





Cover image

Andrea Zanetti

University College Dublin

Title: Organic "ChemisTree", a Telescopic View

"On a busy Monday in the laboratory I was working on three reactions, two of which being a priority, and the third one, since I knew the product was stable enough, was left until last. By the evening when I finally got time to work on the last, the copper salts (side product) had slowly grown (crashed out) in the shape of a tree from the green island (my product mixture). The blue sky background is due to the nitrile glove I was wearing."

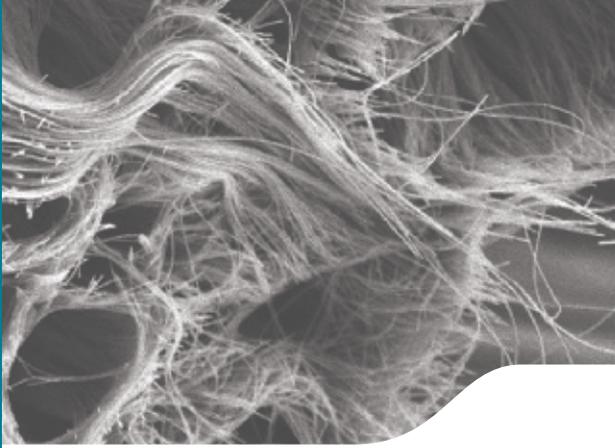


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Vision

Ireland will be a global leader in scientific and engineering research, discovery and innovation.

Mission

Science Foundation Ireland will progress Ireland's society and economy by supporting the best scientific and engineering research while building an awareness of the role, impact and opportunities science creates.



Agenda 2020

Agenda 2020 is SFI's strategic plan over the period 2012 to 2020. It has four primary objectives:

1. To be the best science funding agency in the world at creating impact from excellent research and demonstrating clear value for money invested.
2. To be the exemplar in building partnerships that fund excellent science and drive it out into the market and society.
3. To have the most engaged and scientifically informed public.
4. To represent the ideal modern public service organisation, staffed in a lean and flexible manner, with efficient and effective management.

About Science Foundation Ireland

Science Foundation Ireland funds research in the areas of science, technology, engineering, and mathematics (STEM) which promotes and assists the development and competitiveness of industry, enterprise and employment in Ireland. The Foundation also promotes and supports STEM education and engagement, and creates awareness and understanding of the value of STEM to society and to the growth of the economy.

Excellent Science

Science Foundation Ireland delivering Ireland's International Rankings

Ireland is **10th**
in global scientific ranking

	Animal and Dairy	2 nd
	Immunology	2 nd
	Nanotechnology	2 nd
	Materials Sciences	3 rd
	Agricultural Sciences	4 th
	Chemistry	5 th
	Basic Medical Research	6 th
	Computer Science	6 th

Economic Impact



Research investment supporting jobs and Ireland's economic future

Ireland is

1st in the world for knowledge diffusion

3rd in the world for knowledge and technology outputs

3rd in the world for knowledge impact

7th most innovative country in the world

(Global Innovation Index 2016)

International Collaborations

Science Foundation Ireland researchers were involved in

2,359

international academic collaborations in 63 countries.



A total of **4,199** publications reported by Science Foundation Ireland researchers

40% are available in open access repository.

€184m spend across SFI programmes generates:

▶ **€133m** leveraged non-exchequer funding

▶ €71m EU funding

▶ €45m secured from private enterprise

18%

2.41% of Science Foundation Ireland funded publications are in the top **1%** of publications



Israel 1.50%
Ireland 1.54%
USA 1.74%
UK 1.75%
Denmark 2.38%



Science Foundation Ireland 2.41%

National Science Foundation USA 2.7%

National Institutes for Health USA 2.9%

Industry Collaborations



Science Foundation Ireland awards directly supported

1,603 industry collaborations

929 collaborations with **399 MNCs**

674 collaborations with **491 SMEs**

SFI directly and indirectly supports **31,000 jobs** in Ireland.



40 Conferences and Workshops Programme awards – **8,876** international delegates.

Projected local economic value to Ireland **€10.5m**

31% of SFI Investigator Programme awards published articles that were cited by patents, indicating strong innovation and knowledge transfer to industry.

Partnerships

Working in partnership with international and national funders



Talent & Skills

...supporting the next generation of our talent pipeline

4,239 People

working on Science Foundation Ireland supported research projects

1,441 Postgraduate students supported by Science Foundation Ireland

27% of PhD departures to industry as a first destination

32% of Postdocs to industry as first destination

➔ **53%** of SFI team members are in the private sector 6-8 years post SFI award.

Education & Engagement

Promoting STEM careers and enabling people to join the conservation

1,600 Smart Futures volunteers have engaged with 110,000 students providing STEM careers advice.

550 Primary schools received SFI Discover Primary Science and Maths Awards

Science Week reached **250,000** people

across all 26 counties of the Republic of Ireland Science Foundation Ireland researchers participated in: **2,300+** Media interviews

1,000+ Public lectures and demonstrations

1,000+ Visits to primary and secondary schools SFI Discover Programme supported **44** projects through an investment of €2.8 million.

Joint Statement

Research in science, technology, engineering and mathematics improves our economy, creates employment and enhances vital areas of our society, including healthcare, environment, agriculture and education. Science and technology are playing greater roles in almost every aspect of our lives. Through focused investment in excellent and impactful scientific research and talented researchers, Science Foundation Ireland ensures that Ireland leads the world in strategic research areas, has globally recognised SFI Research Centres, and is a hub for industry/academic research collaborations.

In 2016, Ireland achieved a world ranking of 10th for the overall quality of its scientific research; an increase of 26 places in only 13 years. We have also made significant improvements in our global rankings for individual subjects: 2nd in the world for nanotechnology, Animal and Dairy, and Immunology; 3rd for Material Sciences and Agricultural Sciences; and 4th for Mathematics. With this strong track record, we are well placed to make even more progress towards innovation leadership.

Other key indicators demonstrate the successes achieved by Science Foundation Ireland in 2016. Investigators supported by the Foundation generated €133m in leveraged non-exchequer funding, including €71m in EU funding and €45m secured from private enterprise. Furthermore, 2.41% of SFI funded publications are in the top 1% of publications; this is higher than the national figure of 1.54%. The Irish national data has improved from 1.02% (1980 -2002) and is now on a par with Israel (1.50%), New Zealand (1.70%), USA (1.74%) and UK (1.75%), but still exceeded by countries such as Singapore (2.03%) and Denmark (2.38%). This improvement has coincided with SFI's creation and our use of internationally peer-reviewed competitive schemes, focusing on excellence and impact. SFI's figure of 2.41% of publications in the top 1% is comparable to other leading research funders such as the National Science Foundation USA (2.7%) and the National Institutes for Health USA (2.9%) (Clarivate Analytics InCites citation analysis).

Last year Science Foundation Ireland directly and indirectly supported 31,000 jobs in Ireland, including over four thousand people working on SFI-supported research projects, including 1,440 postgraduate students. Over 1,600 industry collaborations were supported by Science Foundation Ireland in 2016, and our funded researchers were involved in 2,359 international academic collaborations in 63 countries. Our activities are clearly having an influence, with

Ireland now ranking 1st in the world for knowledge diffusion and 3rd in the world for knowledge and technology outputs and knowledge Impact (*Global Innovation Index 2016*).

Science Foundation Ireland launched a new gender initiative in 2016. To ensure that the foundation's review process remains unbiased, Science Foundation Ireland introduced briefing on unconscious bias for all reviewers and all Science Foundation Ireland staff, including the Executive Committee and the Science Foundation Ireland board. The SFI Starting Investigator Research Grant (SIRG) programme, a €10 million investment in 2016, saw a marked increase in the number of female applicants with 55% of the 25 awards granted to women, up from 27% in 2015.

Innovation 2020

Innovation 2020, the Government's five-year strategy for research and development, science and technology, has set out Ireland's plans to double investment in research, development and innovation by the end of 2020. Although this is an ambitious target, it will only bring Ireland's spending on research and development to the OECD average. It is critical that Ireland makes this important investment. The strategy has the capacity to generate accelerated economic growth and development, allowing us to compete internationally and build a sustainable domestic economy.

Innovation 2020 directs that the network of SFI Research Centres be further developed to build critical mass in strategic areas of research strength, addressing enterprise needs. The SFI Research Centres combine world-class scientific research with deep and significant enterprise engagement. The 12 Research Centres that were established in 2012 and 2013 have won over €85 million in competitive EU Horizon 2020 funding and attracted over €40 million in committed cash from 394 industry research contracts. In 2016 we were gratified to see that these flagship SFI Research Centres continue to make new discoveries, publish in the best journals, attract prestigious awards from the European Union (such as European Research Council awards) and have a deep engagement with industry and the public.

In 2016, the organisation issued a funding call to establish new SFI Research Centres which, following rigorous international review, has culminated in the identification of eight SFI Research Centre bids that meet the highest standard for scientific excellence and potential future impact. Science Foundation Ireland has funding to support four of these and will invest



Ann Riordan,
Chairman of Science
Foundation Ireland



Professor Mark
W.J. Ferguson,
Director General,
Science Foundation
Ireland and Chief
Scientific Adviser to
the Government of
Ireland

€72 million over the next six years. These four centres will be supported by 80 industry partners, that will in turn provide an additional €38 million to support the research programmes.

International partnerships

The global socio-political outlook is becoming more uncertain, with events like Brexit and the evolving global environment all having a substantial impact. We must continue to work collaboratively with our international peers. Science Foundation Ireland is working to strengthen our bilateral relationships internationally, with an emphasis on our positive existing engagements with the UK.

While Brexit has serious implications for Ireland generally, there are also opportunities in the science and research world. Our strategy for this is simple; we will enhance our already strong engagements with bodies such as the UK Research Councils, the Royal Society and Wellcome, and seek to build new relationships with other esteemed research organisations and universities. We aim to create schemes which will enable close collaborations between Ireland and UK-based research teams; these links will be beneficial to both sides regardless of whether the UK remains an active participant within the European Research Area or not.

In 2016, Science Foundation Ireland became the first European funding agency to implement the prestigious US National Science Foundation's (NSF) entrepreneurship training I-Corps™ programme. I-Corps@SFI means that Science Foundation Ireland researchers and innovators can further develop their entrepreneurial skills, enabling them to enhance the economic and societal impact of their research. The pilot programme has seen 20 Science Foundation Ireland-funded researchers receive ten awards. This extremely prestigious programme builds on the long-standing relationship that exists between Science Foundation Ireland and the NSF. It will greatly enhance Ireland's innovation potential with Science Foundation Ireland funded researchers receiving immersive, real-world training in bringing scientific and technological research to market.

In December 2016, we announced a new partnership with the National Natural Science Foundation of China which will support collaborative research projects, leveraging our investment and encouraging further development of relationships between the two nations.

Talent

A fundamental part of Science Foundation Ireland's strategy is to establish Ireland as a location for world-class research. Key to that is the development of talent in this country. Our talent development strategy is two-fold: to grow and develop domestic talent and to attract top international researchers. Through programmes such as the SFI Research Professorship and Future Research Leaders programmes, we are attracting top talent to Ireland. In addition, the increased investment in early-career awards is supporting the establishment of a career path for our talented early-stage researchers. Through programmes such as the SFI Industry Fellowship, more than 23% of researchers departing Science Foundation Ireland funded awards have secured well paid jobs in companies.

Science Foundation Ireland works to guide and support the talent pipeline. From the SFI Discover Primary Science and Maths programme for primary school teachers, to the Smart Futures programme which aims to promote STEM careers to second-level students; from PhD students to early career researchers, and those in world-class research centres, Science Foundation Ireland delivers support to ensure that the best talent is nurtured, retained and attracted to Ireland.

#BelieveInScience

In 2016, Science Foundation Ireland ran the most successful Science Week yet. It is clear that Ireland's citizens are interested in global scientific issues and challenges. They want to understand the value of publicly-funded science, and to see the real value of innovation, discovery and research – both economically and for its impact on Irish society: health, wellbeing, education, environment, policy, etc.

With that in mind, Science Foundation Ireland launched the #BelieveInScience campaign to promote the potential that science and discovery offer Ireland, both for today and for tomorrow's world. The #BelieveInScience campaign will see Science Foundation Ireland work in partnership with the Irish research community to share a mutual passion for science with the public, promoting an understanding of the ability of science, technology, engineering and maths to create positive change in the world and to drive a sustainable economy in Ireland.

Our community

Science Foundation Ireland works with a broad range of stakeholders from academia, industry and government to achieve its objectives. We would like to thank the former Taoiseach Enda Kenny TD, Mary Mitchell O'Connor TD, Minister for Jobs, Enterprise and Innovation and Mr John Halligan, Minister of State for Training, Skills and Innovation, other Government Ministers and the many elected representatives who supported the Foundation throughout the year.

We would like to thank the former Taoiseach Enda Kenny TD; the former Minister for Jobs, Enterprise and Innovation, Mary Mitchell O'Connor TD; John Halligan TD, Minister of State for Training, Skills and Innovation, and the other Government Ministers and many elected representatives who have supported the Foundation throughout the year. We look forward to working closely with An Taoiseach Leo Varadkar TD, Tánaiste Frances Fitzgerald TD, Minister for Enterprise and Innovation, and other Government Ministers throughout 2017.

We would like to acknowledge the valuable contribution of Ireland's higher education institutions and the Science Foundation Ireland research community. We thank the many industrial and international partners who have worked collaboratively with SFI funded research and who have co-funded our partnership programmes.

We would like to thank the board members for their support and time commitment to Science Foundation Ireland, through their work and attendance at board and committee meetings during the year.

Finally, we would like to acknowledge and pay tribute to all of Science Foundation Ireland's dedicated employees for their continued commitment to ensuring we meet Science Foundation Ireland's ambitious goals.

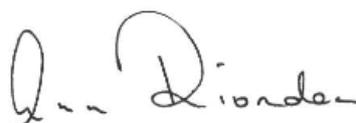
Looking ahead

We are living in uncertain times. Ireland's economy has made significant progress but we cannot take such progress for granted. We believe that investment in people and in innovation has never been more important to secure a stable and sustainable future for Ireland. At the core is the implementation of Ireland's ambitious strategy for research and development - Innovation 2020. Science Foundation Ireland looks forward to working with Government and the wider stakeholder group to progress and fully implement Innovation 2020, and to secure our scientific and economic future.



Prof Mark Ferguson

Director General Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland.



Ann Riordan

Chairman, Science Foundation Ireland

Science Foundation Ireland Board Members



Ms Ann Riordan,
Chairman of Science
Foundation Ireland



Prof Mark W.J. Ferguson, Director
General, Science
Foundation Ireland and
Chief Scientific Adviser
to the Government of
Ireland



Prof Sir Tom Blundell,
Director of Research
and Professor Emeritus
in Biochemistry,
University of Cambridge



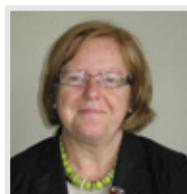
Mr Liam Madden,
Senior Vice President of
Engineering at Xilinx



Dr Rita Colwell is Professor
both at the University of
Maryland at College Park and
at Johns Hopkins University
Bloomberg School of Public
Health and Chairperson of
CosmosID Bioinformatics Inc.



Ms Bernie Cullinan,
CEO of Pragma
Advisory



Ms Mary Doyle,
Deputy Secretary
General, Department
of Education and Skills



Ms Geraldine Ruane,
Chief Operating
Officer, Trinity College
Dublin



Mr Aidan W. Donnelly,
M.D. of Advest
Management Ltd.



Mr Barry O'Sullivan,
CEO of Altocloud



Dr Pat Duane,
Vice President and
General Manager,
Interventional with
Creganna Medical



Mr Dermot Mulligan,
Assistant Secretary
General, Department
of Jobs, Enterprise
and Innovation



Ms Kim Lavelle, Board
Secretary/Chief Risk
Officer

SFI Board Member Biographies are on p48

2016

The Year in Review

January

- > Science Foundation Ireland announced a €28 million investment in research equipment and facilities.
- > Science Foundation Ireland announced an investment of €2.8 million in STEM public engagement and education initiatives.
- > Science Foundation Ireland participated in the BT Young Scientist and Technology Exhibition.
- > Research undertaken by Dr Patrick Walsh, TCD and Consultant Paediatric Gastroenterologist Dr Seamus Hussey, has linked a protein with inflammatory bowel disease in children.



Prof Peter Gallagher (I-LOFAR), Prof Mark Ferguson, Science Foundation Ireland, Lord Rosse, Birr Castle, Minister Richard Bruton T.D., and Marcella Corcoran Kennedy TD at the announcement of SFI's award to build an international LOFAR station at Birr Castle.

February

- > Research led by Prof Paul Cotter, Tyndall National Institute, in collaboration with researchers at Stanford University, has identified a new development in the design of solar cells that can be submerged in water and help to produce clean, renewable fuel from 'water-splitting' chemical reactions.
- > iWish Girls in STEM conference took place in Cork with support from Science Foundation Ireland.
- > Science Foundation Ireland-funded Engineers Week took place.
- > Primary science workshops on Space and sound were delivered to 280 pre-service teachers in Marino College of Education.
- > A team of researchers, led by Prof Martin Caffrey, TCD, have provided the first crystal-clear molecular blueprint of Globomycin. The substance may be used to kill drug resistant bacteria.



The Science Foundation Ireland-funded Engineers Week kicked off on the 28th February.

SCIENCE FOUNDATION IRELAND ANNOUNCED A €28 MILLION INVESTMENT IN RESEARCH EQUIPMENT AND FACILITIES

March

- > SFI St Patrick's Day Science Medal was awarded to technologist Craig Barrett and world-renowned physicist Séamus Davis in Washington DC.
- > The Science Foundation Ireland 'Science Zone' at the Big Day Out - St Patrick's Festival took place with shows, workshops and interactive demonstrations.
- > Science Foundation Ireland's Smart Futures programme hosted a 'Women in STEM' forum meeting with key industry and policy makers in attendance.
- > Three SFI Research Centres, ADAPT, AMBER and Connect, won €6m Horizon 2020 funding for 'the Edge Project' (see page 25).
- > Prof Luke O'Neill, TCD, secured a €2 million Investigator award through the SFI-HRB-Wellcome Trust partnership to investigate totally new theories about how certain cells behave and cause inflammation in the hope of finding new therapies.



UCC graduate Prof Séamus Davis, St Patrick's Day Science Medal in Academia, Mr Charles Flanagan, Minister for Foreign Affairs and Trade, Dr Craig Barrett, St Patrick's Day Science Medal in Industry, and Prof Mark Ferguson, Director General, Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland.

April

- > New SFI-Pfizer Biotherapeutics Innovation Awards announced.
- > Ireland's most powerful microscope, the NION UltraSTEM 200, arrived at AMBER the SFI material sciences Research Centre at TCD.
- > Science Foundation Ireland's ESERO Programme hosted an in-flight call with, British astronaut in Limerick Institute of Technology.
- > The Big Week on the Farm programme was broadcast live every day for a week, as part of the SFI-RTE partnership.
- > Scientists at the APC Microbiome Institute SFI Research Centre showed for the first time that gut bacteria have a direct physical effect on the brain.



Helen Carroll, Darragh McCullough and Ella McSweeney on the farm on RTÉ.

SCIENCE FOUNDATION IRELAND AWARDED EXCELLENCE THROUGH PEOPLE BY NSAI

May

- > Professor Stefan Andersson-Engels, a world renowned biophotonics researcher joined IPIC SFI Research Centre and Tyndall National Institute, UCC, under the SFI Research Professorship Programme.
- > Researcher Dr Jennifer Mahony and Prof Douwe van Sinderen from the SFI Research Centre, APC Microbiome Institute, were awarded a Grand Challenges Explorations Grant by the Bill & Melinda Gates Foundation, to pursue an innovative research project in gut health.
- > Science Foundation Ireland awarded Excellence Through People by NSAI (National Standards Authority of Ireland).



Maurice Buckley, CEO of the NSAI, with Una Clifford, Head of HR and Organisational Development, Science Foundation Ireland, and Pedro Alves, MD of IQNet.

June

- > The SmartBay Subsea Observatory went live and began feeding data from the seabed to businesses, researchers, scientists and policy makers.
- > 546 schools nationwide received an SFI Discover Primary Science & Maths Award.
- > IPIC, Lero and Insight SFI Research Centres provided public engagement content for the Fringe Festival as part of Inspirefest 2016.
- > CÚRAM, the Science Foundation Ireland Centre for Research in Medical Devices, based at NUI Galway, was ranked first in Europe and awarded €2.1 million for its application to develop a new industry-academia fellowship programme called 'MedTrain'.



John Breslin of SmartBay Ireland.

July

- > Science Foundation Ireland became the first European funding agency to implement the highly-regarded US NSF Entrepreneurship Training Programme: Innovation Corps.
- > Dublin's International Festival of Science, Arts, Design & Technology - Festival of Curiosity took place from 21-24 July.
- > Trinity College Dublin appointed Professor Aljosa Smolic, a world-renowned, former Disney creative technologies researcher, under the SFI Research Professorship Programme.
- > RCSI researchers at the Amber SFI Research Centre developed a new generation of biomaterials capable of enhancing bone regeneration.



Director General Science Foundation Ireland and Chief Scientific Adviser to the Government Prof Mark Ferguson, Ellen Byrne, Co Founder and Creative Director of The Festival of Curiosity, Minister for Jobs, Enterprise and Innovation, Mary Mitchell O'Connor, and Vincent McCarthy Co Founder in Neurobiophilia mirrored infinity garden at the 'Urban Escape', at Temple Bar Galleries and Studios, part of The Festival of Curiosity.

€40 MILLION IN RESEARCH FUNDING ANNOUNCED FOR 24 MAJOR RESEARCH PROJECTS

August

- > €40 million in research funding was announced for 24 major research projects that will support over 200 researchers via SFI's Investigators Programme.
- > Connect SFI Research Centre joined the LoRa Alliance, an international organisation encouraging the rapid development and deployment of Internet-of-Things applications.
- > Lero, the Irish software SFI Research Centre and the CSIS Department, University of Limerick, launched a new video series entitled: "Is a computer science course for you?" to assist students in considering their CAO options.
- > AMBER researchers have created a simpler process to produce germanium - tin nanowires which could lead to smarter and greener electronic devices.
- > CURAM, SFI Research Centre announced two new Science On Screen film commissions - 'Mending Legends' and 'Feats of Modest Valour'.



Minister for Jobs, Enterprise and Innovation, Mary Mitchell-O'Connor TD pictured with Prof Mark Ferguson, Director General Science Foundation Ireland, and researchers Rachel McLoughlin, Trinity College Dublin and Eoin Casey, UCD, at the announcement, nearly €40 million in research funding for 24 major research projects.

September

- > The Royal Society announced four new awards under the Royal Society-Science Foundation Ireland University Research Fellowship scheme.
- > Science Foundation Ireland co-hosted the Small Advanced Economies meeting in Dublin, with representation from New Zealand, Singapore, Israel, Denmark, Finland and Ireland.
- > Then Northern Ireland Economy Minister Simon Hamilton, announced £3.6 million of research funding for five research projects involving Queen's University Belfast, through the Investigators Programme Partnership between Science Foundation Ireland and the Department for the Economy.
- > Science Foundation Ireland hosted outreach events at the 85th National Ploughing Championships.



Pictured at the announcement at The Wellcome-Wolfson Institute for Experimental Medicine at Queen's University are (l-r): Minister Hamilton, Dr Amy McKnight who was the lead on one of the successful research projects, Professor James McElnay, Pro-Vice-Chancellor, Queen's University and Dr Darrin Morrissey, Director of Programmes, Science Foundation Ireland.

October

- €22.3 million in research funding for 40 major research projects through Science Foundation Ireland's Starting Investigator Research Grant (SIRG) and Career Development Award (CDA) programmes will support nearly 100 researchers.
- Science Foundation Ireland and the National Natural Science Foundation of China (NSFC) entered into a new partnership, which will support collaborative research projects with researchers in the People's Republic of China.
- Science Foundation Ireland-supported Space Week and Maths Week took place.
- A 'Winning' TV documentary with Henry Shefflin aired on RTE as part of the SFI-RTE partnership, which looked at the science of winning and success.
- UCD appointed Prof Fengzhou Fang under the SFI Research Professor Programme.



SFI SIRG & CDA Award Holders; Laura Russo, Liliana Pasquale, Jianghui Meng, Director General of Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland, Prof Mark Ferguson, Sarah Doyle, Minister of State for Training, Skills and Innovation, John Halligan TD, Susan Kelleher, Nuala Mai Caffrey, Laura Lopez, Angela Feechan, Yan Yan.

November

- Over 250,000 people took part in Science Week, with more than 750 events across the country.
- The Science Foundation Ireland Science Summit took place in Croke Park, as part of Science Week and Awards 2016.
- Prof Barry O'Sullivan, Director of Insight, SFI Research Centre, is named SFI Researcher of the Year 2016.
- University of Limerick appointed Professor Paul Weaver under the SFI Research Professorship Programme.
- Prof Mark Ferguson is appointed to a new high level group by the European Commission that will formulate a vision for future EU research and innovation (FP9) and make recommendations on maximising the impact of EU investments in this area.



Children enjoying a science of food gastronomy show with FoodOppi during Science Week 2016.

December

- Prof William Wijns, leading expert in cardiology, is appointed to NUIG under the SFI Research Professorship Programme.
- Science Foundation Ireland, the Irish Research Council and the Health Research Board will require higher education institutions to have Athena SWAN gender equality accreditation.
- Origin Enterprises PLC and researchers at UCD established a dedicated digital, precision agriculture and crop science collaborative research partnership, supported through the SFI Strategic Partnership Programme.
- Researchers in AMBER, the Science Foundation Ireland-funded materials science research centre, hosted in Trinity College Dublin, have used the wonder material graphene to make the novelty children's material silly putty® (polysilicone) conduct electricity, creating extremely sensitive sensors.



Prof Jonathan Coleman, Investigator in AMBER and Trinity's School of Physics.

CASE STUDY:



Crystal Engineering – developing materials with global commercial potential

Leading the field of crystal engineering are Prof Mike Zaworotko and his team in the University of Limerick. The team's development of metal organic frameworks (MOFs), a new class of porous material, has received international acclaim. In July 2016, a paper by Prof Zaworotko describing the generation of MOFs in the laboratory was published in the journal *Science*, the first publication in *Science* from the University of Limerick.

MOFs have a range of potential applications in chemical processing and manufacturing. The large surface area of MOFs make them ideal for storage, with up to 80% of a MOF being empty space. They also have a high degree of structural flexibility, allowing for high selectivity for gases. The MOFs developed by Prof Zaworotko's team have unparalleled selectivity and capacity for CO₂ capture. These MOFs have been licensed for hazardous gas storage and carbon capture by MOF Technologies in Northern Ireland.

Prof Zaworotko was appointed as Bernal Chair of Crystal Engineering in the University of Limerick in 2013, when he relocated from the University of South Florida through the SFI Research Professorship Programme. This programme aims to attract world-leading researchers to Ireland to build the national research base and enhance Ireland's international reputation as a centre of excellence for research.

A key objective of the programme is to attract iconic research leaders to Ireland. The SFI Research Professorship award to Prof Zaworotko includes funding of €5 million to support research relevant to the pharmaceutical industry and also the clean technology industry, both of which are critical sectors of the Irish economy.

In July 2016, a paper by Prof Zaworotko describing the generation of metal organic frameworks (MOFs) in the laboratory was published in the journal *Science*, the first publication in *Science* from the University of Limerick.



SINCE 1998 AND SOUTH FLORIDA PHARMACEUTICAL CENTRE
Innovation Through Collaboration

Overview of 2016

During 2016, SFI continued the implementation of its strategic plan – Agenda 2020, which aims to ensure that government investment in science is beneficial, both in terms of societal and economic impact, and in provision of trained expertise to the labour market. The information outlined below clearly demonstrates that Science Foundation Ireland is making excellent progress towards meeting the ambitious goals laid out in Agenda 2020.

Excellent Science

Through investment in scientific and engineering research, Ireland has over the past number of years consolidated its position in the international ranking of scientific research capability. Ireland is now 10th in global scientific ranking for the overall quality of scientific research (Thompson Reuters InCites Data). This is the first time that Ireland has broken into the top ten, having been in the top 20 countries for a number of years.

Ireland ranks higher in specific fields:

- 2nd** Animal and Dairy
- 2nd** Immunology
- 2nd** Nanotechnology
- 3rd** Materials Sciences
- 4th** Agricultural Sciences
- 5th** Chemistry
- 6th** Basic Medical Research
- 6th** Computer Science



Table of Country Rankings
(Top 20 Countries – InCites Essential Science Indicators)

Countries-Territories	Rank
SWITZERLAND	1
SCOTLAND	2
NETHERLANDS	3
DENMARK	4
USA	5
ENGLAND	6
BELGIUM	7
SWEDEN	8
WALES	9
IRELAND	10
Up from 14th first time in top ten	
GERMANY (FED REP GER)	11
CANADA	12
AUSTRIA	13
FINLAND	14
SINGAPORE	15
NORTHERN IRELAND	16
NORWAY	17
FRANCE	18
ISRAEL	19
AUSTRALIA	20



IRELAND IS NOW 10TH IN THE GLOBAL SCIENTIFIC RANKINGS

Continued investment by Science Foundation Ireland has enabled supported research teams to contribute significantly to this achievement. Furthermore, 2.41% of SFI funded publications are in the top 1% of publications; this is higher than the national figure of 1.54%. The Irish national data have improved from 1.02% (1980 -2002) and are now on a par with Israel (1.50%), New Zealand (1.70%), USA (1.74%) and UK (1.75%), but still exceeded by countries such as Singapore (2.03%) and Denmark (2.38%). This improvement has coincided with SFI's creation and our use of internationally peer-reviewed competitive schemes, focusing on excellence and impact. SFI's figure of 2.41% of publications in the top 1% is comparable to other leading research funders such as the National Science Foundation USA (2.7%) and the National Institutes for Health USA (2.9%) (Clarivate Analytics InCites citation analysis).

