

MARIE SKŁODOWSKA-CURIE ACTIONS

BUILDING COLLABORATIVE NORTH SOUTH PARTNERSHIPS IN MSCA

THE PRINTWORKS,
DUBLIN CASTLE

24TH MARCH 2015



Programme

10:30 - 11:00 **Registration & coffee**

11:00 - 11:05 **Welcome** – Dr. Suzanne Miller-Delaney, Irish Marie Skłodowska-Curie Office

11:05 - 11:40 **Overview of the MSCA** – Dr. Jennifer Brennan, Irish Marie Skłodowska-Curie Office

11:40 - 11:45 **MSCA success video** - ITN

11:45 - 12:05 **ITI overview & supports for all island applications** – Dr. Bernadette McGahon, ITI

12:05 - 12:10 **All island MSCA success videos** - RISE

12:10 - 12:25 **SFI Investigators Programme 2015** – Dr. Avril Monahan, SFI

12:25 - 12:30 **MSCA success video** – Individual Fellowships

12:30 - 13:30 **Lunch**

13:30 - 14:30 **Parallel information / networking sessions**

- **ERC** – [Main Plenary Room](#) – Dr. Graeme Horley (SFI)
- **Manufacturing & Materials** – [Courtyard Room 1](#) – Ciaran Prunty (QUB)
- **ICT / Data Analytics** – [Poddle Room](#)
Stephen O'Reilly (Enterprise Ireland), Dr. Gerard Kennedy (Enterprise Ireland),
Dr. Dajana Dzanovic (QUB)

14:30 - 15:30 **Parallel information / networking sessions**

- **US Ireland R&D Partnership Programme** - [Main Plenary Room](#) – Dr. Aisling McEvoy (SFI)
- **Energy** - [Courtyard Room 1](#) – Philip Cheasty (Enterprise Ireland), Dominic McLarnon (UU)
- **Health** (incl. connected health, medical devices, drug delivery & food for health) - [Poddle Room](#) - Kay Duggan Walls (HRB), Patricia McCrory (QUB)

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The Irish Marie Skłodowska-Curie Office

The **Marie Skłodowska-Curie Actions (MSCA)** support researchers at all stages of their careers, across all research disciplines & in all employment sectors. The Actions reinforce cooperation between academia & industry in particular through cross-border & cross-sector mobility of researchers. They focus on excellent & innovative research training, career development & knowledge exchange.



The **Irish Marie Skłodowska-Curie Office** is jointly operated by the IUA and the Irish Research Council. The office provides advice and support on preparing applications for Marie Skłodowska-Curie funding and the management of Marie Skłodowska-Curie awards. MSCA applications linked to a **SFI Centre**, can receive tailored support through the dedicated SFI funded MSCA Programme Officer for:

- Call Information
- Project conception & advice
- Proposal review
- Project implementation

For further information please contact:

Dr Suzanne Miller-Delaney (MSCA Programme Officer, SFI Centres)

Email: mariecurie@iua.ie Tel: +353 1 676 4948

EURAXESS Ireland

Based at the IUA, EURAXESS Ireland provides free advice and guidance to researchers (PhD students, postdoctoral scholars, academic staff and R&D personnel in the private sector) moving to or from Ireland to develop their research career. The **EURAXESS.ie website** provides information on a range of issues and areas affecting researchers and their families, including immigration and visas, employment law, healthcare, childcare, and life in Ireland and abroad. Additionally the portal provides a definitive list of research funding opportunities and positions in Ireland. The CV database is a free search facility that allows employers to identify potential research vacancy candidates on euraxess.ie and euraxess.eu.



EURAXESS Ireland is a member of the EURAXESS European Services Network which has more than 200 centres located in 40 European countries. To avail of the services of this extensive network log on to **www.euraxess.eu**

Contact EURAXESS Ireland Helpdesk for tailored assistance at:

Email: jennifer.cleary@iua.ie Tel: +353 1 676 4948

Jennifer Cleary

EURAXESS Ireland Manager

Magda Wislocka

EURAXESS Ireland Officer & Hosting Agreement Scheme Manager

Horizon 2020 Support Activities

InterTradeIreland's current European objective is to increase the number of North South applications to Horizon 2020. InterTradeIreland's supports for Horizon 2020 are available to companies, researchers, academia and other organisations.

