2021

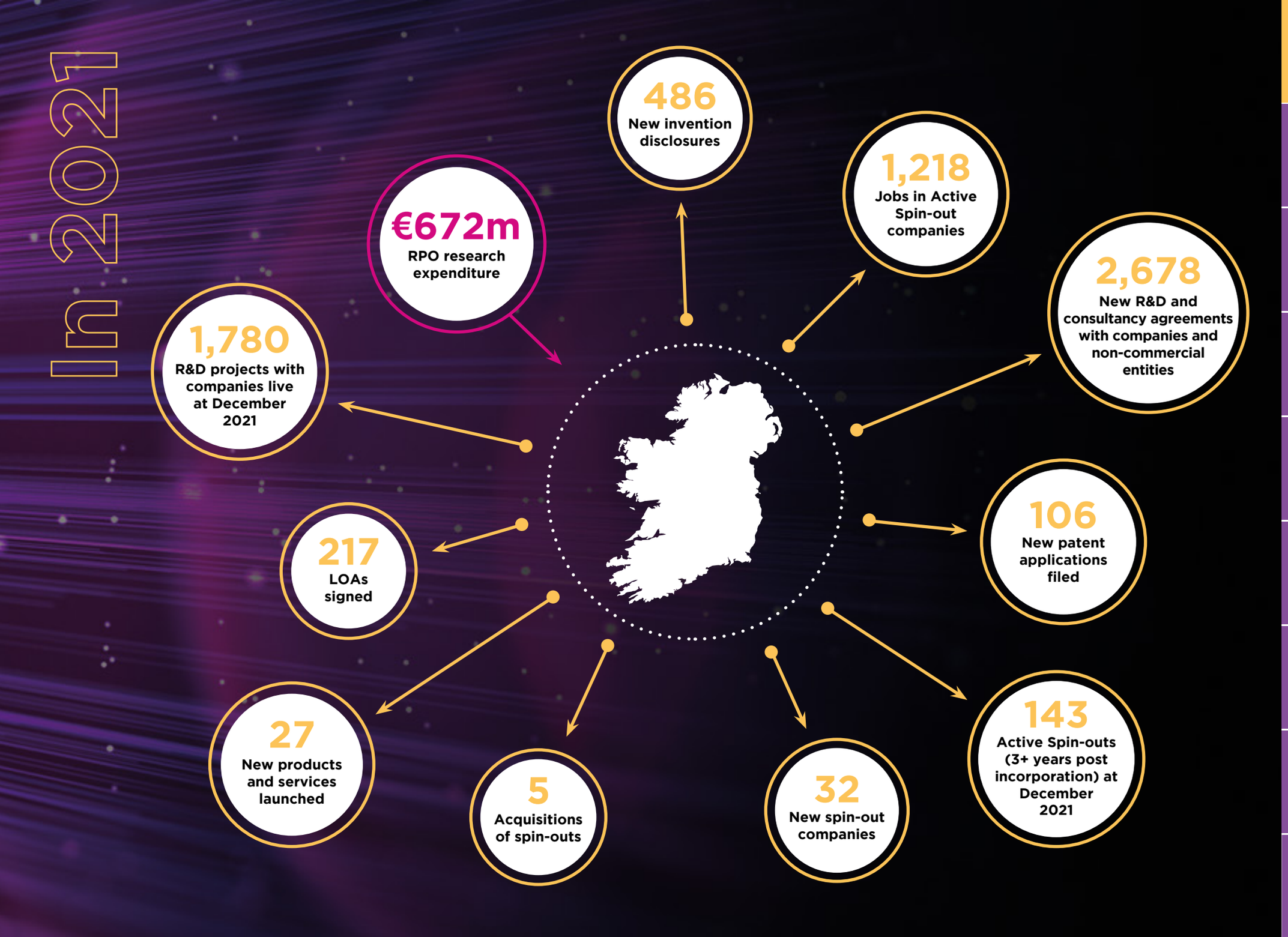
KTI Knowledge Transfer Ireland

Annual Knowledge Transfer Survey

Supported by

ENTERPRISE IRELAND

In 2021



Foreword

Impact 2030: Ireland's Research & Innovation Strategy puts research and innovation at the heart of addressing Ireland's social, economic and environmental challenges. A solid base has been built in the sector that will be further enhanced by this strategy. Ireland has a vibrant and well-functioning research system and our knowledge transfer landscape - where business can engage with public research and expertise and can commercialise it - is well developed, well-resourced and internationally recognised.

Bolstered by significant levels of State investment through Enterprise Ireland, Science Foundation Ireland, IDA Ireland and other sister agencies, the system is delivering real results. One key example is the Enterprise Ireland Technology Transfer Strengthening Initiative (TTSI) that has run since 2007. The results of this initiative are evident in the levels of research commercialisation and engagement successes published by Knowledge Transfer Ireland (KTI) in the Annual Knowledge Transfer Survey.

Access to skills, expertise and facilities from across the Irish higher education system, positions our companies to compete on the world stage. And the world-class research available to companies of all sizes from across the ecosystem positions Ireland as a more attractive location for investment. Identified in Impact 2030 as a key enabler in delivering national objectives for research commercialisation, KTI is key to boosting industry-academia collaborations and the development of spinout companies. The calibre of companies spinning out each year from technologies and expertise across the third level is borne out by the number that progress to become Enterprise Ireland HPSUs (high potential start-ups).

Ireland's strong research and innovation performance can continue to deliver future economic and societal benefit. It is critical that we continue to invest in the rich system that is delivering results.

Leo Clancy,
CEO Enterprise Ireland

Introduction

The Annual Knowledge Transfer Survey (AKTS) is published by KTI in conjunction with the Higher Education Authority (HEA). It provides a review of business engagement and commercialisation activity (knowledge transfer, KT) in the State funded research sector. Data are submitted to KTI by each research Performing Organisation (RPO), co-ordinated by its Technology Transfer Office (TTO)/Innovation Office and include information from other departments such as the Research Office, the Finance Department and individual research departments.