A total of 4,199 publications were reported in 2016. Of these, 2,435 publications (58%) were attributed to Science Foundation Ireland awards. 46% of publications directly attributed to active Science Foundation Ireland awards have an international co-author and 11% have a co-author from industry. Researchers indicated that 43% of their publications are available in an open access repository. There has been a further 53% increase in publications primarily attributed to the SFI Research Centres, which have increased from 578 in 2015 to 844 in 2016.

International Recognition

Researchers supported by Science Foundation Ireland have been recognised nationally and internationally for their achievements and contributions to science:

- > Prof Luke O'Neill, TCD, has been elected a Fellow of the Royal Society.
- > Prof Cormac Taylor, UCD, received the Takeda Distinguished Research Award from the American Physiological Society. The Takeda Distinguished Research Award of the APS Gastrointestinal & Liver Physiology Section recognises an outstanding investigator who is internationally recognised for his/her contribution to research.

- > Prof Tom Brazil, UCD and SFI Research Centre Connect, was elected President of the IEEE Microwave Theory & Techniques Society. This is the first time that a person from Ireland has been elected President of an IEEE Society.

Seven awards celebrating Science Foundation Ireland researchers' contributions to science, technology, engineering and maths were announced at the annual Science Foundation Ireland Science Summit in 2016:

- > **Science Foundation Ireland Researcher of the Year:** Prof Barry O' Sullivan, UCC, Director INSIGHT SFI Research Centre.



Minister Simon Coveney pictured with Prof Barry O'Sullivan, SFI Researcher for the Year 2016, and Prof Mark Ferguson

- > **Science Foundation Ireland Early Career Researcher of the Year:** Prof Valeria Nicolosi, TCD, AMBER SFI Research Centre, and Dr Martin O'Halloran, NUIG, SFI Starting Investigator Research Grant (SIRG).
- > **Science Foundation Ireland Industry Partnership Award:** AMBER SFI Research Centre, TCD & Merck.
- > **Science Foundation Ireland Entrepreneurship Award:** APC Ltd – Prof Brian Glennon and Dr Mark Barrett, UCD, SFI SSPC Research Centre.
- > **Science Foundation Ireland Outstanding Contribution to STEM Communication:** Dr Sabina Brennan, TCD.
- > **Science Foundation Ireland Best Reported Impact:** Dr Emmeline Hill, UCD.
- > **Science Foundation Ireland Research Image of the Year:** Andrea Zanetti, UCD.

OVER 1,600 COLLABORATIONS WITH INDUSTRY



Supporting People

One of the primary reasons that the Government invests in scientific research is to upskill the nation's human capital. People with high levels of training and skills are a key to ensuring innovation is delivered, leading to higher value products and services, delivering higher valued jobs and improved living standards.

Supporting an internationally competitive research base, together with training highly-skilled researchers (PhD graduates), is at the heart of initiatives undertaken by Science Foundation Ireland.

There were 7,262 people working on teams of Science Foundation Ireland award holders during 2016. 4,239 of these were working directly on Science Foundation Ireland awards. This includes 508 award holders. The percentage of awards held by female award holders increased to 24%, up from 22%. Science Foundation Ireland supported 1,441 PhD and Masters students in 2016.

Breakdown of Science Foundation Ireland Research Teams



Attracting Overseas Talent

The SFI Research Professorship programme aims to attract outstanding research talent to Ireland. 2016 was the most successful year to date for the SFI Research Professorship programme; five awards were made. Several of these are in areas directly related to Ireland's economy; specifically, two of the awards are in the domain of advanced manufacturing. Science Foundation Ireland held a very successful launch of the SFI Future Research Leaders programme aimed at attracting early career researchers to Ireland.

Engaging with Industry

Industry collaboration remains one of the key mechanisms for transferring the benefits of public investment in research into sustainable economic development and creating competitive advantage for Ireland. Science Foundation Ireland programmes and initiatives have a strong focus on encouraging and creating a collaborative environment between the researchers Science Foundation Ireland supports and industry; both within Ireland and overseas.

There was a total of 3,390 non-academic collaborations reported with 1,725 organisations in 2016, up 37% and 28%, respectively on 2015. Of these, 1,759 collaborations and 988 distinct organisations were directly attributed to active Science Foundation Ireland awards. 53% of these collaborations have legal agreements in place. 54% of collaboration partners are based in Ireland, while 15% are in the United States, 9% are based in the UK (including Northern Ireland) and the remaining 22% are spread across other countries.

Number of Collaborations

Organisation Type	Total Collaborations
Multinational Corporations	929
Small and Medium Enterprises	674
Government Departments or Semi-State Bodies	110
Private Foundations/Charities/ Non-Governmental Organisations (NGO)	41
Other	5
Total	1,759

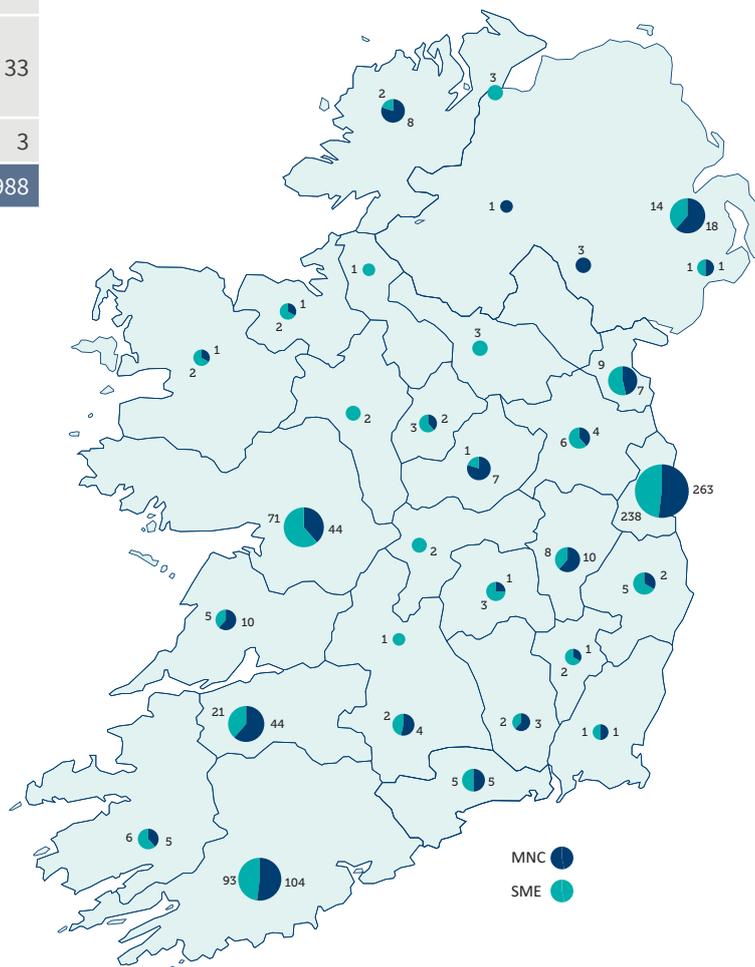
SCIENCE FOUNDATION IRELAND RESEARCH TEAMS ARE COLLABORATING WITH MNCs AND SMEs IN EVERY REGION OF IRELAND

Numbers of individual organisations and companies

Organisation Type	Organisations
Small and Medium Enterprises	399
Multinational Corporations	491
Government Departments or Semi-State Bodies	62
Private Foundations/Charities/ Non-Governmental Organisations (NGO)	33
Other	3
Total	988

Science Foundation Ireland supported researchers are collaborating with MNCs and SMEs in every region in Ireland.

Industry Collaborations in Ireland (attributed to SFI awards)



Pre-commercial outputs from Science Foundation Ireland-funded researchers continued to be strong and include:



SCIENCE FOUNDATION IRELAND RESEARCHERS WERE ENGAGED IN MORE THAN 3,179 ACADEMIC COLLABORATIONS, 72% OF WHICH WERE WITH INTERNATIONAL PARTNERS.

Building Strategic Partnerships

Science Foundation Ireland is committed to leveraging its investment and capability to the maximum extent possible through building and collaborating in strategic partnerships. Four awards were made under the SFI Strategic Partnership programme in 2016, with cumulative industry cash co-investment of more than €8 million.

- > Three awards were made under the Science Foundation Ireland-Pfizer Biotherapeutics Innovation Award programme.
- > Origin Enterprises plc and researchers at UCD have established a dedicated digital, precision agriculture and crop science collaborative research partnership.
- > Science Foundation Ireland and Fraunhofer-Gesellschaft established a partnership to create a Fraunhofer Project Centre (FPC) for Embedded BioAnalytical Systems at Dublin City University (DCU). The FPC will focus on contract and collaborative research, as well as technology development projects, addressing cost-efficient design, development and manufacture of microfluidic 'lab-on-a-chip' technologies.

Enhancing Ireland's International Reputation

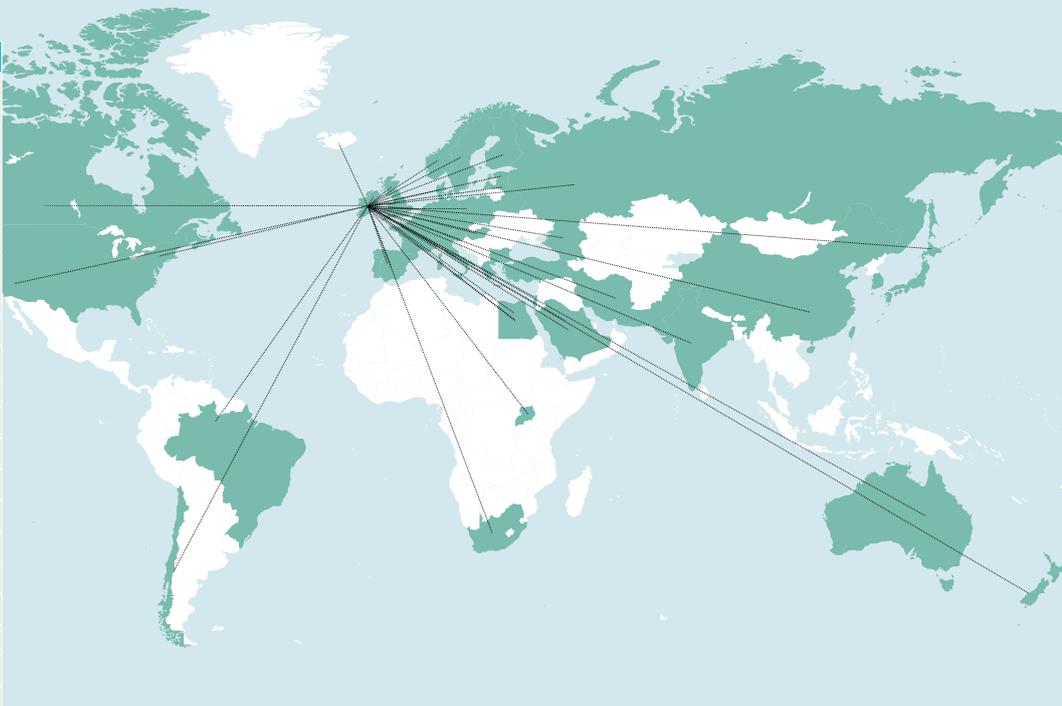
Ireland's reputation as a location for world-class research continues to grow. In 2016, there were more than 3,179 academic collaborations reported by Science Foundation Ireland award holders, 72% of which were with international partners. The collaborations cover most of the globe – the largest number are with European academic institutions (63%), with North America and Asia comprising 21% and 10% respectively. The primary objective for these collaborations is to facilitate joint publications and /or research (80%).



Prof Leonie Young, RCSI and Dr Orla Cunningham, Pfizer pictured at the announcement of awards under the Science Foundation Ireland - Pfizer Biotherapeutics Innovation Award programme.

International Academic Collaborations By Country in 2016

Country	Total
United Kingdom (excluding Northern Ireland)	448
United States of America	443
Germany	195
France	126
Italy	114
Spain	97
Northern Ireland	90
Netherlands	69
Sweden	68
China	65
Denmark	60
Australia	59
Canada	55
India	46
Brazil	40
Belgium	37
Switzerland	36
Austria	33
Portugal	31
Japan	25
Finland	17
Poland	15
Korea, South (Republic of Korea)	15
Israel	14
Norway	14
Turkey	12
Greece	12
New Zealand	12
Russian Federation	12
Singapore	10
Chile	9
Hungary	8
South Africa	6
Czech Republic	6
Saudi Arabia	
Slovakia	4
Slovenia	4
Taiwan, Province of China	3
United States Minor Outlying Islands	3
Lebanon	3
Iran (Islamic Republic of)	3
Luxembourg	3
Hong Kong	3
Algeria	2
Fiji	2
Malta	2
Romania	2
Cyprus	2
Colombia	2
Bulgaria	2
Kuwait	2
Lithuania	2
Latvia	1
Belarus	1
Serbia	1
Mauritius	1
Egypt	1
Estonia	1
Bangladesh	1
Croatia	1
Iceland	1
Oman	1
Grand Total	2359



International Engagement

Ireland's impressive rise in international scientific rankings is a success story which Science Foundation Ireland promotes domestically and internationally to demonstrate Ireland as a destination for excellent research. The quality of research in Ireland is becoming increasingly critical as part of the national dialogue for international trade, investment and education.

In 2016, Science Foundation Ireland engaged heavily through a wide range of domestic fora to ensure that Ireland's investment and success in STEM were represented. These fora included agency representation at all four sessions of the Export Trade Council, the High-Level Group on International Education, the International Trade Coordination Group and the Interdepartmental Committee on the Diaspora. Senior Science Foundation Ireland staff members also participated in new groups and committees established to address the new challenges faced as a result of the UK referendum on BREXIT in June 2016.

Science Foundation Ireland continued to build new partnerships with international research funding agencies and charities.

Science Foundation Ireland is the first European agency to partner with the National Science Foundation (NSF) in the USA on its Innovation Corps (I-Corps) programme. In addition it is participating in the Partnerships for International Research and Education (PIRE) Programme.

PIRE is an NSF-wide programme that supports international activities across all NSF-supported disciplines. The primary goal of PIRE is to support high quality projects in which advances in research and education could not occur without international collaboration. PIRE will catalyse a higher level of engagement between the science and engineering communities in the United States and in Ireland.

Science Foundation Ireland launched a new pilot programme with NSF on their Innovation Corps (I-Corps) Programme. This world-renowned training programme will develop the entrepreneurial skills of Irish researchers. A key objective of the pilot programme is to develop a culture of entrepreneurship amongst researchers at all career stages within Research Performing Organisations.

The Biotechnology and Biological Sciences Research Council (BBSRC) and Science Foundation Ireland have entered an agreement to welcome, encourage and support research applications that cut across national boundaries involving collaborative teams led by researchers from the UK and Ireland.

Science Foundation Ireland signed a partnership agreement with the Engineering and Physical Sciences Research Council (EPSRC) situated in the UK. The first calls will be launched in 2017.

The foundation also continued to engage with other international funding agencies, embassies and consulates in Ireland and other representative bodies to support internationalisation of our funded research.

The prestigious 'Science Foundation Ireland St. Patrick's Day Science Medal' was presented by Mr Charles Flanagan T.D, Minister for Foreign Affairs and Trade, to Dr Craig Barrett and Prof Séamus Davis in Washington DC as part of the St Patricks' Day celebrations. The SFI St Patrick's Day Science Medal recognises the extraordinary contributions made by US-based scientists, engineers or technology leaders with Irish connections. This was the first time the medal was presented to two recipients, each a leading figure in their industry and academic communities, respectively.

A key inward high-level visit in 2016 was the visit by the US National Science Foundation Director, Dr France Cordova. An extensive two-day programme was put in place for Dr Cordova, which included visits to several SFI Research Centres, an industry engagement showcase at Intel in partnership with the American Chamber of Commerce in Ireland, a keynote address at the Science Summit, plus media interviews and a visit with Minister of State for the Diaspora and International Development, Mr Joe McHugh, T.D.

The 2016 Small Advanced Economies Initiative Senior Officials meeting took place at Dublin Castle in September. Science Foundation Ireland worked closely with the Department of Jobs, Enterprise and Innovation and the Department of Foreign Affairs and Trade to deliver a platform for discussion and debate on challenges faced by economies of similar scale.

CASE STUDY:



SFI Research Centre collaboration wins €6m Horizon2020 funding for EDGE programme

In 2016, an outstanding example of the benefits of interdisciplinary collaboration came to fruition when three SFI-funded Research Centres, led by the CONNECT Centre for Future Networks and Communications, were awarded €6 million in shared Horizon 2020 EU funding for a new postdoctoral programme.

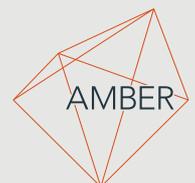
The EDGE project, which will employ 71 world-class ICT researchers, is funded under the European Horizon 2020 Marie Skłodowska-Curie Actions (MSCA): Co-funding of Regional, National and International Programmes (COFUND) Fellowship Programme scheme. The award made to the SFI Research Centres, ADAPT, AMBER and CONNECT, matches a pledged €7m of SFI Research Centre funding. Industry will play a major role by providing secondment opportunities and specialised training to Fellows.

The programme is expected to attract more leading ICT researchers to Ireland's third level institutes, as it will support research at the interface of three strategically important areas of ICT: advanced materials, telecommunications networks and digital content technology. Expertise in these fields is particularly attractive to employers and EDGE will strengthen Ireland's ability to create and attract high quality jobs.

EDGE will run for five years, with third-level institutes around the country participating in the programme. The primary beneficiaries will be the EDGE Fellows who, in addition to the accolade of a prestigious Marie Skłodowska-Curie fellowship, will receive excellent cross-disciplinary training in their chosen area of research.

Ireland has an ambitious target of drawing down €1.25 billion of funding over the course of the lifetime of Horizon 2020. Industry will play a major role by providing secondment opportunities and specialised training to Fellows. EDGE will form the next generation of thought leaders in the ICT field and consolidate Ireland's 'knowledge triangle' by linking higher education, research innovation and industry.

EDGE will run for five years, with ten third-level institutes around the country participating in the programme.



Leveraging Funding from Other Sources

Research that is scientifically excellent and that brings direct economic and social benefits should have multiple sources of support. Equally, large research projects require a level of funding that can realistically be met only by multiple investors. Evidence of scientific excellence is supported by the winning of funding from international sources such as the ERC, the European Union and Wellcome. A diversity of research income is an indicator of both research relevance and quality.

The amount of external funding obtained by Science Foundation Ireland researchers was €169m in 2016, up 6% from €158m in 2015. Funding from enterprise increased by 18% to €45 million in 2016.

Science Foundation Ireland is committed to supporting Ireland's objective of drawing down €1.25 billion under the EU Horizon 2020 programme. To support this goal Science Foundation Ireland has undertaken several initiatives:

- Science Foundation Ireland staff members act as National Contact Points for various Horizon 2020 schemes.
- Prof Mark Ferguson chairs a cross-departmental and high level Strategic Projects Group to drive big bids.
- Science Foundation Ireland has continued its engagement with transnational European funding, joining three new Era-NETs in 2016.
 - Science Foundation Ireland is collaborating with international funding agencies through the ERA-Healthy Diet for a Healthy Life to fund research that will identify and validate biomarkers that are modulated by diet. Following a competitive peer review process, six Irish research groups were awarded funding. This success required Science Foundation Ireland to increase its commitment to this call and resulted in 83% European Commission co-funding.
- Science Foundation Ireland has support programmes to encourage applications to the European Research Council. The successes of researchers in ERC schemes contribute significantly to the total funding that is obtained from the European Union. To date, over €55 million has been won through 32 main ERC awards and eight smaller grants through the Proof of Concept scheme, which helps awardees to look to capitalise on their successful ERC-funded research.

Amount of external funding secured by Science Foundation Ireland funded researchers in 2016 by source.

European Union	71,370,495
Private Enterprise	44,826,760
Irish Research Council	7,470,604
Other Source	7,392,319
Enterprise Ireland	5,191,716
Health Research Board	4,658,652
Enterprise Ireland - Commercialisation Award	4,349,130
Other International Government Source	3,487,071
Department of Agriculture Fisheries and Food	3,351,008
National Institute of Health USA (NIH)	3,247,667
Environmental Protection Agency	2,568,844
Wellcome	2,094,121
Other International Interest Organisation	1,938,169
Charity/Non-Profit Organisation (International)	1,617,986
Enterprise Ireland - Non-Commercialisation Award	1,609,795
Other Irish Government Source	1,472,541
Marine Institute	720,000
Teagasc	716,000
Charity/Non-Profit Organisation (Irish)	672,125
Dept of Communications, Climate Action and Energy	295,000
National Science Foundation US (NSF)	274,421
Higher Education Authority Ireland	50,648
Total	169,375,071



Prof Shane Bergin pictured with Dara O'Briain at the Scintillating Science show in the National Concert Hall, as part of National Science Week 2016

Public Engagement and Education

One of Science Foundation Ireland's strategic objectives, as set out in Agenda 2020, is to have the most engaged and scientifically informed public. The Foundation is not alone in working to achieve this goal. Significant amounts of public funds are invested in public engagement and education in the fields of science, technology, engineering and maths (STEM) across the globe. This increased investment is reflected in STEM education reform and in informal science engagement, such as festivals or public debate. Such activities help identify issues of public concern, create dialogue among citizens and progress topics towards gaining public acceptance.

Actions such as the Responsible Research and Innovation (RRI) of H2020 and funding of the STEM education strategies adopted across many countries, all point to the greater weight being given by advanced and developing nations to public engagement with science. There is a need in Ireland to support and encourage informed, evidence-based debate about the challenges we face, and to ensure a steady STEM talent pipeline. Science Foundation Ireland is mandated to support this.

The mission of the education and public engagement programme is 'to catalyse, inspire and guide the best in education and public engagement with STEM'. In 2016, the programme was further adapted to reflect national policies including Innovation 2020, The National Skills Strategy and research such as the Science in Ireland Barometer (2015). The programme addresses three core areas to achieve a secure STEM talent pipeline and a scientifically engaged public. Education is the bedrock of the talent pipeline, where development from early learning to lifelong learning is nurtured.

In 2016, Science Foundation Ireland supported several education initiatives where new methods of learning and teaching STEM were explored. This bedrock is closely supported by two other elements. The first being the STEM culture or capital our citizens have access to, where science is a recognised part of everyday life. The second is equal access to STEM awareness programmes that work to excite young people, increase their knowledge of STEM and thus open the door of opportunity to all.

Supporting impactful activity in the areas of education, science capital and access to STEM engagement, SFI runs three core activities under the education and public engagement programme 1. SFI Discover Funding programme 2. Supporting researcher engagement capacity and activity and 3. Directly managed programmes.

Overall in 2016, Science Foundation Ireland supported a portfolio of 44 projects with an investment of €2.8 million through the SFI Discover programme, reaching over 1.4 million people throughout the country. The research community funded through Science Foundation Ireland delivered over 950 activities engaging the public with members of the SFI Research Centres receiving training on evaluation and connecting with disengaged audiences. Science Foundation Ireland directly manages three programmes: Discover Primary Science and Maths, Smart Futures and national Science Week. In addition, SFI runs the European Space Education Resource Office (ESERO Ireland).

CASE STUDY:



An integrated approach to education and public engagement

The 85th National Ploughing Championships, Europe's largest outdoor exhibition and agricultural trade show, took place in Scraggan, Tullamore, Co Offaly, in September 2016. The event was attended by more than 280,000 people who came from across the country to engage with over 1,500 exhibitors. Science Foundation Ireland continued to have a strong presence in 2016, with a large marquee space to welcome in visitors, young and old, to explore STEM.

Several elements of the SFI Education and Public Engagement Programme were used in an integrated manner to produce inspiring STEM content to engage attendees at the event. The 12 SFI Research Centres were called upon to develop materials, experiments and workshops, and a large number of smartphone microscope 'make and take' sessions ran, which proved extremely popular, with over 1,000 adults and young people taking part.

Along with world-renowned STEM performers, Scientific Sue, and the Physics Buskers, families experienced hourly entertainment shows and information was provided to the public about STEM careers via the SFI Smart Futures team.

As an extension of the SFI-RTE broadcast partnership, live performances of the 'Insiders Show' took place in the Science Foundation Ireland marquee, while RTE hosted two public panels where topics such as weather, climate change and agriculture were discussed. These activities took place in the Science Foundation Ireland tent, as well as in the RTE tent.

The SFI Research Centre APC Inflatable gut was a big hit. This 'Alimentary Adventures' walkthrough inflatable tunnel mimics the human digestive system. It enabled young people to learn about the organs of our digestive tracts and the bacteria which can be found living in each area of the gut.

Overall, this collaborative approach to delivering STEM engagement at such a large-scale, public-facing event, introduced a vast diversity of people to excellent, innovative science, successfully bringing it to life at the heart of the rural Irish community.

The SFI Research Centre APC inflatable gut was a big hit. This 'Alimentary Adventures' walkthrough inflatable tunnel mimics the human digestive system.



Ciara Ocks and Jude Davis at the launch of the Science Foundation Ireland-funded Engineers Week 2016

Science Week 2016

Science Foundation Ireland both directly manages national Science Week and provides support through the SFI Discover Programme to regional Science Week festivals. Following the findings of the SFI Science in Ireland Barometer, and an independent evaluation of Science Week, Science Foundation Ireland focussed on growing Science Week to broader audiences in 2016. Science Foundation Ireland supported projects that grew activity in areas of low participation, where communities are not traditionally engaged in STEM. Under Science Week 2016, new regional science festivals were launched in Cavan/Monaghan and Kerry and existing festivals reinvented their programmes. An example of this is the Cork Science Festival which, involves four SFI Research Centres, working with local community groups to expand the festival to include a successful open day in Neptune Stadium, Cork.

Overall, Science Week reached over 250,000 people across 750 events in all 26 counties of the Republic of Ireland. It was again featured on RTE's Late Late Show and a live performance by Dara O'Briain at the National Concert Hall, called 'Scintillating Science,' explored science stories with an audience of more than 1,000 people.

Smart Futures – key achievements

Smart Futures is a collaborative government-industry-education programme that provides post-primary students in Ireland with information about careers in STEM. It is coordinated and managed by Science Foundation Ireland, in partnership with Engineers Ireland's STEPS programme and is supported by more than 50 organisations from industry, research and academia. The programme completed its initial three-year strategy in 2016 and launches the next phase of the programme in 2017.

- ✓ **100,000+** post-primary students directly engaged since 2013
- ✓ **1,600+** STEM role models recruited and trained
- ✓ STEM careers resources delivered to students, teachers and parents
- ✓ Presence at key career events, e.g. Higher Options, SciFest, TY EXPO etc.
- ✓ Over **5,000** hours donated by industry and academia through volunteering

The website www.SmartFutures.ie provides STEM career resources, including over 170 STEM career profiles, with the aim of stimulating an interest in STEM subjects in secondary school and at third level.

77%
have changed the way they
TEACH SCIENCE

Teachers are
spending more
time teaching
SCIENCE



26% have
changed the way
they teach **MATHS**

Discover Primary Science and Maths (DPSM)

DPSM has been running for 14 years supporting teachers and school children to engage with the primary school science curriculum. A significant part of the programme is delivering continuing professional development (CPD) to primary school teachers. In 2014, the focus of the CPD programme shifted from training teachers how to carry out science activities in the classroom, to supporting teachers to engage children through an inquiry-based framework, supporting student led teaching and learning. In 2016, Science Foundation Ireland commissioned an independent study to look at the impact of CPD programme on teachers the year after they had completed the programme. The results were very positive, with indicators of increased teacher confidence and time in teaching science.

BEFORE

4%



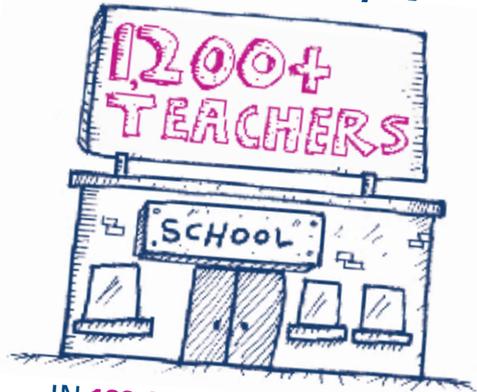
AFTER

31%



**TEACHING OVER 2 HOURS
OF SCIENCE PER MONTH**

CPD IN 2016/17



**IN 120 SCHOOLS TEACHING
OVER 30,000 PUPILS**

Science Foundation Ireland broadcast strategy

Science Foundation Ireland is committed to supporting a greater level of STEM programming on our national broadcast channels. The focus of this strategy has been to support programmes that are relevant to a broad audience, helping to reach people traditionally unengaged in STEM. From April 4 – 8, the Big Week on the Farm show was screened daily on RTÉ 1, to an average audience of 326,000 viewers, one quarter of all Irish TV viewers at that time. This reached a total of over 1.5 million people by the end of the week. SFI co-funded the production with RTÉ and the Broadcasting Authority of Ireland, and worked closely with the production team to identify research stories to feature in the programme. Throughout 2016, SFI worked with Screen Producers Ireland and RTÉ to grow the connection between the research and production communities, resulting in exciting new productions appearing on RTÉ One, RTÉ 2, RTÉjr, 3 and Eir Sport.

Researcher-led engagement

Since 2014, SFI has concentrated its efforts on preparing, motivating and supporting the research community to engage with the public. Much of this effort has been directed to the SFI Research Centres, with SFI supporting annual engagement plans. In 2016 indicators of the positive impact of this work began to emerge with Science Foundation Ireland supported researchers increasing their involvement in education and public engagement activity by over 64% on 2015, delivering over 958 activities ranging from participation in broadcast projects, to 'in-school' interactions and science festivals.

SIRG PROGRAMME GENDER INITIATIVE RESULTED IN 55% OF AWARDS GRANTED TO WOMEN

Education and Public Engagement by activity type in 2016

Activity	Total
Public Event	376
In-Class Activities	216
Informal Learning	117
Other	111
Broadcast/Film	80
Careers Experience Programme	58
Total	958

Gender

In 2016, Science Foundation Ireland published its SFI Gender Strategy 2016-2020, which provides a comprehensive framework for delivering Science Foundation Ireland's actions to retain and increase the participation of excellent female researchers in STEM careers.

