An Roinn Post, Fiontar agus Nuálaíochta
Department of Jobs, Enterprise and Innovation

Directory of Research Centres and Technology Centres 2015

Directory of Research Centres and Technology Centres, 2015

Version 1.1

Delivering excellent scientific research and impactful technologies for industry in 14 areas of national priority.

The Department of Jobs, Enterprise and Innovation (DJEI) acknowledges with thanks the leading contribution of Enterprise Ireland to the production of this Directory and the input of other enterprise agencies including SFI and IDA Ireland.

The Directory is a point-in-time overview of the research centres of scale that are supported by DJEI aligned to the national research prioritisation strategy. It is not meant to be an exhaustive inventory of the excellent research, innovation and technology transfer being carried out right across higher education institutions nationally, often in close collaboration with local industry. Information on the quality and relevance of such research is available directly from those institutions (listed at www.hea.ie).

The criteria used for this Directory are centres of scale that are: (a) supported by DJEI aligned to national research priorities; (b) in receipt of competitive funding of at least €5m over five years; and, (c) carrying out research of a minimum scale, with a national focus. We have also included institutes and facilities of scale that receive recurrent funding from the State to carry out research aligned to priority areas.

Every effort has been made to ensure the accuracy of the information provided in the Directory. Certain editorial choices have been made in the interests of a clear presentation, particularly in identifying which research centres have most relevance to particular national priority areas. Because of technological convergence and the nature of innovation, many research centres can and do offer a range of opportunities beyond those that may be listed in this Directory as their strengths, and we would encourage potential collaborators to engage directly with research centres to identify further opportunities.

It is intended that this Directory will be iterative. The online version will be updated more frequently and should be consulted as the most up-to-date version available at www.knowledgetransferireland.com.

Contents

Foreword

Minister Richard Bruton, TD
Minister for Jobs, Enterprise and Innovation

A key part of the Government's Action Plan for Jobs is to build on the major achievements in scientific research of the past decade and turn more good ideas into good jobs. The Government provides funding of circa €733m annually to stimulate research. In addition, research centres such as the 12 new SFI large research centres are leveraging €190m in funding, while EU funding provides on average a further €100m each year to benefit Irish research. This approach is delivering results, creating jobs, attracting investment and supporting innovation in indigenous companies to enhance their competitiveness in global markets.

We are pursuing a strong commercialisation agenda, allocating up to €120m annually to Enterprise Ireland to support commercialisation to ensure that we get more, as an economy, out of our investment in scientific research over the past decade and more. This national research directory will help deliver on this ambition, by bringing together for the first time, details of all State-supported research centres of scale and their key areas of research, in a way that makes our offering clear to enterprise.

This represents another milestone in the evolution of a system to support the development of close business links between industry and the publicly-funded research system. This resource is designed to deliver benefits for enterprise, benefits for the research system and benefits for Ireland, in terms of enhancing our export potential, our attractiveness as a location for FDI, and creating sustainable, high quality jobs.

Mapping the publicly-funded research system in this way complements other initiatives being implemented by this Government, such as research prioritisation, the development of the Intellectual Property Protocol and a consolidation of research centres, resulting in a smaller number of centres of larger scale being supported by research funders in areas of economic and societal importance.

Together, these measures will place Ireland in a competitive position internationally and is part of a series of Government measures aimed at realising the vision for Ireland to become the best small country in the world in which to do business.

Introduction

Minister Damien English, TD
Minister of State for Skills, Research and Innovation

Ireland has invested significantly, through funding of research and enterprise agencies, in building our research capacity in strategic areas allied to industry needs. Equally important is the investment, through the Higher Education Authority, in programmes designed to enhance the research capabilities, capacity and infrastructure of Ireland's higher education institutions. Together, these investments strongly encourage national collaboration, while emphasising research outputs, so that Ireland may continue to compete with the world's most advanced knowledge economies.

With the launch of this national research directory, Government is shaping the direction of Irish research into the future, ensuring that industry – national and international – is aware of, and can gain from, the wealth of knowledge and expertise that exists within Ireland's State-supported research centres. These research centres are ideally positioned to nurture real collaboration across industry and academia, which supports delivery of commercial outcomes, and ultimately high-value jobs, across all sectors of the economy. They are also ideally positioned to collaborate with industry to maximise Ireland's involvement in the EU Horizon 2020 Framework Programme for Research. More than 500 companies in Ireland are currently collaborating with the centres profiled on the following pages, each benefitting from the collective expertise of both the research teams in the centres and their fellow industry members.

This Directory will complement the work of Knowledge Transfer Ireland in making it easier for companies to engage with Ireland's research system and supporting the building of relationships between industry and academia that will support a sustainable flow of commercialisation activities and build networks of long-term knowledge sharing, which will be of benefit to both sides.

Research prioritisation in Ireland

Having made very significant progress over the past decade in building Ireland's research capability, the Government decided that Ireland needed to build on the strengths that have emerged from the investment to date in science, technology and innovation.

In order to target investment in areas that link directly to current and likely future economic and societal needs, a steering group was formed to undertake a national research prioritisation exercise. This group was asked to make recommendations for the future orientation of public investment in science, technology and innovation. It identified 14 priority areas of research that are most likely to give demonstrable economic and societal return, and where Ireland should focus the majority of competitive funding. Four criteria were used in selecting the 14 priority areas for future, competitively-awarded investment for economic objectives:

1. the area is associated with a large global market or markets in which Irish-based enterprises already compete or can realistically compete;
2. publicly performed R&D in Ireland is required to exploit the area and will complement private sector research and innovation in Ireland;
3. Ireland has built or is building (objectively measured) strengths in research disciplines relevant to the area; and,
4. the area represents an appropriate approach to a recognised national challenge and/or a global challenge to which Ireland should respond.

The Steering Group also identified the need to support platform technologies and infrastructure which underpin the priority areas and acknowledged the critical importance of research for policy and research for knowledge.

Who is involved in research prioritisation?

FOURTEEN PRIORITY AREAS FOR RESEARCH

- Future Networks and Communications
- Data Analytics Management, Security and Privacy
- Digital Platforms, Content and Applications
- Connected Health and Independent Living
- Medical Devices
- Diagnostics
- Therapeutics – synthesis, formulation, processing and drug delivery
- Food for Health
- Sustainable Food Production and Processing
- Marine Renewable Energy
- Smart Grids and Smart Cities
- Manufacturing Competitiveness
- Processing Technologies and Novel Materials
- Innovation in Services and Business Processes

How to use this directory

A national research prioritisation exercise was undertaken in 2011 which identified 14 priority areas for research. Research centres and technology centres, supported through competitive funding, are aligned with these 14 priority areas. To assist with communication about these centres, the 14 priority areas for research have been clustered into six themes.

To use this Directory effectively, you can take one of three approaches:

1. you already know the centres you are interested in, so you can go directly to their pages;
2. you have a broad interest in one or more of six themes for research: go to the index on pages six and seven and identify all the centres that have indicated they are active in those areas;
3. you know exactly which of the 14 priority areas that you are interested in: go to the index on pages six and seven and see all of the centres that are active in that priority area.

Index

6 themes

14 priority areas

ICT

HEALTH & MEDICAL TECHNOLOGIES

PAGE	CENTRE	Future Networks and Communications	Data Analytics, Management, Security and Privacy	Digital platforms, Content and Applications	Connected Health and Independent Living	Medical Devices	Diagnostics	Therapeutics – synthesis, formulation, processing and drug delivery
8	ADAPT			■				
9	AMBER					■		
10	APC						■	
11	ARCH				■			
12	BDI				■	■	■	
13	CCAN							
14	CeADAR		■					
15	CONNECT	■						
16	CÚRAM					■	■	■
17	DPTC							
18	FHI							
19	FMC^2			■				
20	GRCTC							
21	IC^4			■				
22	ICMR							
23	ICOMP							
24	iCRAG							
25	IERC							
26	INFANT					■	■	
27	INSIGHT		■		■			
28	IPIC	■				■	■	
29	IVI							
30	Learnovate			■				
31	LERO		■	■				
32	MaREI							
33	MCCI	■						
34	PMTC							■
35	REMEDI					■		■
36	SBI						■	
37	SEES							
38	SSPC							■
39	TCBB							
41	CRFs				■	■	■	
42	ICHEC		■				■	
43	Marine Institute							
44	NIBRT							■
45	Teagasc							
46	Tyndall	■			■	■		

SUSTAINABLE FOOD

Food for Health

Sustainable Food Production and Processing

ENERGY

Marine Renewable Energy

Smart Cities and Smart Grids

MANUFACTURING AND MATERIALS

Manufacturing Competitiveness

Processing Technologies and Novel Materials

INNOVATION IN SERVICES AND BUSINESS PROCESSES

6 themes

14 priority areas

CENTRE	PAGE
ADAPT	8
AMBER	9
APC	10
ARCH	11
BDI	12
CCAN	13
CeADAR	14
CONNECT	15
CÚRAM	16
DPTC	17
FHI	18
FMC^2	19
GRCTC	20
IC^4	21
ICMR	22
ICOMP	23
iCRAG	24
IERC	25
INFANT	26
INSIGHT	27
IPIC	28
IVI	29
Learnovate	30
LERO	31
MaREI	32
MCCI	33
PMTC	34
REMEDI	35
SBI	36
SEES	37
SSPC	38
TCBB	39
CRFs	41
ICHEC	42
Marine Institute	43
NIBRT	44
Teagasc	45
Tyndall	46

Engaging Content
Engaging People

ADAPT
Centre for Digital Content Platform Research

Prof. Vincent Wade
Centre Director

Research areas

- Analysing media, content and customer interactions
- Enabling global reach via innovative machine translation
- Transforming and delivering personalised content
- Extracting actionable knowledge from all forms of digital content and user interactions
- Empowering innovative customer engagement and interaction across multimodal media

ADAPT Centre
O'Reilly Building
Trinity College Dublin
Dublin 2

T +353 (0)1 896 1797
E collaboration@adaptcentre.ie
www.adaptcentre.ie

The Centre for Digital Content Platform Research (ADAPT) is Ireland's global centre of excellence for digital content and media innovation. ADAPT's cutting-edge technologies enable businesses in all sectors to harness global digital content and media technologies to achieve unprecedented engagement among customers, companies and communities.