InterTradeIreland Travel Schemes

- Cross-Border Collaboration Voucher: Up to £500/€680 towards travel and accommodation costs when developing and establishing H2020 partnerships in the opposite jurisdiction.
- EU Travel Scheme: Up to £350/€475 financial support for existing North South partnerships towards the cost of attending H2020 related events, consortium meetings or EU Commission meetings taking place in Europe.

Advisory Service

InterTradeIreland offers H2020 participants:

- Free advice and online guides
- Help with identifying partners
- Advice related to project ideas
- Signposting to the relevant supports

InterTradeIreland Horizon 2020 App

Launched in December 2013, the InterTradeIreland Horizon 2020 App promotes North South collaboration in Horizon 2020 by bringing together innovative SMEs, researchers, academic institutes and other organisations.

The free App can be accessed via the InterTradeIreland website or it is available to download onto mobile devices at the Apple, Windows and Android App stores.



Events

InterTradeIreland has developed the 'Focus On' event series which concentrates on specific opportunities around topics in the Horizon 2020 Work Programmes. These invitation only events bring together the relevant stakeholders to explore the potential for North South collaboration.

Details of upcoming events can be found on our website: www.intertradeireland.com/horizon2020/ or using our app.



Research Profiles

Artificial Intelligence & Applications (AIA)

AIA consists of 13 academics, 15 PhD students and research associates. AIA conduct research in knowledge and data engineering, unstructured data analytics (image, video and text) and bioinformatics, supported by strong expertise in mathematics and software engineering. AIA undertake externally funded research projects in digital content management, data/text mining, video understanding, text understanding, risk assessment in health/medical, ICT, connected health, food for health and security contexts. AIA publish papers in top-tier journals and conferences.



AMBER (Advanced Materials and Bio-Engineering Research) is a Science Foundation Ireland funded centre that provides a partnership between leading researchers in material science and industry. It is jointly hosted in Trinity College Dublin (TCD) by CRANN and the Trinity Centre for Bioengineering (TCBE), in collaboration with University College Cork and the Royal College of Surgeons in Ireland (RCSI). The centre will deliver internationally leading materials research that will be industrially and clinically informed with outputs including new discoveries and devices in ICT, medical device and industrial technology sectors. AMBER has a strong emphasis on linking industry to research programmes and the aim of the centre is to develop products that directly impact everyone's quality of life such as the development of next generation computer chips and new medical implants and pharmaceuticals that will improve patient care. AMBER brings together Ireland's leading material science researchers working across the disciplines of Physics, Chemistry, Bioengineering and Medicine; with an international network of collaborators and companies.

The SFI funded Trinity Electrochemical Energy Conversion & Electrocatalysis (TEECE) Group located within AMBER develops a range of nanostructured carbon, polymeric, transition metal oxide and oxidised transition metal electrode materials for applications in Electrolysis Reactors, Metal Electrowinning Cells, Advanced fuel cells, Battery systems, Ozone generation reactors and Electrochemical Sensors for pH and biomolecule detection. The PI, Professor Mike Lyons has more than 30 years experience in research and has a special interest in the mathematical modelling and quantitative analysis of electrochemical systems of technological interest. He is also lead PI for TCD in the new EIT-Raw Materials KIC. The TEECE

group is both multinational and multi-disciplinary and includes Chemists, Materials Scientists, Metallurgists, process Engineers and Chemical Engineers.