More information about knowledge transfer, including case studies of business impacts, may be found on the KTI website at www.knowledgetransferireland.com

KTI was established in 2014 by the Department of Enterprise, Trade & Employment as a national initiative to maximise access to publicly funded research by companies and entrepreneurs and to help facilitate the commercialisation of that research to deliver impact. To that end, KTI has developed national frameworks and guidelines that standardise the system and make the process of engagement more straightforward. As a single portal to research, expertise and how to engage, KTI also offers a broad suite of supporting materials and resources. These include directories and guides, a set of template legal agreements, a tool to find funding to support research and innovation, a comprehensive event calendar and more. KTI's resources are available to companies of all sizes and in all sectors.

The HEA leads the development of the higher education and research system with the objective of creating a coherent system of diverse institutions with distinct missions, which is responsive to the social, cultural and economic development of Ireland and its people and supports the achievement of national objectives.

Ireland's Innovation Offices

Each Higher Education Institute across the country and Teagasc (the Agriculture & Food Development Authority) has an Innovation Office, also known as a Technology Transfer Office. These offices are instrumental in supporting enterprise engagement and the commercialisation of research. Acting as a bridge for industry to access the opportunities available to them from state research and expertise, they provide practical guidance and support that would not otherwise be available. Innovation Offices are co-financed by the Technology Transfer Strengthening Initiative (TTSI), a funding programme that is managed by KTI on behalf of Enterprise Ireland.

Innovation Offices support the commercialisation of research through sourcing new opportunities, licensing, contract negotiation, assisting company formation, IP management and advising on appropriate funding.

