are missed by conventional mammography, often delaying treatment to the point where it is too ineffective.

One of the most promising alternative breast imaging techniques is Microwave Imaging. Rather than using the density contrast between healthy and cancerous tissue associated with X-Ray mammography, Microwave imaging exploits the very considerable dielectric contrast between normal and cancerous tissue. Dr. Martin O’Halloran (working with Dr. Martin Gavlin and Dr. Edward Jones) is currently developing a prototype Microwave Imaging System at NUI Galway, which they hope to bring to clinical trials in the next 2-3 years, in collaboration with Prof. Michael Karlin from the National Breast Cancer Research Institute (NBCRI). The benefits of the technology to patients are many. Microwave imaging is non-invasive, non-ionising, does not require the uncomfortable breast compression associated with X-Ray mammography, and significantly, has the potential to detect breast cancer at a much earlier stage, when treatment is most effective.

Dr. O’Halloran has been working in the area of Microwave Breast Imaging since 2004, funded initially by IRCSET and later by Science Foundation Ireland. Over the last eight years, the group has developed state-of-the-art breast imaging algorithms and methods to differentiate between benign and malignant breast cancer. Dr. O’Halloran has just been awarded Science Foundation Ireland’s prestigious Starting Investigator Research Grant, worth almost €500,000. This funding will allow Dr. O’Halloran to build a complete prototype Microwave Breast Imaging system at NUI Galway and bring the technology to clinical trials. As Dr. O’Halloran explains: “Over the last decade the Microwave Imaging group at NUIG have been at the very forefront of image-algorithm development, publishing their work in several high-ranking journals. Despite this, the group did not have the required funding to build a working prototype system, instead testing their algorithms on simulated data or experimental data provided by collaborators. The SIRG award means that the group can now truly compete with international Microwave Imaging research groups and hopefully develop one of the first microwave-based breast imaging systems at NUIG.”

Dr. O’Halloran completed a degree in Electronic Engineering at NUI Galway in 2004 prior to commencing his PhD. Electronic Engineering was an obvious choice of degree. “I always had a strong interest in science at second level. Electronic Engineering seemed like a natural fit for me, because it involved the direct application of science to real-world practical problems, such as the breast cancer detection system we’re currently developing.” Continuing his career in research has been a rewarding challenge. “Firstly, all involved in the Microwave Imaging project here at NUIG are keenly aware of the potential societal benefits of a more effective technology for breast cancer detection. Secondly, building a prototype medical imaging device requires the development of a wide range of skills, ranging from hardware design to algorithm development and clinical trial management. It’s also very exciting to see new years of fundamental research culminating in a working prototype system.”
Creating an International Hub of High Performing Software Organisations

Almost every aspect of our daily lives depends on software and yet much of it is poorly understood, under-utilised, and quickly out-dated, and is often used for purposes its original designers never imagined. Software organisations struggle to satisfy an audience, particularly the younger ‘digital natives’ who, never knowing life without technology, have huge appetite and expectations for today’s software applications.

This multi-disciplinary research brings together researchers from the Whitaker Institute at NUI Galway and the Leeds Irish Software Engineering Research Centre. Funded by Science Foundation Ireland, this €1.8m initiative involves three research fellows, five full-time and three industry-based PhDs in NUI Galway. In addition, dedicated time from more than 20 staff from companies including Cisco, Information Mosaic, Almir, Intel and Storm Technologies, amongst others.

The research and the broader industry network have grown organically over the last 20 years. This is the first Irish recommendation in over 20 years. It makes available Hakluyt’s text in a way that has not been possible before, opening up the era of early modern travel and exploration to a new generation of readers.

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Spotlight on Outreach: NUI Galway & BABORÓ DEMONSTRATE the POWER OF ART & SCIENCE

Through the Baboró International Arts Festival for Children, Researchers at NUI Galway were given a unique opportunity to work with local artists on a project that was designed to get school children thinking creatively about how to live more sustainably. Baboró launched BEAST! (Baboró: Environment, Arts, Science and Technology) Phase 1, in Spring 2012, as a continuation of their development of art through science, by exploring Science, Technology and the Arts with 8 NUI Galway Researchers, 8 Artists, 8 Teachers and over 200 Primary School students from Galway city and county schools. The students were given the opportunity to engage in research and science with specialists in the classroom, at the Ryan Institute’s Cúrsa Research Centre, at an NUI Galway Chemistry Laboratory and even during a visit to one of the researcher’s own Eco-houses.