Health



Manufacturing
and Materials



Medical Devices

TCD, UCC, RCSI



Advanced Materials & Processing (AMP)

The Advanced Materials & Processing (AMP) Research Cluster has a vibrant research culture and has created a reputation for multidisciplinary research excellence into the processing, modelling and development of high performance material and composite technologies for a plethora of applications. Within the AMP Research Cluster is the **Polymer Processing Research Centre (PPRC)** formed in 1996, to focus on advanced extrusion, rotational moulding and thermoforming technologies and the **Medical Polymers Research Institute (MPRI)**, established in 2003 through a joint initiative with the School of Pharmacy, and dedicated to high technology R&D for healthcare industries in respect of medical materials and devices. In recent years the significant investment in processing, analytical and testing facilities has created an outstanding research infrastructure and a platform for undertaking high quality applied and fundamental research, reflecting the needs of the polymer and medical device industry in the UK and abroad. The operation and management of the AMP research agenda is funded via research grant income generated from Research Council UK, EU, Government and Industrial funders. Currently there is a critical mass of 11 lead academics and 30 post-graduate researchers within the AMP Research Cluster. Additionally the AMP has recently established a Doctoral Training Centre in Healthcare Technologies, which includes an industrially-relevant, structured training programme. PhD students attend monthly coaching and mentoring sessions taken by academics and post-doctoral researchers as well as attending relevant conferences, an annual Summer School and participation in an industrial secondment relevant to their PhD studies.



Drug Delivery



Energy



Food



Health



Manufacturing
and Materials



Medical Devices

QUB



The Alimentary Pharmabiotic Centre (APC) is about people working together across the boundaries of traditional research sectors. The APC has created a lively trans-disciplinary

environment with clinicians, clinician-scientists and basic scientists from diverse backgrounds working in teams, sharing ideas and resources. Although focused upon the magic and mysteries of the gastrointestinal bacterial community, (the microbiota), the scale and scope of the work has become one of the fastest moving areas of biology, of relevance to all branches of medicine and veterinary science, and is of growing importance to the economic welfare of society. The microbiota is not only a target for treatment and prevention of disease, it is a repository for functional food ingredients and even new drugs and is a source of novel biomarkers of disease risk. APC researchers welcome collaborators from industry, large and small enterprises, indigenous and multi-national, and have extensive experience with the food, agriculture, pharmaceutical, biotechnology and diagnostic sectors. The scientific organisation of the APC consists of a matrix of vertical pillars or themes of intellectual pursuit which are supported by multiple horizontal or shared technology platforms. This ensures freshness of ideas and support for intellectual curiosity while serving as a magnet to attract and drive industry-focussed research.

For more information please go to our website:
<http://www.ucc.ie/research/apc/content/index.html>



Applied Polymer Technologies

In 2013, APT Ireland was formed to serve the €2 billion polymer industry in Ireland, comprising 200 companies and employing 12,000 people. The new Centre is located on the Athlone Institute of Technology (AIT) campus. AIT is an education and research institution located in Ireland where over 6,000 students undertake undergraduate and postgraduate courses. Since 2000, €100 million has been invested in the campus. AIT has developed international collaborations with leading multinational companies and universities in Europe, Asia and North America. AIT is a key participant in the IRC and is a funded International Centre for Graduate Education in Micro and Nano Engineering which involves 14 partners from US, China and Europe. The APT Ireland has a core research focus on polymer materials processing, formulation and enhancement, supporting the development of innovative, high-value products, with the aim of increasing the global competitiveness of Irish-based polymer sector. APT is able to provide EU partners solutions for using polymer materials across the medical, composite, recycling and pharmaceutical sectors.



Atomistic Simulation Centre (ASC)

The Atomistic Simulation Centre (ASC) is concerned with the theory and computer simulation of materials at the nanoscale.



Drug Delivery



Energy



Health



ICT



Manufacturing
and Materials

QUB



Competence Centre for Sustainable Energy (CASE)

Industry led research in turbines, energy from biomass and energy systems & integration.