UNIVERSITIES

1 Dublin City University
2 Maynooth University
3 NUI Galway
4 RCSI University of Medicine and Health Sciences
5 Trinity College Dublin
6 University College Dublin
7 University College Cork
8 University of Limerick

INSTITUTES OF TECHNOLOGY

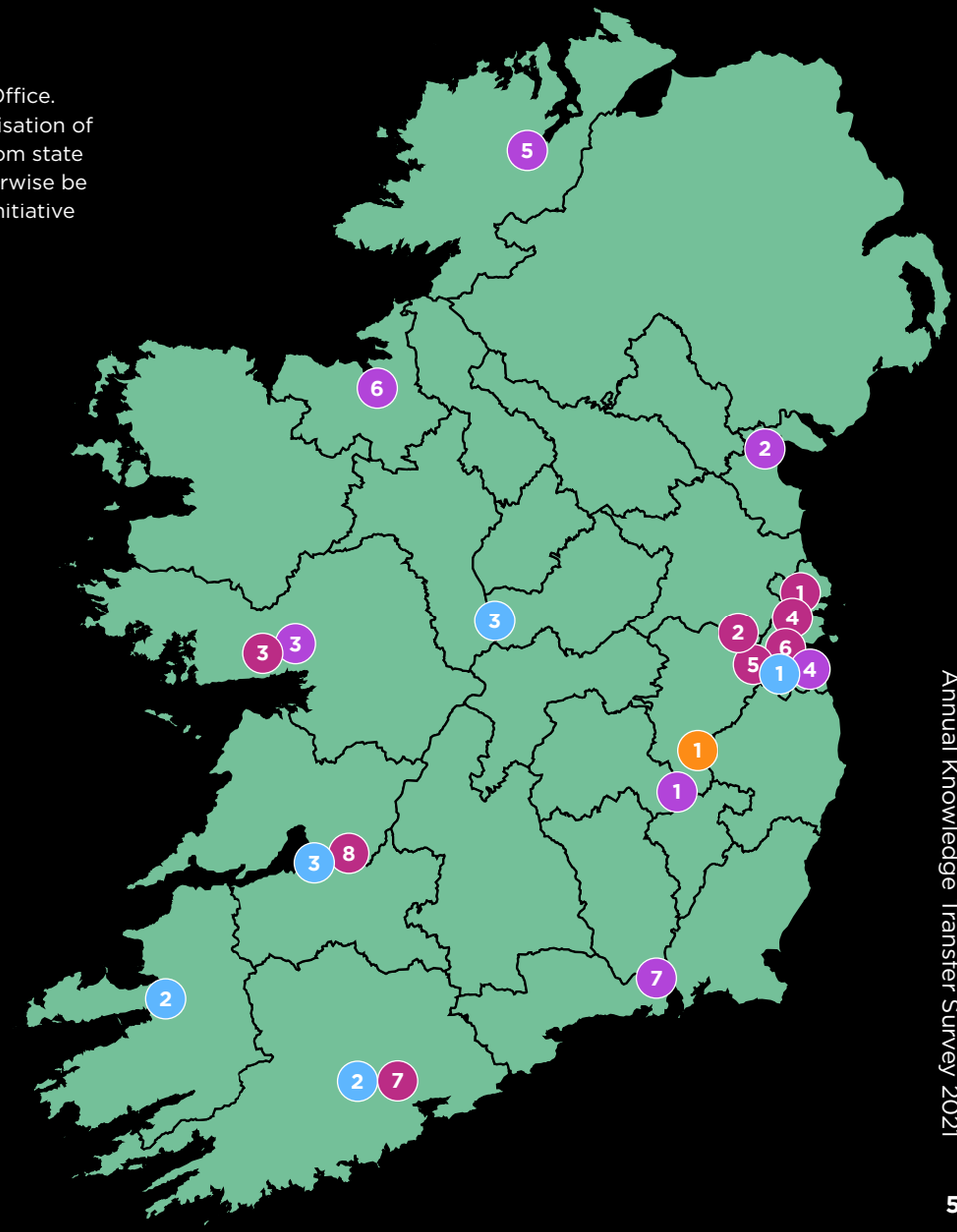
1 Institute of Technology Carlow
2 Dundalk Institute of Technology
3 Galway-Mayo Institute of Technology
4 Dun Laoghaire IADT
5 Letterkenny Institute of Technology
6 Institute of Technology Sligo
7 Waterford Institute of Technology