Dynamic digital content interactions are key to valuable customer engagement and enhanced global reach and revenue. ADAPT innovations can help to analyse, personalise and deliver digital content more effectively to drive business in the digital age. ADAPT partners are developing ground-breaking technologies to turn the enormous volume of content into digital revenues by enabling unprecedented levels of global engagement between organisations and customers using world-leading research. ADAPT works with leading enterprises across industry sectors, including: CISCO and Intel to ensure consistent brand voice across global communications; Symantec to identify future online community leaders; and, Xanadu to deliver personalised content for targeted customer segments. We also work with enterprises such as: Welocalize to enhance translation productivity; and, Microsoft to detect offensive content in social media. By enabling deeper customer engagement, ADAPT enhances efficiencies and global reach for industry partners in key priority sectors for Ireland, including ICT, localisation, financial services, eCommerce, media, entertainment and games, life sciences, digital culture and humanities, and eLearning/education.

Research performed by

- Trinity College Dublin
- Dublin City University
- University College Dublin
- Dublin Institute of Technology

AMBER
Advanced Materials and BioEngineering Research

Prof. Stefano Sanvito
Centre Director

Advanced Materials and BioEngineering Research (AMBER) provides a partnership between leading materials science researchers and industry. The centre delivers internationally leading materials research with outputs including discoveries in the ICT, medical devices, pharma and industrial technology sectors.

AMBER combines world-class fundamental and applied research activity within a vibrant culture of industrial engagement and commercialisation. Central to AMBER's research remit are the collaborative projects performed with each of our industry partners. The industry partners are diverse, both in terms of sectors and scale, covering the four primary sectors of ICT, medical devices, pharmaceuticals and advanced manufacturing technologies. A primary objective of the AMBER centre is to create new knowledge and intellectual property, and to successfully transfer that knowledge to industry through licensing agreements, staff exchange and formal transfer of know-how. We work in conjunction with the technology transfer offices of TCD, UCC and the RCSI to achieve this. We offer industry the opportunity to cost-effectively access research, innovation and infrastructure underpinned by world-leading human capital.

Research performed by
- Trinity College Dublin
- University College Cork
- The Royal College of Surgeons in Ireland

Research areas
- 2D materials and composites
- Biomaterials
- Medical devices
- Semiconductor and memory devices
- Polymers and membranes

AMBER
CRANN Institute
Trinity College Dublin
Dublin 2

T +353 (0)1 896 3030
E stefano.sanvito@tcd.ie
www.ambercentre.ie
Twitter @ambercentre

APC
Alimentary Pharmabiotic Centre

Prof. Fergus Shanahan
Centre Director

Research areas

- Discovery of molecules for therapeutics and functional foods
- Designing functional ingredients/foods across the lifespan
- Links between diet, microbes and mental health
- Signalling, host immune-inflammatory responses
- Technology platforms

Alimentary Pharmabiotic Centre
BioSciences Building
University College Cork
Western Road
Cork

Dr Brendan Curran
Business Development
T +353 (0)21 490 1754
E bcurran@ucc.ie
http://apc.ucc.ie

The Alimentary Pharmabiotic Centre (APC) is a gastrointestinal health research centre exploring the role that gastrointestinal bacteria (microbiota) play in health and disease. The microbiota is a target for treatment and prevention of disease, and a source of functional food ingredients, new drugs and disease biomarkers.

APC research is relevant to many different industry sectors: food, pharma, biotechnology, infant nutrition, medical foods and veterinary. APC investigators are global research leaders in these areas. The APC has also developed a number of technology platforms that can be of significant benefit to industry clients in furthering their own R&D agenda, such as culture-to-product, pre-clinical models, next generation sequencing, bioIT and human studies.
The APC is very experienced in managing industry interactions and welcomes industry partners through a variety of flexible modalities. The benefits of partnership include the ability to undertake collaborative research with leading experts, access to our technology platforms and our extensive databases, and the reservoir of expertise held by the APC investigators.
The APC works closely with State agencies and can support clients in accessing appropriate State funding mechanisms.

Research performed by

- University College Cork
- Teagasc
- Cork Institute of Technology

ARCH
Applied Research for Connected Health

Prof. Brian Caulfield
Lead Investigator

Applied Research for Connected Health (ARCH) is the centre of connected health research in Ireland. People and technology come together through ARCH to deliver better health outcomes and prove these from economic, clinical, technology robustness and usability perspectives. ARCH adds value to R&D, creating and retaining jobs.

ARCH is an industry-driven technology centre providing access to world-class clinicians, academics and patient cohorts to explore and evaluate potential connected health solutions for the global market. Changing demographics coupled with reducing resources are placing increasing pressures on health systems across the globe. New care models must ensure patient quality of life while reducing costs and maintaining or improving clinical outcomes. Connected health is an emerging model of care ensuring stakeholders are 'connected' by means of timely sharing and presentation of accurate and pertinent information regarding patient well-being through smarter use of data, devices and people. Ireland is in a unique position to become a global centre of activity and excellence in connected health. ARCH is at the centre of an unparalleled connected health education and research infrastructure that spans a range of activities from gathering, analysing and interpreting data, through the development of new knowledge and care models to implementing and evaluating change.

Research performed by

- University College Dublin
- University of Limerick
- Dublin City University
- Maynooth University
- NUI Galway
- Dundalk Institute of Technology
- Dublin Institute of Technology

Research areas

- How care is delivered today and how might it be improved by connected health technologies?
- How can the barriers to the use of connected technologies be overcome and maximum impact achieved?
- How can large and diverse health-relevant data sets be mined for actionable information and presented to diverse stakeholders?

ARCH
NexusUCD
Block 9/10 Belfield Office Park
Clonskeagh
Dublin 4

T +353 (0)1 716 5400
E b.caulfield@ucd.ie
www.arch.ie

BDI
Biomedical Diagnostics Institute

Joseph McManus
Centre Director

Research areas

- Immunoassay development
- Sensor technology
- Lab on a chip/microfluidic platforms
- Molecular diagnostics
- Assay reagent development

The Biomedical Diagnostics Institute (BDI) is an academic–business–clinical partnership carrying out cutting-edge research programmes on the development of next-generation biomedical diagnostic devices. Our vision is to develop diagnostic and monitoring devices that directly address specific unmet clinical needs and translate these into the clinical setting.

The BDI comprises scientists and engineers working across five universities, in collaboration with clinicians based in six hospitals in Dublin and Galway. Since its establishment in 2005, this multidisciplinary BDI team has built significant IP and expertise in assay development, molecular diagnostics, lab-on-a-chip devices and high performance sensor development. This may be used to the advantage of industry partners experiencing R&D challenges in biomarker validation, assay development and new diagnostic product development, with a particular focus on near-patient/point-of-care testing. The BDI has a strong project management ethos, employing project managers who ensure clear project scoping and that objectives are met in an efficient manner. Through its clinical collaborators, the BDI has access to patient cohorts in disease areas such as cancer, cardiovascular disease, infectious disease and chronic inflammatory conditions such as rheumatoid arthritis. This facilitates device/assay verification in appropriate patient samples and, importantly, in dedicated clinical research centre facilities.

Research performed by

- The Royal College of Surgeons in Ireland
- Trinity College Dublin
- NUI Galway
- Tyndall National Institute

Biomedical Diagnostics Institute
Dublin City University
Glasnevin
Dublin 9

T +353 (0)1 700 7658
E joseph.mcmanus@dcu.ie
www.bdi.ie

CCAN
Collaborative Centre for Applied Nanotechnology

Dr Alan Hynes
Centre Director

The Collaborative Centre for Applied Nanotechnology (CCAN) was established to help Irish-based companies to enhance their competitive advantage through nano-enabled and materials-based product innovation. CCAN helps companies to access expertise and funding from across the Irish nanotechnology and materials network.

CCAN (pronounced "see-can") helps our member companies to make better products by adopting and applying Ireland's leading advanced materials and nanotechnology expertise. CCAN makes it easy for multiple companies or research providers to collaborate in order to combine the variety of skillsets necessary to develop new products based on advanced materials. We aim to put nanotechnology to work, thereby creating value for our industry members and the Irish economy. We deliver industry solutions by combining expertise from anywhere in the country into project teams focused on our industry members' requirements. Our focus is on materials solutions for life science and ICT companies. CCAN currently has 20 member companies, 15 of which are SMEs. In a 2013 survey, 100% of CCAN member companies would recommend membership to other companies. If your company is involved in or needs materials development, then talk to us to see how CCAN membership can help your business.

Research performed by
- Tyndall National Institute
- CRANN/AMBER at Trinity College Dublin
- University College Dublin
- Dublin City University
- NUI Galway

Research areas
- Advanced materials for medical devices, diagnostics and ICT applications
- Low friction and x-ray opaque medical device polymers
- Ultra-thin coatings for advanced surface properties (conductivity, droplet control)
- Nanoporous metals for electrochemical sensing
- Functionalised microneedles for health applications

CCAN
Tyndall National Institute
(& CRANN, Trinity College Dublin)
Lee Maltings, Dyke Parade
Cork
T +353 (0)21 234 6059
E alan.hynes@ccan.ie
www.ccan.ie

CeADAR
Centre for Applied Data Analytics Research

Edward McDonnell
Centre Director

Research areas

- Visualisation and analytic interfaces
- Data management for analytics
- Advanced analytics

The Centre for Applied Data Analytics Research (CeADAR) is an industry-focused technology centre for the development and deployment of big data analytics technology and innovation, focusing on developing tools, techniques and technologies that enable people, organisations and industries to use analytics for better decision making.

The aim of the CeADAR is to rapidly deliver deployable big data analytics technology demonstrators to industry from a research agenda that is solely defined by its industry members. The primary outputs are prototypes and demonstrators, along with state-of-the-art reviews of data analytics technology, tools, best practice methodologies and processes. The prototypes and demonstrators are proposed by the Centre's industry members and resourced from our core funds. Each of the 20 projects that we deliver each year produces:

1. A technology and competitive state-of-the-art review.
2. Technical specification agreed with industry partners.
3. A technology demonstrator within six months of project start.
4. Assistance with member on-premise demonstrator evaluation.