Energy

QUB, UU, AFBI



The Connected Health Innovation Centre (CHIC) is focused on business led research in the area of connected health. CHIC seeks to lead transformational research which aligns care needs with technology providers, researchers and clinical experience. CHIC targets research in areas such as e-Health, digital health, tele-health, tele-monitoring, disease management, and home based care. Key focuses for the research are Vital Signs Sensing Development, Integrated Care, Assisted Living and Point of Care Diagnostics. The centre is based at the University of Ulster and builds on advanced engineering capability in sensors, tissue engineering, advanced materials alongside advanced computing expertise in the application of Smart technology in areas such as rehabilitation, enablement and self-management. CHIC is funded by Invest NI as one of Northern Ireland's competence centres. The centre has been funded since June 2013 and is supported by over 25 companies and a memorandum understanding with NI Health and Social Care.



Connected Health



Data Analytics



ICT



Medical Devices

UU

CONNECT

The Centre for Future Networks and Communications (CONNECT) is the follow-on from CTVR, and is a flagship research centre for communications networking, services, applications and



technologies. CTVR is Ireland’s national telecommunications research centre, researching and designing wireless and optical telecommunication networks and technologies.



Data Analytics



ICT



Manufacturing
and Materials

TCD, CIT, DCU, DIT, MU, UCC, UCD,
UL, WIT, Tyndall National Institute

Centre for Sustainable Technologies (CST)

The Ulster University’s Centre for Sustainable Technologies (CST) is primarily the University’s energy research centre whose performance in the UK Universities 2014 Research Excellence Framework (REF) saw 100% of its research rated as world-leading and internationally excellent reflecting the strong portfolio of external research grants levered from prestigious sources and a vibrant PhD programme. Coupled with many world-leading and internationally excellent outputs, the REF results confirm the global reputation of Built Environment research at Ulster, of which CST is a major part. Its facilities include Terrace Street – a fully instrumented suite of houses for technology evaluation and demand side management, as well as laboratories for the development and evaluation of solar energy (PV and Thermal including the patented “SolaCatcher”), heat pumps (low temperature domestic to high temperature industrial), energy storage (phase change and thermochemical materials), bio-energy (gasification and novel oil seeds extraction technologies), advanced vacuum glazings, insulation products and thermal comfort. Other activities include energy market modelling (in particular addressing energy storage and demand side management cost-effective integration), energy process techno-economic simulation and development of low-cost wireless instrumentation that underpins building physics analysis.



Energy

UU (Collaborations with UCD,
CIT, DIT, GMIT and DkIT)



Centre for Research in Medical Devices



The objective for CÚRAM is to radically improve health outcomes for patients by developing innovative implantable medical devices. Devices will be developed with strong clinical collaborations, with industry partners and hospital groups, to enable rapid translation to the clinic. CÚRAM will design and create implantable ‘smart’ medical devices. Implants will be designed and manufactured to respond to the body’s environment and to deliver therapeutic agents, such as drugs, exactly where needed. CÚRAM’s outputs will particularly benefit patients with chronic diseases such as heart disease, diabetes and musculoskeletal diseases. Research areas include:

- Combinational and advanced delivery devices
- Enhancement of current implants and devices
- Design of devices

- Characterisation of implants and devices
- Clinical translation of selected CÚRAM technologies



NUIG, UCD, DCU, UCC, RCSI,
TCD, UL

Diabetes Research Group (DRG), Ulster University.

The Diabetes Research Group (DRG) at University of Ulster was formed in 1989 and currently consists of 8 academic staff, 4 postdoctoral researchers and 20 PhD and Masters research students. Research facilities are located within the Saad Centre for Pharmacy & Diabetes. Research activities have largely focused on discovery and pre-clinical development of novel targets for treatment of diabetes, obesity and related metabolic disorders. Research discoveries have led to numerous high impact publications, as well as development of a significant patent portfolio and intellectual property which are commercialized through Innovation Ulster. The strategic research areas of interest to DRG include; (1) *antidiabetic actions of structurally modified peptides*. The focus of this research is to evaluate the impact of structural modification of biologically active brain-gut peptides on satiety, insulin-releasing activity and antihyperglycaemic potential. This work has culminated in the synthesis of a number of novel biologically potent enzyme-resistant peptide analogues for potential obesity-diabetes therapy with substantial pre-clinical investigations completed for these targets. (2) *Discovery, targets and action of antidiabetic drugs*. This research is directed towards discovery, isolation and characterization of novel antidiabetic agents from natural sources, including plants, marine sources and amphibian venoms. Other research areas of interest include; *Insulin secretion and gene therapy*; *Mechanisms of pancreatic beta-cell dysfunction* and *Inter-relationships between diet and diabetes/obesity*. More recently we have an interest with colleagues in Nutrition at Ulster and collaborators in Life Sciences at University of Limerick on the potential of functional foods in therapy of diabetes and obesity.