TECHNOLOGICAL UNIVERSITIES

1 TU Dublin
2 Munster TU
3 TU of the Shannon

STATE BODY

1 Teagasc - Agriculture and Food Development Authority



3 Executive Summary

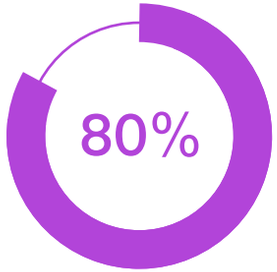
Imelda Lambkin,
Manager, Disruptive Technologies,
Innovation and Knowledge Transfer
at Enterprise Ireland

Executive Summary

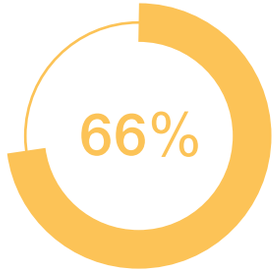
Submission to the AKTS is from Ireland's Higher Education Institutes which in 2021 comprised eight Universities, three Technological Universities, seven Institutes of Technology and two Colleges. Teagasc, the Marine Institute and Irish Manufacturing Research (IMR) also contribute. A complete list of these Research Performing Organisations (RPOs) is provided in Appendix 2.

Research projects between companies and RPOs are of significant importance in the area of RD&I activity. In 2021 there were 1,339 new R&D agreements signed with companies to commence new research projects. At year end there were 1,780 research projects live across all RPOs. There were a total of 2,121 new contracts with industry in 2021 which include 782 consultancy agreements.

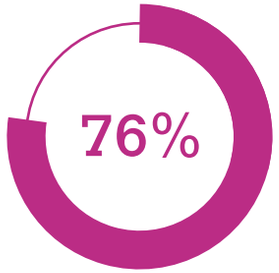
347 Collaborative Research Agreements and 210 Consultancy Agreements were signed with Non-commercial entities. The total number of R&D Agreements and Consultancy Agreements signed in 2021 with industry and non-commercial entities totalled 2,678. The majority of intellectual property licences, options and assignments to companies were for patents and software at 30% and 22% respectively.