The Centre has an extensive catalogue of demonstrators, IP and big data analytics technology assessments, which are immediately available for evaluation. It is also the focal point of a thriving data analytics ecosystem delivering courses, seminars, conferences, consultancy and members' networking events throughout the year.

Research performed by

- University College Dublin
- University College Cork
- Dublin Institute of Technology

CeADAR Centre for Applied Data Analytics Research
NexusUCD
Blocks 9/10
Belfield Office Park
Clonskeagh
Dublin 4

T +353 (0)1 716 5716
E edward.mcdonnell@ucd.ie
www.ceadar.ie

CONNECT
The Centre for Future Networks and Communications

Linda Doyle
Centre Director

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.

CTVR comprises 120 world-class researchers who undertake leading-edge research underpinned by €60 million in funding from State, EU and commercial sources. To date, CTVR has worked with over 150 industry partners. Our future vision espouses the idea of the service-aware network, with a programmable network substrate performed into existence in response to a service need. With the advent of CONNECT, we have expanded our research programme to include applications, services, security and internet of things. CONNECT is the 'one-stop shop' for ICT research in Ireland, and offers a transformative experience for industry looking to engage with academic research. Companies can commission specific projects, from product development to longer-term research – our expert researchers are dedicated to delivering at the pace and standard of excellence that industry demands. CONNECT commences in January 2015, while CTVR will be folded into CONNECT in 2015/16.

Research performed by

- Trinity College Dublin
- Cork Institute of Technology
- Dublin City University
- Dublin Institute of Technology
- Maynooth University
- University College Cork
- University College Dublin
- University of Limerick
- Telecommunications Software and SystemsGroup/Waterford Institute of Technology
- Tyndall National Institute

Research areas

- Wireless and optical technologies
- Wireless and optical architectures
- Networking services and security
- Responsive things (internet of things)
- Testbeds and experimentation

CONNECT
Dunlop Oriel House
O'Reilly Institute
Trinity College
University of Dublin
Dublin 2

T: +353 (0)1 896 8441
E: info@ctvr.ie
www.ctvr.ie
www.connectcentre.ie

CÚRAM
The Centre for Research in Medical Devices

Prof. Abhay Pandit
Centre Director

Research areas

- Combinational and advanced delivery devices
- Enhancement of current implants
- Analytical characterisation and design of devices
- Assessment of implants and devices
- Translation of selected CÚRAM technologies into clinical assessment

The objective for the Centre for Research in Medical Devices (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. As the global population ages, with one in three people expected to be over 65 by 2050, the financial burden for healthcare is expected to rocket. CÚRAM will position Ireland as the driver in developing medical device technologies, which will provide affordable transformative solutions for chronic diseases to meet this challenge. CÚRAM will also sustain and strengthen Ireland's standing as a major global hub for medical device sector research and development. CÚRAM will include almost 40 industry partners, including indigenous Irish companies and multinationals, and support product development and the creation of new spin-out companies.

Research performed by

- NUI Galway
- University College Cork
- Dublin City University
- Trinity College Dublin
- University of Limerick
- The Royal College of Surgeons in Ireland
- University College Dublin

CÚRAM
National University of Ireland Galway
Biosciences
Dangan
Galway

T +353 (0)91 495833
E abhay.pandit@nuigalway.ie
www.devices.ie

DPTC
The Dairy Processing Technology Centre

Professor Dick Fitzgerald
Lead Researcher

The Dairy Processing Technology Centre (DPTC) is an industry–academic collaborative research centre, hosted by the University of Limerick, with a research agenda driven by the long-term growth opportunities for the dairy sector created by the removal of milk quotas in 2015.

DPTC has been established as a centre of excellence for dairy processing research and innovation. The Centre will help to fuel growth in the Irish dairy sector by performing research focused on cost-efficient processing, facilitating a step-change in environmental sustainability and creating, validating and commercialising a pipeline of science and technology-based manufacturing platforms for dairy ingredients. The foundation of the DPTC is a strong, long-term industry–academic collaborative partnership that will develop, build and translate the knowledge and capabilities in dairy processing that are needed today and for the long-term growth development of the sector. Current members of the Centre are the industry partners Arrabawn Co-op, Aurivo Co-op, Carbery Group, Dairygold Co-op, Glanbia Ingredients Ireland, Kerry Group, Lakeland Dairies and Tipperary Co-op, and together with Teagasc, University College Cork, University College Dublin, and NUI Galway, and collaborating partner institutions Dublin City University, Dublin Institute of Technology, and Institute of Technology Tallaght.

Research performed by
- University of Limerick
- Teagasc
- University College Cork
- University College Dublin
- NUI Galway
- Dublin City University
- Trinity College Dublin
- Dublin Institute of Technology
- Institute of Technology Tallaght

Research areas
- Efficiencies – cost competitiveness in dairy processing
- Process development – next generation dairy processing science and technology
- Product innovation – innovating for value through dairy processing
- Quality and safety – product quality and safety by design
- Environmental sustainability – towards a zero emissions dairy industry

The Dairy Processing Technology Centre
Department of Life Sciences
University of Limerick

T +353 (0)61 202 598
E dick.fitzgerald@ul.ie

FHI
Food for Health Ireland

Jens Bleiel
Centre Director

Picture: Gary O'Neill

Alyssa Flynn, aged 6 months, shows FHI CEO Jens Bleiel, Minister for Jobs, Richard Bruton and Olympic Gold Medalist Ronnie Delaney a range of functional foods derived from milk.

Research areas

- Technology and healthy cheeses
- Infant nutrition
- Appetite modulation
- Glycaemic management
- Performance nutrition and healthy ageing

Food for Health Ireland (FHI) unites world-class science and industry expertise to improve health through innovation in food. Its purpose is to identify novel ingredients coming from milk to develop functional food ingredients that will offer health benefits to consumers.

FHI links world-class academic research with industry vision for the potential of successful market innovations. The industry-focused research strategy within FHI includes the identification, development and exploitation of novel milk-derived bioactive compounds for improving health and wellbeing. FHI also provides a pipeline for the development of new functional food ingredients and products with validated health benefits for consumers.

The FHI approach is to work with Irish food industry partners and in close connection with scientists. FHI has built a unique bridge between high-class research organisations and industry needs.

FHI also provides a contract research facility for small and large global food companies utilising our competencies, resources and technologies. This service provides a gateway to academic research in Ireland and supports open innovation. FHI has completed over 30 projects of this kind since 2008.

Research performed by

- Teagasc Food Research Centre, Moorepark, Fermoy, Co. Cork
- University of Limerick
- University College Cork
- Dublin City University
- NUI Galway
- Maynooth University
- University College Dublin

Food for Health Ireland
Science Centre South
University College Dublin
Belfield
Dublin 4

T +353 (0)1 716 2391
E Jens.bleiel@ucd.ie
www.fhi.ie
Twitter: @fhi_phase2

FMC²
Financial Mathematics and Computation Cluster

The Financial Mathematics and Computation Cluster (FMC²) is a research collaboration between industry, UCD, DCU and Maynooth University. The group brings together complementary expertise in financial mathematics, financial economics and computer science to create a holistic research programme in asset and risk management.

The main objective of FMC² is to create a globally recognised research centre that will provide essential support for the future development of the international service sector in Ireland. To achieve this the cluster provides support for innovation activities of Irish-based international financial companies by addressing crucial research questions and expanding the research and development capacity of the financial services sector in Ireland. The cluster also creates a steady supply of highly skilled postdoctoral researchers and PhD graduates, as well as supporting an annual MSc internship programme. This supply of trained personnel aims to facilitate the growth of the sector in Ireland. In addition, the cluster provides a programme of industry-focused events bringing world-class researchers and industry practitioners together to discuss topical issues concerning the sector.

Research performed by

- University College Dublin
- Maynooth University
- Dublin City University

Prof. John Cotter
Centre Director

Research areas

- Robust asset allocation
- Fund performance evaluation
- Algorithmic trading
- Asset pricing and risk
- Portfolio, pension and real estate risk

FMC²
UCD Michael Smurfit
Graduate Business School
Carysfort Avenue
Blackrock
Co. Dublin

T +353 (0)1 716 8900
E john.cotter@ucd.ie
www.fmc-cluster.org

GRCTC
Financial Services Governance, Risk and Compliance Technology Centre

Peter Cowap
Centre Director

Research areas

- Regulatory compliance change management system
- Regulatory compliance interpretation methodology
- Regulatory compliance information system
- Regulatory compliance knowledge base
- Regulatory compliance knowledge management system

Governance, Risk and Compliance Technology Centre
13 South Mall
Cork

T +353 (0)21 465 8631
E p.cowap@ucc.ie/
www.grctc.com

The Financial Services Governance, Risk and Compliance Technology Centre (GRCTC) is undertaking industry- and business-focused R&D on the regulatory compliance challenges facing the financial industry. The Centre's current research focus is on the development of semantic technologies and capability maturity models to help address these issues.

Semantic technologies can help to answer many of the questions confronting the financial industry in the 'Age of Compliance', including:

- what are the compliance imperatives in a regulation and where do they appear?;
- how do I perform regulatory compliance management; and,
- how do I query my structured and unstructured data to identify regulatory compliance issues, measure risk, or evaluate controls?

The GRCTC is answering these questions by developing families of interlinked regulatory and GRC ontologies, and related process and maturity models that:

- capture regulatory concepts, taxonomies, and rules in formal semantics to enable efficent access to, and smarter consumption of, financial regulations; and,
- perform data virtualisation of structured and unstructured data using semantic technologies to enable smart data analytics.

Member companies have access to the GRCTC's unique market knowledge, ground-breaking R&D projects, multidisciplinary expertise, and related resources to develop new and improved products, processes, tools, applications and services in an industry that is critical to the Irish economy.