UU

Drug Delivery Research Group (DDRG), Queen’s University Belfast.

The Drug Delivery Research group (DDRG), in collaboration with the international pharmaceutical industry, governments and leading charities, aims to provide innovative and practical drug delivery concepts for optimisation of clinical outcomes. Key highlights include the pharmaceutical development of a microbicide-releasing vaginal ring product now in Phase 3 trials, the out-licensing of our drug delivery technologies and the development of products, including Ametop™ and Femring™. Current focus within the group is based around vaginal ring development, polymer extrusion, injection molding and additive manufacturing applied to dosage forms, novel swellable microneedle arrays and stable formulation of bioactives.



Drug Delivery



Health



Medical Devices

QUB



ECIT

The Institute of Electronics, Communications and Information Technology



CENTRE FOR SECURE INFORMATION TECHNOLOGIES

The Institute of Electronics, Communications and Information Technology (ECIT) was established in 2003 to commercialise world-class research and expertise in a variety of enabling digital communications technologies at the School of Electronics, Electrical Engineering and Computer Science at Queen’s University Belfast. Its four research clusters cover areas such as Secure Digital Systems, Wireless Communication Systems, Speech, Image & Vision Systems and High Frequency Electronics. ECIT has many activities in research, development and innovation across the ICT, however, our focus on market need and coordinated opportunity have led to the development of Centres of Excellence within the ECIT Infrastructure. The centres of excellence cover areas such as Capital Markets, Space, IoT and Cyber Security. ECIT hosts the Centre for Secure Information Technologies (CSIT). Which is the UK’s National Innovation Centre for cyber security technologies. ECIT has a strong pedigree in FP7 project activity. Projects include HANDHOLD, PRECYSE, NANOSTREAMS and BEWISER. ECIT is also currently coordinating the Horizon 2020 project SAFECrypto.



Data Analytics



Energy



ICT

QUB



IRISH CENTRE FOR RESEARCH IN APPLIED GEOSCIENCES



iCRAG is a newly established SFI centre. It brings together a team of researchers representing the full geosciences spectrum with a clear focus on the economic impact of the wider geosciences sector. iCRAG aims to transform applied geosciences research in Ireland by focussing resources into thematic areas and by requiring that research outputs are systematically embedded into industry to maximise impact. The Centre’s research programme consists of four cohesive topics or ‘spokes’ in the areas of raw materials, marine geoscience, groundwater and hydrocarbons which are built around four enabling technology and equipment based ‘platforms’ which focus on geophysical sensing and imaging, geochemistry, 3D geological modelling and public perception and understanding.



Energy



Manufacturing and Materials

UCD, UCC, NUIG, NUIM, TCD, DIAS

The Irish Centre for Fetal and Neonatal Translational Research (INFANT) is Ireland’s first and only dedicated perinatal research centre. INFANT was established in 2013 following a successful bid to the Science Foundation Ireland (SFI) 2012 National Research Centre’s call, led by founding directors Professors Louise Kenny and Geraldine Boylan. INFANT is largely based at University College Cork. It has a diverse funding portfolio and works across the entire perinatal space. INFANT has a range of industry partners ranging from SMEs to large multinationals who support the centre in addressing the largely unmet worldwide clinical need for effective innovations for the most common complications of pregnancy and the most significant problems for newborns. The overall aim of INFANT is to become the world’s leading perinatal translational research centre within the first 6 years of the SFI Centres Programme.