R&D agreements with Irish Companies



R&D agreements with Irish SMEs

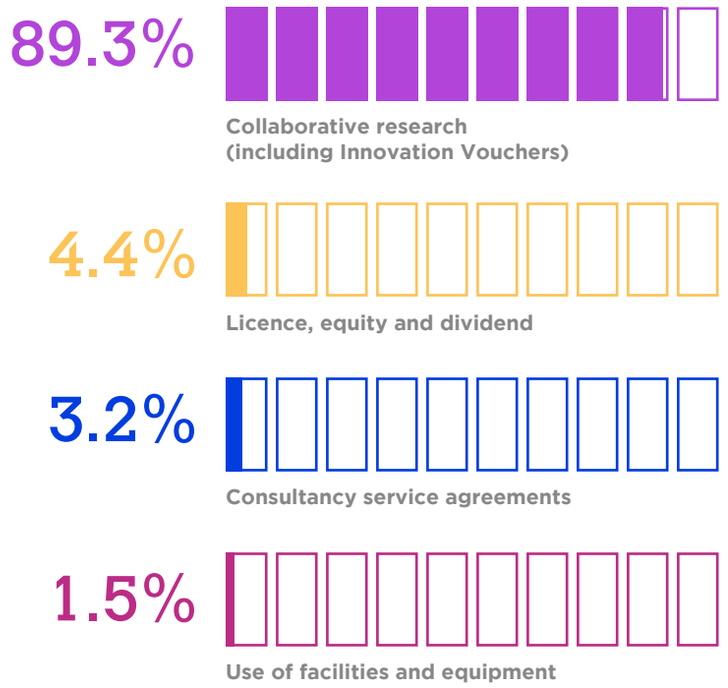


Repeat company engagements

Over the period 2017-2021 the total number of spin-out companies formed was 139, an average of 28 per year. In 2021, 32 new spin-outs were created. Five companies previously spun out from an RPO were acquired by or merged with another company. As of December 2021, there were 143 Active Spin-out companies (3+ years post formation) and these companies employ at least 1,218 people.

Research expenditure for the 23 RPOs totalled €672m in 2021 with 8.6% (€57.6m) of this being derived from Industry. Revenue return to RPOs from commercialisation activities with industry totalled approximately €143m. 89% of this came from research agreements (research collaborations + Innovation Vouchers) and almost 3% from consultancy services. The remaining revenue return came from license, equity and dividend and use of facilities and equipment.

Revenue from commercialisation activities with companies



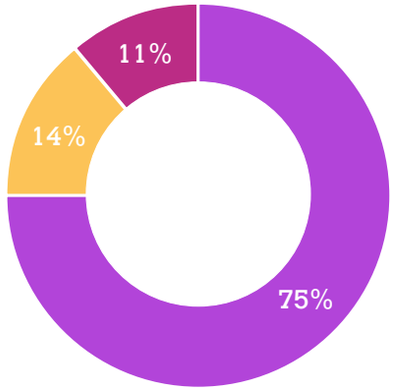
4 Research Funding In Ireland

Research Funding in Ireland

The AKTS uses year-in data on actual research expenditure provided by the individual RPOs to enable a more direct comparison with data from other countries. It does not include block grant and capital expenditure.

The total research expenditure in 2021 was €672 million which is an increase of almost 6% when compared to 2020. Research Expenditure in 2021 is the highest since 2014 (increase of over 30% over the period 2014-2021).

Research expenditure by type of RPO, 2021



€504m	University
€97m	Technological University and Institutes of Technology
€71m	Colleges and State Research Body
€672m	Grand total

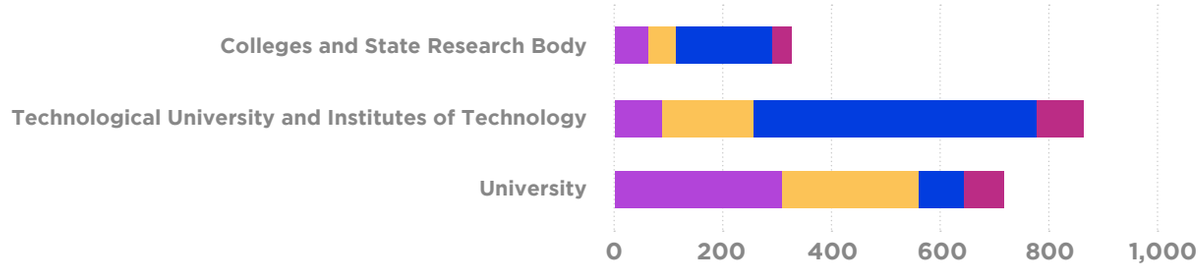
5 Working with Companies and Non-Commercial Entities

Collaborative R&D and Consultancy.