“What struck me most was the willingness of 8/9 year olds to get involved,” said Chemistry’s Dr. Peter Crowley, who was one of the BEAST! Project Researchers. He added, “They always had more questions and possible explanations... just the opposite of university students!” Following their scientific and technical work, the children then worked with 8 Artists to create an artistic interpretation of what they had learned from the Researchers. This work was presented during the Baboró festival in October as BEAST! Phase 2 The Exhibition.

The BEAST! project partners include the Ryan Institute at NUI Galway and Dublin City of Science 2012. BEAST! Pundit Campaign

Volvo Ocean Race Festival

One of the surprise success stories of the recent Volvo Ocean Race Festival was the popular enthusiasm generated for a heritage exhibition whose theme and displays are something not normally associated with history.

The NUI Galway-based Computing and Communication Museum of Ireland was relocated to the Global Village in the Claddagh for the duration of the festival where it provided a fascinating insight into advances in communications from ancient hieroglyphics to today’s Internet. The array of electronic artefacts on display included such iconic computers/consoles as the Apple II, IBM PC, Amiga, Atari 2600, BBC, Sinclair ZX81, PDP 11 and the Commodore Vic 20.

In presence at the festival touched an emotional cord with so many visitors,” according to Brendan Smith, curator and co-founder of the museum in his capacity as Education Outreach Officer of the Digital Enterprise Research Institute (DERI), where it is permanently located.

Accelerating Science’ flagship exhibition comes to Galway

CERN, the world’s leading laboratory for particle physics, has brought ‘Accelerating Science’, its flagship travelling exhibition, to Galway this Autumn in partnership with the Galway Science & Technology Forum and Boston Scientific. Starting with the History of the Universe, the Exhibition takes visitors on an extraordinary journey which will include activating a model of the Large Hadron Collider, understand how a particle detector works and what happens when particles collide at almost the speed of light. Our own Dr. Andy Shearer has played a key role in the exhibition and his research group have led the talks and tours over the past weeks. The exhibition gives the story of the Higgs particle whose detection CERN announced in July. Find out more and plan a visit soon.

Confrontations is due once more to Dr. Shearer, along with colleagues from the Ryan Institute, Irish Seaweed Research Group, Griffith Geoscience Project, Marine Botany, Energy Research Centre, Marine Zoology, Air-Sea Group, College of Engineering & Informatics, Centre for Climate and Air Pollution Studies and the Centre for Astronomy as well as the Marine Institute, GalwayAtlantis and Blackrock Castle observatory in Cork for a wildly successful 2nd year of Sea2Sky in September.

NUI Galway Establishes the Whitaker Institute

The eminent economist and former Secretary of the Department of Finance, Dr T.K. Whitaker, was recently received at NUI Galway recently as the University announced the establishment of the Whitaker Institute for Innovation and Societal Change. Over 200 members make up the faculty with expertise spanning across the College of Business, Public Policy and Law and the College of Arts, Social Sciences and Celtic Studies. The Whitaker Institute builds on a decade of research excellence and policy-focused contributions supported by over €11 million in competitive national and international research funding.

For more information, please visit www.nuigalway.ie/whitakerinstitute

This research has a number of aims. Firstly, it will document the development and implementation of the Initiative since 2010, identifying the number of cafes provided and number of users involved. It will also examine the self-reported impact on young people attending and participating in a sample of youth cafes representing both urban and rural settings. It will also seek to identify the Initiative’s broader community impact as perceived by a number of key informants and wider stakeholders in each setting. The research will conclude in a number of policy and practice lessons for future implementation of the Initiative elsewhere in the country. The research is expected to conclude in late 2013.

By Liam Cunniffe, School of Political Science and Sociology, Child and Family Research Centre
Both Lorraine McLaughlin and Ann Lyons from the Community Knowledge Initiative (CKI) at NUI Galway along with Professor Ronald Minken from Dublin City University (DCU) recently edited a new Palgrave Macmillan publication entitled Higher Education and Civic Engagement: Comparative Perspectives. The book was published in July 2012 provides an original and challenging contribution to contemporary debates on the civic purpose of higher education, exploring diverse manifestations of civic engagement through teaching and learning, research and volunteering, across a range of international contexts. The chapters offer critical contemporary perspectives from a robust comparative perspective on the role of higher education institutions in terms of civic engagement. Perspectives from the United States, Argentina, Australia, Ireland, Spain, Lebanon and the United Kingdom feature in the book. The contributors to the book are also a diverse group and include academics, university leaders, administrators, community activists and a poet! The book will represent an important text for leaders of higher education, academics, administrators, members of community researchers and professional practitioners.