UCC, RCSI

Insight Centre for Data Analytics was founded in 2013 as part of nationwide Insight Center for Data Analytics (<http://insight-centre.org/>). It counts more than 350 researchers, 8 Institutions, 30 industrial partners and €88 million funding. The institute performs fundamental and applied research in a range of research areas, including data analytics, recommender systems, real-time analytics, data streams and sensor networks, knowledge discovery, natural language processing, social network analysis, among others. Research outcomes are applied in use cases in a range of domains, including eBusiness, eHealth, Green & Sustainable IT, Smart Cities, Smart Buildings, and Life Sciences. Institute members actively participate in standardization activities (W3C, OASIS). The Insight institute has been very successful in acquiring EU funding.



UCD, UCC, DCU, NUIG



The Irish Photonic Integration Centre (IPIC) is a Science Foundation Ireland (SFI) Research Centre that brings together over 100 researchers from four institutes to develop new light-enabled technologies. Targeting the ICT and medical devices sectors, IPIC is working with 20 industry partners to develop the next generation of highly-compact and miniaturised photonic technologies. The Centre’s work is focused on revolutionising the speed of data transfer through faster more energy efficient devices and delivering new smart medical devices for improved diagnosis and treatment of disease. IPIC is led by Tyndall National Institute in collaboration with University College Cork (UCC), Cork Institute of Technology (CIT) and Dublin City University (DCU).

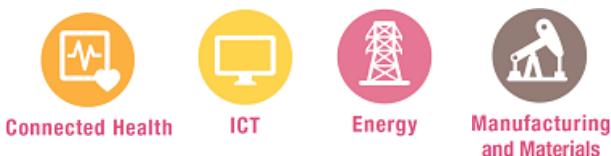


**Tyndall National Institute, UCC,
DCU, CIT**



Lero brings together leading software teams from universities and institutes of technology in a co-ordinated centre of research excellence with a strong industry focus. Ireland has a vibrant and successful software sector, with nine of the world’s top 10 multinational technology companies having a significant presence in Ireland. Lero is a key pillar of that sector. Since it was founded in 2005, it has become one of the best known and most highly regarded software research centres in the world. It is home to 289 researchers and funded to the tune of €41m. Research Areas include: Methods and standards for high integrity software; Autonomous and adaptive systems; Software performance; Adaptive security and privacy. Research projects include: ARC – Ensuring software code consistency with architecture; ASCENS – Autonomic service components ensembles; MANSEC – Managing the security of evolving and adaptive systems; MANYCORE – Understanding software performance on many-core hardware systems; Real-time log analytics in the cloud; FOSOMO – Feature-oriented modernisation of legacy software; Multi-level smart city sustainability ecosystems; Applying flow techniques to software engineering projects; Developing metrics for large-scale agile software engineering processes; Model-based diagnostics with provable properties; Software for analytics and security.

See more at: <http://www.lero.ie>



**UL, DCU, DKIT, MU, NUIG,
TCD, UCC, UCD**

The SFI Marine Renewable Energy Ireland (MaREI) Centre is a cluster of key university and industrial partners dedicated to solving the main scientific, technological and socio-economic challenges related to marine renewable energy. These challenges will require innovative solutions to reduce time to market and reduce costs to a competitive level. They cover all aspects of the technology development and require solutions to the engineering problems, energy conversion and storage transmission and integration as well as the enabling ICT technologies and environmental aspects. MaREI will deliver significant economic and societal impacts, leveraging from existing internationally recognised groups in Irish universities working in the MRE sector. MaREI will develop an innovation environment that will yield intellectual property and high potential start-up companies, and lead to jobs in the Irish economy through the outputs from the targeted projects with the industry partners.