Research performed by

- University College Cork
- NUI Galway
- University College Dublin

IC4
The Irish Centre for Cloud Computing and Commerce

Tony McEnroe
Centre Director

Research areas
- Cloud architecture
- Service lifecycle
- Business research
- Cloud security

The Irish Centre for Cloud Computing and Commerce (IC⁴) is a multi-institutional, multi-disciplinary research centre whose mandate is to carry out rapid-turnaround, applied research projects in areas of cloud computing that are chosen by its industrial members.

IC⁴'s mission is to:

i) generate and transfer knowledge and technology to its industry members, in areas they can commercialise;
ii) accelerate the rate at which businesses adopt cloud computing; and,
iii) showcase Ireland's capabilities in cloud computing.

One of IC⁴'s main research priorities is "building trust and dependability in the cloud", with the goal of addressing the need for compliance to standards, quality of service, data privacy, auditability and reliability of service. These issues permeate the cloud ecosystem and are relevant to cloud platform or application developers, cloud service providers, cloud solution resellers and cloud consumers.

IC⁴'s multidisciplinary team of postdoctoral researchers delivers fast-turnaround research under industry-friendly commercialisation terms. Members get access rights to all core-funded research results but can also get exclusive access rights to results on targeted projects that are focused at their specific needs.

Research performed by
- Dublin City University
- University College Cork
- Athlone Institute of Technology

The Irish Centre for Cloud Computing and Commerce
Dublin City University
Glasnevin
Dublin 9

T +353 (0)1 700 6849
E tony.mcenroe@ic4.ie
www.ic4.ie

ICMR
Irish Centre for Manufacturing Research

Barry Kennedy
CEO

Research areas
- Manufacturing informatics
- Operational excellence
- Energy management
- Energy efficiency
- Operations research

The Irish Centre for Manufacturing Research (ICMR) is an independent manufacturing and industrial energy efficiency research centre focused on delivering solutions for the manufacturing ecosystem throughout Ireland. Our passion is to make Ireland a world leader in advanced manufacturing operations.

As an independent research centre, the ICMR offers manufacturing industry a unique environment to collaborate with peers across all manufacturing sectors, and to inform and guide manufacturing research that not only addresses industry problems but also visions for future factories.

We are a cross-sectoral research centre with partner companies in semiconductors, ICT, pharmaceuticals, medical devices, food, energy services, aerospace and other areas. We work closely with academic, Government and industry partners, and through bringing this cross-sectoral interaction around one table, we establish best in class knowledge and behaviours as the starting point for future research. Through pilot projects embedded in company facilities, ICMR research has demonstrated productivity improvements and efficiency savings opportunities in excess of €20M for member and partner companies. It has achieved this through delivery of enterprise-ready solutions in areas such as schedule optimisation, operations simulation, metrology, HVAC commissioning and energy-efficient production. We are open to all levels of collaboration with Irish-based SMEs and large/MNC manufacturers.

Research performed by
- Irish Centre for Manufacturing Research
- Dublin City University
- Limerick Institute of Technology
- Maynooth University
- NUI Galway
- Trinity College Dublin
- Institute of Technology Tralee
- University College Cork
- University of Limerick
- University of Ulster

ICMR
IR5-2-2
Collinstown Industrial Park
Leixlip
Co. Kildare

T +353 (0)1 606 2996
E info@icmr.ie
www.icmr.ie

IComp
Irish Centre for Composites Research

Dr Terry McGrail
Centre Director

The Irish Centre for Composites Research (IComp) provides world class innovative R&D, consultancy and networking opportunities for industry throughout Ireland across all sectors where there are opportunities to use composite materials and associated technologies.

IComp provides the focal point in Ireland for academia and industry to work together to address some of the critical issues related to the use of composite materials which have been identified by IComp industrial members who include companies from the supply chain and, for example, the aerospace, electrical, construction and renewable energy sectors.

IComp's R&D activities include materials innovation and processing, the design of composite components and structures, joining technologies (including adhesive bonding and surface engineering) and damage detection and repair, all supported by a comprehensive programme of modelling, testing and in-depth characterisation. Additionally, bespoke experimental support, consultancy, networking and information services are provided to industrial members.

IComp has well equipped laboratories with the capability of manufacturing, testing and inspecting composite components and structures up to the semi-tech scale. The world class faculty and research staff at UL, UCD and AIT has many years of experience working in national and international funded programmes.

Research performed by

- University of Limerick
- University College Dublin
- Athlone Institute of Technology

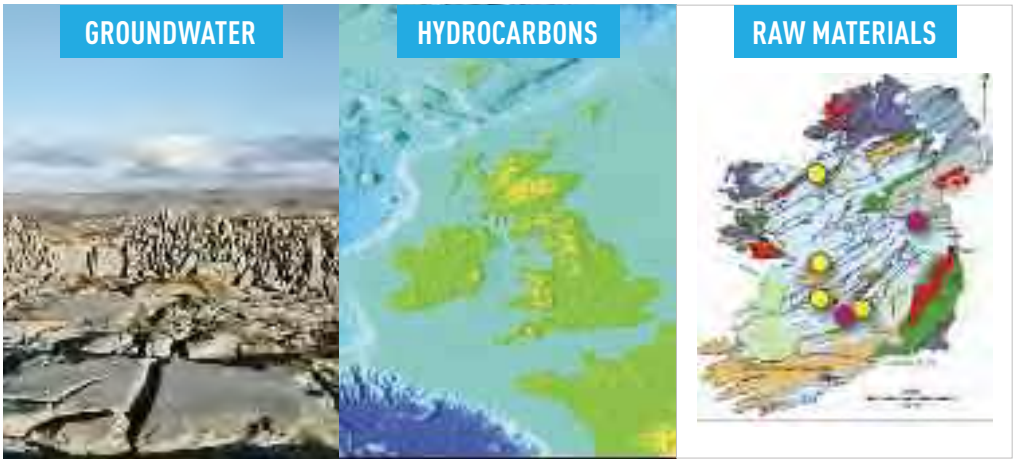
Research areas

- Innovative processing and product development of thermoplastic composites including recycling
- Liquid resin infusion processes and product innovation for out-of-autoclave manufacture
- Adhesives and adhesion science for bonding and dis-bonding composites and metals
- Surface engineering to tailor composite, polymer, fibre and metal surfaces to optimise performance
- Damage prediction, detection and repair of composites

Irish Centre for Composites Research
MSSI Building
University of Limerick
Limerick
T +353 (0)61 234164
E terry.mcgrail@ul.ie
www.icomp.ie

iCRAG
Irish Centre for Research in Applied Geosciences

Prof. John Walsh
Centre Director



Research areas

- Raw materials – mineral/aggregate geoscience
- Marine – ocean geoscience
- Groundwater – hydrogeology/hydrology
- Hydrocarbons – petroleum geoscience
- Geochemistry, geophysics, 3D geological modelling and public perception and understanding

Irish Centre for Research in Applied Geosciences
UCD School of Geological Sciences
Belfield
Dublin 4

T +353 (0)1 716 2169
E john.walsh@ucd.ie
www.icrag-centre.org
twitter.com/iCRAGcentre

The Irish Centre for Research in Applied Geosciences (iCRAG) brings together Ireland's leading geoscience experts on issues underpinning economic development – from safe and secure groundwater supplies to the discovery of mineral/aggregate deposits, and from de-risking oil and gas exploration to educating and informing the public on geoscience-related issues.

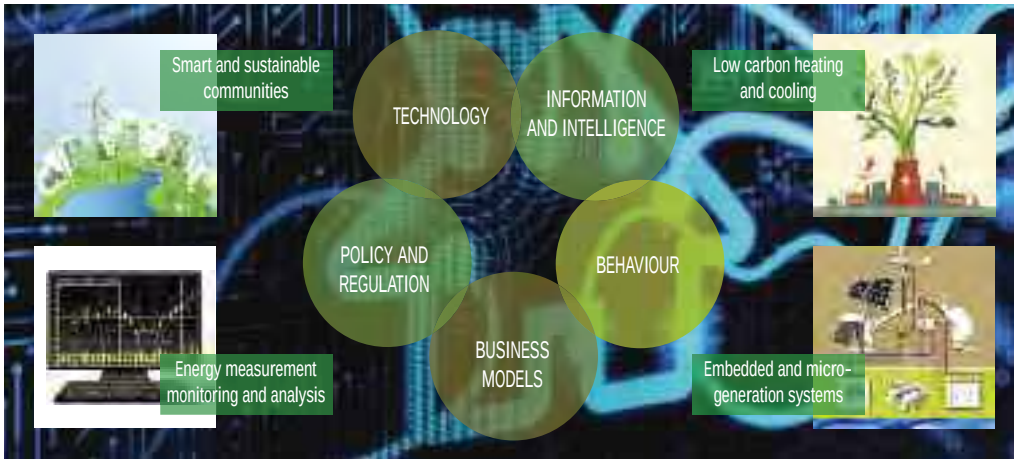
Geoscience underpins the discovery of raw materials, water and energy resources that are critical to the world's economy. With increasing demand and diminishing supply, focused innovations in geoscience are of paramount importance globally. iCRAG comprises a team of internationally leading researchers and both large- and small-scale industrial partners that will work to carry out research to find and harness these resources while protecting the environment. iCRAG's overarching objectives are:

1. To significantly de-risk Ireland's offshore and onshore hydrocarbon and mineral resource exploration, thus increasing exploration activities while also increasing the potential of sourcing a secure supply.
2. To ensure safe and secure groundwater supplies and to address geoscience-related 'quality of environment' issues.
3. To engage with citizens and policy makers to explain the nature of resource-related industries and to facilitate the timely progression of identified resources to extraction.

Research performed by

- University College Dublin
- Trinity College Dublin
- NUI Galway
- University College Cork
- Maynooth University
- Dublin Institute for Advanced Studies
- Geological Survey of Ireland
- Environmental Protection Agency
- Teagasc

IERC
International Energy Research Centre



Prof. Tony Day
Executive Director

The International Energy Research Centre (IERC) leads collaborative research to meet global societal needs for secure, affordable and sustainable energy services. It is focused on demand side energy efficiency and embedded energy generation at the building, community and city levels.