For further information see: http://www.palgrave.com


American Slavery, Atlantic Slavery, and Beyond provides an up-to-date summary of past and present views of American slavery in international perspective and suggests new directions for current and future comparative scholarship. It argues that we can better understand the nature and meaning of American slavery and antislavery if we place them clearly within a Euro-American context. Current scholarship on American slavery acknowledges the importance of the continental and Atlantic dimensions of the historical phenomenon, comparing it often with slavery in the Caribbean and Latin America. However, since the 1980s, a handful of studies has looked further and has compared American slavery with European forms of unfree and nominally free labour. Building on this innovative scholarship, Dal Lago treats the U.S. “peculiar institution” as part of both an Atlantic and a wider Euro-American world. He shows how the Euro-American context is no less crucial than the Atlantic one in understanding colonial slavery and the American Revolution in an age of global enlightenment, reformism, and revolutionary upheavals; the Cotton Kingdom’s heyday in a world of systems of unfree labour; and the making of radical Abolitionism and the occurrence of the American Civil War at a time when nationalist ideologies and nation-building movements were widespread.

The Disarmament of Hatred, Gearóid Barry

Documenting an audacious Franco-German movement for moral disarmament, instigated in 1921 by war veteran and French Catholic politician Marc Sangnier, this transnational study examines the European resonance of Sangnier’s Peace Congresses in the interwar period. Advocating the “disarmament of hatred,” this movement—with its staged reconciliation and crossing of borders—roused both hope and hostility in the aftermath of the First World War. Mining a variety of sources, both known and new, this book considers the Peace Congresses’ surprising appeal and its political economy (embracing Quakers, socialists, socialists and the popes) while reconfiguring the transnational histories of youth movements, women’s peace activism and Christian Democracy. Examining also the excruciating new choices between peace and appeasement in the France and Europe of the 1930s, this study casts new light on key questions in European history in the era of two World Wars. Author Gearóid Barry is a lecturer in Modern European History at NUI Galway and his current project looks at pacifism in the Euro-American world in transnational context.

Strategy and Strategists, James Cunnigham, Whitaker Institute, NUI Galway and Brian Harley, Dublin City University

Strategy and Strategists (2012) published by Oxford University Press, provides an illuminating exploration of strategy and its implications for business. Adopting a critical and reflective approach, the book guides the reader through the complexities of strategy, clearly presenting the conflicting viewpoints and arguments within the strategy field. The book included 25 readings from classic seminal pieces to contemporary contributions, practitioner reflections, case studies and features to encourage critical reflection, including discussion questions, ‘implications for strategy practice’, and ‘spotlight’ features to highlight topical issues.

Understanding Identity and Organizations, Kate Kenny, School of Political Science and Sociology and Whitaker Institute, National University of Ireland, Galway, Ireland, Andrea Whittle, Cardiff University, UK; Hugh Willmott, Cardiff Business School, University of Cardiff, UK

An understanding of identity is essential for a complete understanding of life in today’s workplaces. This book offers insights into why people, groups and organizations behave the way they do. The authors describe, for example, work identities that are considered dirty, deviant and degrading, and how identity ‘management’ can be used as a form of control in contemporary organizations. Complex theoretical concepts are made accessible by using lively examples from popular culture, covering topics such as unemployment, globalization and online identities.

New Hardiman Scholars Arrive

24 new PhD students have been awarded Hardiman Research Scholarships. The Hardiman Research Scholarships offer opportunities for suitably qualified individuals to pursue a structured postgraduate degree by research.

Structured PhD programmes, while retaining the focus on the advancement of knowledge through original research of traditional programmes, also provide professional development modules in subject-specific and transferable skills.

The prestigious Hardiman Research Scholarship scheme was first launched in NUI Galway in 2011 to support outstanding PhD students whose research focuses on the five key areas of research in which the University offers leading expertise: Namely in honour of James Hardiman, who was appointed the University’s first Librarian in 1449, the scholarship programme aims to produce highly focused PhD graduates from a pool of national and international candidates. In a joint initiative Cancer Care West and the Galway University Foundation have donated €1 million to provide ten fully funded scholarships. The Cancer Care West Hardiman scholars will perform translational and clinical research in the area of Cancer Biology. Therapeutics and all aspects of oncology at NUI Galway and the associated University Hospital Galway.

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