Science Foundation Ireland's Agenda 2020 set out an ambitious plan to make Ireland a global knowledge leader. One of the targets set by the publication was to reach 25% female award holders in STEM. Since then it has been revised upwards to a new target of 30% female award holders within SFI's portfolio by 2020.

Science Foundations Ireland's Gender Strategy sets out the agency's roadmap to not only achieve this goal but to improve the representation and progression of women in all aspects of STEM careers in Ireland. Strand 1 of the strategy focuses on gender equality across Science Foundation Ireland education and public engagement initiatives, with the aim of increasing the participation and interest of girls in STEM-related activities. Strand 2 targets female representation within the Science Foundation Ireland funded portfolio and Science Foundation Ireland review panels. Concrete measures to achieve these targets are outlined. Finally, Strand 3 will ensure that gender perspectives are integrated into the research content of Science Foundation Ireland-funded research programmes.

To ensure that awards made under Science Foundation Ireland funding schemes do not preclude or unintentionally discourage the hiring of female researchers, Science Foundation Ireland continues to offer a maternity allowance that provides award holders with funding when they or a team member take a period of maternity or adoptive leave. As an additional support mechanism for researchers further along the career pipeline, the Investigator Career Advancement (ICA) category of the SFI Investigators Programme stipulates that reviewers consider career breaks and periods of part-time work undertaken by the applicant when assessing their productivity over a timeframe. Through our seat on the Science Europe Gender and Diversity Working Group, Science Foundation Ireland has led the 'Grant Management' task of the working group which has crystallised its outputs in the widely-disseminated publication of the 'Practical Guide to Improving Gender Equality in Research Organisations'. In 2016, Science Foundation Ireland was one of only four organisations tasked with providing leadership regarding the implementation of the Global Research Council (GRC) Action Plan towards Equality and Status of Women in Research.

To ensure that the agency review process remains unbiased, in 2016, all SFI staff, including the executive committee and the SFI board, received sector-specific, data driven unconscious bias training by an external provider. Feedback and learnings from the session have been fed into process improvements within the organisation, such as expanded briefing to peer reviewers and a reconsideration of the information provided to review panels.



CASE STUDY:

Biotech industry collaboration established to develop anti-cancer agents

A research team led by Professor Celine Marmion at the Royal College of Surgeons in Ireland (RCSI), has established a collaboration with a French-based biotech company called Onexo, that specializes in the development of orphan oncology therapeutics, to develop multi-functional metallodrug candidates as anti-cancer agents.

Onexo, a leading developer of orphan oncology drugs, announced the collaboration with RCSI in 2016, to develop a discovery-stage programme on the derivatives of belinostat (Beleodaq®), a histone deacetylase (HDAC) inhibitor. The collaboration aims to optimise the pharmacokinetic profile of belinostat, to increase its lifetime, efficacy and stability.

The goal is to develop conjugate molecules derived from belinostat and with distinctive features compared to existing HDAC inhibitors, which may lead to new patent opportunities. RCSI will lead compound synthesis and in vitro testing, while Onexo will lead the in vivo studies. This collaborative industry research is ultimately focusing on developing innovative therapeutics for rare cancers, one of the fastest growing markets in the healthcare industry with high, unmet medical needs.

Novel technology developed by the RCSI group, with support from Science Foundation Ireland, has also produced an innovative class of multi-functional platinum drug candidates as anti-cancer therapies. A number of papers have been published on this work including one in *Chemical Communications*, the flagship journal of the Royal Society of Chemistry.

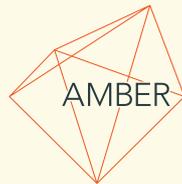
The goal is to develop conjugate molecules derived from belinostat and with distinctive features compared to existing HDAC inhibitors, which may lead to new patent opportunities.

SFI Research Centres

12 World-leading Centres of Scale and Excellence

Excellent
Science

Industry
Collaboration



Software
Pharma
Nanotechnology
MEDICAL DEVICES



Applied Geosciences
Digital Content

Industry commitment of €190 million

€355 million from SFI

Telecommunications



PERINATAL RESEARCH

Nano Materials

Functional Foods



FOOD FOR HEALTH

BIG DATA

Marine Renewable Energy



International
Engagement

Talent
Skills

SFI Research Centres

Excellent Science

3,778 
Journal Publications

2,278
Conference Publications

52
Coordination of Major EU Research Projects

19 
ERC Awards



Talent & Skills

327 
PhD Graduates

33% 
of trainee departures with industry as first destination

48 
MSc/MEng Graduates



Economic Impact

+300 
Collaborations with industry

13
Spinout Companies

+€132m 
Funding from non-exchequer sources

190
Enterprise Ireland Commercialisation Awards

+100
Licence Agreements

+€28m
Cash Received from Industry

SFI RESEARCH CENTRES HAVE BEEN ESTABLISHED WITH AN INVESTMENT OF €355 MILLION FROM GOVERNMENT THROUGH SFI AND A FURTHER €190 MILLION FROM INDUSTRY COLLABORATORS.

Science Foundation Ireland has established 12 world-leading SFI Research Centres that focus on strategically important areas of research for Ireland linking scientists and engineers in partnerships across academia and industry. The first seven centres were established in 2013, with a further five in 2015.

Each SFI Research Centre spans several higher education institutions and collaborates with multiple industry partners. Science Foundation Ireland has committed to invest over €355m in the 12 Research Centres, with a further €190m from industry collaborators.

All 12 Research Centres are outstanding centres of Applied and Basic Combined (ABC) research. They are making important scientific advances, enhancing enterprise and industry, developing critical skills, supporting regional development and enhancing Ireland's international reputation.

These 12 SFI Research Centres are focused on strategic areas of importance to Ireland with a focus on delivering scientific excellence, with economic and societal impact - Pharma, Big Data, Medical Devices, Nanotechnology/ Materials, Marine Renewable Energy, Food for Health/ Functional Foods, Perinatal Research, Applied Geosciences, Software, Digital Content, Telecommunications and Medical Devices etc.

Key achievements of SFI Research Centres

The SFI Research Centres were funded with a primary objective to deliver significant economic and societal impact to Ireland. Their success is strongly driven by a number of key performance indicators. Each SFI Research Centre sets targets for the relevant indicators, and is continually measured against these targets. The SFI Research Centres are also mandated to maintain a minimum level of 30% cost share from industry partners, which includes a minimum of 10% cash.

The 15 KPIs are reported and validated with SFI Research Centres on a six monthly basis. Table 1 shows the cumulative KPI results against target, for the 12 Research Centres, from start date until the end of 2016. Key highlights include the level of non-exchequer, non-commercial funding; this includes over €132m secured against a target of €107m, 168 participations in and 52 co-ordinations of EU consortia and the awarding of 19 prestigious ERC awards. Commercialisation activities are strong with 13 spin-outs already reported, 101 licensing agreements signed and over 190 Enterprise Ireland commercialisation awards secured. The academic outputs are strong with over 3,700 journal and 2,200 conference publications reported. The number of trainees that have departed to industry as a first destination is greater than 20%. The cash cost share KPI is greater than 10%, but the overall cost share (cash and in-kind) is just behind the 30% target, due to less-than-expected company in-kind contribution.

Combined cumulative KPI results for the 12 SFI Research Centres against their targets from inception to the end of 2016

	KPI	Target	Result
Excellent Research	Journal publications	2,178	3,778
	Conference publications	1,760	2,278
Skills and Talent	MSc/MEng graduates	83	48
	PhD graduates	134	327
	% Trainee departures with industry as first destination	28.1%	33.0%
Economic Impact	Participations in major EU initiatives	157	168
	Coordinations in major EU initiatives	48	52
	ERC awards granted	15	19
	Funding from non-exchequer, non-commercial sources	€107,200,000	€132,453,859
	Cash in bank	€20,784,142	€28,842,854
	% Industry cost share (cash)	10.0%	13.9%
	% Industry cost share (total)	30.0%	28.5%
	Enterprise Ireland commercialisation awards	111	190
	Licence agreements	65	101
	Spin out companies formed	11	13

CASE STUDY:



Tyndall researcher publishes breakthrough in quantum computing

A team led by Dr Emanuele Pelucchi at the SFI-funded Research Centre IPIC, in the Tyndall National Institute, University College Cork, published a paper in the highly prestigious journal, Nature Photonics, detailing a significant breakthrough that advances understanding of how to harness the opportunity and power of quantum computing.

The breakthrough led by Dr Emanuele Pelucchi, head of the Epitaxy and Physics of Nanostructures group, could enable the use of quantum computers sooner than expected and significantly accelerate progress in this field internationally.

The technology that currently underpins quantum computing is difficult to develop at scale. Dr Pelucchi's research team at Tyndall have taken a step forward by making quantum dot light-emitting diodes (or LEDs) that can produce entangled photons (whose actions are linked), theoretically enabling their use to encode information in quantum computing.

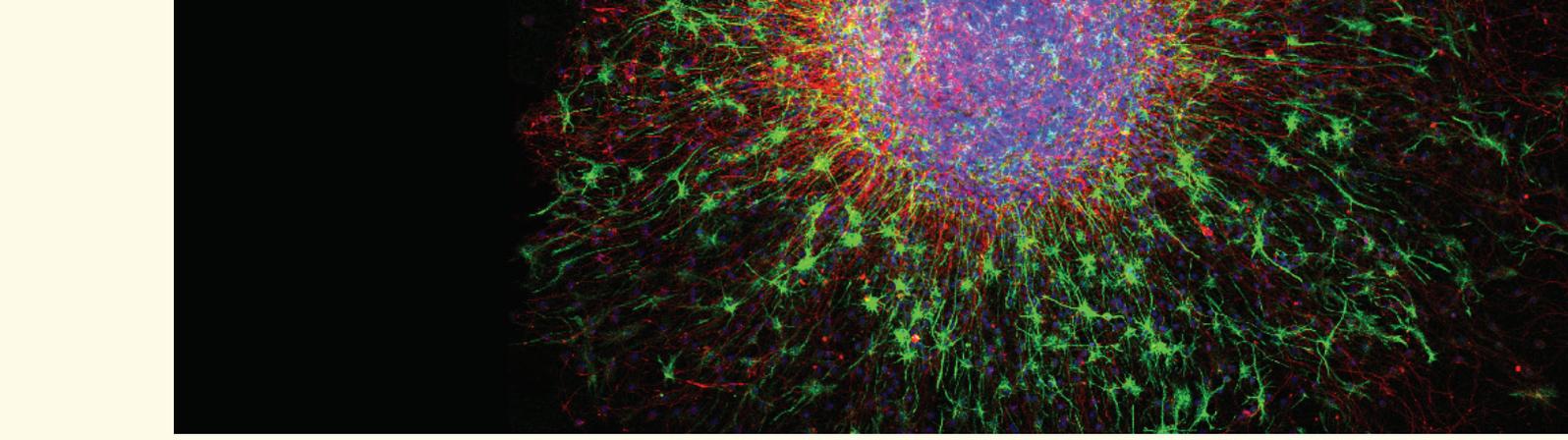
This is not the first time that LEDs have been made that can produce entangled photons, but the methods and materials described in Dr Pelucchi's paper have important implications for the future of quantum technologies as based on a (potentially) scalable quantum dot platform.

Indeed, quantum computing is heralded as the next revolution in terms of global computing. Google, Intel and IBM are just some of the big names investing millions currently in the field of quantum computing, which will enable faster, more efficient computing required to power the requirements of our future needs.

SFI supports photonics innovations. The IPIC team at Tyndall are strong players and the technologies developed are being commercialised across a number of sectors and as a result, are driving global innovation through investment, talent and new research in this area.

Photonics innovations by the IPIC team at Tyndall are being commercialised across a number of sectors and as a result, are driving global innovation through investment, talent and research in this area.





Impactfully Engaging with Industry

At the end of 2016, the 12 SFI Research Centres had signed collaborative research agreements with over 400 industry partners with another 200 contracts under negotiation. The Centres are collaborating with both Irish and multinational SMEs and MNCs through a wide range of projects spanning a one-to-six-year period. In addition to collaborative research, the SFI Research Centres are actively commercialising Intellectual Property generated from these industry engagements. In the past year, three new companies have been spun out and there have been thirty licensing agreements signed. The SFI Research Centres have also provided skilled personnel to industry with over 20% of trainees moving to industry as a first destination

- Prof Louise Kenny, INFANT, developed a diagnostic test for the early detection of pre-eclampsia in pregnancy which was licensed for development to a UCC spin out company, Metabolomic Diagnostics. Prof Kenny has supported investor pitches with the company's CEO resulting in their success in 2016 in securing additional venture funding of €1.6 million with the aim of bringing the PrePsia™ blood test to market in 2017.
- INSIGHT has created a 'masterclass' series of talks that can be delivered, free of charge, to businesses throughout Ireland. Covering industries including agri-food, health, media, manufacturing and logistics, the new programme is part of the group's industry outreach programme.
- An additional three spin out companies were reported last year:
 - Tucana Health (APC)
 - MCR Agri-Analytics (Insight)
 - Nova Leah (Lero)

Attraction of International Funding

The 12 Research Centres are acting as international beacons for attracting talent and leveraging non-exchequer funding with emphasis on EU Horizon 2020. The Centres are exceeding targets on ERC awards and are leading and participating in major H2020 consortia. By the end of 2016, across all twelve SFI Research Centres, €132 million was drawn down from international funding agencies. These EU and international collaborations are enabling the transfer of students and postdoctoral researchers and the exchange of ideas and expertise.

- CÚRAM was awarded €2.1 million to develop a new industry-academia fellowship programme called 'MedTrain'. The submission was ranked number one out of 72 applications submitted from across Europe to the Marie Skłodowska Curie Actions Scheme under the Horizon 2020 funding programme. The MedTrain programme will offer 31 prestigious two-year postdoctoral fellowships over the next four and a half years to experienced researchers in the area of medical device R+D. Curam also secured funding of €1.3 million to coordinate the Marie Skłodowska-Curie Actions Initiative Training Network BrainMatTrain. This network is designed to educate and train 15 early stage researchers in functionalised biomaterials, materials science, functionalisation strategies, in vitro model systems, in vivo neuroimaging, preclinical models and prototype design, all focussed on the area of Parkinson's disease therapy.
- IPIC has secured funding of €2.5 million to lead an EU H2020 Research Infrastructure consortium called PIXAP. PIXAPP will establish the world's first open access photonic integrated circuit (PIC) assembly and packaging pilot line. It will provide Europe's SMEs with a unique one-stop-shop, enabling them to exploit the breakthrough advantages of PIC technologies.

CASE STUDY:

BIG QUESTIONS OF IRISH SCIENCE

N°26

WHAT IF mackerel could fight super-bugs?



What if Mackerel Could Fight Superbugs?

Researchers in the SFI Research Centre APC Microbiome Institute in University College Cork and at Teagasc Food Research Centre Moorpark, have discovered a protein produced by bacteria found in the intestines of mackerel fish, that can kill a wide range of harmful bacteria.

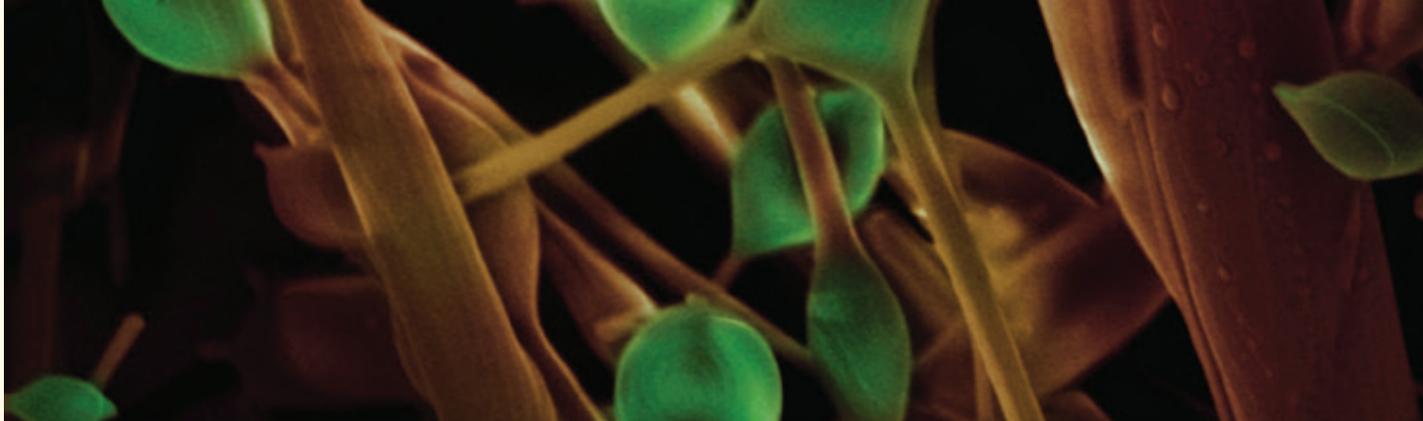
The discovery led by APC researchers, Professors Paul Ross and Colin Hill, identified that the Formicin protein, produced by an intestinal bacteria from mackerel, *Bacillus paralichenformis* APC1576, is an antimicrobial agent. Formicin is classified as a broad spectrum bacteriocin due to its ability to kill a wide range of harmful bacteria including *Staphylococcus aureus*, *Clostridium difficile* and *Listeria monocytogenes*. It is unique in terms of its charge and composition.

Antimicrobial agents such as bacteriocin offer a realistic alternative to the use of antibiotics in face of the increasing threat of drug resistance. Researchers in the APC Microbiome Institute have also identified a range of other antimicrobial bacteriocins, including Thuricin and Lacticin 3147, which will be further developed for medical use in humans and animals. Artugen Therapeutics, a spin out company founded by Profs Ross and Hill and based in Cork, was set up to exploit these novel antimicrobial compounds and bacteria to control disease-causing bacteria.

The SFI-supported research on formicin was featured as the Editors Choice in the journal *Microbiology* in October 2016.



Antimicrobial agents such as bacteriocin offer a realistic alternative to the use of antibiotics in face of the increasing threat of drug resistance.



- Researchers at the AMBER SFI Research Centre will lead an international TRANSPIRE project worth over €4.4 million euro under the European-funded “Future and Emerging Technologies - Open” (FET Open) programme. They are the first group in Ireland to coordinate such a project. The project will develop a new class of magnetic materials that could enable new, on-chip and chip-to-chip data links at least 100 times, possibly 1,000 times faster than current technology.
- Three international partnerships between SFI Research Centres and Engineering Research Centres funded by the US National Science Foundation were awarded in 2016, representing an additional investment of €3 million from SFI and a matching investment from the National Science Foundation along with significant funding from the Department for the Economy (DfE) in Northern Ireland.
 - MaREI, together with the Economic and Social Research Institute (ESRI) are collaborating with the NSF Engineering Research Centre, Future Renewable Electric Energy Delivery and Management Systems (FREEDM) and the Energy Power & Intelligent Control Research Cluster (EPIC) at Queen’s University Belfast (QUB) to determine how to optimise the generation of intermittent renewable energy at the point of consumption, while maintaining safe, secure, reliable energy at affordable prices.
 - AMBER is collaborating with the NSF Engineering Research Centre, Translational Applications of Nanoscale Multiferroic Systems (TANMS), and the Centre for Nanostructured Media (CNM) at Queen’s University Belfast to develop materials which can be used to develop high performance magnetoelectric memory cells.
 - CÚRAM is collaborating with the NSF Engineering Research Centre, Revolutionizing Metallic Biomaterials (RMB) and the Nanotechnology and Integrated Bioengineering Centre (NIBEC) at Ulster University. This project aims to develop advanced metallic biomaterials that can be used to create biodegradable orthopaedic devices.
- The MaREI Centre will lead the €10.5m EU MaRINET2 initiative, which aims to accelerate the development of offshore renewable energy technologies and infrastructure. MaRINET 2 will ensure the continued integration and enhancement of all leading European research infrastructure and facilities specialising in research, development and testing of offshore renewable energy systems, including electrical sub systems and grid integration.

Enhancing Ireland's International Reputation

SFI Research Centres are enhancing the international reputation and profile of Ireland which is in turn attracting the interest of industry to invest in Ireland.

- Prof Barry O’Sullivan, Insight, was elected Deputy President of the European Association for Artificial Intelligence (EurAI). EurAI, formerly ECCAI, was established in July 1982 as a representative body for the European artificial intelligence community. Its aim is to promote the study, research and application of Artificial Intelligence in Europe. EurAI has more than 4,500 members across more than 30 countries, making it the largest AI organisation in the world. The primary objective of the association is to promote research in, and study of, artificial intelligence, as well as representing the AI community externally.
- Emma Snapes (Biobank Manager at INFANT) is the national academic representative on the International Organization for Standardization (ISO) Technical Committee 276, that is working to develop internationally unified protocols in biobanking.
- LERO hosted the 37th International Conference on Information Systems (ICIS), in the Convention Centre, Dublin, in December 2016. The conference had a record breaking attendance of 1,547 attendees bringing more than €2 million to the Irish economy.

CASE STUDY:



International collaboration supports development of new lung disease treatment

Professor Anne Marie Healy, Investigator with AMBER and SSPC, two of Science Foundation Ireland's Research Centres, was awarded €600,000 in research funding in 2016, to develop a new inhaler for the treatment of lung disease. The funding provided by the National Institutes of Health (NIH), one of the world's foremost medical research centres based in the United States, is part of a collaborative project worth €8.8 million overall.

The funding is being used to develop a new dry powder inhaler for the treatment of lung disease, which could help millions of patients with cystic fibrosis, asthma and chronic obstructive pulmonary disease (COPD). Ireland has the highest incidence of cystic fibrosis in the world, with approximately one in 19 Irish people carrying one copy of the altered gene that causes the condition, and the fourth highest prevalence of asthma in the world, with almost 5,000 asthma admissions to hospital on average each year.

There have been no new mucolytic drugs introduced to treat lung disease in the past 20 years and only one in the past 50 years. The NIH funded research aims to design, develop and trial novel carbohydrate based compounds within a dry powder inhaler, an easily deliverable format, that could benefit millions of patients with mucus-associated lung disease.

This proposed new treatment has the potential to greatly improve the respiratory function of these patients with lung disease, thus improving overall quality of life and reducing hospital admissions. The inhaler will be the first of its kind, with clinical trials commencing within the five year project framework.

The funding provided by the National Institutes of Health (NIH), one of the world's foremost medical research centres based in the United States, is part of NIH-funded collaborations secured in Ireland worth €8.8 million.



- Prof Aljosa Smolic was awarded €4.5 million in funding through the SFI Research Professorship Programme and moved to TCD from Switzerland. His research focuses on visual computing and was showcased along with the work of the ADAPT Research Centre at an event in the Science Gallery Dublin in December 2016. That Ireland is home to such expertise was instrumental in Huawei's decision to establish its R&D Centre in video technology in Dublin, which will create 60 R&D jobs.
- Prof Andersson-Engels was awarded €6 million under the SFI Research Professorship Programme to lead the biophotonics research programme in IPIC. Prof Engels moved from Lund University, Sweden, to Cork in 2016. He was recently elected as a Fellow of The Optical Society of America (OSA). As an OSA Fellow, Prof Andersson-Engels joins a distinguished group of members who have served the Society and the optics and photonics community with distinction.

Advancing Scientific Excellence

SFI Research Centres are acting as thought leaders across a wide range of disciplines in ICT, health, energy, geosciences and pharma. They are achieving research excellence and leadership, as measured through indicators such as publication in top tier journals and conferences, citations, editorship of top tier journals, and invitations to give lectures at top tier conferences. At the end of 2016, across all 12 SFI Research Centres, over 6,000 publications (journals and conference publications) were attributed to the SFI Research Centres.

- Prof Johnathan Coleman, AMBER, published a paper in the top research journal *Science*, in December 2016, on the development of a completely new type of graphene/polymer composite that is the most sensitive electromechanical sensor ever made. This sensor can continuously measure blood pressure in a non-invasive manner and therefore could have many applications in medical devices and diagnostics.
- In November 2016, Prof Emanuele Pelucchi, IPIC, published a paper in the highly prestigious journal *Nature Photonics*, which details a significant breakthrough that advances understanding of how to harness the opportunity and power of quantum computing.

- In 2016, the SFI Research Centres attracted a further five European Research Council (ERC) grants, including an Advanced Grant, a Consolidator Grant and a Starting Grant (all awarded to AMBER researchers). Two ERC Proof-of-concept grants were awarded to AMBER and Lero.

Creating Societal Impact

SFI Research Centres are leading key national projects which will have major societal impact.

- Researchers in APC and SSPC have discovered a drug that increases appetite, in a development they believe may also point the way to a drug that can trigger weight loss. This research, published in *Scientific Reports* has the potential to reverse weight loss caused by severe illness or in those with anorexia.
- A data-based system to assess and monitor patients recovering from concussion has been developed by researchers in Insight in collaboration with Fujitsu. The platform, called KIDUKU, can quickly provide doctors with simple sensor readings that are taken using cheap, widely available technology.
- Lero is working closely with the National Council for Curriculum and Assessment (NCCA) to introduce a junior cycle course in coding. A pilot programme was launched in 2016 in collaboration with the Department of Education and Intel.

Education and Public Engagement

The SFI Research Centres are engaging the Irish public with research, inspiring future STEM students and training and educating the future cohort of engineers and scientists to take up high-value employment in MNCs and SMEs in Ireland. In 2016, the Research Centres ran 578 education and public engagement activities, reaching a total of over 6.7 million people.

Highlights include:

- Through funding awarded from the SFI Discover Programme Call, CÚRAM partnered with the Galway Film Centre to run the Science on Screen Project. This project enabled the production of two films. Feats of Modest Valour, a touching portrait of three individuals with Parkinson's Disease. Woven together with observation and animation, the film shows the ground-breaking research taking place at CÚRAM and the profound impact this will have on people with Parkinson's Disease, both nationally and worldwide. Mending Legends looked at the devastating effects of tendon injury on athletes and the team of scientists who are working to form the world's first 3D cell assembled tendon prototype.
- CONNECT displayed their interactive Smart Farm demonstration at the National Ploughing Championships in September 2016, highlighting how their research can improve farming practices utilising sensor technology. This content went on to be featured on the 2017 Big Week on the Farm programme shown on RTE, reaching an average audience of 311,000 people.
- In 2016, SFI Research Centres APC, MaREI, Infant, IPIC and Insight worked together on the development and delivery of a new Science Week festival in Cork. The Cork Science Festival focused on engaging key target audiences, along with developing strong community partnerships for Science Week and implementing outcomes from the 2015 Science Week evaluation to deliver a festival of scale and impact engaging with circa 12,000 individuals in the Cork area.

CASE STUDY:



Preventing sepsis - potential new treatment drug

An international collaboration led by Dr Steven Kerrigan, an SFI-funded researcher in the Royal College of Surgeons Ireland (RCSI), has developed a potential new drug for the prevention of sepsis. The collaboration is between RCSI's Irish Centre for Vascular Biology, the Endothelial Cell Research Group at Dublin City University and the Centre for Molecular and Vascular Biology at the University of Leuven, Belgium.

Sepsis is normally treated by prolonged use of intravenous antibiotics, a treatment option becoming more limited due to the increasing emergence of bacteria which are resistant to antibiotics. Treating sepsis costs the global economy more than €18 billion annually. The new drug may prevent the progression of sepsis by preventing bacteria from sticking to the inner-most side of a blood vessel. This prevents the bacteria from interfering with the regulation of the cells lining the blood vessel, preventing cell death and separation, which can cause blood vessel leakage and circulatory collapse.

Dr Kerrigan's research is funded by the SFI Career Development Award which supports excellent investigators in the early stages of their research career who are already in an independent academic research position.

Dr Kerrigan's research was published in the Journal of Thrombosis and Haemostasis in December 2016. A patent has been filed on the drug target and Dr Kerrigan's team aim to progress this research to human clinical trials in the near future.

Treating sepsis costs the global economy more than €18 billion annually. The new drug may prevent the progression of sepsis by preventing bacteria from sticking to the inner-most side of a blood vessel.

A Balanced Award Portfolio

New awards in 2016

Science Foundation Ireland funds a balanced portfolio of programmes, many involving national and international collaborations with both small and large companies, charities, international funders as well as national funders such as the Teagasc, Marine Institute, Environmental Protection Agency, Health Research Board, etc. Science Foundation Ireland funds across the career spectrum from early-stage researchers to mid-stage career researchers to emerging research stars and up to established highly-esteemed research leaders, through individual and collaborative awards.