The IERC aims to address global societal needs for secure, affordable and sustainable energy services by transforming the efficiency of energy-enabled services and enhancing the quality of people's lives. While a range of solutions exists to help reduce energy use, integrated system thinking is required to provide low-carbon solutions that will deliver efficiently and effectively throughout their lifetimes. The IERC aims to develop a truly collaborative ecosystem delivering economic impact through research and business partnerships. The Centre aims to develop new products and services that will ensure real energy demand reductions across society and capacity build for our partners. The IERC has developed a collaborative research and IP model to engage key stakeholders in delivering integrated, system-level solutions. The IERC is funded jointly by the Department of Enterprise, Jobs and Innovation and the Department of Energy, Communications and Natural Resources.

Research performed by

- Cork Institute of Technology
- Dublin Institute of Technology
- Dublin City University
- Limerick Institute of Technology
- NUI Galway
- Maynooth University
- Tyndall National Institute
- University College Cork
- University College Dublin
- University of Ulster
- I2E2 Research Centre

Research areas

- Smart cities and sustainable communities
- Low carbon heating and cooling
- Monitoring, measurement and analysis of energy
- Embedded and micro generation systems

IERC
Tyndall National Institute
Lee Maltings
Cork

T +353 (0)21 234 6949
E tony.day@ierc.ie
www.ierc.ie

INFANT
The Irish Centre for Fetal and Neonatal Translational Research

Prof. Louise Kenny
Prof. Geraldine Boylan

Research areas

- Biomarkers for screening and diagnostics in pregnancy
- Innovative cot-side monitoring
- Medical devices
- Maternal and infant nutrition
- Perinatal clinical trials

INFANT Centre
5th Floor
Cork University Maternity Hospital
Wilton
Cork

T +353 (0)21 420 5023
E infant@ucc.ie
www.infantcentre.ie
www.facebook.com/infantcentre
@infantcentre

The Irish Centre for Fetal and Neonatal Translational Research (INFANT), located at Cork University Maternity Hospital, is Ireland's first dedicated perinatal research centre. Founded upon a decade of world-class multidisciplinary collaborative research and an array of industry partnerships, INFANT is an international leader of discovery and innovation in perinatal healthcare.

INFANT addresses unmet worldwide clinical needs for effective screening tests for the most common complications of pregnancy and the most significant problems for newborns. One in five pregnancies is complicated by pre-eclampsia, preterm birth or fetal growth restriction. In half of affected cases, the disease is so severe that maternal or infant morbidity or mortality can result. For the fetus, the short journey down the birth canal is one of the most dangerous. Some 5% of newborns experience asphyxia at birth, and might later develop brain injury and seizures. The creation of next-generation devices to facilitate point-of-care and remote monitoring and diagnostics will transform antenatal and neonatal healthcare and service delivery on a global level, and position Ireland at the forefront. Access to world first technologies allows INFANT's industry partners to deliver innovative solutions to global markets, creating exciting economic opportunities and delivering sustainable high knowledge value jobs in Ireland.

Research performed by

- University College Cork
- The Royal College of Surgeons in Ireland

Insight
Centre for Data Analytics

At Insight Centre for Data Analytics we undertake high impact research in data analytics. We derive value from 'Big Data' and provide innovative technology solutions for industry and society by enabling better decision making.

The Insight Centre for Data Analytics is a joint initiative between researchers at DCU, NUI Galway, UCC, UCD and other partner institutions. Insight brings together more than 250 researchers from these institutions with over 40 industry partners, to position Ireland at the heart of global data analytics research. Insight offers data analytics solutions for a broad range of industry partners in ICT, healthcare, retail, finance, media and public services. Insight's expertise includes the whole data value chain from the integration of multiple heterogeneous data sources, to discovering patterns and trends in data and making sense of them. Innovative solutions include using data to:

- develop products and services based on matching the short- and long-term needs of individuals and organisations to a real-time picture of information, opportunities, and services;
- understand customer behaviour to increase customer satisfaction, experience and loyalty;
- drive recommendations and support decision-making;
- find optimal solutions to complex problems; and,
- automate business processes.

Research performed by

- University College Dublin
- Dublin City University
- NUI Galway
- University College Cork
- Maynooth University
- The Royal Irish Academy
- Tyndall National Institute
- Trinity College Dublin

Oliver Daniels
CEO

Research areas

- Linked data and semantic web
- Machine learning and statistics
- Media analytics and personal sensing
- Optimisation and decision analytics
- Recommender systems

Insight at UCD
O'Brien Centre,
Belfield, Dublin 4
Insight at DCU
School of Computing
Collins Avenue
Glasnevin, Dublin 9
Insight at UCC
Western Gateway Building
Western Road, Cork
Insight at NUIG
IDA Business Park, Lower
Dangan, Newcastle, Galway

Eamon O Doherty
Head of Business Development
T +353 (0)1 716 2412
E eamon.odoherty@insight-centre.org
www.insight-centre.org

IPIC
Irish Photonic Integration Centre

Prof. Paul Townsend
Centre Director

Research areas

- Enabling continued growth of the internet through faster, more energy-efficient devices
- Delivering smart medical devices for improved treatment of disease
- Developing highly compact instrumentation for point of care diagnostics
- Developing systems for food and environment monitoring

Irish Photonic Integration Centre
Tyndall National Institute
Lee Maltings
Dyke Parade
Cork

T +353 (0)21 490 4177
E Patrick.morrissey@tyndall.ie
www.ipic.ie

The Irish Photonic Integration Centre (IPIC) brings together over 100 researchers from four institutes to develop new light-enabled technologies. Targeting the ICT, medical devices and diagnostics sectors, IPIC works with 18 industry partners to develop the next generation of highly compact and miniaturised photonics devices.

Photonics is the generation, manipulation and utilisation of light and is a key enabling technology that underpins the internet and impacts diverse industries such as medical devices, renewable energy, manufacturing and environmental monitoring. It is also an industry where Europe has significant global presence with 20% market share, equivalent to €60bn per annum, and with the global market expected to grow to over €600bn by 2020.

IPIC's integrated research team has capabilities from the theory of novel light-emitting materials right through to the design of devices and systems. This includes the unique ability to accelerate transfer from laboratory to market by delivering concept demonstrations, including low volume manufacturing of prototypes, exploiting IPIC's advanced fabrication and packaging capabilities.

IPIC's facilities include modelling and design, materials growth, device fabrication, packaging, device characterisation and systems testing.

Research performed by

- Tyndall National Institute
- Cork Institute of Technology
- Dublin City University
- University College Cork

IVI
Innovation Value Institute

The Innovation Value Institute's (IVI) contribution to Government and industry is the availability of a body of knowledge that directs those managing information and technology in the most effective practices dedicated to optimising their investment and delivering business outcomes and value.

The IVI researches, develops and disseminates empirically proven and industry-validated IT best practice through a unique open collaboration between leading academic and industry practitioners. The IVI facilitates a collaborative community of like-minded peers committed to investigating, advancing and disseminating the frameworks, tools and best practices associated with managing IT value and IT-enabled innovation. The IT-Capability Maturity Framework (CMF) has been used by over 500 global organisations to enable and measure improvements in key areas:

- IT capability measurement and improvement;
- IT organisational design and capability management;
- IT business alignment and leadership;
- organisation benchmarking and best practice;
- IT risk management – DP; and,
- enabling digital processes across all business departments.

The IVI represents a 'triple-helix' support and innovation model across academia, government and industry, and facilitates a thriving international consortium, which now includes over 100 organisations globally. This collaboration provides the stable foundation and ecosystem to transform the way public and private sector organisations manage IT for value and innovation.

Research performed by

- Maynooth University

Martin Delaney
General Manager

Research areas

- Defining and presenting the capability that organisations need to use the opportunities presented by technology and information management
- Developing the tools and training needed to allow organisations to use our research output
- Defining and developing an IT capability framework for SMEs
- Using the IVI capability framework to address current business challenges
- Developing a European framework for ICT professionalism for the European Commission

Innovation Value Institute
Maynooth University
Maynooth
Co. Kildare
T +353 (0)1 708 6931
E ivi@nuim.ie
www.ivi.nuim.ie

Learnovate

Dr Martyn Farrows
Centre Director

The Learnovate Centre is leading learning innovation to provide real impact for our industry partners and position Ireland as a global leader in learning technologies.

Research areas

- Social and informal learning
- Mobile and collaborative learning
- Assessment and learning analytics
- Personalisation and adaptive learning
- Game mechanics for learning

The Learnovate Centre is an industry-focused centre of excellence for research and innovation in learning technologies, hosted by Trinity College Dublin. Our mission is to enhance the competitive advantage of Ireland's learning technology industry. Through targeted research projects and a series of industry-focused services we provide innovation support, driving growth and job creation.

Our research projects are focused on investigating areas of interest to our industry partners, from schools/K12 through higher education and into corporate learning.

Our world-class team employs a multidimensional approach to research. The team has a core of technology-enhanced learning expertise from TCD, UCD, NUIG and WIT. In addition, the Centre provides a wealth of experience across disciplines including pedagogy, user interface design and software development. Commercial experience is embedded throughout our team to ensure we remain industry focused.

Research performed by

- Trinity College Dublin
- University College Dublin
- NUI Galway
- Waterford Institute of Technology

Learnovate Centre
Unit 28
Trinity Technology and Enterprise Campus (TTEC)
Pearse Street
Dublin 2

T +353 (0)1 896 4910
E info@learnovatecentre.org
www.learnovatecentre.org

Lero
The Irish Software Research Centre

The Irish Software Research Centre (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. Nine of the world's top 10 multinational technology companies have a significant presence in Ireland. Many companies not classified as software companies utilise software as a key component of the products and services they offer. Competitive advantage accrues to companies who get their products to market sooner and whose products have superior quality in the eyes of their customers. Adopting the best software engineering processes and methodologies relevant to their field of activity can help Irish companies to boost productivity, while process certification can open access to new markets and increase sales. Higher reliability and higher integrity software can reduce the risk of software-driven disasters. Lero has raised the level and profile of Irish software research with such effect that it is now one of the best known and highly regarded software research centres in the world.