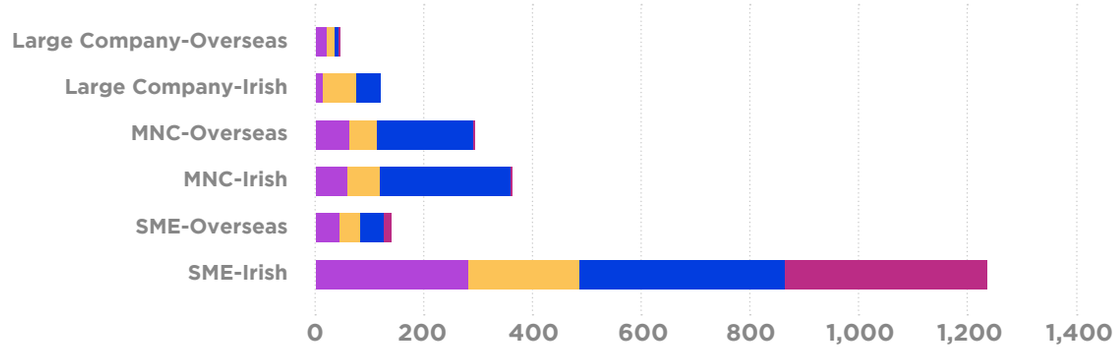
An important benefit to industry and non-commercial organisations is accessing research and expertise through the RPOs. This may be by way of research projects or access to consultancy services. In 2021 R&D and Consultancy Service Agreements with Industry increased by close to 3% when compared to the previous year.

R&D and Consultancy Service Agreements with non-commercial entities (public sector organisations or charities) were down by 64% when compared to the previous year. This is due to an anomaly in 2020 where a single RPO signed a large number of consultancy agreements with non-commercial entities.

Number of R&D and Consultancy Services Agreements with Industry 2021 by RPO Type



Number of R&D or Consultancy Service Agreements with Industry in 2021 by Company Type



- Research Collaboration Agreements (wholly-funded by industry)
- Research Collaboration Agreements (part-funded by industry)
- Consultancy Services Agreements (with industry)
- Innovation Voucher Agreements

3%

Decrease in R&D Agreements with Industry

2%

Increase in Research Collaboration Agreements with Industry

10%

Increase in the number of Consultancy Service Agreements with Irish Companies

7.5%

increase in live R&D projects with companies

24%

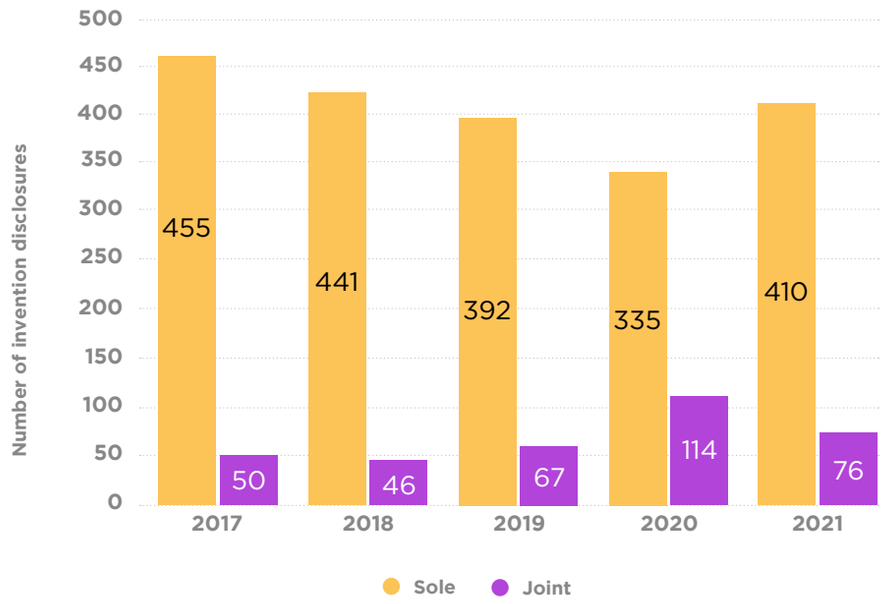
increase in live R&D Projects with industry & non-commercial entities

6 Inventions, Intellectual Property and Licensing

Invention Disclosures and Intellectual Property

Over the past five years there has been a total of 2,386 new invention disclosures with an increase in 2021 of 8%. As in previous years, the majority are sole invention disclosures where just one RPO is involved.