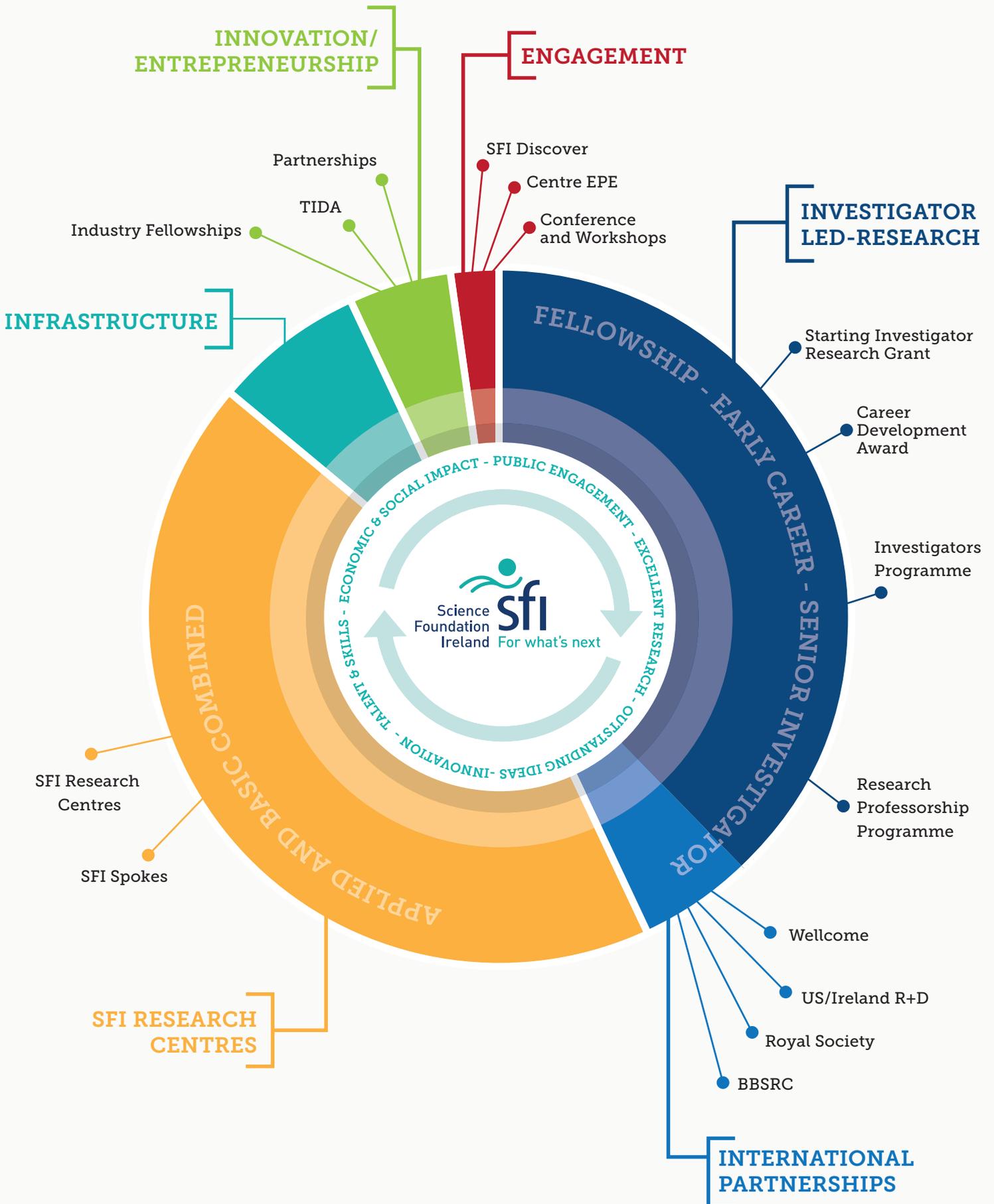
393 new awards were approved in 2016 across 20 programmes with a value of €194 million. Total payments to research bodies/institutions in 2016 were €184 million.

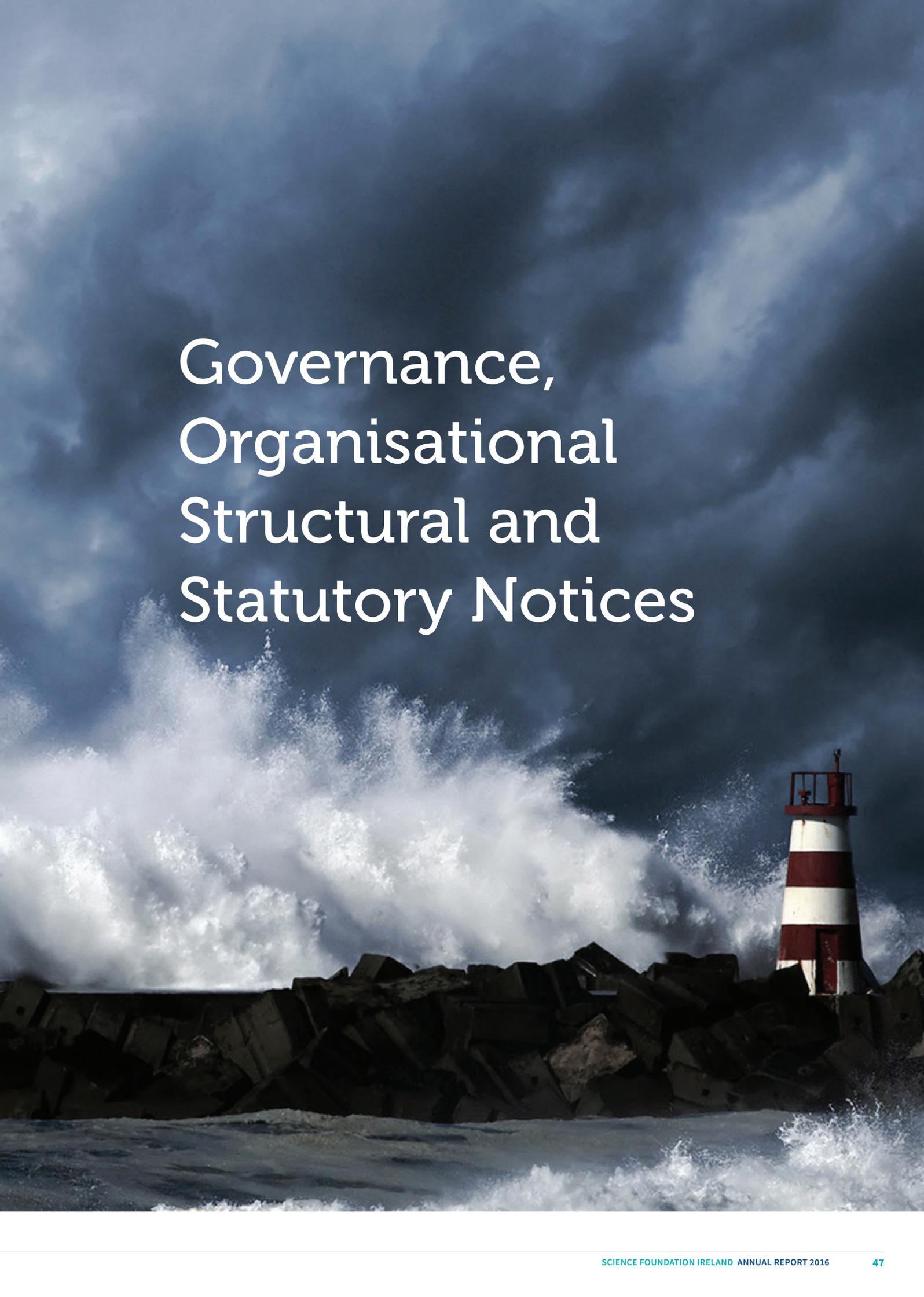
Summary of award programme decisions in 2016:

- 53 awards were made to support early career years through an investment of €28.4 million under the Starting Investigator Research Grant and Career Development Award programmes.
- Five awards were made to attract world leading researchers to Ireland through an investment of €29 million under the SFI Research Professor Programme in key sectors such as digital content, advanced manufacturing and medical devices.
- SFI's research infrastructure programme funded 38 research equipment and facilities awards valued at €47 million to support 36 key research infrastructure projects. These awards were in strategically important sectors, including animal and human health, internet of things, networks and manufacturing.
- 59 awards were made as part of the SFI Discover Programme totaling €3.2 million to support the education and engagement of the public and young people in STEM.
- 34 outstanding senior researchers were supported by an investment of €45 million through the SFI Investigator Programme. Co-funding for seven of the projects is being provided by the Department for the Economy, Northern Ireland, the Geological Survey of Ireland, the Marine Institute, and the Environmental Protection Agency.
- Ten awards were made under the new BBSRC-SFI Joint Partnership involving an investment of €4.9 million
- Five awards funded under the SFI-Royal Society Partnership Scheme resulted in prestigious Royal Society University Fellowship (URF) awards to Irish early career researchers. The newly appointed research fellows will be working on a wide range of research areas including applying mathematical models to solve biomedical problems, understanding evolution of cooperation in humans, probing the evolution of cyanobacteria and their role in oxygenation of the early earth, the modelling of atomistic processes of radiation damage in materials for nuclear power generation, characterisation of habitable worlds and addressing fundamental questions in the field of low energy nuclear physics.
- 45 awards funded under the SFI Technology Innovation Award Programme (TIDA) with an investment of €4.5 million.
- 34 awards valued at €2.5 million were approved under the SFI Industry Fellowship Programme aimed at providing researchers with first hand experience of working in an industry research environment.
- €10 million was approved to support four key strategic Partnership Awards with industry.
- Four awards valued at €2.5 million were approved under the ERC development programme aimed at increasing our success rate.

Full details of all awards and grant commitments made by programme are outlined on page 81.

Science Foundation Ireland Portfolio 2016



A dramatic seascape featuring a lighthouse with red and white horizontal stripes on the right side. The lighthouse is situated on a dark, rocky breakwater. Large, white-capped waves are crashing against the breakwater, creating a massive spray of water that fills the middle ground. The sky is filled with dark, heavy, grey clouds, suggesting an approaching storm. The overall mood is one of resilience and strength.

Governance, Organisational Structural and Statutory Notices

Science Foundation Ireland Board Members



Ms Ann Riordan, Chairman of Science Foundation Ireland

An experienced board member, Ann Riordan has held several senior positions in the ICT sector. Notably she established Microsoft Ireland in 1990 and was instrumental in establishing the Fastrack to IT (FIT) initiative which has to date trained over 18,000 long-term unemployed people. She has served on the Information Society Steering Committee and the Irish Council for Science, Technology & Innovation. Since her retirement from Microsoft she has served as: President of the Institute of Directors in Ireland; Chairman of the National Standards Authority of Ireland; Chairman of Tourism Ireland; Chairman of the Dublin Regional Tourism Authority and as a public interest director of the EBS Building Society.



Prof Mark W.J. Ferguson, Director General, Science Foundation Ireland and Chief Scientific Adviser to the Government of Ireland

Professor Mark Ferguson commenced as Director General of Science Foundation Ireland in January 2012 and as Chief Scientific Adviser to the Government of Ireland in October 2012. Prof Ferguson is a founding member of the Small Advanced Economies Initiative, Chair of the eHealth Ireland Committee, a member of EU High Level Expert Group on H2020 Impact and has been involved in a number of international reviews of R&D systems, including Hungary and Canada. Mark Ferguson graduated from the Queens University of Belfast with degrees in Dentistry (BDS 1st class honours), Anatomy and Embryology (BSc 1st class honours, PhD) and Medical Sciences (DMedSc), holds Fellowships from the Royal Colleges of Surgeons in Ireland (FFD), and Edinburgh (FDS) and is a Founding Fellow of the UK Academy of Medical Sciences (FMedSci). He is a member or Fellow of a number of learned Societies, and was made a "Commander of the British Empire" (CBE) by the Queen in 1999 for services to Health and Life Sciences.



Prof Sir Tom Blundell is Director of Research and Professor Emeritus in Biochemistry, University of Cambridge

Professor Sir Tom Blundell is Director of Research and Professor Emeritus in Biochemistry, University of Cambridge. He has previously held teaching and research positions in the Universities of London, Sussex and Oxford and leads an active research team in structural and computational biology. Co-founder of Astex Therapeutics, he has also been a member of a number of Boards or Scientific Advisory Boards of both pharma and biotech companies including SKB, Celltech and UCB. Tom has held several prestigious roles in public bodies, Royal Commissions and Charities including as a member of the advisory group to the Prime Minister and founding CEO and Chair of the UK Biotechnology and Biological Sciences Research Council. Tom was knighted in 1997 and is a member of several academies. He has received numerous international awards, prizes, medals and honours for his research work and holds Honorary Doctorates from 16 Universities.



Mr Liam Madden, Senior Vice President of Engineering at Xilinx

Liam Madden leads a world-wide organization of R&D professionals, including teams in Dublin and Cork. Mr Madden has spent more than 30 years in the US semiconductor industry where he has contributed to a range of industry leading products and technologies. Based in Silicon Valley, he has worked with established companies and start-ups, including a leadership role in a successful IPO. Mr Madden is a regular speaker at university and industry events worldwide. He holds five patents in semiconductor technology. He is a Fellow of Engineers Ireland and in June 2013 was appointed an Adjunct Professor of Electrical, Electronic and Communication Engineering at UCD.



Dr Rita Colwell is Professor both at the University of Maryland at College Park and at Johns Hopkins University Bloomberg School of Public Health and Chairperson of CosmosID Bioinformatics Inc.

Dr Colwell served as the 11th Director of the US National Science Foundation (NSF) from 1998-2004. In her capacity as NSF Director, amongst other initiatives, she broadened the NSF range of programmes including cyber infrastructure and also special interaction in science and mathematics education, graduate science and engineering education and the increased participation of women and minorities in science and engineering. Dr Colwell is a member of the U.S. National Academy of Sciences and has a number of honorary doctorates and serves on science advisory boards worldwide. She received the National Medal of Science from the President of the United States in 2006.



Ms Bernie Cullinan, CEO of Pragma Advisory

Bernie Cullinan is CEO of Pragma Advisory, a company providing strategic and operational advisory solutions for companies in the SME sector in a broad range of domains. Bernie is also a director of Crest Solutions Limited, Crest Solutions (T.S) UK Limited and Each&Other. Bernie has held C-level positions in a number of Irish technology companies and continues to be active in this sector. In these roles, Bernie has played a key role in driving growth and shareholder value in the US, UK and Ireland. Bernie is a past Chairman of the Irish Software Association. Bernie has a BComm from UCD, an MBA from UCD and is a Fellow of the Chartered Institute of Management Accountants (CIMA). Bernie is a past President of CIMA and is a member of the DCU Educational Trust.



Ms Mary Doyle, Deputy Secretary General, Department of Education and Skills

Mary Doyle sits on the SFI Board as the appointee of the Minister of Education and Skills. Mary took up her current role in the Department of Education and Skills in June 2012 where she leads the Higher Education Division in the Department. She has worked in the Departments of the Taoiseach, Health, and was Director General in the Office/ Department of the Minister for Children and Youth Affairs. She has been a member of the National Economic and Social Council and the National Statistics Board and a Forum Member of the Economic and Social Research Institute. She holds a degree in European Studies from the University of Limerick and a Masters in Public Service Management from Trinity/Irish Management Institute.



Ms Geraldine Ruane, Chief Operating Officer, Trinity College Dublin

Geraldine Ruane is an innovative senior executive with a track record of leading the transformation of blue chip multi-disciplined organisations in both the private and public sectors, creating high performing national and international profitable organisations. As a Chief Executive, Board Member, Chartered Director and Accountant Geraldine possesses broad and deep experience and knowledge of customer focused growth companies in various sectors including Pharmaceutical, ICT, Financial Services, Industrial Services, and Higher Education. In these sectors, Geraldine has developed and implemented strategies, designed, developed and implemented major change management programmes. Known for her consultative management style, she has a keen focus on strong leadership, team development and delivering significant business results.



Mr Aidan W. Donnelly, M.D. of Advest Management Ltd

Aidan Donnelly is the M.D. of Advest Management Ltd., a private equity fund management company. In addition, he is Chairman of NORA, the Irish government agency responsible for Ireland's National Oil Reserves and has a number of interests in renewable and environmental start-up companies. Aidan has extensive experience in the development and management of technology-oriented multinationals in Ireland such as Xerox (Europe) Ltd. Quantum Peripheral Products Ltd., Puritan Bennett, Cabletron Systems, Betdaq (Global Betting Exchange Ltd.) and most recently, ServeCentric Ltd. For over 12 years, Aidan also served in the Irish army, holding the rank of Captain in the Army Ordnance Corp. He earned a M.B.A. (UCG), M.I.E. (UCD) and a B.Sc. (UCG). He is a Chartered Director (C.Dir.) with the IOD.



Mr Barry O'Sullivan, CEO of Altocloud

Barry O'Sullivan is CEO of Altocloud, a software company with a mission of improving customer engagement experiences for ecommerce and inside sales. Prior to Altocloud, he was SVP at Cisco Systems and has been General Manager of several multi-billion dollar divisions including Collaboration and Voice over IP, which he led from number six to the number one market share position worldwide. O'Sullivan has spent most of his career in Silicon Valley, joining Cisco in 2002, having previously been General Manager of Nortel's contact centre software business. He is co-founder of the Irish Technology Leadership Group. He holds a Bachelors Degree in electrical engineering from UCC and a Masters Degree in computer science from the University of Limerick, as well as a Masters degree in business administration from Santa Clara University, California.



Dr Pat Duane, Vice President & General Manager, Interventional with Creganna Medical

Pat Duane is first and foremost a scientist, who has spent most of his 26 years working in the medical device industry sector. Currently Pat is Vice President and General Manager, Interventional with Creganna Medical part of TE Connectivity. He has extensive national and international leadership experience and currently leads a diverse business organisation, with cross functional representatives across 3 continents. Prior experience includes senior business, research and operational roles in Medtronic Inc. Pat holds a Doctorate in Business from Henley Management College, London and his area of interest is the post-acquisition integration of small or medium enterprises into multi-national corporations. Pat holds a Masters in Engineering Design from University College Dublin and a BSc. in Applied Physics from National University of Ireland, Galway. Pat is passionate about innovation and a named inventor on over 12 internationally issued patents.



Mr Dermot Mulligan, Assistant Secretary General, Department of Jobs, Enterprise & Innovation

Dermot Mulligan is Assistant Secretary General/Head of the Innovation and Investment Division of the Department of Jobs, Enterprise and Innovation. He reports to the Secretary General of the Department and the Minister and his areas of responsibility include formulation and implementation of Government policy on Innovation (including Science, Technology, Research and Development), Foreign Direct Investment and North/South Trade. He has previously worked in a range of Government Departments including the Departments of Health, Finance and Education & Skills. He holds a first degree in Law and an M.Sc. (Economics) in Policy Studies from Trinity College Dublin and an MBA from the University of Warwick.

Executive Team



Prof Mark Ferguson, Director General, SFI and Chief Scientific Adviser to the Government of Ireland

See full profile on page 48.



Mr Donal Keane, B.Comm FCA, Chief Operations Officer

Mr Donal Keane was appointed Chief Operations Officer at Science Foundation Ireland with effect from 1 November 2005, with responsibility for Grants, IT, Finance, HR and Facilities. Donal joined SFI from Dun Laoghaire Institute of Art, Design and Technology where he held the position of Secretary/Financial Controller from 1997 to 2005.

Prior to that Keane held senior management positions at Our Lady of Lourdes Hospital Drogheda, GE Capital and Wang Finance in both Dublin and Toronto, Canada. His professional training was undertaken at Coopers & Lybrand from 1978 to 1982. Donal Keane holds a B.Comm degree from University College Dublin and is a Fellow of the Institute of Chartered Accountants in Ireland.



Dr Ruth Freeman Director - Strategy and Communications

Dr Abigail Ruth Freeman was appointed as Director of Strategy and Communications in 2013. Prior to her current appointment Dr Freeman has held a series of positions at Science Foundation Ireland, including Director of Programmes, Enterprise and International Affairs, with responsibility for overseeing all Science Foundation Ireland research funding programmes and management of funded awards, as well as the Foundation's activities in conjunction with industry and international partners. Prior to this, Dr Freeman held roles as both Director of Enterprise and International Affairs and Head of Industry-Research Development. Dr Freeman joined Science Foundation Ireland as a Scientific Programme Manager in November 2006.

Prior to joining Science Foundation Ireland Dr Freeman was working as a researcher at Trinity College Dublin (TCD). She holds PhD and Bachelor degrees in Genetics from TCD. During her time there as a student she was awarded a Trinity scholarship, the Eli Lilly Chemistry Prize and the Roberts prize for Biology. Dr Freeman's PhD research, on population genetics in hybrid zones, was funded by a prestigious studentship from the Wellcome Trust and was carried out at TCD and ILRI, Nairobi. She was a founding member of the Trinity Research Staff Association; the first Irish association representing contract researchers.



Dr Darrin Morrissey Director of Programmes

Dr Darrin Morrissey was appointed SFI Director of Programmes in September 2014. Darrin joined SFI from Stiefel, a GlaxoSmithKline (GSK)-owned company that develops and manufactures dermatology products. At Stiefel, he held the role of Business Improvement Director and was responsible for leading strategy deployment, change management and business transformation.

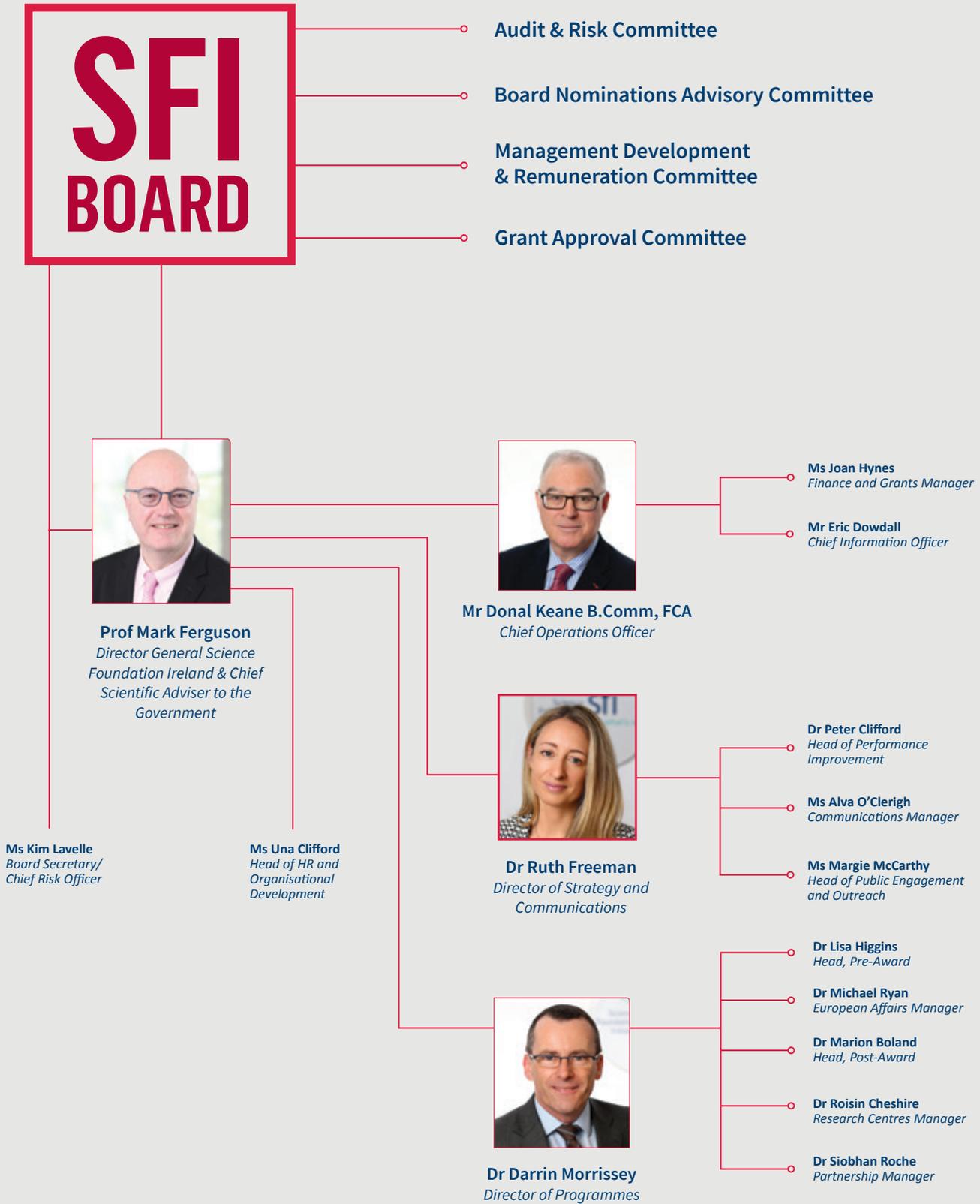
Darrin originally joined GSK in 2007 as Head of Oncology for Ireland and led the establishment of GSK's oncology business and the launch of its oncology and haematology therapeutics portfolio. During his time with GSK Darrin also held the role of Global Oncology Marketing Director with responsibility for developing launch strategy for melanoma therapy assets.

Prior to his time with GSK, Darrin worked across a number of pharmaceutical and biotech companies – including Sanofi-aventis, Eli Lilly & Tibotec-Virco – in a variety of commercial and clinical research roles.

Darrin qualified with a BSc in Microbiology and he holds a PhD from University College Cork. His PhD research focused on the molecular mechanisms that underlie cancer metastasis. He also worked as a postdoctoral researcher in UCC, where he conducted 'first-in-human' clinical trials of probiotic bacteria-containing food products.

Darrin also holds a Diploma in Advanced Management Practice awarded by NUI Galway.

Organisation Structure



Chairman's Statement on Corporate Governance

Science Foundation Ireland was established as a body corporate by the Industrial Development (Science Foundation Ireland) Act 2013, as amended. The members of the Board of Science Foundation Ireland constitute the members of the agency. In 2015, the Board achieved Swift3000 certification from the National Standards Authority of Ireland, following a rigorous audit of its adherence to the highest principles of corporate governance. In 2016 we have continued to observe these principles. The Board conducted a self-assessment in December 2016. The Board noted the approval of a new Code of Practice on the Governance of State Bodies in 2016 and received a briefing on its terms. The new code came into effect for accounting periods commencing on or after the 1st September, 2016. In respect of the year ended 31 December 2016, SFI is compliant with the 2009 Code of Practice for the Governance of State Bodies and has made significant progress in implementing the provisions of the 2016 Code. The Financial Statements for 2016 reflect the requirements of the Code of Practice for the Governance of State Bodies 2009 and elements of the 2016 revised code relating to financial disclosures.

How the Board Operates

The Chairman leads the Board and ensures its effectiveness. The Chairman also organises its business and sets its agenda with input from the Director General. In addition to the Chairman, there are currently ten independent non-executive Board Members, national and international, who have a range of strong and complementary skills, including scientific experts and outstanding researchers, representatives from SME's and MNCs and members who have expertise in the areas of corporate governance, risk management, entrepreneurship, marketing and finance. The Board includes a representative from the Department of Jobs, Enterprise & Innovation and from the Department of Education & Skills who have expertise in areas directly relevant to the activities of Science Foundation Ireland.

The Board has approved a schedule of matters reserved to it and its duly authorised Committees for decision. Matters reserved to the Board include the approval of strategic plans, approval of annual plans and budgets, approval of grants in excess of specified financial thresholds, approval of annual

reports and financial statements. Matters delegated by the Board to management include implementation of the Board approved strategy, day-to-day management and operation of the business and the implementation of risk management policies and processes.

Before each Board and Committee meeting, relevant reports and papers are circulated to Board members. At regular intervals, the Board receives reports on grant expenditure, management accounts and updates on the progress and implementation of the strategic plan. The Board has the opportunity to discuss and challenge/question these reports and updates with the Director General and other senior management, who attend all or part of the Board meetings.

The key responsibilities and areas of focus for the Board are:

- Engagement – inviting representatives of key stakeholders including from third parties who operate in the area of scientific research, funding, third level education sector or those who are involved in collaborations with industry to attend Board meetings and discuss relevant matters with the Board.
- Strategy – review and discuss reports and updates relating to key strategic topics, including national policy initiatives and to monitor performance against KPIs set out in Science Foundation Ireland's strategy, Agenda 2020
- Financial and operational performance – review and monitor the performance of Science Foundation Ireland, including through regular reporting and discussions with the Director General and other senior management at the Board and Audit & Risk Committee.
- Senior management – ensure that the senior management team has the skills and resources to deliver Science Foundation Ireland's objectives and that appropriate succession and contingency planning is in place.
- Evaluation and composition – review the performance of the Board and its Committees to ensure that they are effective. Ensure that the Board and its Committees comprise competent and capable individuals with a range of skills and experience who bring independent views to the decisions being made.
- Internal controls – maintain an appropriate internal control framework.
- Risk – ensure that there are effective risk management policies and processes in place and an appropriate governance structure.

Board's Responsibilities

The Board has collective responsibility to establish the strategic direction of the Foundation within the legislative framework and allocated resources. The Board holds overall responsibility for the discharge of key functions specified in relevant legislation. The Board is responsible to set the ethical tone of the Foundation by its own actions but also in overseeing senior management and staff to ensure that Science Foundation's values, good standards of governance and ethical behaviours permeate all levels of the Foundation.

The Board directs and supports the Director General to ensure that the Foundation complies with relevant obligations, to assure the Foundation's system of internal financial control and risk management, to ensure full compliance with corporate governance requirements both in terms of the activities of the Foundation and in terms of their own dealings with the Foundation. The Board, principally through the Audit & Risk Committee monitors the risk management framework and receives reports on the principal risks facing the Foundation, including the management response to them. The Board supervises and approves the production of the Annual Report and Accounts. The Board approves the annual budget, capital and revenue budgets and monitors expenditure. An annual business plan shall be approved by the Board and submitted to the Minister and an Oversight Agreement and Performance Delivery Agreement agreed with the Department each year or as otherwise required. Service Level Agreements shall be amended as required. The Board oversees that a qualified management team and a robust management structure are in place.

Chair's Responsibilities

The Chairperson's primary duties are to organise the Board and set the agenda for Board meetings in consultation with the Director General, taking into account strategic matters and concerns of Board members and to chair all Board meetings. The Chairperson also ensures that the Board receive accurate, timely and clear information about the Foundation's performance in order that the Board can take sound decisions and monitor effectively. As Chair of the Board Nominations Advisory Committee, the Chair leads the review of Board membership to ensure there are no skills gaps and advises the relevant Minister of any such views sufficiently in advance of when Board vacancies are due to arise.

The Chairperson ensures Board members receive induction and are offered opportunities for development and training so as to best ensure Board effectiveness. As Chair of the Management Development & Remuneration Committee, the Chair leads the Committee in reviewing the performance of the Director General and setting annual objectives, in ensuring that the senior management team has the skills and resources to deliver Science Foundation Ireland's objectives and that appropriate succession and contingency planning is in place. The Chairperson takes a lead in establishing the highest standards of corporate governance and ensures compliance with the Code of Practice for the Governance of State Bodies.

Director General's Responsibilities

The functions, powers and duties of the Director General are provided for in the 2003 founding legislation. This sets out inter alia that the Director General is responsible for the development of key divisions of the Foundation including the strategic management of policy, grants, finance, communications and international functions so as to support the development of a high performance organisation.