Research performed by

- University of Limerick
- Dublin City University
- Dundalk Institute of Technology
- NUI Galway
- Maynooth University
- Trinity College Dublin
- University College Cork
- University College Dublin

Prof. Mike Hinchey
Centre Director

Research areas

- Methods and standards for high integrity software
- Autonomous and adaptive systems
- Software performance
- Adaptive security and privacy

Lero – The Irish Software Research Centre
Tierney Building
University of Limerick
Limerick

T +353 (0)61 213028
E info@lero.ie
www.lero.ie

MaREI
Marine Renewable Energy Ireland

Prof. Conchúr Ó Brádaigh
Centre Director

The SFI Marine Renewable Energy Ireland (MaREI) Centre is a cluster of key academic and industrial partners dedicated to solving the main scientific, technical and socio-economic challenges related to marine renewable energy.

Research areas

- Device modelling, design, testing and optimisation
- Power take-off, control and storage
- Composite materials, structural testing
- Resource assessment, environmental monitoring, consenting and governance analysis
- Life-cycle analysis, techno-economic modelling and decision support systems

Marine Renewable Energy Ireland (MaREI)
Room G1
Civil Engineering Building
University College Cork
College Road
Cork

T +353 (0)21 490 3534
E conchur.obradaigh@ucc.ie
www.marei.ie

MaREI originates from well-established marine renewable energy (MRE)-related research entities throughout Ireland. The Centre comprises internationally recognised experts in MRE, and associated and complementary fields, capable of providing the research necessary for Ireland to achieve a commercially successful MRE industry. A primary focus is the development of strategic long-term relationships with industrial partners by providing them with access to world-class researchers and test-bed infrastructure.

This industry-centred approach provides a focal point to enable over 45 companies to participate in the development of a vertically integrated supply chain. The Centre will promote and enhance cross-fertilisation of ideas between industry and academia in the MRE sector. This will generate new ideas or perspectives and provide an innovative environment that will yield intellectual property, leading to start-up companies and jobs. MaREI will deliver significant economic and societal impacts, by using internationally recognised groups in Irish universities and their industrial partnerships.

Research performed by

- University College Cork
- University of Limerick
- NUI Galway
- Maynooth University
- University College Dublin
- Cork Institute of Technology

MCCI
Microelectronic Circuits Centre Ireland

MCCI's (Microelectronic Circuits Centre Ireland) mission is to increase the export revenue and employment levels of microelectronics companies located in Ireland.

MCCI is a technology centre focused on carrying out microelectronic circuit research for the benefit of industry. MCCI is a world leader in analogue and mixed-signal integrated circuit research. Microelectronics is a key enabling technology and MCCI is working with medical companies on new ultra-low power implantable microchips to monitor the human body, with smart food companies on microchips that can detect if a beef burger contains horsemeat, and with energy companies to reduce the power in data centres. The world-class circuits that we design allow companies to differentiate their products. In the last two years alone there have been five commercial licences from MCCI, 50% of MCCI staff have transferred into industry, and our member companies have created over 1,000 new jobs, with 120 of those jobs attributed to MCCI.

Research performed by

- University of Limerick
- Maynooth University
- University College Dublin
- Tyndall National Institute
- Cork Institute of Technology

Mark Barry
Centre Director

Research areas

- Analogue and mixed-signal circuits research
- Sensors
- Communications
- Smart medical devices
- Smart agri-food devices

MCCI (Microelectronic Circuits Centre Ireland)
Tyndall National Institute
Lee Maltings
Dyke Parade
Cork

T +353 (0)21 234 6164
E mark.barry@mcci.ie
www.mcci.ie

PMTC
Pharmaceutical Manufacturing Technology Centre

Dr Chris Edlin
Centre Director

Research areas

- Advanced rapid micro-analytical techniques
- Enabling and control of continuous processing by process analytical technology (PAT)
- Soft sensor modelling tools
- Active pharmaceutical ingredient (API) real-time release PAT
- Pharmaceutical packaging technologies
- Cleaning, validation and verification

Pharmaceutical Manufacturing Technology Centre
University of Limerick
Castletroy
Limerick

T +353 (0)61 202293
E chris.edlin@ul.ie
www.pmtc.ie

The Pharmaceutical Manufacturing Technology Centre (PMTC) is a leading industry-informed research centre focused on developing advanced technology solutions for all stages of pharmaceutical manufacturing. The market-focused research delivers solutions to contemporary issues currently facing the pharmaceutical industry.

The PMTC is hosted at the University of Limerick with core funding from the Irish Government, supplemented with co-funding from industry and leveraging further research funding. The PMTC is co-ordinated by an industry–academia advisory committee with an industrially driven research programme. Indigenous SMEs along with MNCs access the PMTC to inform the research agenda. Company engagement allows the PMTC to execute world-leading, industry-relevant research in advanced technology solutions to address contemporary manufacturing issues across the pharmaceutical sector. Members benefit by having access to core capability and skills in continuous processing, mathematical modelling, statistics and process optimisation; and, unrivalled awareness of research programme outputs. Other benefits include: pre-agreed project agreements; professionally managed, timely access to IP and research outputs; opportunities to identify talent for future recruitment; and, access to members only networking forums with key industry players, academia, regulators and government agencies. The Centre accesses state-of-the-art research facilities capable of delivering molecule to patient solutions through its Irish academic members.

Research performed by

- University College Cork
- University of Limerick
- Institute of Technology Tallaght
- Waterford Institute of Technology
- Cork Institute of Technology
- Tyndall National Institute
- NUI Galway
- NIBRT
- Dublin City University
- Dublin Institute of Technology

REMEDI
The Regenerative Medicine Institute

Prof. Timothy O'Brien
Centre Director

The Regenerative Medicine Institute (REMEDI) is a research centre focused on using stem cell and regenerative medicine technologies to treat human disease. REMEDI's mission is to conduct basic research in stem cell biology, and translate and commercialise the results to regenerative therapeutics.

Based at NUI Galway and partner institutes, REMEDI is a collaboration between scientists, engineers, clinicians and industry. REMEDI currently has focused research programmes in areas such as stem cell biology, immunology, gene therapy and cell manufacturing. The two main translational targets at the centre are vascular disease and osteoarthritis. REMEDI manages and operates the Centre for Cell Manufacturing Ireland (CCMI), a facility licensed by the Health Products Regulatory Authority to manufacture stem cells for human applications. Researchers are involved in multiple EU-funded projects as both co-ordinators and partners, and have ongoing projects with approximately 15 companies. Orbsen Therapeutics is a spin-out company from REMEDI, which has developed proprietary technologies enabling the isolation of pure and therapeutic stromal cells from human tissues. Since its foundation in 2004, REMEDI scientists have published over 250 original journal articles, given over 330 invited talks, filed 13 patents, won 47 scientific awards, been cited over 12,500 times and graduated 110 Masters and 36 PhD students.

Research areas
- Regenerative medicine
- Stem cell biology
- Advanced cell manufacturing
- Immunology
- Gene therapy

Research performed by
- Medtronic Vascular
- Boston Scientific
- Eli Lilly
- De Puy
- Abbott Diagnostics
- Randox
- Proxy Biomedical
- Enbio
- Ziel
- Medical Energetics
- Creganna-Tactyx
- Orbsen Therapeutics
- Poly-Pico
- RegenLab
- HumanMed
- Abiel
- Terumo
- Miltenyi
- Biostor
- FIOS

The Regenerative Medicine Institute
Bioscience Building
Corrib Village
NUI Galway

T +353 (0)91 495166
E timothy.obrien@nuigalway.ie
www.remedi.ie
www.nuigalway.ie/stem-cells

SBI
Systems Biology Ireland

Prof. Walter Kolch
Centre Director

Systems Biology Ireland (SBI) develops new approaches to diagnosis and treatment of lifestyle and age-related diseases. The centre specialises in the collection and integration of fragmented molecular, physiological and individual patient data for clinical and industrial settings.

From basic to applied research, SBI can support the innovation efforts of organisations serving the healthcare, functional foods, cosmetic and research markets. We can support bespoke innovation projects through:

- Industry fellowships: through our postdoctoral fellowship scheme your company can access senior researchers at our centre for full- or part-time projects. Fellowships are fully funded, giving your company access to world-class expertise.
- Innovation capacity: you can grow your innovation capacity by working with us to design specific industry postgraduate or postdoctoral projects that address key innovation opportunities at your organisation.
- Contract research: access hardware and expertise, or outsource key experiments to our team. Our business support team can assist you in accessing the many schemes available to fund collaborative projects.
- Clinical trials: SBI can help your organisation design, fund and run pre-clinical or clinical trials on site or within our partner hospitals.

Research areas

- Discovery of new diagnostic and prognostic indicators of emerging disease
- Development of assay technology for drug screening and clinical diagnosis
- Overcoming drug resistance in cancer therapy
- Identification of responsive sub-populations for clinical trials
- Regenerative medicine and tissue repair

Research performed by

- NUI Galway
- Trinity College Dublin
- University of Oxford
- The European Molecular Biology Laboratory (EMBL)
- MIT (Massachusetts Institute of Technology)
- RIKEN
- Weizmann Institute of Science
- Teagasc
- The Beatson Institute for Clinical Research
- Uppsalla University
- St Anna Children's Cancer Research Institute
- University College London (UCL)
- Kings College London

Systems Biology Ireland
Science Link Building
UCD
Belfield
Dublin 4

T +353 (0)1 716 6331
E sbiadmin@ucd.ie
www.ucd.ie/sbi/

SEES
Sustainable Electrical Energy Systems

Prof. Mark O'Malley
Centre Director

The Electricity Research Centre (ERC) is a unique collaboration between academia and major players in the electricity industry to tackle fundamental and applied research questions underpinning the development of the Sustainable Electrical Energy Systems Cluster (SEES Cluster).

Ireland's success in integrating renewable energy, particularly wind energy, onto our electricity grid is remarkable by international standards, with wind often providing close to 50% of our electricity. This is due to a number of factors, including our location and the ambitious mindset of the industry and other key stakeholders. Researchers, working in close collaboration with industry, pursue a portfolio of projects on the impact of key drivers on the power system, and increasingly on energy systems integration. Industry collaborators, through the Electricity Research Centre Industry Affiliates Programme, gain access to the breadth of research undertaken – time to interact with researchers and PhD students is often the most valuable aspect of the relationship. Facilities include a real-time digital simulator with hardware in the loop test capability. There are many opportunities to contribute and formally link to relevant existing ERC research projects and new proposals, as well as the opportunity to inform future Electricity Research Centre research direction.