Energy



Manufacturing
and Materials

UCC, UCD, NUIG, UL, MU



Nanotechnology and
Integrated Bioengineering
Centre

NIBEC - the Nanotechnology and Integrated Bioengineering Centre is a world-class research facility at the Jordanstown campus of Ulster University. The centre represents a consolidation of research groups, associated with advanced material types used in medical devices, electronics, photonics, tissue engineering, nanotechnology, microfluidics, sensors, MEMS, optical and environmental devices. The multi-million pound purpose-built buildings house some of the most sophisticated nano-fabrication, biological and characterisation equipment currently available. NIBEC is staffed by an internationally recognised and well experienced team of researchers and academics working predominantly at the interface of bioengineering and nanotechnology.

Key research themes include:

Sensors and Connected Health: Sensors, Point-of-Care Monitoring and Integrated intelligence based platforms.

Tissue Engineering and Regenerative Medicine: The surface science of biomaterials and their biological interface, surface modification of medical substrates, fabrication of bio-active scaffolds.

Clean Technology: The development of engineering and materials principles to address sustainable environmental issues.

Nanomaterials: The growth and characterisation of nanostructures to enhance biomedical device function.



UU

PARENT & BABY LAB, Queen's University Belfast.

The Parent and Baby LAB (Learning About Baby...together) is a research group within QUB's School of Nursing & Midwifery which aims to develop innovations that will lead to effective high quality and low-cost psychosocial assessment of infants and families.



QUB

Pharmacy & Pharmaceutical Sciences Research Group (PPSRG), Ulster University.



UU

Plasmas and Nanoscale Engineering Groups (PNEG), Engineering Research Institute, Ulster University.

Nanomaterials synthesis at room temperature and atmospheric pressure

- (A) Fabrication of quantum confined nanomaterials and semiconductor alloy quantum dots for 3rd generation solar cells, plasmonics, sensors & biomedicine.
- (B) Gas-phase room temperature synthesis of pristine & surface engineered nanoparticles for direct delivery to biological tissue.
- (C) Gas-phase microreaction chemistry with picolitre droplets in steady-state low temperature plasmas at atmospheric pressure.
- (D) Enhanced nanoparticle dispersion in colloids for polymer nanocomposites and polymer nanofluids with applications in aerospace, biomedicine and multi-channel microfluidics.
- (E) High volume rapid carbon nanotube growth at atmospheric pressure.

Microfluidics, microplasmas and bio-physics to study bacterial interactions for AMR and pathogen detection

- (A) Physics, chemistry and biological response of isolated bacteria in microdroplets to low temperature plasmas, applied charge & fields and the impact on anti-microbial resistance and viability.
- (B) Trapping of individual bacteria using structured electric fields for rapid airborne identification
- (C) In-situ synthesis of nanoparticles onto isolated bacteria via plasma-exposed droplet carriers for enhanced pathogen detection
- (D) Secondary effects of very low energy electrons on DNA

Microfluidic Plastic Lab on Chip

- (A) Multi-channel membrane-based chemical analysis
- (B) Sensor system for deep ocean profiling of dissolved inorganic carbon

Current project funding:

US-Ireland Deep Ocean Sensors; **EPSRC (UK)** Bacterial Physics & Detection; **EPSRC (UK)** Inorganic quantum dot heterojunctions for solar cell devices; **EPSRC (UK)** Advanced Nanotube Application and Manufacturing; **EPSRC (UK)** quantum dots with tailored energy band structure. See <http://gow.epsrc.ac.uk/NGBOViewPerson.aspx?PersonId=9985> for project summaries. Also Royal Society (UK), **Marie-Curie ITN** – reactive atmospheric processing (www.rapid-itn.eu/), *Leverhulme international network* (<http://www.plasmamate.net/>).

Collaborations:

U. Glasgow, U. St. Andrews, U. Cambridge, U. Manchester, Tyndall-UCC, QUB, Bochum (Germany), Fraunhofer IST (Germany), Eindhoven U. Tech., Jean Lamour Institute (France), AIST (Japan)



Energy



Health



Manufacturing
and Materials



Medical Devices

UU



Founded in 1999, the multi-award winning Queen's University Ionic Liquid Laboratories (QUILL), brings together chemists, chemical engineers, physicists, pharmacists, and biologists to respond to both societal and industrial demands for low environment impact chemical technologies. Winner of 5 IChemE Awards (2013/2014).