The Director General is also responsible for the implementation of the Board's plans and policies and the development of strategic plans for the Foundation. The Director General is also charged with the enhancement of the national and international reputation of Science Foundation Ireland and thereby of scientific research in Ireland. The Director General meets with the Minister for Jobs, Enterprise and Innovation as a stakeholder and develops appropriate relationships with sister agencies and other research funding bodies. The Director General submits strategic plans and proposed budgets to the Board and reports to the Board on progress of Science Foundation Ireland's development and operations based on the setting of targets and agreement of key performance indicators. The Director General is also responsible for ensuring the Foundation has appropriate policies on staffing, procurement, compliance, IT, communications and risk management and monitors adherence to the policies. In terms of development, the Director General ensures that policies on growth and service diversification are effectively planned and implemented. Director General also sets the ethical tone of the Foundation by its own actions but also in overseeing senior management and staff to ensure that Science Foundation Ireland's values, good standards of governance and ethical behaviours permeate all levels of the Foundation.

Board Secretary's Responsibilities

The Board Secretary is responsible to the Foundation for good governance and for the guidance of the Board in its effective execution of its tasks. The Board Secretary keeps up to date with relevant legal, statutory and regulatory requirements and must also be in a position to support non-executive Board members in the discharge of their duties. The Board Secretary is responsible for ensuring the appointment of Board members is properly carried out and assists with induction and training of Board members. The Board Secretary organises Board and Board Committee meetings, facilitates the flow of high quality information to Board members to ensure the Board can carry out its duties effectively and to ensure that the Board's decisions and instructions are properly communicated and carried out. The Board Secretary is responsible for reviewing developments in Corporate Governance, Ethics, ensuring compliance with the Code of Practice for the Governance of State Bodies and for ensuring that the principles of good governance are adhered to.

Science Foundation Ireland Board

The Science Foundation Ireland Board normally consists of 12 members appointed by the Minister for Jobs, Enterprise and Innovation, as set out in Section 8 of the Industrial Development (Science Foundation Ireland) Act 2003. The quorum for the Science Foundation Ireland Board is five members.

Six meetings were held in 2016 as follows:

Date	Venue	Number of Attendees
8 February 2016	Board Room, Wilton Park House	10/12
14 April 2016	Board Room, Wilton Park House	11/12
10 June 2016	Board Room, Wilton Park House	12/12
12 September 2016	Analog Devices Building, University of Limerick	8/12
24 October 2016	Board Room, Wilton Park House	10/12
12 December 2016	Board Room, Wilton Park House	11/12

Science Foundation Ireland Board Membership

Board Members 2016

Name of Director	Attendance at Board Meetings (6 meetings)
Ms Ann Riordan (Chairman)	6 out of 6
Ms Bernie Cullinan (Deputy Chair)	5 out of 6
Prof Sir Tom Blundell	6 out of 6
Dr Rita Colwell	3 out of 6
Mr Aidan Donnelly	6 out of 6
Ms Mary Doyle	5 out of 6
Dr Pat Duane	4 out of 6
Prof Mark Ferguson	6 out of 6
Prof Liam Madden	5 out of 6
Mr Barry O'Sullivan	6 out of 6
Ms Geraldine Ruane	5 out of 6
Mr Dermot Mulligan	5 out of 6

(1) In compliance with Sections 9(3) and 9(4) of the Industrial Development (Science Foundation Ireland) Act 2003 relating to Board Membership, the following Board Members were re-appointed to the SFI Board in August 2016:

- Professor Rita Colwell; and
- Ms Mary Doyle

Board Committees

Audit & Risk Committee

The Audit Committee monitors the system of internal controls and financial safeguards, oversees the internal audit function and the conduct of audits of Science Foundation Ireland grants made to external institutions. The Committee ensures a system to monitor risk and provide for mitigating actions is in place and kept up-to-date. The Committee also monitors and reviews Science Foundation Ireland financial reports on a regular basis including the Annual Financial Statements. The Committee is also responsible to oversee compliance with corporate governance requirements, including with the Code of Practice for the Governance of State Bodies as updated in September 2016.

Number of meetings: 7

Chair: Bernie Cullinan,

Membership: Geraldine Ruane, Aidan Donnelly, Marcus Breathnach

Audit & Risk Committee	2016
Bernie Cullinan	6 out of 7
Geraldine Ruane	4 out of 7
Aidan Donnelly	7 out of 7
Marcus Breathnach	7 out of 7

During 2016, the Science Foundation Ireland Audit & Risk Committee consisted of 4 members. Membership includes a representative from the Department of Enterprise, Jobs & Innovation and two of the members are qualified accountants and one has significant experience and training in the area of risk management. Audit & Risk Committee meetings are attended by the Director General, the Chief Operations Officer, the Finance & Grants Manager and the Chief Risk Officer (also the Secretary to the Committee). At the commencement of each meeting, the Audit & Risk Committee meet without the members of the management team and the Internal Audit Coordinator being present. Further, the Committee holds an “in camera” session with the Internal Audit Coordinator at the close of each meeting. At each Audit Committee meeting, the Committee received an update report from the Internal Audit Coordinator, including a copy of any audit reports completed for review.

During 2016, the Audit Committee presided over the tender for the provision of Internal Audit services to the Foundation resulting in the re-appointment of Mazars from July 2016. A representative from the C&AG Office attended the December Audit & Risk Committee meeting and the members of the Audit & Risk Committee held a session with the C&AG representative without the management team present as required under the Code of Practice for the Governance of State Bodies. The Committee reviewed the Science Foundation Ireland Risk Register as a standing item at each meeting, including any updates thereto. Cyber security was a key theme in risk management for Science Foundation Ireland in 2016. The Committee also received updates in terms of risk training and risk awareness measures implemented in Science Foundation Ireland in 2016. Also as a standing item, the Committee had regular updates on financial matters through the provision of Monthly Management Accounts and Grants Expenditure Reports. A revised Terms of Reference for the Audit & Risk Committee was approved in February 2016 following dissolution of the Corporate Governance Committee and transfer of responsibilities to the Audit & Risk Committee. The Audit & Risk Committee noted the adoption of a new Code of Practice for the Governance of State Bodies in September 2016 and was updated in terms of implementation timelines and Departmental overview.

Board Nominations Advisory Committee

The Board Nominations Advisory Committee considers the skill sets required on the Science Foundation Ireland Board as well as relevant areas of expertise and advises the Minister of Enterprise, Jobs and Innovation accordingly when Board vacancies arise. The Terms of Reference of the Committee was changed in February 2017 when the Committee assumed responsibility for reviewing Codes of Conduct and oversight of the Board induction process.

Number of meetings: 1

Chair: Ann Riordan

Membership: Mark Ferguson, Dermot Mulligan

Nominations Advisory Committee	2016
Ann Riordan	1 out of 1
Mark Ferguson	1 out of 1
Dermot Mulligan	1 out of 1

In 2016, the Board Nominations Advisory Committee reviewed Board retirements for the coming 24-month period and beyond. The Skills Matrix outlining the key skills/profiles required on the SFI Board was reviewed in the context of the pending retirements and any gaps in competencies which may arise. Recommendations were made to the Minister in terms of the rotation of Board members, having due regard for the benefits of continuity and harnessing experience as well as of diversity on the Board including gender.

The Committee took into account the relevant provisions of the new Code of Practice for the Governance of State Bodies, including those relating to renewal of Board appointments. The Committee also reviewed membership of the Board Committees. The Committee agreed to the proposed change to its Terms of Reference to include reviewing the Codes of Conduct and oversight of Board inductions, which change was approved by the Board in February 2017.

Management Development & Remuneration Committee

The Management Development & Remuneration Committee reviews the performance of the senior management team and oversees the Foundation's planning for management development and succession.

Number of meetings: 2

Chair: Ann Riordan

Membership: Ann Riordan, Bernie Cullinan

Management Development Committee	2016
Bernie Cullinan	2 out of 2
Ann Riordan	2 out of 2

Grant Approval Committee

The Science Foundation Ireland Grant Approval Committee is delegated the power to approve research grant proposals in line with the delegated authority levels approved by the Board.

Number of meetings: 6

Chair: Liam Madden

Membership: Liam Madden, Pat Duane, Barry O'Sullivan, Rita Colwell, Martin Lyes, Mark Ferguson

Grant Approvals Committee	2016
Liam Madden	6 out of 6
Pat Duane	2 out of 6
Barry O'Sullivan	5 out of 6
Rita Colwell	2 out of 6
Martin Lyes	6 out of 6
Mark Ferguson	6 out of 6

The Grant Approval Committee met six times during 2016 and approved 69 awards including three awards under the Research Professorship Programme and three awards under the Strategic Partnerships Programme. In February 2016, the Committee also reviewed the SFI Terms & Conditions related to termination and suspension of awards and remedies available to SFI. The GAC received an update on the implementation of an earlier review of SFI Peer Review Procedures in June 2016. This evaluation was undertaken by an independent Review Group comprising three experts between March and July 2015. The overall assessment was that the Review Group was impressed by the quality and integrity of the peer review procedures employed by SFI and concluded that they are fair, professional and in keeping with international standards of peer review, however some recommendations were made and actions were agreed upon. The Committee initiated an evaluation of the GAC which will be conducted during 2017.

Induction and Professional Development

As there were no new Board members appointed in 2016, there was no Induction Sessions held. As part of organisational training the SFI Board received a presentation on unconscious bias. In October 2016, the Board received a briefing on Board member duties and responsibilities and were provided with overview of the Code of Practice on Governance of State Bodies.

Risk Management

The SFI Board has adopted the SFI Risk Policy & Strategy. This outlines the risk management system in place and sets out the roles and responsibilities of the various stakeholders who are involved with the management of risk. It is the policy of SFI to adhere to best practice in the area of risk management. The Policy & Strategy sets out the process by which SFI identifies and addresses the key risks attached to its activities. These risks are compiled by the Management Risk Committee with the input and support of the Executive Committee and reported on at regular intervals to the SFI Audit & Risk Committee and to the Board, including associated mitigation measures, controls and updates.

Statutory and Other Notices

1. Board Members – Register of Interests

The Board operates to the best practice corporate governance principles and in accordance with the guidelines set out in the Code of Practice for the Governance of State Bodies, as issued by the Department of Finance, both in its activities and in its use of committees. In accordance with these guidelines, Science Foundation Ireland Board Members register their interests in other undertakings with the Secretary.

2. Ethics in Public Office Acts, 1995 and Standards in Public Offices Act, 2001

Science Foundation Ireland became subject to the Ethics in Public Office Acts 1995 and 2001 on the 1 January 2005. Science Foundation Ireland has complied with the provisions of the Act.

3. Freedom of Information Act, 1997, Freedom of Information (Amendment) Act, 2003 and Freedom of Information Act 2014

Science Foundation Ireland became a prescribed body under the Freedom of Information Act, 1997 from 31 May 2006. Science Foundation Ireland complies fully with the Act. Requests for information under this Act should be addressed to the FOI Officer, Science Foundation Ireland, Wilton Park House, Wilton Place, Dublin 2. In 2016 SFI received 3 FOI requests.

4. Prompt Payment of Accounts Act, 1997

4.(i) Prompt Payment of Accounts Act, 1997

Science Foundation Ireland comes under the remit of the Prompt Payment of Accounts Act, 1997 which came into effect on 2 January 1998, and the European Communities (Late Payment in Commercial Transactions) Regulations 2002, which came into effect on the 7 August 2002. It is the policy of Science Foundation Ireland to ensure that all invoices are paid promptly. Specific procedures are in place that enable SFI to track all invoices and ensure that payments are made before the due date. Invoices are registered daily and electronic payments are issued as required to ensure timely payments. Management is satisfied that Science Foundation Ireland complied with the provisions of the Act in all material respects.

4. (ii) Prompt payment to Suppliers

Science Foundation Ireland is committed to meeting its obligations under the 15 day Prompt Payment Rule, which came into effect on 1st July 2011. This provision ensures that payments to suppliers in respect of all valid invoices received will be made within 15 calendar days. Science Foundation Ireland reports quarterly in the “About SFI - Customer Service” section of the website on the implementation of the 15 day Prompt Payments Rule.

5. Employment Equality Acts 1998 and 2004

Science Foundation Ireland wholeheartedly supports the principle of equal opportunities in employment. It opposes all forms of discrimination on the grounds of colour, race, nationality, sexual orientation, ethnic or national origin (and/or area of origin), religion, gender, marital status, age or disability. Science Foundation Ireland's commitment to implementing equal opportunities is reflected in its policies, practices and procedures, recruitment, promotion, training, use of non-discriminatory language in company documents and publications. The objective is to ensure that all staff are selected and treated only on the basis of their abilities, knowledge and qualifications.

6. Protected Disclosures Act, 2014

There were no protected disclosures made to Science Foundation in 2016.

7. Safety, Health and Welfare at Work Act 2005

In accordance with the above Act, Science Foundation Ireland in consultation with IDA implements appropriate measures to protect the safety, health and welfare of all employees and visitors within its offices.

8. Clients' Charter

Science Foundation Ireland has published a Clients' Charter setting out its commitment to a high quality of service. This Charter includes a procedure for dealing with complaints. In 2016, no complaints were received under the Charter.

9. Reporting by Public Sector Bodies

Under Statutory Instrument (SI) 542, 2009 the public sector has specific energy reporting obligations. SFI's offices are located in Wilton Park House, Wilton Place, Dublin 2. The building facilities are managed by IDA. In each area relevant to energy usage and services to the building, SFI is satisfied that IDA endeavours to employ the most energy efficient and environmentally friendly means available. In compliance with Statutory Instrument (SI) 542, 2009, Science Foundation Ireland has reported details of energy usage for 2016 through the public sector monitoring & reporting (M&R) website.



Annual Financial Statements

Report of Comptroller & Auditor General

Report for presentation to the Houses of the Oireachtas

Science Foundation Ireland

I have audited the financial statements of Science Foundation Ireland for the year ended 31 December 2016 under the Industrial Development (Science Foundation Ireland) Act 2003. The financial statements comprise the statement of income and expenditure and retained revenue reserves, the statement of comprehensive income, the statement of financial position, the statement of cash flows and the related notes. The financial statements have been prepared in the form prescribed under Section 24 of the Act, and in accordance with generally accepted accounting practice.

Responsibilities of the Members of the Board

The Board is responsible for the preparation of the financial statements, for ensuring that they give a true and fair view and for ensuring the regularity of transactions.

Responsibilities of the Comptroller and Auditor General

My responsibility is to audit the financial statements and to report on them in accordance with applicable law.

My audit is conducted by reference to the special considerations which attach to State bodies in relation to their management and operation.

My audit is carried out in accordance with the International Standards on Auditing (UK and Ireland) and in compliance with the Auditing Practices Board's Ethical Standards for Auditors.

Scope of audit of the financial statements

An audit involves obtaining evidence about the amounts and disclosures in the financial statements, sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of

- ▶ whether the accounting policies are appropriate to Science Foundation Ireland's circumstances, and have been consistently applied and adequately disclosed
- ▶ the reasonableness of significant accounting estimates made in the preparation of the financial statements, and
- ▶ the overall presentation of the financial statements.

I also seek to obtain evidence about the regularity of financial transactions in the course of audit.

In addition, I read Science Foundation Ireland's annual report to identify material inconsistencies with the audited financial statements and to identify any information that is apparently materially incorrect based on, or materially inconsistent with, the knowledge acquired by me in the course of performing the audit. If I become aware of any apparent material misstatements or inconsistencies, I consider the implications for my report.

Opinion on the financial statements

In my opinion, the financial statements:

- ▶ give a true and fair view of the assets, liabilities and financial position of Science Foundation Ireland as at 31 December 2016 and of its income and expenditure for 2016; and
- ▶ have been properly prepared in accordance with generally accepted accounting practice.

In my opinion, the accounting records of Science Foundation Ireland were sufficient to permit the financial statements to be readily and properly audited. The financial statements are in agreement with the accounting records.

Matters on which I report by exception

I report by exception if I have not received all the information and explanations I required for my audit, or if I find

- ▶ any material instance where money has not been applied for the purposes intended or where the transactions did not conform to the authorities governing them, or
- ▶ the information given in Science Foundation Ireland's annual report is not consistent with the related financial statements or with the knowledge acquired by me in the course of performing the audit, or
- ▶ the statement on internal financial control does not reflect Science Foundation Ireland's compliance with the Code of Practice for the Governance of State Bodies, or
- ▶ there are other material matters relating to the manner in which public business has been conducted.

I have nothing to report in regard to those matters upon which reporting is by exception.



Seamus McCarthy
Comptroller and Auditor General
31 May 2017

Board Members' Report

For the year ended 31 December 2016

Board Members' Responsibilities

Financial Statements

Section 24 (2) of the Industrial Development (Science Foundation Ireland) Act, 2003, requires Science Foundation Ireland to keep, in such form as may be approved by the Minister for Jobs, Enterprise and Innovation with the consent of the Minister for Public Expenditure and Reform, all proper and usual accounts of money received and expended by it and in particular, to keep in such form as aforesaid all special accounts as the Minister may from time to time direct.

In preparing those financial statements, Science Foundation Ireland is required to:

- ▶ select suitable accounting policies and apply them consistently;
- ▶ make judgements and estimates that are reasonable and prudent;
- ▶ prepare the financial statements on the going concern basis unless it is inappropriate to presume that Science Foundation Ireland will continue in operation;
- ▶ State whether applicable accounting standards have been followed, subject to any material departures disclosed and explained in the financial statements

The Board is responsible for keeping adequate accounting records which disclose, with reasonable accuracy at any time, its financial position which enables it to ensure that the financial statements comply with the overall requirements of Section 24 of the Industrial Development (Science Foundation Ireland) Act, 2003. The Board is also responsible for safeguarding its assets and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

On behalf of the Board of Science Foundation Ireland:



Ms Ann Riordan
Chairman

Date: 25 May 2017



Prof Mark Ferguson
Director General

Date: 25 May 2017

Statement on Internal Financial Control

On behalf of the Board of Science Foundation Ireland I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

The system can only provide reasonable and not absolute assurance that assets are safeguarded, transactions authorised and properly recorded, and that material errors or irregularities are either prevented or detected in a timely period.

The Board has taken steps to ensure an appropriate control environment is in place by:

- ▶ Clearly defining and documenting management responsibilities and powers;
- ▶ Establishing formal procedures for monitoring the activities and safeguarding the assets of the organisation;
- ▶ Developing a culture of accountability across all levels of the organisation.

The Board has also established processes to identify and evaluate business risks by:

- ▶ Working closely with Government and various Agencies to ensure that there is a clear understanding of Science Foundation Ireland goals and support for the Agencies' strategies to achieve those goals;
- ▶ Carrying out regular reviews of strategic plans both short and long term and evaluating the risks to bringing those plans to fruition;
- ▶ Setting annual targets for each area of our business followed by regular reporting on the results achieved;

The system of internal financial control is based on a framework of regular management information, administration procedures including segregation of duties and a system of delegation and accountability. In particular, it includes:

- ▶ A comprehensive budgeting system, with annual budgets for both Capital and Current expenditure, which are reviewed and agreed by the Board;
- ▶ Regular reviews by the Board of periodic and annual financial reports which indicate financial performance against forecasts;
- ▶ External Peer review of all Research proposals by scientific experts to adjudicate whether the proposal is worthwhile from an educational and scientific research viewpoint and that it meets the criteria for funding;

- ▶ Monitoring and control of all Research Grants awarded, with annual grant payments based on budget projections provided for each award with option to defer grant payments if expenditure is below budget;
- ▶ Annual systems based Internal audit reviews in respect of Research Grants awarded carried out at the Eligible Research Bodies;
- ▶ Setting targets to measure financial and other performance;
- ▶ Formal project management disciplines;
- ▶ Clearly defined capital investment control guidelines which comply with Government Procurement rules.

Science Foundation Ireland has established an Internal Audit function, in accordance with the Framework set out in the Code of Practice for the Governance of State Bodies 2009 which reports directly to the Audit Committee. An annual Internal Audit work plan is agreed by the Audit Committee. The work of internal audit is informed by analysis of the risks to which the body is exposed. The Audit Committee meets six times a year and reviews the outcome of the specific internal audits and the on-going adequacy and effectiveness of the system of internal financial controls. These reports highlight deficiencies or weaknesses, if any, in the system of internal financial control and the recommended corrective measures to be taken where necessary.

A Risk Management Committee meets on a regular basis to review and manage risks identified throughout the Foundation. These risks are ranked and updated on a comprehensive SFI Risk Register, which is reported as a standing item on the SFI Audit Committee and reported periodically to the Board.

The Board's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of Internal Audit and the Audit Committee which oversees the work of Internal Audit, the control exercised by the Executive managers within SFI who have responsibility for the development and maintenance of the framework and comments by the Comptroller and Auditor General in his Management Letter.

Statement on Internal Financial Control

The Department of Public Expenditure and Reform (DPER) Circular 13/2014 Management of and Accountability of Grants from Exchequer Sources (the Circular) outlines the public financial management principles, procedures and additional reporting requirements to be followed in the management of grant funding provided from public money. Sanction was obtained from DPER to pre fund grant payments to eligible research bodies on 11th May 2017. With regard to Section 5 – Grantees Responsibilities, SFI have been in correspondence with the Higher Education Authority who confirmed that they have issued instructions and a standard template to the Higher Education Institutes (HEIs) (Grantees) in respect of the required disclosures / responsibilities under the Circular. The effective date of implementation of the Circular for the HEIs is 1st October 2015, i.e. their 2015/2016 Financial Statements. SFI will ensure that as a term and condition of the grant, all Grantees will be notified of their Responsibilities under the Circular.

I confirm that the Board conducted a review of the effectiveness of the system of internal financial controls for 2016.

On behalf of the Board of Science Foundation Ireland:



Ms Ann Riordan
Chairman

Date: 25 May 2017

Statement of Income and Expenditure and Retained Revenue Reserves

For the year ended 31 December 2016

	Notes	2016 €'000	2015 €'000
Income			
Oireachtas Grant	2	193,469	170,439
Other Income	3	896	824
Net Deferred Retirement Benefit Funding	5(c)	1,271	1,145
		195,636	172,408
Expenditure			
Administration, Operations & Promotion Expenses	4	9,570	8,714
Depreciation	6	155	115
Retirement Benefit Costs	5(a)	1,149	954
Grants Payable	9(a)	184,776	162,706
		195,650	172,489
Excess of Expenditure over Income		(14)	(81)
Transfer (to) / from the Capital Account	7	(15)	(122)
Surplus /(Deficit) for the Year		(29)	(203)
Balance Brought Forward at 1 January 2016		626	829
Balance Carried Forward at 31 December 2016		597	626

The Statement of Cash Flows and Notes 1 to 16 form part of these Financial Statements

On behalf of the Board of Science Foundation Ireland:



Ms Ann Riordan
Chairman

Date: 25 May 2017



Prof Mark Ferguson
Director General

Date: 25 May 2017

Statement of Comprehensive Income

For the year ended 31 December 2016

Notes	2016 €'000	2015 €'000
Surplus/(Deficit) before Appropriations	(14)	(81)
Experience gains/(losses) on retirement benefit obligations	161	(469)
Change in assumptions underlying the present value of Retirement benefit obligations	(3,927)	(589)
Total Actuarial Gain/(Loss) in the period	(3,766)	(1,058)
Adjustment to Deferred retirement benefits funding	3,766	1,058
Other Comprehensive Income/(Loss) for the year	(14)	(81)

The Statement of Cash Flows and Notes 1 to 16 form part of these Financial Statements.

On behalf of the Board of Science Foundation Ireland:



Ms Ann Riordan
Chairman



Prof Mark Ferguson
Director General

Date: 25 May 2017

Date: 25 May 2017

Statement of Financial Position

For the year ended 31 December 2016

	Notes	2016 €'000	2015 €'000
Fixed Assets			
Property, Plant & Equipment	8	<u>235</u>	220
Current Assets			
Receivables	10	633	723
Cash and Cash Equivalents		382	333
		<u>1,015</u>	1,056
Current Liabilities (Amounts Falling due within one year)			
Payables	11	<u>(418)</u>	(430)
Net Current Assets		<u>597</u>	626
Long term Liabilities (Amounts falling due after one year)			
		-	-
Retirement benefits			
Retirement Benefit Liability	5(b)	(15,113)	(10,076)
Deferred Retirement Benefit Funding Asset	5(c)	15,113	10,076
		-	-
Total Net Assets		<u>832</u>	846
Representing:			
Capital Account	7	235	220
Accumulated Surplus at end of Year		597	626
		<u>832</u>	846

The Statement of Cash Flows and Notes 1 to 16 form part of these Financial Statements.

On behalf of the Board:



Ms Ann Riordan
Chairman



Prof Mark Ferguson
Director General

Date: 25 May 2017

Date: 25 May 2017

Statement of Cash Flows

For the year ended 31 December 2016

	Notes	2016 €'000	2015 €'000 <i>restated</i>
Net Cash Flows from Operating Activities			
Excess Expenditure over Income		(14)	(81)
Depreciation of Fixed Assets	6	155	115
(Increase)/Decrease in Receivables	10	90	(270)
Increase/(Decrease) in Payables	11	(12)	54
Net Cash Flow from Operations		219	(182)
Cash Flows from Investing Activities			
Payments to acquire Property, Plant and Equipment	8	(170)	(237)
Net Cash Flows from Investing Activities		(170)	(237)
Cash Flows from Financing Activities			
		-	-
Net Increase/(Decrease) in Cash and Cash Equivalents		49	(419)
Cash and Cash Equivalents at 1 January 2016		333	752
Cash and Cash Equivalents at 31 December 2016		382	333

Notes to the Financial Statements

For the year ended 31 December 2016

1 Accounting Policies

The basis of accounting and significant accounting policies adopted by Science Foundation Ireland are set out below. They have been applied consistently throughout the year and for the preceding year.

(a) General Information

Science Foundation Ireland was set up under the Industrial Development (Science Foundation Ireland) Act 2003, and by the Industrial Development (Science Foundation Ireland) (Amendment) Act, 2013, with its Head Office at Wilton Park House, Wilton Place, Dublin 2.

Science Foundation Ireland's primary objectives as set out under section 7 of the Industrial Development (Science Foundation Ireland) Act 2003, as amended by the Industrial Development (Science Foundation Ireland) (Amendment) Act, 2013, are as follows:

Science Foundation Ireland funds oriented basic and applied research in the areas of science, technology, engineering, and mathematics (STEM) which promotes and assists the development and competitiveness of industry, enterprise and employment in Ireland. The Foundation also promotes and supports the study of, education in and engagement with, STEM and promotes an awareness and understanding of the value of STEM to society and in particular to the growth of the economy.

Science Foundation Ireland is a Public Benefit Entity (PBE).

(b) Statement of Compliance

The financial statements of Science Foundation Ireland for the year ended 31 December 2016 have been prepared in accordance with FRS 102, the financial reporting standard applicable in the UK and Ireland issued by the Financial Reporting Council (FRC), as promulgated by Chartered Accountants Ireland.

(c) Basis of Preparation

The financial statements have been prepared under the historical cost convention, except for certain assets and liabilities that are measured at fair values as explained in the accounting policies below. The financial statements are in the form approved by the Minister for Jobs, Enterprise and Innovation with the consent of the Minister for Public Expenditure and Reform under the Industrial Development (Science Foundation Ireland) Act 2003, and by the Industrial Development (Science Foundation Ireland) (Amendment) Act, 2013. The financial statements reflect the requirements of the Code of Practice for the Governance of State Bodies 2009 and elements of the 2016 revised code relating to financial disclosures, which came into effect for accounting periods commencing on or after the 1st September, 2016.

The following accounting policies have been applied consistently in dealing with items which are considered material in relation to Science Foundation Ireland's financial statements.

(d) Revenue

Revenue is recognised on an accruals basis except in the case of Oireachtas Grants which are recognised on a cash receipts basis.

(e) Property, Plant and Equipment

Property, Plant and Equipment are stated at cost less accumulated depreciation, adjusted for any provision for impairment. Depreciation is provided on all property, plant and equipment, at rates estimated to write off the cost less the estimated residual value of each asset on a straight-line basis over their estimated useful lives, as follows:

(i) Computer Equipment & Computer Software	3 years
(ii) Plant & Equipment	5 years

Residual value represents the estimated amount which would currently be obtained from disposal of an asset, after deducting estimated costs of disposal, if the asset were already of an age and in the condition expected at the end of its useful life.

(f) Capital Account

The Capital Account represents the unamortised funds utilised for the acquisition of Property, Plant and Equipment and is written down in line with the depreciation policy for these assets.

(g) Foreign Currency

Monetary assets and liabilities denominated in foreign currencies are translated at the exchange rates ruling at the end of the Financial year. Revenues and costs are translated at the exchange rates ruling at the dates of the underlying transactions. The resultant surpluses or deficits are dealt with in the Statement of Income and Expenditure and Retained Revenue Reserves.

(h) Employee Benefits

Short term benefits

Short term benefits such as holiday pay are recognised as an expense in the year, and benefits that are accrued at year-end are included in the Payables figure in the Statement of Financial Position.

Retirement Benefits

The Industrial Development (Forfás Dissolution) Act 2014 (No 13 of 2014) which was passed into law on 16th July 2014 made provision for the dissolution of Forfás and provided for the establishment of Science Foundation Ireland as a separate legal employer. Under the legislation:

- ▶ Science Foundation Ireland is responsible for the establishment of its own pension scheme.

Notes to the Financial Statements

For the year ended 31 December 2016

- ▶ SFI Staff who were members of the Forfás Pension scheme join the new scheme on superannuation terms no less favourable than those they enjoyed under the Forfás scheme immediately before the date of transfer.
- ▶ SFI is responsible for the pensions of staff who retire after 16th July 2014.
- ▶ The Department of Jobs, Enterprise and Innovation assumes legal responsibility for the existing Forfás pension scheme and existing SFI pensioners and former staff with preserved benefits.
- ▶ Employee pension contributions are paid to the Exchequer.