Research performed by

- University College Dublin
- Trinity College Dublin
- The Economic and Social Research Institute
- University of Limerick
- Maynooth University

Research areas

- System analysis and modelling
- Markets and regulation
- Policy and social studies
- End use and flexibility
- Interconnection and demonstration

Electricity Research Centre
Engineering & Materials Science Centre
University College Dublin
Belfield
Dublin 4

T +353 (0)1 716 1858
E erc@ucd.ie
www.erc.ucd.ie

SSPC
Synthesis and Solid State Pharmaceutical Centre

Prof. Kieran Hodnett
Scientific Director

Research areas

- New frontiers in pharmaceutical synthesis
- Crystal growth and design
- Drug product formulation and manufacture
- Advanced biopharmaceutical technologies

Synthesis and Solid State Pharmaceutical Centre
Materials and Surface Science Institute (MSSI)
University of Limerick
Limerick

T +353 (0)61 202246
E kieran.hodnett@ul.ie
www.sspc.ie

The Synthesis and Solid State Pharmaceutical Centre (SSPC), a global hub of pharmaceutical process innovation and advanced manufacturing, leads the way for next generation drug manufacture. The SSPC is the largest research collaboration in Ireland, and one of the largest globally, within the pharmaceutical area.

The SSPC is a unique collaboration between 22 industry partners, nine Irish research performing organisations and 12 international academic collaborators. In total, the SSPC supports over 250 active members across academia and industry nationally and internationally. The role of the SSPC is to link experienced scientists and engineers in academia and the pharmaceutical industry, to address critical scientific and industry-focused research challenges. Our research programme leads the way for next generation drug manufacture, and supports 27 world-class principal investigators, 28 postdoctoral researchers and 60 PhD candidates working across 19 research projects. These span the entire pharmaceutical production chain from synthesis of the molecule, to the isolation of the material, and the formulation of the medicine. The aim of the SSPC is to deliver relevant solutions that address the manufacturing needs of the pharmaceutical companies and, through this, to build a highly innovative pharmaceutical community in Ireland.

Research performed by

- University of Limerick
- University College Cork
- University College Dublin
- Trinity College Dublin
- Dublin City University
- NUI Galway
- Athlone Institute of Technology
- Waterford Institute of Technology
- National Institute for Bioprocessing Research and Training

TCBB
Technology Centre for Biorefining and Bioenergy

Biorefining & Bioenergy
AN ENTERPRISE IRELAND & IDA IRELAND INITIATIVE

Bart Bonsall
Technology Leader

Ireland's national Technology Centre for Biorefining and Bioenergy (TCBB) is your ideal project partner for applied research programmes such as Horizon 2020 and the Bio-Based Industries joint undertaking (BBI) to develop the commercial potential of Ireland's biomass resources.
Partnering industry with research: innovation for a sustainable and competitive bio-based economy.

The TCBB is an organisation of industry members, academic experts, institutions and State agencies working together to expedite the commercial development of the Irish biomass resource. The TCBB is one of a number of such centres established and led by industry and co-hosted by universities. The Centre's applied research programmes are targeted towards commercial deployment of results within a two- to three-year period. The TCBB is ideally positioned to develop new collaborations to optimise the use of Ireland's bioresources, and is your ideal project partner and proposal writer for national programmes and EU-funded R&D programmes such as Horizon 2020 and the BBI. The TCBB is a partner in BioBase N.W.E. (pilot plant photo above) and the ReNEW Network, both EU INTERREG IVB N.W.E.-funded projects – broadening the range of expertise, pilot plant facilities and collaboration opportunities that we can provide to industry.

Research performed by
- NUI Galway
- University College Dublin
- University of Limerick
- Trinity College Dublin

Research area
- Renewable heat, power and biofuels
- Wastewater treatments and AD technologies
- Enzyme biotechnology; glycobiotechnology
- Organic fertilisers and biochar
- Biorefining for biochemicals, bioplastics and biopolymers

Technology Centre for Biorefining and Bioenergy
Room 121
Orbsen Building
NUI Galway
Galway

T +353 (0)91 495034
E contact@tcbb.ie
www.tcbb.ie
@TCBBeire_irl
TCBB LinkedIn Group

National institutes and facilities

CRF/Cs
Clinical Research Facilities and Centres

The aim of the Clinical Research Facilities and Centres (CRF/Cs) is to provide the infrastructure, space and facilities, experienced research and specialist support staff, and the necessary quality and oversight programmes that are critical for the successful conduct of world-class patient-focused clinical research.

There are currently five CRF/Cs in Ireland, working together to develop a national network for clinical research infrastructure, which will provide centralised access and support for clinical research in Ireland. These five facilities and centres are all affiliated to teaching hospitals and universities, three in Dublin, one in Cork and one in Galway:

1. HRB Clinical Research Facility Cork at the Mercy Hospital Cork.
2. HRB Clinical Research Facility Galway at University Hospital Galway.
3. Wellcome Trust HRB Clinical Research Facility at St James's Hospital.
4. UCD Clinical Research Centre at the Mater Misericordiae University Hospital and St Vincent's University Hospital.
5. Clinical Research Centre Royal College of Surgeons at Beaumont Hospital.

The CRF/Cs are committed to providing state-of-the-art facilities and equipment to facilitate research in partnership with academia and the commercial sector, in order to gain a better understanding of how drugs work on humans, and to develop life-enhancing therapies through clinical trials and basic research. Research carried out at these locations aims to find breakthroughs in drug treatments, food therapies, food supplementations and medical devices, which will be converted into better and safer treatments for patients. Patient-focused research is top of the agenda. The units facilitate a wide range of researchers in conducting clinical trials, observational studies and the collection of biological materials in areas such as: experimental medicine; early and late phase clinical trials; and, studies by allied health professionals.

CRF Cork
Professor Joe Eustace
HRB CRF Cork, 2nd Floor, Mercy University Hospital, Cork
T +353 (0)21 493 5150
E Joseph.Eustace@hse.ie
www.ucc.ie/en/crfc/

CFR Galway
Professor Martin O'Donnell
HRB CRF Galway, NUI Galway, Geata an Eolais, University Road, Galway
T +353 (0)91 524411
E martin.odonnell @nuigalway.ie
www.nuigalway.ie/hrb_crfg/

CRF SJH
Professor Michael Gill
The HRB CRF SJH, Trinity Centre for Health Sciences, St James's Hospital, Dublin 8
T +353 (0)1 896 2241
E mgill@tcd.ie
www.sjhcrf.ie

CRC UCD
Dr Peter Doran
UCD CRC, School of Medicine & Medical Science, Mater Hospital, Dublin 7
T +353 (0)1 716 4582
E peter.doran@ucd.ie
www.ucd.ie/medicine/ourresearch/researchenvironment/ucdclinicalresearchcentre/crcresearch/

CRC RCSI
Professor Dermot Kenny
The CRC RCSI, Beaumont Hospital, Dublin
T +353 (0)1 402 2358
E dkenny@rcsi.ie
www.rcsicrc.ie

ICT HEALTH FOOD ENERGY MANUFACTURING AND MATERIALS BUSINESS PROCESSES

ICHEC
Irish Centre for High-End Computing

Prof. J-C Desplat
Centre Director

Research areas
- Novel technologies
- Parallel computing
- Many-core platforms
- High-resolution weather forecasting
- Oil and gas

The Irish Centre for High-End Computing (ICHEC) exploits emerging many-core computing and novel technologies to deliver efficiencies and innovations across a wide range of industries – 'Delivering innovation through industry-focused solutions'.

ICHEC is Ireland's national high-performance computing (HPC) research and technology organisation, focusing on enabling the effective use of HPC technologies in business and academia. ICHEC adopts a multidisciplinary approach combining domain experts with professional software engineers and accredited project managers, delivering efficient and cost-effective access to a portfolio of diverse services tailored to address the complex problems facing industry.
ICHEC's in-house expertise in climate is evidenced through a longstanding collaboration with Met Éireann providing the national weather service. ICHEC will continue to innovate in such domains as renewable energy, banking, smart cities and agriculture. Key engagements have been established in oil and gas, technology evaluation, performance engineering, and data analytics, with clients including Tullow Oil, Intel and General Motors.
ICHEC operates Fionn, Ireland's supercomputer, as well as a number of leading-edge test platforms. Operated as a near-mission critical service, Fionn offers unique capability in Ireland to those industry clients with the most demanding computational requirements.

Research performed by
- University College Dublin (iCRAG)
- NUI Galway (ICHEC's host)
- University of Limerick (LERO 3)
- Dublin City University (BDI)
- Tyndall National Institute

Irish Centre for High-End Computing (ICHEC)
The Tower
Trinity Technology & Enterprise Campus
Grand Canal Quay
Dublin 2

T +353 (0)1 524 1608
E J-c.desplat@ichec.ie
http://www.ICHEC.ie
https://Industry.ichec.ie

Marine Institute

Dr Peter Heffernan
Chief Executive Officer

The Marine Institute is the State agency responsible for marine research, technology, development and innovation. We support the sustainable development of Ireland's vast marine resource through research, monitoring, strategic funding programmes and national marine research platforms.

We carry out research aligned to statutory monitoring programmes to safeguard Ireland's marine environment, ensure seafood safety, and meet national and international requirements. We also provide scientific and technical advice to Government to help inform policy, resource management and licensing decisions. We promote, co-ordinate and catalyse marine research, guided by national and European research strategies.

Our research supports the work of development agencies to maximise the economic potential of existing and emerging marine sectors. We support the development of the emerging ocean energy sector through oceanographic, seabed mapping, data management and other technical services.

Our laboratory facilities, and unique catchment and climate change research facilities are complemented by Ireland's national multi-purpose research vessels – *RV Celtic Explorer* and *RV Celtic Voyager*, and an unmanned submarine, *ROV Holland 1*.