Energy



Manufacturing
and Materials

QUB



The Synthesis and Solid State Pharmaceutical Centre (SSPC) is the largest centre of its type in the world. It is funded by the Science Foundation Ireland, and comprises a working partnership between 9 research organisations, 12 international academic collaborators, and 22 of the world's leading pharma companies. The unique collaboration between academia and industry in this initiative provides unparalleled opportunities for early-career researchers to develop their individual research skills, while working with state-of-the-art equipment and the latest technologies and engaging regularly with the pharma industry. With a remarkable range of expertise from synthesis, process engineering, crystallisation and formulation, the SSPC has already attracted a large number of excellent scientists, with a total of 38 PIs, 32 postdocs and 60 PhD students.












UL, UCD, TCD, UCC, NUIG, DCU,
AIT, WIT

Ulster University Marine Research Group (UUMRG), Northern Ireland Centre for Food & Health (NICHE)

The UU marine research group (UUMRG) is primarily focused on bioassay led screening of marine derived bioactive extracts and compounds in relation to the areas of gut health (prebiotics), cardiovascular disease (antioxidant, inflammation and lipid status), diabetes, appetite control and cancer. Research to date has included in vitro bioactivity screening assays, animal studies as well as human intervention trials with the aim of identifying bioactive compounds and substantiating their bioactivity in-vivo to establish their potential as pharmaceutical candidates or ingredients for the functional food market. The UUMRG is a leading member of the NutraMara consortium and currently has existing collaborations with university research groups throughout the island of Ireland that have continued beyond the NutraMara project. These include collaborations with the University of Limerick, Sligo IT, Teagasc-Moorepark and National University of Ireland Galway. UUMRG also have collaborative projects with the University of Reading and Fondazione Edmund Mach – Italy and Norwegian College of Fishery Science in Tromsø, Norway. UUMRG have also been involved in numerous farm to fork projects including the EU framework 7 projects - Hydrocolloid Derivatives as Functional Food Ingredients (HYFFI) and Seaweed derived anti-inflammatory agents and antioxidants (SWAFAX). UUMRG is currently involved in 2 nationally funded FIRM projects investigating marine derived bioactive peptides as a source of novel treatments for diabetes (MARAPEP) and seaweed source polysaccharides as a source of health promoting dietary fibre prebiotics (PREMARA). UUMRG has extensive experience working with industry both locally (Moy Park, Irish Seaweeds Ltd), nationally (Marigot Ltd, Cybercolloids, Hebridean seaweeds and Ocean Harvest) and internationally (Ingredion Inc, Kerry Ingredients, Industrias Roko, Killybegs Fisherman Organisation).



UU

	 Manufacturing and Materials	 Energy	 ICT	 Data Analytics	 Health	 Connected Health	 Medical Devices	 Drug Delivery	 Food
CASE		X							
CST		X							
iCRAG	X	X							
MaREI	X	X							
QUILL	X	X							
CONNECT	X		X	X					
ECIT & CSIT		X	X	X					
Lero	X	X	X			X			
CHIC			X	X		X	X		
Insight			X	X		X	X		
AIA			X	X	X	X			X
ASC	X	X	X		X			X	
IPIC	X		X		X		X		
NIBEC	X			X	X	X	X	X	
AMBER	X				X		X		
PNEG	X	X			X		X		
AMP, PPRC & MPRI	X	X			X		X	X	X
INFANT					X	X	X		X
Parent & Baby LAB					X	X			
APC				X	X	X	X	X	X
DRG					X			X	X
UUMRG / NICHE					X				X
CURAM	X				X		X	X	
APT	X				X		X	X	
SSPC					X			X	
DDRG					X		X	X	
PPSRG	X	X			X			X	

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