Science Foundation Ireland also operates the Single Public Services Pension Scheme (“Single Scheme”), which is a defined benefit scheme for pensionable public servants appointed on or after 1 January 2013. Single Scheme members’ contributions are paid over to the Department of Public Expenditure and Reform (DPER).

Pension costs reflect pension benefits earned by employees, and are shown net of staff pension contributions which are remitted to the Department for Jobs, Enterprise and Innovation in respect of Science Foundation Ireland’s retirement benefit scheme and to DPER in respect of the Single Scheme. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable.

Actuarial gains or losses arising on scheme liabilities are reflected in the Statement of Comprehensive Income, and a corresponding adjustment is recognised in the amount recoverable from the Department of Jobs, Enterprise and Innovation.

The financial statements reflect, at fair value, the assets and liabilities arising from Science Foundation Ireland’s pension obligations and any related funding, and recognise the costs of providing pension benefits in the accounting periods in which they are earned by employees. Retirement benefit scheme liabilities are measured on an actuarial basis using the Projected Unit Credit method. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of Jobs, Enterprise and Innovation.

(i) Operating Leases

Rental expenditure under operating leases is recognised in the Statement of Income and Expenditure and Retained Revenue Reserves as they fall due.

(j) Research Grant Payments

Amounts paid to Research Bodies on foot of research

grants awarded are charged to the Statement of Income and Expenditure and Retained Revenue Reserves in the year of payment.

(k) Critical Accounting Judgements and Estimates

The preparation of the financial statements requires management to make judgements, estimates and assumptions that affect the amounts reported for assets and liabilities as at the balance sheet date and the amounts reported for revenues and expenses during the year. However, the nature of estimation means that actual outcomes could differ from those estimates. The following judgements have had the most significant effect on amounts recognised in the financial statements.

Depreciation and Residual Values

The Directors have reviewed the asset lives and associated residual values of all fixed asset classes, and in particular, the useful economic life and residual values of fixtures and fittings, and have concluded that asset lives and residual values are appropriate.

Retirement Benefit Obligation

The assumptions underlying the actuarial valuations for which the amounts recognised in the financial statements are determined (including discount rates, rates of increase in future compensation levels, mortality rates and healthcare cost trend rates) are updated annually based on current economic conditions, and for any relevant changes to the terms and conditions of the pension and post-retirement plans.

The assumptions can be affected by:

- (i) The discount rate, changes in the rate of return on high-quality corporate bonds
- (ii) Future compensation levels, future labour market conditions
- (iii) Changes in Demographics

Notes to the Financial Statements

For the year ended 31 December 2016

2 Oireachtas Grant

The Oireachtas Grants voted to Science Foundation Ireland from Vote 32 (Subhead B.4), Science and Technology Development Programme by Department of Jobs, Enterprise and Innovation as shown in the financial statements consist of:

		2016 €'000	2015 €'000
Grants for Current Expenditure			
Pay - Note 1*	Subhead B.4.2	3,989	3,709
Administration Expenses	Subhead B.4.2	5,480	4,730
Grants for Capital Expenditure			
Research Grants	Subhead B.4.2	184,000	162,000
		193,469	170,439

* Note 1 - The 2016 Pay Allocation is stated net of employee pension contributions of €183,000 (2015: €191,000) remitted to the Exchequer.

Under Section 11 of the Industrial Development Act, 1993, as amended by Section 4(a) of the Industrial Development Act, 2009, the aggregate amount of grants made by the Minister to Enterprise Ireland, IDA and Science Foundation Ireland to enable them to discharge their Capital obligations and liabilities shall not exceed €7,000,000,000. At 31 December, 2016 the aggregate amount made available to the three Agencies was €5. 88 billion (2015 €5. 52 billion).

3 Other Income

	2016 €'000	2015 €'000
Research Grant Funding:		
Contributions from other Funding agencies to Awards made by SFI		
Teagasc [Note (i)]	291	186
Marine Institute [Note (ii)]	386	-
Environmental Protection Agency [Note (iii)]	28	-
Geological Society of Ireland [Note (iii)]	28	-
Health Research Board [Note (iv)]	43	-
EU Marie Curie Co Funding (Starting Investigator Research Grant Funding) [Note (v)]	-	367
Irish Cancer Society [Note (vi)]	-	142
Total Grant Co funding	776	695
European Space Agency [Note (vii)]	120	120
ERACoSysMed Co Fund	-	11
NanoSciE+ [Note (viii)]	-	(2)
Total	896	824

- (i) Contribution from Teagasc for 50% co-funding of two awards made by SFI in 2014 under the 2013 IVP Programme.
- (ii) Contributions from the Marine Institute for 50% Co-Funding of two IVP awards made in 2016 under the 2015 IVP programme.
- (iii) Contributions from the Geological Society of Ireland and the Environmental Protection Agency for 33.3% Co-Funding by each agency of one IVP award made in 2016 under the 2015 IVP programme.
- (iv) Contribution from the Health Research Board in respect of a US/Ireland R&D Partnership award.

Notes to the Accounts

For the year ended 31 December 2016

3 Other Income (continued)

- (v) EU Marie Curie Fund contribution in 2015 towards Starting Investigator Research Grant Funding awards made in 2012.
- (vi) Contribution from the Irish Cancer Society towards the ICS-SFI Collaborative Cancer Research Centre (CCRC) Programme awarded in 2015.
- (vii) Funding arising from an annual contract between Science Foundation Ireland and European Space Agency (ESA) for the implementation of a European Space Education Resource Office (ESERO) in Ireland.
- (viii) EU Nano Science E+ Collaborative Research Call - income represents final payment to the EU in relation to this programme.

4 Administration, Operations & Promotion

	Notes	2016 €'000	2015 €'000
Remuneration and other pay costs	4(a)	4,410	4,274
Programme Management		936	768
Accommodation		854	810
Professional & Support Services (Note 1)		449	341
Accounting & Internal Audit Services		145	186
Marketing & Supports (Note 2)		1,534	1,259
Specialist & Education Services		182	212
IT Support & Infrastructure		622	514
HR Management (Note 3)		60	36
Administration Expenses		353	288
Audit Fee		25	26
Total		9,570	8,714

Note 1: Included in Professional & Support services is legal fees of €82k (2015: €29k), tax and financial advisory fees of €11k (2015: €0) and other consultancy fees of €106k (2015: €81k)

Note 2: Included in Marketing & Supports is public engagement consultant fees of €120k (2015: €142k)

Note 3: Included in the HR Management figure is Staff Hospitality related expenditure of €4,679 (2015: €3,350)

4 (a) Remuneration and other pay costs

	2016 €'000	2015 €'000
Staff Salaries	3,673	3,536
Employers' contribution to Social Welfare	318	317
Increase/(reduction) in holiday pay accrual	(30)	38
Staff Training and Development	149	89
Staff travel and subsistence costs (Note 1)	163	136
Board Members' Remuneration and Expenses	137	158
Total	4,410	4,274
Actual employed	47	49

The total Key Management personnel compensation for 2016 was €621,163 (2015: €648,273). This includes the compensation for the Board members, the Director General and three Executives who report to him.

Science Foundation Ireland deducted pension levies from staff of €213,238 (2015: €239,705) which were paid over to the Department for Jobs, Enterprise and Innovation.

Note 1 - Of the total staff travel and subsistence costs of €163,000, €103,000 relates to international travel and subsistence and €60,000 relates to national travel and subsistence.

Notes to the Accounts

For the year ended 31 December 2016

4 (b) Employee benefits breakdown

Range of Key Management Personnel Remuneration		Number of Employees	
From	To	2016	2015
€60,000	- €69,999	18	17
€70,000	- €79,999	5	6
€80,000	- €89,999	1	1
€90,000	- €99,999	7	7
€120,000	- €129,999	2	2
€140,000	- €149,999	1	1
€170,000	- €179,999	1	1

4 (c) Board Members' Emoluments

Board Member	Board Fees	Vouched Expenses	Meetings attended	Board Fees	Vouched Expenses	Meetings attended
	2016	2016	2016	2015	2015	2015
	€	€		€	€	
Board Member						
Ann Riordan (Chairman)	20,520	547	6 out of 6	20,520	1,492	6 out of 6
Sir Tom Blundell	11,970	2,562	6 out of 6	13,366	2,597	4 out of 6
Barry O Sullivan	-	18,154	6 out of 6	-	18,567	6 out of 6
Mark Ferguson	-	-	6 out of 6	-	-	6 out of 6
Rita Colwell	11,970	5,205	3 out of 6	11,970	18,212	4 out of 6
Bernie Cullinan	11,970	-	5 out of 6	11,970	1,492	6 out of 6
Geraldine Ruane	-	-	5 out of 6	998	125	6 out of 6
Pat Duane	11,970	-	4 out of 6	11,970	3,078	5 out of 6
Dermot Mulligan	-	-	5 out of 6	-	-	3 out of 3
Aidan Donnelly	11,970	-	6 out of 6	11,970	1,887	6 out of 6
Mary Doyle	-	-	5 out of 6	-	125	5 out of 6
Liam Madden	-	23,513	5 out of 6	-	16,527	5 out of 6
Dermot Curran	-	-	-	-	125	3 out of 3
General Board Expenses		6,385	n/a		10,712	n/a
Total	80,370	56,366		82,764	74,939	

Board members are paid fees as determined by the Minister for Jobs, Enterprise and Innovation with the consent of the Minister for Public Expenditure & Reform. Certain Board members are excluded from receiving fees from SFI under the "One Person One Salary" remuneration arrangements whereby public servants cannot receive Board fees in addition to a salary. In addition, two Board members, Prof Liam Madden and Mr. Barry O'Sullivan, have waived their Board fees.

The following Board members are based overseas: Prof. Sir Tom Blundell is UK based while Dr. Rita Colwell, Mr. Barry O'Sullivan and Prof. Liam Madden are US Based.

The Director General's remuneration package for 2016 was as follows: annual basic salary €175,554 (2015: €175,554) and standard public sector pension arrangements apply. No performance related bonus was applicable.

Professor Ferguson is also Chief Scientific Advisor (CSA) to the Government, a role formerly under the administration of Forfás. There is no remuneration for this role and all administration costs for the office are absorbed by SFI. Total expenses for the year incurred by the Director General in the discharge of both roles amounted to €30,674 (2015: €23,409) of which €2,339 (2015: €4,841) related to CSA activities.

Notes to the Accounts

For the year ended 31 December 2016

4 (c) Board Members' Emoluments (continued)

Of the total board vouched expenses costs of €56,366, €49,200 relates to international travel and subsistence and €7,166 relates to national travel and subsistence.

General Board expenses for 2016 include accommodation and meal costs for Board meetings held off site. During 2016 six Board meetings were held. The following appointments to and resignations from the Board took place in 2016.

1. Ms. Mary Doyle retired and was reappointed on 24 July 2016.
2. Dr. Rita Colwell retired and was reappointed on 24 July 2016.

5 Retirement Benefit Costs

(a) Analysis of total retirement benefit costs charged to the Statement of Income and Expenditure and Retained Revenue Reserves

	2016 €'000	2015 €'000
Current Service Cost	1,045	948
Interest on Retirement Benefit Scheme Liabilities	287	197
Employee Contributions	(183)	(191)
	1,149	954

(b) Movement in net Retirement benefit obligation during the financial year

	2016 €'000	2015 €'000
Net retirement benefit obligation at 1 January	10,076	7,873
Current service Costs	1,045	948
Interest Costs	287	197
Payments to Pensioners	(61)	-
Actuarial (Gain) / Loss	3,766	1,058
Net retirement benefit obligation at 31 December	15,113	10,076

The Board recognises these amounts as an asset corresponding to the unfunded deferred liability for retirement benefits on the basis of the set of assumptions described above and a number of past events. These events include the statutory basis for the establishment of the retirement benefit scheme, and the policy and practice currently in place in relation to funding public service pensions including contributions by employees and the annual estimates process. The Board has no evidence that this funding policy will not continue to meet such sums in accordance with current practice.

The net deferred funding for retirement benefits recognised in the Statement of Income and Expenditure and Retained Revenue Reserves is as follows:

(c) Deferred Funding Retirement Benefits

	2015 €'000	2014 €'000
Funding recoverable in respect of Current Year Retirement benefit costs	1,332	1,145
Less State Grant applied to pay retirement benefits	(61)	-
	1,271	1,145

Notes to the Accounts

For the year ended 31 December 2016

5 Retirement Benefit Costs (continued)

(d) General Description of the scheme

Science Foundation Ireland has responsibility for the pension costs of:

1. staff with effect from 16th July 2014, under the Industrial Development (Forfás Dissolution) Act 2014. Staff who are/were members of the Forfás Pension Scheme joined the new Science Foundation Ireland pension scheme on superannuation terms no less favourable than those they enjoyed under the Forfás scheme immediately before the date of transfer from Forfás to SFI.
2. staff who are members of the Single Public Service pension scheme.

Both schemes are defined benefit pension schemes and are fully funded annually on a pay as you go basis from monies provided by the Department of Jobs, Enterprise and Innovation.

The scheme is a defined benefit final salary scheme with retirement benefits linked to final salary and length of service. The valuation used for FRS 102 disclosures are based on an actuarial review of the Science Foundation Ireland Superannuation scheme for the financial year ending 31 December 2016 carried out by a qualified independent actuary, taking account of the requirements of the FRS in order to assess the scheme liabilities at 31 December 2016.

The principal actuarial assumptions were as follows:

Liabilities shown in the Financial Accounts are computed using the Projected Unit Credit method.

	2016	2015
Financial Assumptions		
Discount Rate	2.00% p.a	2.85% p.a.
Future Salary Increases	3.45% p.a	3.30% p.a.
Future State Pension increases	3.45% p.a	3.30% p.a.
Future Pension Increases	2.95% p.a	2.80% p.a.
Future inflation	1.95% p.a	1.80% p.a.
Revaluation in deferment	2.95% p.a	2.80% p.a.
<i>* discount rate reflects a duration of liabilities of approximately 31 years in 2016 (31 years in 2015)</i>		
Demographic Assumptions		
Mortality pre-Retirement	62% PNMLOO (Males)	62% PNMLOO (Males)
	70% PNFLOO (Females)	70% PNFLOO (Females)
Mortality post-Retirement	58% ILT15 (Males)	58% ILT15 (Males)
	62% ILT15 (Females)	62% ILT15 (Females)
Retirement age		
New entrants	Age 65	Age 65
Other members	Age 62	Age 62

The Mortality basis explicitly allows for improvements in life expectancy over time, so that life expectancy at retirement will depend on the year in which a member attains retirement age (age 65). The table below shows the life expectancy for members attaining age 65 in 2016 and 2036.

Year of attaining age 65	2016	2036
Life expectancy - Male	21.1	23.6
Life expectancy - Female	23.6	25.7

Notes to the Accounts

For the year ended 31 December 2016

5 Retirement Benefit Costs (continued)

Prior Year Comparatives

Year ending December 31st	2016 €'000	2015 €'000	2014 €'000	2013 €'000	2012 €'000
Closing pension liability	15,113	10,076	7,873	-	-
Experience (loss)/gain arising on the plan Liabilities	161	(469)	164	-	-
% Liabilities	1.1%	-4.60%	2.1%	-	-
Total (loss)/Gain recognised in Statement of Total Recognised Gains & losses	(3,766)	(1,058)	38	-	-
% Liabilities	-24.92%	-10.50%	0.5%	-	-

6 Depreciation

	Note	2016 €'000	2015 €'000
Depreciation of property, plant and equipment	8	155	115
		155	115

7 Capital Account

	2016 €'000	2015 €'000
Opening Balance as at 1 January	220	98
Transfer from Statement of Income and Expenditure and Retained Revenue Reserves		
- To fund Fixed Asset acquisitions	170	237
- Amortised in line with asset depreciation	(155)	(115)
Net Movement	15	122
Closing balance as at 31 December	235	220

Notes to the Accounts

For the year ended 31 December 2016

8 Property, Plant & Equipment

	Computer Equipment €'000	Computer Software €'000	Fixtures & Fittings €'000	Total €'000
Cost				
At 1 January 2016	716	648	168	1,532
Additions	88	74	8	170
Disposals	(37)	-	-	(37)
At 31 December 2016	767	722	176	1,665
Depreciation				
At 1 January 2016	636	585	91	1,312
Charge for Year	81	55	19	155
Disposals	(37)	-	-	(37)
At 31 December 2016	680	640	110	1,430
Net Book Amount				
At 1 January 2016	80	63	77	220
Net Movement for Year	7	19	(11)	15
At 31 December 2016	87	82	66	235

9 Grants

	2016 €'000	2015 €'000
(a) Analysis of Grants Paid		
Priority Area A - Future Networks & Communications	14,878	17,707
Priority Area B - Data Analytics, Management, Security & Privacy	19,028	19,552
Priority Area C - Digital Platforms, Content & Applications	5,445	2,459
Priority Area D - Connected Health and Independent Living	1,902	703
Priority Area E - Medical Devices	7,128	6,197
Priority Area F - Diagnostics	16,791	8,723
Priority Area G - Therapeutics: Synthesis, Formulation, Processing and Drug Delivery	23,335	20,304
Priority Area H - Food for Health	8,102	10,408
Priority Area I - Sustainable Food Production and Processing	8,144	4,512
Priority Area J - Marine Renewable Energy	4,235	12,365
Priority Area K - Smart Grids & Smart Cities	1,812	3,403
Priority Area L - Manufacturing Competitiveness	1,898	1,829
Priority Area M - Processing Technologies and Novel Materials	33,230	28,372
Priority Area N - Innovation in Services and Business Processes	483	86
Basic Biomedical Science (BBS)	11,768	16,636
Other	11,260	9,450
Research Infrastructure Opportunistic fund awards to Research Bodies	15,337	-
Total	184,776	162,706

The analysis of grants paid reflects the results of the National Research Prioritisation Strategy adopted by Government following input from the research community, the enterprise sector and research funding departments and agencies.

Notes to the Accounts

For the year ended 31 December 2016

9 Grants (continued)

(b) Grant Commitments

	2016 €'000	2015 €'000
Outstanding Grant Commitments as at 1 January	426,828	460,862
Grants Approved during the year	194,343	131,432
De-commitments during the year	(9,576)	(3,088)
Grant Payments made in the year - Gross	(184,776)	(162,706)
<i>Amounts received other funding agencies for Co-Funding of SFI awards</i>		
Teagasc	291	186
Irish Cancer Society	-	142
Environmental Protection Agency	28	-
Marine Institute	386	-
Geological Society of Ireland	28	-
Health Research Board	43	-
Outstanding Commitments as at 31 December	427,595	426,828

10 Receivables

	2016 €'000	2015 €'000
Debtors	3	188
Prepayments	630	535
Total	633	723

11 Payables

	2016 €'000	2015 €'000
General Creditors	86	188
Deferred Income*	120	-
Accruals	197	187
Interagency Balance - IDA**	15	55
Total	418	430

* *Deferred income represents monies received from the EU in respect of three awards funded by SFI as part of the ERA-CoSysMed Co-funded call, which will be amortised against Research Grant income over the lifetime of the research awards.

**Interagency Balances relate to the balances owed by Science Foundation Ireland to IDA at 31 December 2016, being the difference between the amount of money paid to IDA by Science Foundation Ireland and the actual money spent by IDA on behalf of Science Foundation Ireland.

Notes to the Accounts

For the year ended 31 December 2016

12 Commitments under Operating Leases

Science Foundation Ireland is a tenant of IDA (formerly under Forfás tenancy) in Wilton Park House and currently has no commitments under operating leases on the building, but pays rent to IDA as a contribution to the lease costs incurred by IDA.

13 Taxation

Section 227 of the Taxes Consolidation Act, 1997, provides an exemption from tax on the income of non-commercial state bodies except where interest is subject to tax at source (e.g. DIRT). The net amount of such income is credited to the Statement of Income and Expenditure and Retained Revenue Reserves.

SFI is liable to employer taxes in Ireland and complies with related withholding, reporting and payment obligations.

14 Related Party Disclosures

Science Foundation Ireland adopts procedures in accordance with the guidelines issued by the Department of Public Expenditure and Reform covering the personal interests of Board members. In the normal course of business, Science Foundation Ireland may approve grants or enter into other contractual arrangements with entities in which Science Foundation Ireland Board members are employed or are otherwise interested.

In cases of potential conflict of interest, Board members do not receive Board documentation or otherwise participate in or attend discussions regarding these transactions. A register is maintained and available on request of all such instances.

15 Contingencies and Legal Actions

There are no contingencies or legal actions which require specific provision in the Financial Statements.

16 Approval of Financial Statements

The Financial Statements were approved by the Board of Science Foundation Ireland on 25 May, 2017.

Grant Commitments and Payments Analysis 2016

2016 Payments by Programme	
	€'000
SFI Research Infrastructure awards	47,388
SFI Investigators Programme	43,865
SFI Research Centres	42,890
SFI Career Development Award	6,385
SFI Research Professorship Programme	6,230
SFI Starting Investigator Research Grant (SIRG)	4,968
SFI Technological Innovation Development Award (TIDA)	4,472
SFI Discover Programme	3,293
Centres for Science Engineering & Technology (CSET)	2,783
US Ireland R&D Partnership	2,434
SFI Strategic Partnership Programme	2,404
SFI Industry Fellowship Awards	2,055
SFI ERC Development Award	1,924
SFI ERC Support Programme	1,498
SFI Research Centres – Spokes (Rolling & Fixed Call)	1,216
BBSRC-SFI Joint Funding of Research	1,175
EU Joint Programme Initiative	1,099
SFI President of Ireland Young Researcher Award (PIYRA)	1,082
SFI Fellowship Programme	1,080
SFI Research Frontiers Programme	1,016
SFI-Pfizer Biotherapeutics Innovation Award Programme	822
RS-SFI University Research Fellow	815
SFI Maternity Allowance	590
SFI Conference & Workshop	438
SFI / Irish Research Council - Postgraduate Scholarship Scheme	427
Translational Research Awards	381
Strategic Research Centres (SRC)	350
ICS-SFI Collaborative Cancer Research Centre (CCRC) Programme 2014	292
SFI-HRB-Wellcome Trust Biomedical Research Partnership	249
SFI Advance Award Programme	95
SFI/Irish Universities Association (IUA) Partnership	90
Engineering - Professorship & lectureship Programme	81
International Strategic Cooperation Award	81
STOKES - Professor & Lectureship Programme	36
Walton programme	15
NSF/SFI Graduate Research opportunities Worldwide (GROW) Programme	7
US-Ireland R&D Partnership Planning Grant	-1
Charles Parsons Energy Research Awards	-25
Grand Total	184,000

2016 Payments by Institution	
	€'000
Trinity College Dublin	39,923
National University of Ireland, Galway	28,088
University College Dublin	24,451
University of Limerick	23,196
University College Cork	20,246
Tyndall National Institute	16,258
Dublin City University	11,139
Royal College of Surgeons in Ireland	5,260
Maynooth University	4,791
Teagasc	1,701
Waterford Institute of Technology	1,233
Dublin Institute for Advanced Studies	1,125
Dublin Institute of Technology	1,074
The Royal Society	815
The National Institute for Bioprocessing Research and Training	630
Cork Institute of Technology	624
Health Research Board	586
Irish Research Council	427
Stop.watch Television Ltd	242
Institute of Technology Tallaght	238
STEPS, Engineers Ireland	189
The Festival of Curiosity Ltd	180
RTE	160
Tile Films	135
Cosmos Education T/A - Blackrock Castle Observatory	134
National Youth Council of Ireland	129
The Irish Universities Association	127
Athlone Institute of Technology	116
Royal Society of Chemistry	90
SciFest Ltd	90
I Wish STEM Company Limited by Guarantee	83
Institute of Technology Sligo	75
Dundalk Institute of Technology	73
ECDL Ireland Ltd T/A ICS Skills	57
Kite Entertainment	54
Royal Dublin Society RDS	50
Cork Electronic Industries Association	50

2016 Payments by Institution	
	€'000
FabLab Foundation Ireland	48
Calmast, Waterford Institute of Technology	45
Learn It Educational Solutions Ltd	45
British Council Ireland	44
Whipsmart Media Ltd	33
Feilte Dhuibh Linne Teoranta t/a St Patrick's Day Festival	33
Glensheen Ltd	32
Monaghan County Council - Library Service	32
Limerick Institute of Technology	31
Atlantic Corridor	30
Tralee Institute of Technology	29
National Concert Hall	26
Learning Hub Limerick Ltd	23
Galway Science & Technology Forum	21
National College of Ireland	20
Dun Laoghaire Institute of Art, Design & Technology	16
Mayo County Council	16
Crossing the Line Productions	11
Mind the Gap Films	10
The Ark	10
The Rediscovery Centre Ltd	7
Dublinia (The Medieval Trust)	6
Cork City Council	3
Gallomanor Communications Limited	3
National Museum of Irl, Archaeology & Natural History	3
St. Patrick's Day Festival	-4
Project Arts Centre	-9
Queen's University Belfast	-22
Environmental Protection Agency (Co-funding contribution)	-28
Geological Survey of Ireland (Co-funding contribution)	-28
The Marine Institute (Co-funding contribution)	-323
Grand Total	184,000

2016 Grant Commitments by Programme	
	€'000
SFI Research Infrastructure	47,411
SFI Investigator Programme	45,014
SFI Research Professorship Programme	29,426
SFI Career Development Award	15,934
SFI Starting Investigator Research Grant (SIRG) Programme	12,457
SFI Strategic Partnership Programme	10,032
BBSRC-SFI Joint Funding of Research	4,962
SFI Technological Innovation Development Award	4,553
US Ireland R&D Partnership	4,233
SFI Discover Programme	3,169
Royal Society -SFI University Research Fellow	2,708
EU Joint Programme Initiative	2,575
SFI Industry Fellowship Awards	2,506
SFI ERC Development Award	2,257
SFI-HRB-Wellcome Trust Biomedical Research Partnership	1,770
SFI ERC Support Programme	1,747
SFI Fellowship	1,679
SFI President of Ireland Young Researcher Award	986
SFI Maternity Allowance	545
SFI Conference & Workshop	369
NSF/SFI Graduate Research opportunities Worldwide (GROW) Programme	7
US-Ireland R&D Partnership Planning Grant	3
Grand Total	194,343

2016 Number of Awards by Programme	
SFI Discover Programme	59
SFI Technology Innovation Development Award	45
SFI Conferences and Workshops	40
SFI Research Infrastructure	36
SFI Investigators Programme	34
SFI Industry Fellowship	34
SFI Starting Investigator Research Grant (SIRG) Programme	27
SFI Career Development Award	26
SFI Maternity Allowance	17
SFI-HRB-Wellcome Trust Biomedical Research Partnership	10
BBSRC-SFI Joint Funding of Research	10
European Joint Programming Initiative	9
SFI ERC Support Programme	9
US-Ireland R&D Partnership Programme	8
SFI Fellowship Programme	8
SFI Research Professorship Programme	5
Royal Society -SFI University Research Fellow	5
SFI ERC Development Programme	4
SFI Strategic Partnerships	4
SFI President of Ireland Young Researcher Award	1
NSF/SFI Graduate Research opportunities Worldwide (GROW) Programme	1
US Partnership Planning	1
Grand Total	393



The following awards are funded through the European Regional Development Fund and Science Foundation Ireland under Ireland's European Structural and Investment.