In partnership with SEAI we operate two ocean energy test sites, a quarter scale wave energy test site and the planned full scale Atlantic marine energy test site.

Research performed by

- Dublin City University
- Dublin Institute of Technology
- Galway-Mayo Institute of Technology
- NUI Galway
- Maynooth University
- Queen's University Belfast
- Trinity College Dublin
- University College Cork
- University College Dublin
- University of Limerick
- University of Ulster

Research areas

- Fisheries and aquaculture including ecosystems approach to managing resources
- Marine environment and seafood safety
- Biodiscovery and functional foods
- Physical and chemical oceanography
- Renewable ocean energy

Marine Institute
Rinville
Oranmore
Co. Galway

T +353 (0)91 387200
E institute.mail@marine.ie
www.marine.ie

NIBRT
National Institute for Bioprocessing Research and Training

Dr Reg Shaw
Centre Director

Research areas

- Biopharmaceutical manufacturing
- Bioanalytics and product characterisation
- Process analytical technologies/quality by design
- Process development and optimisation
- Customised training and education programmes

National Institute for Bioprocessing Research and Training (NIBRT)
Foster Avenue
Mount Merrion
Co. Dublin

T +353 (0)1 215 8100
E Reg.shaw@nibrt.ie
www.nibrt.ie

The National Institute for Bioprocessing Research and Training's (NIBRT) mission is to support the growth and development of all aspects of the biopharmaceutical industry in Ireland by becoming a global leader in biopharmaceutical manufacturing research, education and training.

The NIBRT performs high impact, world class, industry-aligned research in all aspects of bioprocessing, biopharmaceutical manufacturing, therapeutic protein characterisation, compliance and regulation. Research is conducted via a wide variety of industry-friendly mechanisms including consultancy, contact and collaborative research programmes. The Institute's research partners include companies such as MSD, Lilly, Sanofi-Genzyme, BioMarin, Pfizer, Waters and Agilent. The NIBRT also designs, develops and delivers best-in-class education and training solutions for biopharmaceutical manufacturing across all levels to national and international students and workforces. Training clients include companies such as Amgen, MSD, Lilly, Sanofi-Genzyme, Regeneron, BioMarin, Jazz and Alexion.

The NIBRT provides state-of-the-art biopharmaceutical manufacturing facilities (6,500m2) for research, process development and training activities. The Institute has won numerous national and international awards including: the ISPE/Interphex Facility of the Year Award; Bioprocess International Manufacturing Collaboration of the Decade, Waters Centre of Innovation; and, the Taoiseach's Public Service Excellence Awards.

Research performed by

- University College Dublin
- Trinity College Dublin
- Dublin City University
- Institute of Technology Sligo
- Synthesis and Solid State Pharmaceutical Centre (SSPC)
- NUI Galway

Teagasc
Food Research Centres (Moorepark and Ashtown)

Declan Troy
Acting Head of Food Programme

Teagasc supports science-based innovation in the agri-food sector and wider bio-economy that underpins profitability, competitiveness and sustainability. It contributes to the national programme of innovation activities including the creation of commercially-applicable knowledge.

Teagasc is committed to transferring its discoveries from the lab to industry for the benefit of the Irish economy in a flexible manner. Developing partnerships and collaborations with industry is central to our strategy. There are many different ways in which you can engage with us, from services and contract research to collaborations and commercialisation of intellectual property. We offer specific capabilities, services, know-how and specialised infrastructure that are critical in professional and quality engagement with industry, and we have available technologies developed in house for which we are actively seeking industrial partners for commercialisation. A critical element of our service offering is Moorepark Technology Ltd (MTL), a modern plant containing pilot-scale processing equipment for the dairy industry. The meat industry is served by a meat technology centre, the prepared consumer food sector avails of our food processing facility, and specialised laboratories are available in support of the overall food industry.

Research performed by

Teagasc research centres in partnership with Irish universities and institutes of technology, and universities and research institutes in Europe, the USA, Canada, South America, Asia, Australia and New Zealand.

Research areas

- Food: food biosciences; food chemistry and technology; food safety; food industry development
- Animal and grassland research and innovation
- Crops, environment and land use
- Rural economy and development
- Technical and specialist services

Teagasc Food Research Centre
Ashtown
Dublin 15

T +353 (0)1 805 9500
E declan.troy@teagasc.ie
www.teagasc.ie

ICT HEALTH FOOD ENERGY MANUFACTURING AND MATERIALS BUSINESS PROCESSES

Tyndall National Institute

Dr Kieran F. Drain
CEO

Research areas

- Information and communications technology
- Health and medical technologies
- Sustainable food
- Energy
- Manufacturing and materials

Tyndall National Institute is one of Europe's leading research centres, specialising in information and communications technology (ICT) hardware and systems. Tyndall is focused on developing technology solutions for health, communications, energy, agriculture, food, marine and the environment sectors.

Tyndall has 460 researchers, engineers, staff and postgraduate students (120), interacting with over 200 industry partners and generating over 200 peer-reviewed publications annually. Tyndall works through world-class teams performing ground-breaking R&D and innovation on new materials, devices and systems with a philosophy of "from atoms to systems", focusing on impact to the Irish economy. Tyndall is globally recognised in its core research areas of photonics and micronano systems. Hosting state-of-the-art semiconductor fabrication facilities and services, Tyndall delivers prototypes and new product opportunities to industry. Tyndall actively develops strong partnerships with other universities and research bodies to provide multidisciplinary solutions, creating breakthrough product technology for industry. Critical to Tyndall's success is its focus on market-needs-driven research. This distinguishes the Institute from university-based research. Tyndall shares many characteristics and performance targets typical of Europe's leading research technology organisations (RTOs). Tyndall at UCC is host to four industry-focused research centres – IPIC, MCCI, CCAN and IERC.

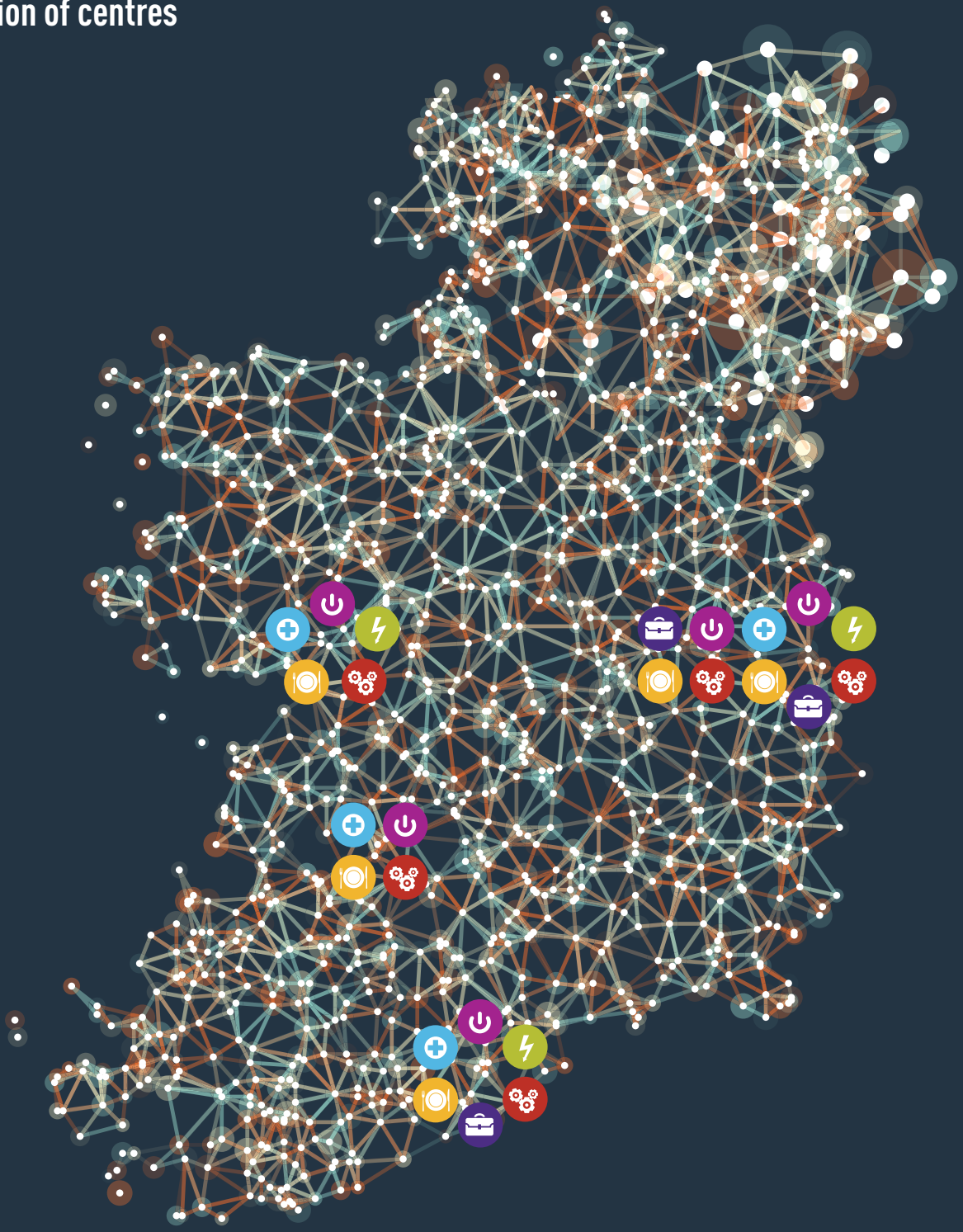
Research performed by

- Over 200 research performing organisations

Tyndall National Institute
Lee Maltings
Dyke Parade
Cork

T +353 (0)21 234 6171
E Kieran.drain@tyndall.ie
www.tyndall.ie

Location of centres



An Roinn Post, Fiontar agus Nuálaíochta
Department of Jobs, Enterprise and Innovation

Department of Jobs, Enterprise and Innovation,
23 Kildare Street,
Dublin 2.

Tel: +353 1 631 2121
LoCall: 1890 220 222
Email: info@djei.ie

ThinkMedia.ie