- ▶ SFI Research Centres
 - ADAPT
 - CONNECT
 - CURAM
 - iCRAG
 - INSIGHT
 - LERO
- ▶ All SFI Spokes Programme awards
- ▶ SFI Investigators Programme awards funded to NUI Galway

2016 Number of Awards by Institution	
University College Dublin	75
Trinity College Dublin	72
National University of Ireland, Galway	41
University College Cork	33
Dublin City University	27
University of Limerick	22
Tyndall National Institute	18
Royal College of Surgeons in Ireland	12
Health Research Board	11
Maynooth University	11
Dublin Institute of Technology	6
Dublin Institute for Advanced Studies	5
The Royal Society	5
Cork Institute of Technology	4
Teagasc	4
Waterford Institute of Technology	4
Institute of Technology Tallaght	2
The Festival of Curiosity Ltd	2
The Marine Institute	2
The National Institute for Bioprocessing Research and Training	2
Atlantic Corridor	1
British Council Ireland	1
Cork Electronic Industries Association	1
Cosmos Education T/A - Blackrock Castle Observatory	1
Crossing the Line Productions	1
Dublinia (The Medieval Trust)	1
Dun Laoghaire Institute of Art, Design & Technology	1

2016 Number of Awards by Institution	
ECDL Ireland Ltd T/A ICS Skills	1
Environmental Protection Agency	1
FabLab Foundation Ireland	1
Feilte Dhuibh Linne Teoranta t/a St Patrick's Day Festival	1
Fighting Blindness	1
Galway Science & Technology Forum	1
Geological Survey of Ireland	1
Glenosheen Ltd	1
I Wish STEM Company Limited by Guarantee	1
Institute of Technology Sligo	1
Kite Entertainment	1
Learn It Educational Solutions Ltd	1
Learning Hub Limerick Ltd	1
Limerick Institute of Technology	1
Mayo County Council	1
Monaghan County Council - Library Service	1
National College of Ireland	1
National Concert Hall	1
National Museum of Irl, Archaeology & Natural History	1
National Youth Council of Ireland	1
Royal Dublin Society RDS	1
Royal Society of Chemistry	1
Stop.watch Television Ltd	1
The Ark	1
The Rediscovery Centre Ltd	1
Tile Films	1
Tralee Institute of Technology	1
Whipsmart Media Ltd	1
Grand Total	393

List of SFI awards made in 2016

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Manus Biggs	BBSRC-SFI Joint Funding of Research	Rapid Bone Graft Synthesis Through Dual Piezoelectric/Nanomechanical Stimulation	National University of Ireland, Galway	387,894.10
Fiona Doohan	BBSRC-SFI Joint Funding of Research	Oats for the future: deciphering the potential of host resistance and RNAi to minimise mycotoxin contamination under present and future climate scenarios	University College Dublin	540,174.70
Philip McGinnity	BBSRC-SFI Joint Funding of Research	A microbial basis for Atlantic salmon energetics	University College Cork	638,903.50
Kanishka Nilaweera	BBSRC-SFI Joint Funding of Research - Responsive Mode	The role of hypothalamic neuropeptide network in regulating tissue sizes in response to diet energy content and composition	Teagasc	617,165.90
Stephen Gordon	BBSRC-SFI Joint Funding of Research - Responsive Mode	Tackling a multi-host pathogen problem - phylodynamic analyses of the epidemiology of M. bovis in Britain and Ireland	University College Dublin	316,820.70
Paula Bourke	BBSRC-SFI Joint Funding of Research - Responsive Mode	EnvironSafe: Cold Plasma Innovations for Food Safety and Sustainability	Dublin Institute of Technology	597,562.30
Frank Wellmer	BBSRC-SFI Joint Funding of Research - Responsive Mode	Characterization of a novel Polycomb group protein complex and its effects on the plant epigenome	Trinity College Dublin	539,204.50
Jeremy Simpson	BBSRC-SFI Joint Funding of Research - Responsive Mode	Elucidating the mechanisms and pathways of extracellular vesicle uptake and intercellular stress response	University College Dublin	407,712.30
Oliver Blacque	BBSRC-SFI Joint Funding of Research - Responsive Mode	Bilateral BBSRC-SFI: Structure-function relationships in the ciliary transition zone	University College Dublin	630,295.50
Robert Lahue	BBSRC-SFI Joint Funding of Research - Responsive Mode	Mechanisms & consequences of HDACs in the NCoR complex, in controlling the activity of MutSb in trinucleotide repeat expansions	National University of Ireland, Galway	286,291.30
Fergus Shanahan	Brussels Conference Event Programme	Microbiome-based Foods for Health and Sustainability	University College Cork	37,465.00
Gerard O'Keefe	Career Development Award	Development of GDF5 neurotrophic factor therapy for Parkinson's disease.	University College Cork	639,453.00
Angela Feechan	Career Development Award	ReWIZ: Re-establishing Wheat Immunity to Zymoseptoria tritici	University College Dublin	523,698.00
Eoghan McGarrigle	Career Development Award	Underpinning Automated Oligosaccharide Synthesis	University College Dublin	636,595.00
Jian Zhao	Career Development Award	Technologies towards Flexible High-Capacity Optical Networks	Tyndall National Institute	877,013.00
Conor Buckley	Career Development Award	Intraoperative Single Stage Procedure for Intervertebral Disc Regeneration (INSPIRE)	Trinity College Dublin	637,894.00
Gabriel Leen	Career Development Award	Optical Fibre based sensors	University of Limerick	504,825.00
Sarah Doyle	Career Development Award	Investigating the molecular mechanisms underlying Interleukin-1 family regulation of vascular integrity in the eye to identify next-generation therapeutics for AMD.	Trinity College Dublin	638,309.00
Tristan McLoughlin	Career Development Award	Exact Methods in Strongly Coupled Systems	Trinity College Dublin	620,974.00
Bryan Hennesly	Career Development Award	Automated Raman micro-spectroscopy and automated holographic Raman tweezers for high throughput screening of carcinoma cells	National University of Ireland, Maynooth	601,611.00
Andrew Kellett	Career Development Award	Polynuclear Platinum(II) Biomaterials (PPTBio) for Antisense Therapeutic Application and Detection of Human Genetic Disease	Dublin City University	642,150.00
Michael Walsh	Career Development Award	Targeting the temporal gradient of wall shear stress as the key mediator of vascular tissue response to implanted medical devices using in silico, in vitro and in vivo approaches	University of Limerick	612,735.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Brian Mac Namee	Career Development Award	DeepNovelty: Using Deep Recurrent Neural Networks for Novelty Detection in Data Streams	University College Dublin	507,512.00
Simon Kelly	Career Development Award	Neural mechanisms of rapid value-guided sensorimotor decisions in humans	University College Dublin	605,120.00
Eoin Scanlan	Career Development Award	A Novel Ligation Methodology for the Chemical Synthesis of Therapeutic Proteins	Trinity College Dublin	632,078.00
Dimitrios Zeugolis	Career Development Award	Tissue Engineered Nanoassemblies – Advanced Biomimicry of Living Equivalents (Short Title: TENABLE)	National University of Ireland, Galway	493,759.00
Prince Anandarajah	Career Development Award	Programmable multicarrier Transmitter for flexible Optical Networks (PROTON)	Dublin City University	583,138.00
Eoin Cummins	Career Development Award	Carbon dioxide as a regulator of inflammatory signaling.	University College Dublin	628,349.00
Darran O'Connor	Career Development Award	HER CHOICE: Development of a prototype decision support tool for HER2+ breast cancer	Royal College of Surgeons in Ireland	647,925.00
Mark Tangney	Career Development Award	Edible Probiotics As Cancer Therapeutics	University College Cork	605,767.00
Roger Preston	Career Development Award	Structure-based engineering of activated protein C to optimize its therapeutic potential for the treatment of inflammatory diseases	Royal College of Surgeons in Ireland	638,694.00
Graham Kells	Career Development Award	Characterising and Stabilising Quantum Order in Complex Systems	Dublin Institute for Advanced Studies	589,754.00
Colin Clarke	Career Development Award	Understanding biopharmaceutical production at subcellular resolution: The application of ribosome footprint profiling to optimise therapeutic protein synthesis in mammalian cell factories.	The National Institute for Bioprocessing Research and Training	619,059.00
Edmund Lalor	Career Development Award	The electrophysiology of natural speech processing in the human brain	Trinity College Dublin	619,270.00
Damien Thompson	Career Development Award	ENGAGE – Engineering protein interfaces to control aggregation	University of Limerick	633,733.00
Lidia Tajber	Career Development Award	Active pharmaceutical ingredients as ionic liquids: significance of protonics and functional profiling for the design of effective medicines (ActPiILs)	Trinity College Dublin	637,106.00
David Gomez Matallanas	Career Development Award	Deciphering the role of the tumour suppressor LATS1 in melanoma	University College Dublin	557,843.00
Cora O'Neill	Centres of Excellence in Neurodegeneration	Therapeutic targeting of impaired lysosomal flux in Alzheimer's disease	University College Cork	201,112.00
Andrew Bowie	Conference & Workshop	Keystone Symposia Conference on Myeloid Cells	Trinity College Dublin	41,000.00
Thomas Cotter	Conference & Workshop	Cell Death and its Translational Ramifications	University College Cork	15,000.00
Kevin Mitchell	Conference & Workshop	Synaesthesia and Cross-modal Perception. An international conference in conjunction with the UK Synaesthesia Association	Trinity College Dublin	6,000.00
Patrick Harrison	Conference & Workshop	Cystinosis Research Workshop	University College Cork	3,000.00
Sejong Park	Conference & Workshop	Groups in Galway 2016	National University of Ireland, Galway	3,350.00
Dr. Roisin Loughran	Conference & Workshop	Music Technology Workshop 2016 (MusTWork16): Establishing a Partnership Between Music Technology, Business Analytics and Industry in Ireland	University College Dublin	500.00
Dr. Kevin Burke	Conference & Workshop	6th Conference on Applied Statistics in Ireland	University of Limerick	5,450.00
Dermot Cox	Conference & Workshop	64th SSC meeting of International Society on Thrombosis & Haemostats	Royal College of Surgeons in Ireland	25,000.00
Irene Walsh	Conference & Workshop	30th World Congress of the International Association of Logopedics and Phoniatrics (IALP)	Trinity College Dublin	15,000.00
Lorraine Brennan	Conference & Workshop	The Metabolomics Society Conference 2016	University College Dublin	15,000.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Eugene Kashdan	Conference & Workshop	118th European Study Group with Industry	University College Dublin	3,600.00
Kevin Sullivan	Conference & Workshop	Chromosome Segregation and Aneuploidy	National University of Ireland, Galway	5,000.00
Owen Conlan	Conference & Workshop	Open Repositories 2016	Trinity College Dublin	6,210.00
Grainne Kirwan	Conference & Workshop	21st Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPST21)	Dun Laoghaire Institute of Art, Design & Technology	16,000.00
Daniela Tropea	Conference & Workshop	Biology of Brain Disorders	Trinity College Dublin	8,400.00
Conor O'Mahony	Conference & Workshop	27th Micromechanics and Microsystems Europe Workshop (MME 2016)	Tyndall National Institute	8,000.00
Peter Thorne	Conference & Workshop	9th ACRE Workshop and Historical Weather and Climate Data Forum	National University of Ireland, Maynooth	5,000.00
Fionnuala Ní Áinle	Conference & Workshop	Venous Thromboembolism (VTE) Dublin 2016	University College Dublin	5,000.00
Chandralal Hewage	Conference & Workshop	ICMRBS 2018	University College Dublin	4,950.00
Niall Holmes	Conference & Workshop	Civil Engineering Research in Ireland 2016	Dublin Institute of Technology	3,000.00
Thomas Brendan Murphy	Conference & Workshop	39th Research Students Conference in Probability and Statistics	University College Dublin	2,000.00
Gerald Barry	Conference & Workshop	UCD squared - Connected One Health	University College Dublin	1,700.00
Vladimir Dotsenko	Conference & Workshop	12th William Rowan Hamilton Geometry and Topology Workshop	Trinity College Dublin	5,000.00
John Morrissey	Conference & Workshop	ISSY33-Exploring and Engineering Yeasts for Industrial Application	University College Cork	13,590.00
Jeremy D Glennon	Conference & Workshop	31st International Symposium on Chromatography (ISC2016)	University College Cork	25,000.00
Louise Kenny	Conference & Workshop	INFANT Research Workshop: "Better Outcomes for Maternal, Fetal and Infant Health"	University College Cork	3,000.00
Elizabeth Brint	Conference & Workshop	Inaugural joint annual meeting of the Irish Society of Immunology and the Microbiological Society (Irish Division). "Exploring the microbe immune system interface"	University College Cork	8,510.00
Tobias Engel	Conference & Workshop	Neuroscience Ireland Young Investigator Workshop	Royal College of Surgeons in Ireland	2,700.00
Martin Leahy	Conference & Workshop	International Conference on Advanced Laser Technologies (ALT '16)	National University of Ireland, Galway	6,100.00
Jonathan Bones	Conference & Workshop	BioPharma Ambition	The National Institute for Bioprocessing Research and Training	7,000.00
Fiona Regan	Conference & Workshop	DCPM 2016 - IWA the international water association IWA Regional Conference on Diffuse Pollution and Catchment Management	Dublin City University	10,800.00
Douwe van Sinderen	Conference & Workshop	PropioBifido2016: 4th International Symposium on Propionibacteria and Bifidobacteria	University College Cork	11,100.00
Denis Shields	Conference & Workshop	7th Annual Computational and Molecular Biology PhD Symposium	University College Dublin	2,936.00
Stephen O'Brien	Conference & Workshop	MACS10 - Empowering Industrial Mathematical and Statistical Modelling for the Future	University of Limerick	5,630.00
David MacHugh	Conference & Workshop	Harvesting Knowledge from Big Data in Agriculture and Food	University College Dublin	1,800.00
John Ringwood	Conference & Workshop	Modelling, control and forecasting in wave energy systems	National University of Ireland, Maynooth	6,000.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Tiziana Margaria	Conference & Workshop	SOFSEM, 43th International Conference on Current Trends in Theory and Practice of Computer Science	University of Limerick	10,000.00
Kieran Hodnett	Conference & Workshop	Adopting Continuous Manufacturing – Developing the Platform for Success	University of Limerick	5,000.00
Breandan Kennedy	Conference & Workshop	Retia 2016	Fighting Blindness	9,700.00
Paul O'Toole	EU Joint Programme Initiative	Diet Induced Arrangement of the gut Microbiome for Improvement of cardiometabolic health (DINAMIC)	University College Cork	499,871.00
Douwe van Sinderen	EU Joint Programme Initiative	Impact of early life on microbiome development and later health (EarlyMicroHealth)	University College Cork	498,272.40
Albert Flynn	EU Joint Programme Initiative	DERIVE: Development of Riboflavin biomarkers to relate dietary sources with status, gene-nutrient interactions	University College Cork	127,595.60
Susan Joyce	EU Joint Programme Initiative	CABALA: Circulating Bile Acids as biomarkers of metabolic health - Linking microbiota, Diet and Health	University College Cork	249,600.00
John Cryan	EU Joint Programme Initiative	HEALTHMARK: Metabolic HEALTH through nutrition, microbiota and tryptophan bioMARKers	University College Cork	250,000.40
Lokesh Joshi	EU Joint Programme Initiative	SALVAGES: Innovative Technological Approaches for validation of Salivary AGEs as novel biomarkers in evaluation of risk factors in diet-related diseases	National University of Ireland, Galway	248,693.90
Catherine Phillips	EU Joint Programme Initiative	ALPHABET: Early life programming of childhood health: a nutritional and epigenetic investigation of adiposity and bone, cardiometabolic, neurodevelopmental and respiratory health	University College Dublin	250,000.50
Anne Molloy	EU Joint Programme Initiative	VALID - Valerolactones and healthy Ageing: Linking dietary factors, nutrient biomarkers, metabolic status and inflammation with cognition in older adults	Trinity College Dublin	248,409.20
Marco Monopoli	Industry Fellowship	Impact of Glycans at the BioNano Interface	Royal College of Surgeons in Ireland	119,630.00
Frank Bello	Industry Fellowship	Optical and Thermal Transport of Near Field Transducers for Heat-Assisted Magnetic Recording (HAMR)	Trinity College Dublin	121,891.00
Tony Donnelly	Industry Fellowship	Pulsed laser micromachining and surface colouring in RFID applications and devices	Trinity College Dublin	102,631.26
Alan O'Doherty	Industry Fellowship	Translating basic fertility research for clinical application with an emphasis on unexplained male factor infertility	University College Dublin	76,912.00
Sivaramakrishnan Ramadurai	Industry Fellowship	Influence of formulation on Bisphosphonate lipid membrane interactions investigated on MemSense Platform	Dublin City University	76,782.00
Jason Kilpatrick	Industry Fellowship	Electrical and Nanomechanical Diamond Probes for Adama Innovations (ENDPA)	University College Dublin	109,637.00
Niall Hyland	Industry Fellowship	Validation of intestinal Tryptophan Metabolism as a Therapeutic Target in Obesity and Insulin Resistance	University College Cork	18,389.00
Tadhg Kennedy	Industry Fellowship	Processing Technologies and Novel Materials for Electrochemical Sensor Developments based on Semiconductor Manufacturing and Integration	University of Limerick	68,001.00
Ehtsham Haq	Industry Fellowship	Understanding the interplay of surface, interface and process parameters on thin film magnetic materials used in advanced sensors	University of Limerick	80,571.00
Vincent Wade	Industry Fellowship	Personalisation and Assessment in the Classroom	Trinity College Dublin	3,887.00
Richard Doyle	Industry Fellowship	Processing Technologies and Novel Materials for Electrochemical Sensor Developments based on Semiconductor Manufacturing and Integration	Tyndall National Institute	84,257.00
Sebastian Vencken	Industry Fellowship	Development and optimisation of an extracellular microRNA-based diagnostic assay for lung and colorectal cancer biomarkers	Royal College of Surgeons in Ireland	58,075.00
Wanan Sheng	Industry Fellowship	Development of Numerical Tool for Design Optimisation of OEBuoy Wave Energy Converter	University College Cork	100,812.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Mark McCormack	Industry Fellowship	Validation of genetic markers for epilepsy drug response phenotypes in an electronic health record system	Royal College of Surgeons in Ireland	11,960.00
Tandra Ghoshal	Industry Fellowship	Innovative protocol for the development of nanoporous/nanostructured materials patterning using block copolymer lithography for advanced optoelectronic thermal management	University College Cork	82,521.00
Fionnuala Murphy	Industry Fellowship	Consequential life cycle assessment of novel waste plastic-to-fuel systems: maximising energy return with minimal environmental impacts	University College Dublin	89,016.54
Therese Holton	Industry Fellowship	A centralised food database integrating ingredients, health outcomes and molecular data to address the consumer, academic and commercial need for reliable information in relation to food and health associations	University College Dublin	73,247.00
Xiulong Bao	Industry Fellowship	Compact Printed Helical Antennas for Multi-Band Satellite Positioning Systems	Dublin Institute of Technology	114,566.00
Tony Loughman	Industry Fellowship	Development of IVD control materials and assays for infectious disease diagnostic laboratories	Institute of Technology Tallaght	69,195.00
Charlie Stallard	Industry Fellowship	Plasma Vapour Deposition to Minimise Oxygen Permeation in Photochromic Lenses	University College Dublin	68,211.00
Andrew Pringle	Industry Fellowship	Validating DAQRI's Augmented Reality Headgear for Workplace Training	University College Dublin	62,568.00
Michal Szpak	Industry Fellowship	Geohazard Assessment of the Southern Porcupine Basin	Dublin City University	71,947.00
Alireza Soroudi	Industry Fellowship	Enhancing the Irish Transmission Network Flexibility through Smart Technology	University College Dublin	95,111.00
Claire Timon	Industry Fellowship	Commercialisation of the web based dietary assessment tool Foodbook24	University College Dublin	64,372.00
Clare Davidson	Industry Fellowship	Development of a wearable, non-invasive blood glucose monitor for use in Diabetes	University College Dublin	68,652.00
Paul Walsh	Industry Fellowship	Multi-Gene Assay Cloud Computing Platform	Cork Institute of Technology	71,256.00
Dezhong Zhou	Industry Fellowship	Development of Hyperbranched Poly(beta-amino ester) as a New Generation of Tissue Adhesive for Sternum Bonding	University College Dublin	95,130.00
Ramesh Neppalli	Industry Fellowship	Materials to optimize membrane scaling and product performance	Trinity College Dublin	81,762.00
Stefano Porto	Industry Fellowship	Next Generation Optical Fibre Access Network Technologies	Tyndall National Institute	52,664.00
Ramji Lakshmanan	Industry Fellowship	Evaluation of MEMS transducers for sensor applications in gas and liquid environments.	Dublin City University	89,413.00
Duygu Kiyvan	Industry Fellowship	Improving the performance of electromagnetic mining exploration: a case study on the Navan Zn-Pb deposit, Ireland	Dublin Institute for Advanced Studies	64,710.00
Colin Wade	Industry Fellowship	Manufacturing of silicon Laue components for gamma-ray focusing applications	University College Dublin	73,245.00
Brian Caulfield	Industry Fellowship	Application of Kines Health Technologies Q-TUG and Q-Gait in Clinical Motor Function Assessment	University College Dublin	13,000.00
Sandeep Narayanan Kadan Veedu	Industry Fellowship	Robust Wireless Connectivity for the Internet-of-Things	University College Dublin	72,059.00
Emanuel Pelucchi	Investigator Programme	Quantum control of nanostructures for quantum networking	Tyndall National Institute	1,498,256.59
John Donegan	Investigator Programme	Athermal semiconductor lasers for applications in information and communications technologies	Trinity College Dublin	1,433,366.00
Damien Flynn	Investigator Programme	Energy storage and demand-side flexibility within future electricity markets	University College Dublin	783,215.00
John Lowry	Investigator Programme	The development and characterisation of microelectrochemical sensors and biosensors for real-time neurochemical monitoring of brain energy metabolism	National University of Ireland, Maynooth	1,214,271.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Mani Ramaswami	Investigator Programme	Conformational Triggers, Mechanisms and Pathways for Neurodegenerative Disease	Trinity College Dublin	2,133,494.00
Gil U Lee	Investigator Programme	Nanotechnology Enabled Biopharmaceutical Downstream Processing (NanoBiopharm)	University College Dublin	892,211.00
Oliver Dolly	Investigator Programme	Delineating the exocytotic proteins (SNAREs) underlying sensitisation of nociceptor sub-sets in chronic pain : engineering botulinum neurotoxins as improved versatile analgesics	Dublin City University	2,775,948.00
Tom Ray	Investigator Programme	Building the Next Generation MKID Camera	Dublin Institute for Advanced Studies	1,600,200.00
Louise Allcock	Investigator Programme	Exploiting and conserving deep-sea genetic resources	National University of Ireland, Galway	1,940,150.00
Timothy O'Brien	Investigator Programme	COMBINATORAL CELL THERAPY FOR DIABETES-RELATED CRITICAL LIMB ISCHAEMIA	National University of Ireland, Galway	739,074.00
Martin Ulrich Hegner	Investigator Programme	Nanomechanical detection of noncoding RNA for diagnosis in biological fluids	Trinity College Dublin	1,276,291.00
David Chew	Investigator Programme	Developing geochronology by LA-ICPMS imaging: applications of U-Pb calcite dating in raw materials research	Trinity College Dublin	647,921.00
Sylvia Draper	Investigator Programme	Targeting Synthetic and Material Advances in the Activity and Function of Light-emitting Molecular Complexes: New Platform Technologies Based on Polyaromatic Ligands'	Trinity College Dublin	1,356,177.00
Marina Lynch	Investigator Programme	Targeting glial plasticity to alleviate age-related loss of neuronal function in Alzheimer's disease	Trinity College Dublin	1,786,484.00
Eoin O'Reilly	Investigator Programme	Multiscale Simulation and Analysis of emerging Group IV and III-V Semiconductor Materials and Devices	Tyndall National Institute	1,605,610.00
Brian Donlon	Investigator Programme	Developing geochronology by LA-ICPMS imaging: applications of U-Pb calcite dating in raw materials research - D Chew	Environmental Protection Agency	-215,973.67
Koen Verbruggen	Investigator Programme	Developing geochronology by LA-ICPMS imaging: applications of U-Pb calcite dating in raw materials research - D Chew	Geological Survey of Ireland	-215,973.67
Henry Curran	Investigator Programme	Combustion Chemistry for Sustainable Fuel Utilization	National University of Ireland, Galway	1,714,058.00
Christopher Brunsson	Investigator Programme	Building city dashboards: Addressing fundamental and applied problems	National University of Ireland, Maynooth	2,352,670.00
Rachel McLoughlin	Investigator Programme	Profiling 'immune signatures' predictive of outcome in Staphylococcus aureus infection: Advancing next generation vaccine design	Trinity College Dublin	2,192,331.00
Georg Duesberg	Investigator Programme	Investigating Emerging 2D Semiconductor Technology	Trinity College Dublin	1,877,163.00
Stephen Fahy	Investigator Programme	Thermoelectric efficiency of IV-VI and V2-VI3 materials driven near phase transitions	Tyndall National Institute	1,750,383.00
Cian O'Mathuna	Investigator Programme	Advanced Integrated Power Magnetics Technology- From Atoms to Systems	Tyndall National Institute	1,483,783.00
Martyn Pemble	Investigator Programme	Design, Deposition and Exploitation of Novel Micro and Nano-scale Materials and Devices for Advanced Manufacturing- DEPO-Man	Tyndall National Institute	1,938,557.00
Philip McGinnity	Investigator Programme	Wild farmed interactions in a changing world: formulation of a predictive methodology to inform environmental best practice to secure long-term sustainability of global wild and farm fish populations	University College Cork	1,709,586.00
Aoife Gowen	Investigator Programme	Multi-scale hyperspectral imaging for enhanced understanding and control of food microbiology (HyperMicroMacro)	University College Dublin	1,548,873.00
Federico Milano	Investigator Programme	Advanced Modelling for Power System Analysis and Simulation	University College Dublin	1,744,155.00
David MacHugh	Investigator Programme	Development of Next-Generation Control Tools for Bovine Tuberculosis: A One Health Approach	University College Dublin	1,849,519.00
Eoin Casey	Investigator Programme	Interactions between bacterial biofilms and nanoparticles: a focus on the EPS matrix	University College Dublin	1,176,703.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Jonathan Yearsley	Investigator Programme	Biodiversity, resilience and food security: understanding the role of biodiversity in maintaining food production	University College Dublin	568,131.00
William Gallagher	Investigator Programme	Optimal Management of Gender-Specific Cancers via Efficient Use of Protein Profiling, Digital Pathology and Systems Medicine Tools (OPTI-PREDICT)	University College Dublin	2,510,941.00
Catherine Godson	Investigator Programme	Discovery of an integrated risk profile for chronic kidney disease and development of a clinical biomarker panel for personalising medicine	University College Dublin	1,171,485.00
John Evans	Investigator Programme	Exploiting and conserving deep-sea genetic resources - Louise Allcock	The Marine Institute	-970,075.00
John Evans	Investigator Programme	Wild farmed interactions in a changing world: formulation of a predictive methodology to inform environmental best practice to secure long-term sustainability of global wild and farm fish populations - P McGinnity	The Marine Institute	-854,793.00
Oliver Daniels	Maternity Supplement	INSIGHT - Ireland's Big Data and Analytics Research Centre	National University of Ireland, Galway	24,060.71
Oliver Daniels	Maternity Supplement	INSIGHT - Ireland's Big Data and Analytics Research Centre	National University of Ireland, Galway	25,522.22
Oliver Daniels	Maternity Supplement	INSIGHT - Ireland's Big Data and Analytics Research Centre	National University of Ireland, Galway	49,923.19
Jochen Prehn	Maternity Supplement	BCL-2 family proteins and cellular bioenergetics in the control of cell survival: Towards novel predictive and prognostic markers for disease progression and therapy responses in colorectal cancer patients	Royal College of Surgeons in Ireland	22,861.29
Mark O'Malley	Maternity Supplement	SRC SEES: Sustainable Electrical Energy Systems -	University College Dublin	54,086.21
Judith Coppinger	Maternity Supplement	Characterisation of Hsp90 trafficking pathways in Cystic Fibrosis -	University College Dublin	40,995.21
Louise Kenny	Maternity Supplement	Irish Centre for Fetal and Neonatal Translational Research (INFANT) -	University College Cork	32,820.31
Michael Morris	Maternity Supplement	Advanced Materials and BioEngineering Research Centre (AMBER)	Trinity College Dublin	18,326.09
Robert Forster	Maternity Supplement	Confirmed: A Multifunctional Anti-Counterfeiting and Package Integrity Label -	Dublin City University	29,146.05
Michael Zaworotko	Maternity Supplement	Crystal Engineering of Task-Specific Materials -	University of Limerick	25,610.57
Paul Townsend	Maternity Supplement	I-PIC Irish Photonic Integration Research Centre -	Tyndall National Institute	31,465.77
Anita Maguire	Maternity Supplement	ENSNARE -	University College Cork	35,086.99
Karen English	Maternity Supplement	Investigating the capacity for multipotent adult progenitor cells to prolong graft survival through modulation of homeostatic proliferation -	National University of Ireland, Maynooth	37,431.90
Oliver Daniels	Maternity Supplement	INSIGHT -	National University of Ireland, Galway	24,834.10
Sheila McBreen	Maternity Supplement	Advances in gamma-ray Space Science using Silicon Photomultipliers -	University College Dublin	32,081.40
Rachel McLoughlin	Maternity Supplement	Profiling "immune signatures" predictive of outcome in Staphylococcus aureus infection; Advancing next generation vaccine design	Trinity College Dublin	37,431.90
Michael Morris	Maternity Supplement	AMBER	Trinity College Dublin	23,700.09
Martin Caffrey	NSF/SFI Graduate Research opportunities Worldwide (GROW) Programme	Martin Caffrey GROW Supplement -	Trinity College Dublin	6,800.00
Tomas Ryan	PIYRA	Neurobiological Substrates of Memory Engram Storage and Retrievability	Trinity College Dublin	986,012.00
Jean-Christophe Desplat	Research Infrastructure	National High-Performance & Technical Computing Infrastructure	National University of Ireland, Galway	5,411,270.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Bernard Mahon - VP for Research	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	National University of Ireland, Maynooth	1,345,280.00
Mary Shire - VP for Research	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	University of Limerick	2,372,845.00
Lokesh Joshi - VP for Research	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	National University of Ireland, Galway	2,372,845.00
Peter McLoughlin - VP for Research	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	Waterford Institute of Technology	248,290.00
John Boland - VP for Research	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	Trinity College Dublin	2,372,845.00
Anita Maguire - VP for Research	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	University College Cork	2,372,845.00
Cormac Harrington	Research Infrastructure	SFI Research Infrastructure - Cat D - Opportunistic Funding	Tyndall National Institute	4,250,000.00
Niall Barron	Research Infrastructure	Mass spectrometer	Dublin City University	1,136,920.00
Gregory Hughes	Research Infrastructure	Integrated surface modification and characterisation facility	Dublin City University	1,921,131.00
Dermot Brabazon	Research Infrastructure	Asylum Instruments MFP-3D Atomic Force Microscope (AFM), with Nano-Indentation and Electrochemical Modules	Dublin City University	305,205.00
John Costello	Research Infrastructure	Multicolour - Multidimensional Ultrafast Laser Spectroscopy Facility	Dublin City University	877,652.00
Liam Barry	Research Infrastructure	Advanced Signal Characterisation Facility	Dublin City University	727,686.00
Gerard O'Connor	Research Infrastructure	"Additive/subtractive manufacturing testbed - for electrically, optically and thermally - activated biomaterials"	National University of Ireland, Galway	1,092,350.00
Rhodri Ceredig	Research Infrastructure	Ireland's first high resolution flow based imaging system	National University of Ireland, Galway	506,258.24
Frank Barry	Research Infrastructure	"A Test Bed for Advanced Manufacturing of Cell Therapy Products: Centre for Cell Manufacturing Ireland Development Strategy"	National University of Ireland, Galway	499,874.00
Timothy McCarthy	Research Infrastructure	CASPER (Compact Airborne Sensor Pod for Environmental Reconnaissance)	National University of Ireland, Maynooth	314,880.00
Neil Trappe	Research Infrastructure	Development of a high frequency Terahertz measurement and characterisation facility	National University of Ireland, Maynooth	680,444.00
Jochen Prehn	Research Infrastructure	Light Sheet Fluorescence Microscope (LSFM) for imaging of live and optically cleared biological samples	Royal College of Surgeons in Ireland	480,605.38
Donal O'Shea	Research Infrastructure	Automated Biopolymer and Biomaterial Synthesis Facility	Royal College of Surgeons in Ireland	345,389.00
Kingston Mills	Research Infrastructure	Imaging Flow Cytometer	Trinity College Dublin	554,769.00
Aiden Corvin	Research Infrastructure	A high-throughput, production-scale next-generation sequencing platform to meet the needs of the Irish genome research community	Trinity College Dublin	882,914.00
Daniel J Kelly	Research Infrastructure	PrednicAI Infrastructure Resource (PAIR)	Trinity College Dublin	1,109,577.00
Kieran Kilcawley	Research Infrastructure	Comprehensive Time-of-Flight Gas Chromatography Mass Spectrometer	Teagasc	268,456.00
Martin Danaher	Research Infrastructure	UHPLC-MS3 system for investigating contaminants in food and environmental samples	Teagasc	352,136.00
Alan Mathewson	Research Infrastructure	National facility for wafer-scale fabrication and characterisation of integrated piezoelectric materials and microelectromechanical systems for energy harvesting, energy storage and biomedical applications (PiezoMEMS Cluster)	Tyndall National Institute	3,154,508.00

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Michael Gilchrist	Research Infrastructure	3-D imaging and metrology system	University College Dublin	320,202.00
Angela Feehan	Research Infrastructure	PICS: Physiology Infrastructure for Crop Stress	University College Dublin	1,206,811.10
Jeremy Simpson	Research Infrastructure	An advanced high-throughput imaging platform for multi-dimensional analysis of complex biological models in health and disease	University College Dublin	704,486.00
Eoin Casey	Research Infrastructure	Cryogenic extreme-resolution Scanning Electron Microscope	University College Dublin	1,209,796.00
Ursel Bangert	Research Infrastructure	"Observations of Materials' Structural dynamics in Real time & Environments at Atomic Resolution (ORACLE)"	University of Limerick	1,724,182.00
Sarah Hudson	Research Infrastructure	Biologicals Process Infrastructure Testbed (BioPOINT)	University of Limerick	1,633,739.00
Conor McCarthy	Research Infrastructure	Composites and Plastics Joining Suite	University of Limerick	921,160.00
Stephen Dooley	Research Infrastructure	Molecular Process Analytical Technology Test-Bed for Sustainable Chemical Transformations	University of Limerick	1,597,130.00
Noel O'Dowd	Research Infrastructure	Multifunctional Nanometrology Facility (MNF)	University of Limerick	1,231,806.00
Peter McLoughlin	Research Infrastructure	Smart Sensing Systems Development Platform	Waterford Institute of Technology	904,985.00
Aljoscha Smolic	Research Professorship Programme	V-SENSE - Extending Visual Sensation through Image-Based Visual Computing	Trinity College Dublin	6,007,167.00
Stefan Andersson-Engels	Research Professorship Programme	Novel applications and techniques for in vivo optical imaging and spectroscopy	Tyndall National Institute	6,060,188.00
William Wijns	Research Professorship Programme	Reducing adverse cardiovascular events through modulation of event-triggering stressors and plaque modification	National University of Ireland, Galway	4,947,951.00
Prof. Fengzhou Fang	Research Professorship Programme	Ultra-precision Machining in Medical Device Manufacturing	University College Dublin	6,059,392.90
Prof. Piet Lens	Research Professorship Programme	Innovative Energy Technologies for Biofuels, Bioenergy and a Sustainable Irish Bioeconomy	National University of Ireland, Galway	6,351,495.00
Morgan Fraser	RS-SFI University Research Fellow	The Fate of the most massive stars	The Royal Society	535,861.70
John Goold	RS-SFI University Research Fellow	Thermodynamics for Quantum Technologies	The Royal Society	523,261.70
Richard Hobbs	RS-SFI University Research Fellow	Engineering energy transfer on the nanoscale at plasmonic surfaces	The Royal Society	550,561.70
Aidan McDonald	RS-SFI University Research Fellow	Bioinorganic Nucleophilic Reactivity of Metal-Bound Superoxide	The Royal Society	550,561.70
Sinead O'Keefe	RS-SFI University Research Fellow	Advancing Photonics for Radiotherapy	The Royal Society	547,501.70
Liz McBain	SFI Discover	FameLab Ireland 2017	British Council Ireland	49,300.00
Valerie Cowman	SFI Discover	EDU-STEM	Cork Electronic Industries Association	50,000.00
Alex Vakaloudis	SFI Discover	Teachers of Things	Cork Institute of Technology	30,384.00
Clair McSweeney	SFI Discover	A Hand in Space- the masses behind human space exploration	Cosmos Education T/A - Blackrock Castle Observatory	49,338.00
Eilish McLoughlin	SFI Discover	Science on Stage	Dublin City University	11,200.00

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Eilish McLoughlin	SFI Discover	Physics Busing	Dublin City University	41,400.00
Eilish McLoughlin	SFI Discover	Improving Gender Balance, Ireland	Dublin City University	170,000.00
Mary Cleary	SFI Discover	Tech Week	ECDL Ireland Ltd T/A ICS Skills	75,000.00
Edelle Moss	SFI Discover	Science Foundation Ireland Science Zone at the Big Day Out	Feilte Dhuibh Linne Teoranta t/a St Patrick's Day Festival	36,826.00
Gerard Ryder	SFI Discover	Fiosracht	Institute of Technology Tallaght	49,211.00
Ross Maguire	SFI Discover	FIRST® LEGO® League Leinster & Munster	Learn It Educational Solutions Ltd	50,000.00
Pramod Pathak	SFI Discover	ELI Afterschool Coding Club	National College of Ireland	22,450.00
Heike Felzmann	SFI Discover	Genetic testing: engaging the West of Ireland	National University of Ireland, Galway	48,751.00
Mary Cunningham	SFI Discover	STEM in Youth Work	National Youth Council of Ireland	252,150.00
Aoibhinn Ni Shuilleabhain	SFI Discover	Maths Sparks: Developing Mathematical Thinking through Problem Solving Workshops	University College Dublin	6,773.00
Stephen Rooke	SFI Discover	A Rough Guide to the Future	Tile Films	150,000.00
Adam Wallace	SFI Discover	Fab Foundation Ireland All island network for STEM awareness programme	FabLab Foundation Ireland	100,000.00
Gillian Keating	SFI Discover	I Wish - inspiring women in Stem	I Wish STEM Company Limited by Guarantee	160,000.00
Sean O'Brien	SFI Discover	Science Hub at Learning Hub Limerick	Learning Hub Limerick Ltd	25,000.00
Philip Hennessy	SFI Discover	STEM in Sport	Limerick Institute of Technology	34,294.00
Nigel Flegg	SFI Discover	Music and Science: Quadratics to Quavers	National Concert Hall	28,600.00
Enda O'Connell	SFI Discover	ReelLIFE SCIENCE Video Competition	National University of Ireland, Galway	8,500.00
Muriel Grenon	SFI Discover	Cell EXPLORERS -national expansion for a sustainable public engagement model	National University of Ireland, Galway	181,332.00
Tomas Ward	SFI Discover	Dublin Maker 2017	National University of Ireland, Maynooth	50,000.00
Claire Mulhall	SFI Discover	RDS Primary Science Fair Regionalisation	Royal Dublin Society RDS	50,000.00
Hannah Spry	SFI Discover	Expansion of Spectroscopy in a Suitcase (SIAS)	Royal Society of Chemistry	50,000.00
Mary Murphy	SFI Discover	INSIDERS 2, Children's TV Science Series for Broadcaster RTÉ	Stop.watch Television Ltd	243,850.00
Daniel Vincent McCarthy	SFI Discover	Curiosity Studio 2017	The Festival of Curiosity Ltd	50,000.00
Daniel Vincent McCarthy	SFI Discover	CURIOUS FASHION / FUTURE FASHION 2017	The Festival of Curiosity Ltd	50,000.00
Joseph Roche	SFI Discover	Engaging Irish Society with National Citizen Science Questions	Trinity College Dublin	50,000.00
Jessamyn Fairfield	SFI Discover	Bright Club	National University of Ireland, Galway	19,450.00
Lynn Scarff	SFI Discover	CREATIVE COLLISIONS - a strategic partnership with SFI and SGD	Trinity College Dublin	218,000.00
Brendan Tangney	SFI Discover	CodePlus Mentoring: Coding Better Futures for Girls	Trinity College Dublin	50,000.00

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Simon Elliott	SFI Discover	Tyndall MakerDojo 2017	Tyndall National Institute	49,917.00
Anca Mustata	SFI Discover	The IMT National Integration of Mathematics Outreach	University College Cork	50,000.00
Aoibheann Bird	SFI Discover	Suite Science	University College Dublin	15,200.00
Shane Bergin	SFI Discover	Learning by Heart	University College Dublin	28,322.00
Emma Sokell	SFI Discover	Seeing the Light	University College Dublin	3,935.00
Alexandra Boyd	SFI Discover	Improve with Improv- theatre training for better STEM Communicators	University College Dublin	45,432.00
Colin Fitzpatrick	SFI Discover	Raw Engagement for Sustainable Technology And Repair Talk (RESTART)	University of Limerick	50,000.00
Sheila Donegan	SFI Discover	CALMAST STEM Outreach Hub for Southeast of Ireland	Waterford Institute of Technology	50,000.00
Jonathan McCrea	SFI Discover	Sci:COM National Science Communication Conference	Whipsmart Media Ltd	59,000.00
Darren Smith	SFI Discover Programme Opportunistic Funding	Brain Freeze 3	Kite Entertainment	60,000.00
Cepa Giblin	SFI Discover Programme Opportunistic Funding	Rocketeers	Crossing the Line Productions	11,750.00
Sheila Dooley	SFI Discover Programme Opportunistic Funding	Meet the Experts	Dublinia (The Medieval Trust)	6,338.00
Sarah Miller	SFI Discover Programme Opportunistic Funding	Let's Talk Science 2016	The Rediscovery Centre Ltd	7,550.00
Siobhan Pierce	SFI Discover Programme Opportunistic Funding	Discovering the Secrets of Living in the Past - Experimental Archaeology Open Day	National Museum of Irl, Archaeology & Natural History	2,900.00
Jonathan Mackey	SFI Discover Programme Opportunistic Funding	Science Week at Dunsink Observatory for 2016 and Beyond	Dublin Institute for Advanced Studies	2,550.00
Aideen Howard	SFI Discover Programme Opportunistic Funding	Science Week at the Ark	The Ark	11,090.00
Mr. Tom Hyland	SFI Discover Programme Science Week 2016	Galway Science Festival	Galway Science & Technology Forum	20,000.00
Dr. Jeremy Bird	SFI Discover Programme Science Week 2016	Sligo Science Festival	Institute of Technology Sligo	17,125.00
Dr. Noel Mulligan	SFI Discover Programme Science Week 2016	Kerry Science Festival	Tralee Institute of Technology	31,750.00
Mr. Pat McHale	SFI Discover Programme Science Week 2016	Mayo Science Festival	Mayo County Council	16,000.00
Ms. Jackie Gorman	SFI Discover Programme Science Week 2016	Midlands Science Festival	Atlantic Corridor	33,000.00
Ms. Deirdriu McQuaid	SFI Discover Programme Science Week 2016	Monaghan Science Festival	Monaghan County Council - Library Service	35,000.00
Dr. Sheila Donegan	SFI Discover Programme Science Week 2016	Waterford Science Festival	Waterford Institute of Technology	35,000.00
Ms. Bernie Quilligan	SFI Discover Programme Science Week 2016	Limerick Science Festival	University of Limerick	25,440.00

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Ms. Catriona Boyle	SFI Discover Programme Science Week 2016	Teagasc - Festival of Food and Farming	Teagasc	4,443.25
Mr. Mervyn Horgan	SFI Discover Programme Science Week 2016	Cork Science Festival	Glenosheen Ltd	35,000.00
Orla Hardiman	SFI ERC Development Programme	DECIPHERING ALS HETEROGENEITY: A PRECISION MEDICINE APPROACH TO NETWORK BASED BIOMARKER DEVELOPMENT	Trinity College Dublin	610,640.00
Robert Whelan	SFI ERC Development Programme	The Neurobiology of Voluntary Nicotine Abstinence: Genetics, Environment and Neurocognitive Endophenotypes	Trinity College Dublin	608,419.00
Javier Fullera	SFI ERC Development Programme	iTHERC: An integrated geophysical-petrological THERmoChemical model of Ireland's and North Atlantic crust and lithospheric mantle	Dublin Institute for Advanced Studies	509,099.00
Stephen Dooley	SFI ERC Development Programme	Synthesis and Purification of Hydroperoxides from Liquid Fuels and Demonstration of their Ability to Extend Low Temperature and Lean Combustion Limits in Reciprocating Engines	Trinity College Dublin	529,168.00
Lokesh Joshi	SFI ERC Support Programme	SFI ERC Support Programme – Prof Martin O'Donnell (NUIG)	National University of Ireland, Galway	296,768.00
VP Research (UCD)	SFI ERC Support Programme	SFI ERC Support Programme - Professor Robert B Staszewski (UCD)	University College Dublin	159,889.00
Lokesh Joshi	SFI ERC Support Programme	SFI ERC Support Programme- Professor Gary Donohoe, NUI Galway	National University of Ireland, Galway	150,000.00
Anita Maguire	SFI ERC Support Programme	SFI ERC Support Programme – Dr Maria McNamara (University College Cork)	University College Cork	272,473.00
John Boland	SFI ERC Support Programme	SFI ERC Support Programme - Prof. Jonathan Coleman (Trinity College Dublin)	Trinity College Dublin	150,000.00
John Boland	SFI ERC Support Programme	SFI ERC Support Programme- Dr. Aidan McDonald (Trinity College Dublin)	Trinity College Dublin	150,000.00
Niall Smith	SFI ERC Support Programme	ERC Support Programme - William Whelan-Curtin (CIT)	Cork Institute of Technology	268,000.00
John Boland	SFI ERC Support Programme	ERC Support Programme - Valeria Nicolosi (TCD)	Trinity College Dublin	150,000.00
John Boland	SFI ERC Support Programme	ERC Support Programme - Lydia Lynch (TCD)	Trinity College Dublin	150,000.00
Oliver Daniels	SFI Fellowship	SFI Fellowship	National University of Ireland, Galway	181,006.80
Prof. Orla Feely	SFI Fellowship	SFI Fellowship	University College Dublin	325,661.70
John Boland	SFI Fellowship	SFI Fellowship	Trinity College Dublin	49,873.20
Greg Hughes	SFI Fellowship	SFI Fellowship	Dublin City University	78,622.70
John Boland	SFI Fellowship	SFI Fellowship	Trinity College Dublin	216,238.10
John Boland	SFI Fellowship	SFI Fellowship	Trinity College Dublin	279,620.90
John Boland	SFI Fellowship	SFI Fellowship	Trinity College Dublin	257,030.80
Orla Feely	SFI Fellowship	SFI Fellowship	University College Dublin	291,107.70
Andriy Temko	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Sound based observation of neonatal brain growth and status	Health Research Board	33,608.75
Elizabeth Heron	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Artificial neural Networks, Genomic Data and Case-Control Classification	Health Research Board	21,199.50

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Luke O'Neill	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Metabolic reprogramming in innate immunity	Health Research Board	560,650.75
Eileen Roche	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Modelling of pharmacokinetics into ischemic heart tissue from an implantable, replenishable therapy reservoir	Health Research Board	24,540.25
Niamh O'Sullivan	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Uncovering the role of ER-shaping proteins in neurodegenerative disease	Health Research Board	32,474.00
Triona NiChonghaile	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Determining the mechanism of action of a novel histone deacetylase 6 specific inhibitor that kills chemoresistant breast cancer	Health Research Board	31,784.00
Graham Love - R McLoughlin	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Staphylococcus aureus induced immunosuppressive memory: consequences for bug and for host	Health Research Board	394,376.75
Graham Love - William Gallagher	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Institutional Strategic Support Fund	Health Research Board	275,000.00
Graham Love - John Boland	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Institutional Strategic Support Fund	Health Research Board	275,000.00
Graham Love - Andrew Smyth	SFI-HRB-Wellcome Trust Biomedical Research Partnership	Identifying Interventions to Prevent and Manage Chronic Kidney Disease	Health Research Board	121,623.00
Jinghau Meng	SIRG	Unravelling the role of SNARE proteins in pruritus (itch) and developing novel SNARE-targeting biotherapeutics for treating chronic itch	University College Dublin	519,440.80
Jennifer Mahony	SIRG	Phage-host interactome of the dairy bacterium Streptococcus thermophilus (PHIST)	University College Cork	519,492.00
Stephen Lalor	SIRG	The role of the respiratory microbiome in licensing pathogenic Th17 cells to access the CNS and mediate inflammatory demyelination	Trinity College Dublin	519,739.00
Yan Yan	SIRG	Defining the dynamic interface between nanoparticles and immune system	University College Dublin	517,342.00
Matteo Lusi	SIRG	Crystal Engineering of Solid-Solutions for Tunable Drugs	University of Limerick	485,530.00
Nuala Mai Caffrey	SIRG	Between the Sheets - Atomic and Molecular Intercalation in Two Dimensional Layered Materials from First Principles	Trinity College Dublin	453,766.00
Kevin McGuinness	SIRG	Large scale semi-supervised deep learning for computer vision	Dublin City University	456,875.00
Klaas-Jan Stol	SIRG	Software Development with Alternative Workforces	University of Limerick	463,314.00
Lorna Lopez	SIRG	Discovery to clinical utility of rare mutations by whole genome sequencing in neurodevelopmental disorders	Trinity College Dublin	511,997.00
Niall McEvoy	SIRG	Synthesis and Characterisation of 2D-Material Heterostacks	Trinity College Dublin	503,335.00
Susan Kelleher	SIRG	Polymeric nanoneedle arrays for injecting drugs into cells for localised gene therapy (GeneInject)	Dublin City University	517,238.00
Aideen Ryan	SIRG	'RESTRAIN' Investigation of tumour stromal interactions in metastatic colon cancer for the identification of novel immuno-therapeutic targets	National University of Ireland, Galway	518,821.00

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Emily Hams	SIRG	Defining the role of RORa in immunometabolism	Trinity College Dublin	517,213.00
Naomi Walsh	SIRG	Functional application of genomic variants to deliver personalized strategies for pancreatic cancer patients	Dublin City University	519,712.00
Liliana Pasquale	SIRG	Forensic Investigations for Cyber-Physical Incidents	University College Dublin	489,139.00
James Walsh	SIRG	CARBCAP: Organocatalytic CO2 reduction on high surface-area electrodes.	Dublin City University	503,478.00
Antonio Benedetto	SIRG	Breathing Life into Room-Temperature Ionic Liquids: a Comprehensive Experimental and Computational Study of their Interaction with Biomolecules	University College Dublin	499,376.00
Laura Russo	SIRG	Glyco-functionalised Hydrogel for Intervertebral Disc Tissue Repair	National University of Ireland, Galway	518,749.00
Ahmad B. Albadarin	SIRG	Natural materials for Advanced Therapeutics (NEAT): Biomaterial Derived Excipients for Improved Bioavailability	University of Limerick	509,184.00
Santosh Kulkarni	SIRG	Advanced Power Magnetics Programme for High Efficiency Power Supplies	Tyndall National Institute	508,011.00
Jianghui Meng	SIRG	Unravelling the role of SNARE proteins in pruritus (itch) and developing novel SNARE-targeting biotherapeutics for treating chronic itch	Dublin City University	0.00
Susan Kelleher	SIRG	Polymeric nanoneedle arrays for injecting drugs into cells for localised gene therapy (Geneinject)	University College Dublin	0.00
Daniela Boehm	SIRG	Harnessing the potential of plasma activated liquids for bio-medical applications	Dublin Institute of Technology	476,782.00
Ruairi de Frein	SIRG	Efficient monitoring of large scale datacenters (EOLAS)	Dublin Institute of Technology	461,013.00
David Monaghan	SIRG	New Adventures in Motion Capture Technology	Trinity College Dublin	484,057.00
Susan Logue	SIRG	IRE1 α regulated secretome – a novel driver of triple negative breast cancer	National University of Ireland, Galway	520,001.00
John O'Toole	SIRG	Advancing Neuroprotection for Premature Infants: Automated Analysis of Neurological Signals for Early Detection of Brain Injury	University College Cork	463,080.00
Martin Steinhoff	Strategic Partnership Programme	Usage of Omics Technology for identification of critical mediators and pathways in patients with recalcitrant atopic dermatitis, psoriasis and hidradenitis suppurativa	University College Dublin	682,000.70
Michael Gill	Strategic Partnership Programme	6/7 Psychiatric Genomics Consortium finding actionable variation	Trinity College Dublin	842,029.50
Gregory O'Hare	Strategic Partnership Programme	CONSUS: Crop Optimisation through Sensing, Understanding & Visualisation	University College Dublin	5,262,054.20
Jens Ducree	Strategic Partnership Programme	Fraunhofer Project Centre for Embedded Bioanalytical Systems at DCU	Dublin City University	3,245,800.00
David Brayden	TIDA	Silica nanoshells for oral peptide delivery: widening the platform	University College Dublin	122,651.00
Tobias Engel	TIDA	Development of a simple, fast blood test to support seizure diagnosis	Royal College of Surgeons in Ireland	115,170.00
Nigel Stevenson	TIDA	Restoration of anti-viral responses to Interferon- α towards the development of a therapeutic cure for HIV	Trinity College Dublin	128,100.00
Graham Cross	TIDA	Ion implant lithography for wafer scale diamond nanoelectromechanical system (NEMS) fabrication	Trinity College Dublin	129,830.00
Anthony Robinson	TIDA	Copper-Diamond Composite Heat Spreaders using Cold Spray Additive Manufacturing Technique	Trinity College Dublin	123,509.00
Grainne Cunniffe	TIDA	Mosaic scaffolding for osteochondral regeneration: modular biomimetic PCL templates functionalised with cartilage and bone specific extracellular matrix (ECM) components	Trinity College Dublin	126,550.00

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Laure Marignol	TIDA	Development of a Companion diagnostic test for radiotherapy prostate cancer patients (CASPAR)	Trinity College Dublin	129,365.00
Isabel Rozas	TIDA	RATIONALLY DESIGNED INHIBITORS OF STAPHYLOCOCCUS AUREUS COLONIZATION	Trinity College Dublin	130,000.00
Andrew Bowie	TIDA	Novel anti-inflammatory therapeutics derived from a human adapted poxvirus	Trinity College Dublin	129,505.00
Finn Purcell-Milton	TIDA	Quantum Solar Salts: Innovative Luminescent Solar Concentrators utilizing Zn-Cu-In-S Quantum Dots based Alkali Halide Salt composites	Trinity College Dublin	98,602.00
Emma Creagh	TIDA	Inflammatory Caspases - Expression and Function in Treatment-Resistant Oesophageal Cancer.	Trinity College Dublin	121,534.50
Annemarie McCarthy	TIDA	Multimode RGBIR-d Sensor for Optical Mapping of Basal Cell Carcinomas	Cork Institute of Technology	123,887.00
Andrew Way	TIDA	Creating a system for post-editing of machine translation on touchscreen devices	Dublin City University	116,823.00
Niall Barron	TIDA	miRNA knockout using CRISPR/Cas9 to enhance recombinant protein productivity in CHO cells	Dublin City University	121,471.00
Dermot Diamond	TIDA	Conformable glucose sensor for non-invasive optical detection in a wearable platform	Dublin City University	114,046.00
Toufic ElArnaout	TIDA	Building a novel crystallization monitoring process analytical technology (MXM, for MicroXtalMorph)	Dublin Institute of Technology	101,309.00
Andrew Flaus	TIDA	Optimised chromatin substrates for epigenetic drug screening	National University of Ireland, Galway	129,968.00
Paul Murphy	TIDA	Design and synthesis of carbohydrate based therapies for fibrosis	National University of Ireland, Galway	126,872.00
Thomas Barry	TIDA	Culture independent diagnostics technologies for the rapid detection of Non Tuberculosis Mycobacteria associated with water distribution system contamination	National University of Ireland, Galway	120,223.00
Sara Farrona	TIDA	Enhancing plant growth and resilience by Ensifer-mediated seed priming	National University of Ireland, Galway	120,232.45
Leo Quinlan	TIDA	ESCAPEFOG; Electrical Stimulation Cueing for Freezing of Gait correction in people with Parkinson's Disease.	National University of Ireland, Galway	106,223.00
James O'Gara	TIDA	Repurposing D-cycloserine and related drugs to overcome resistance to beta-lactam antibiotics in bacterial pathogens	National University of Ireland, Galway	119,322.00
Fergal O'Brien	TIDA	Collagen-based, multi-layered scaffold for closure of tympanic membrane perforations (TympanoColl)	Royal College of Surgeons in Ireland	129,357.00
Jacintha O'Sullivan	TIDA	Pre-clinical evaluation of CC12, a novel anti-angiogenic drug, as a combination therapy for colorectal cancer patients.	Trinity College Dublin	129,685.00
Saibal Roy	TIDA	Low-cost, Wideband Electromagnetic Vibration Energy Harvesters for Powering 'Internet of Things'- (EMPOWER)	Tyndall National Institute	123,850.00
Justin Holmes	TIDA	Development of "green and clean" block co-polymer lithography for nano-patterning	University College Cork	123,409.00
Mark Tangney	TIDA	LITE: Live Imaging with Targeting Enzymes	University College Cork	125,458.00
Walter Kolch	TIDA	Next Generation Ex-vivo Functional Predictive Assays for High Grade Serous Ovarian Cancer Screening: Three Dimensional, Multicellular Drug Screening using Lab on a Chip Technologies	University College Dublin	128,690.00
Eoin Casey	TIDA	Development of Continuous Spatially Distributed Diafiltration for Pharmaceutical Synthesis	University College Dublin	117,557.00
Declan Gilheary	TIDA	Platform for microRNA drug synthesis	University College Dublin	95,652.00
Aleksandra Kaszubowska-Anandarajah	TIDA	Real-time Flexible Transmitters for Optical Networks - REFLECTION	Trinity College Dublin	128,658.00

SFI Research Scientist	Programmes	Research Title	Research Body	Total value of award including overheads
Brian Ward	TIDA	The Surface Ocean Autonomous Profiling Platform (SOAPP): Optimisation toward Commercial Potential	National University of Ireland, Galway	124,660.00
Daniel O'Toole	TIDA	Development of a nebulised recombinant SOD protein for acute respiratory distress syndrome.	National University of Ireland, Galway	129,099.00
William Wright	TIDA	uBeeClean: Varroa mite removal using airborne ultrasound	University College Cork	125,599.00
Margaret McGee	TIDA	Novel Anti-inflammatory Biotherapeutic Development	University College Dublin	129,815.00
Madeline Murphy	TIDA	Development of a novel assay for sensitive and accurate detection of early stage kidney disease via exploitation of an hypoxia inducible protein	University College Dublin	129,345.00
Andrew Phillips	TIDA	Development of Regenerative and Systematically Upgradable Antibiotic Polymers	University College Dublin	126,265.60
Jennifer Mahony	TIDA Training	Next generation diagnostic tools for problematic dairy bacteriophages	University College Cork	3,500.00
Charles Spillane	TIDA Training	High Metal Yeast for Improved Pig Nutrition - Sandesh Swamidatta	National University of Ireland, Galway	3,500.00
Eric Moore	TIDA Training	Lisa Helen - Development of a minimally invasive smart impedance probe for detection of malignant and non-malignant breast masses	Tyndall National Institute	5,500.00
Aisling Dunne	TIDA Training	Assessment of marine derived linear tetrapyrroles as immunosuppressive agents for organ transplantation - Sharee Ann Basdeo	Trinity College Dublin	4,500.00
Antoinette Perry	TIDA Training	epiCaPTure: A non-invasive urine test for early detection of High-Risk Prostate Cancer	University College Dublin	3,500.00
Jacintha O'Sullivan	TIDA Training	Development and validation of an integrated 21-marker molecular test for predicting response to chemoradiation therapy in oesophageal adenocarcinoma patients - Niamh Lynam Lennon	Trinity College Dublin	3,500.00
Martina Schroeder	TIDA Training	Development of tool compounds for the therapeutic manipulation of human DDX3 protein - Niamh McCormack	National University of Ireland, Maynooth	3,500.00
Jeff Punch	TIDA Training	A Multiple Degree-of-Freedom Vibrational Energy Harvester - Rachel Gleeson	University of Limerick	3,500.00
Nathan Jackson	US-Ireland Planning Grant	Robust Ultra-Low-Power Sensors for Safety Critical Applications	Tyndall National Institute	3,100.00
Philip Cummins	US-Ireland R&D Partnership	COMP.Ang1: Vascular Normalization and Neuroprotection for Diabetic Retinopathy	Dublin City University	442,086.80
Catherine Godson	US-Ireland R&D Partnership	Integrative genomic, epigenetic and functional studies in diabetic kidney disease	University College Dublin	798,292.00
Graham Love - C Godson	US-Ireland R&D Partnership	Integrative genomic, epigenetic and functional studies in diabetic kidney disease	Health Research Board	-345,538.70
Debra Laefer	US-Ireland R&D Partnership	AMASS: Advanced Manufacturing and Assembly of Steel Structures planning grant	University College Dublin	435,063.20
Valeria Nicolosi	US-Ireland R&D Partnership	Spin and valley interactions in intrinsic and magnetic two-dimensional transition metal dichalcogenides	Trinity College Dublin	406,250.00
Brian O'Gallachoir	US-Ireland R&D Partnership; Centre-to Centre Mechanism	CREDESCENCE	University College Cork	888,213.20
Stefano Sanvito	US-Ireland R&D Partnership; Centre-to Centre Mechanism	Ultra-low Energy Electric Field Control of Nonvolatile Magnetoelectric Memory Devices	Trinity College Dublin	996,767.20
Patrick McGarry	US-Ireland R&D Partnership; Centre-to Centre Mechanism	Bioresorbable Magnesium alloy Systems for the promotion of Regenerative Biological Function	National University of Ireland, Galway	611,805.20
Total				194,343,443.77

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