Invention disclosures, 2017 – 2021

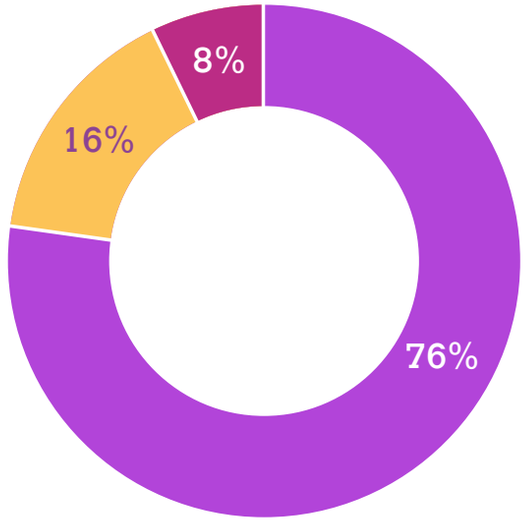


8%

New invention disclosures

Patent Applications Filed

The trend in the number of patents filed has previously increased year on year. In 2021, however, the numbers dropped significantly from 147 (2020) to 106 which is the lowest in the last five years. Of the patents filed in 2020 50% progressed to PCT applications in 2021, slightly down on the previous year (2020, 57%). The UK IPO and EPO remain the most popular initial patent filing offices.

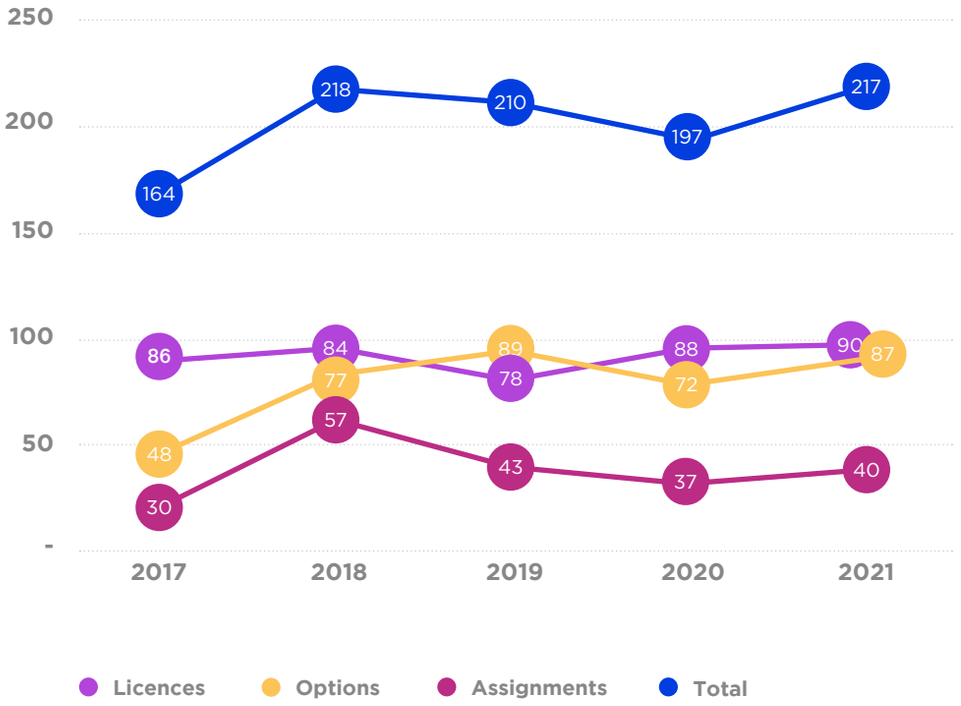


81	University
17	Technological University and Institutes of Technology
8	Colleges and State Research Body
106	Grand total

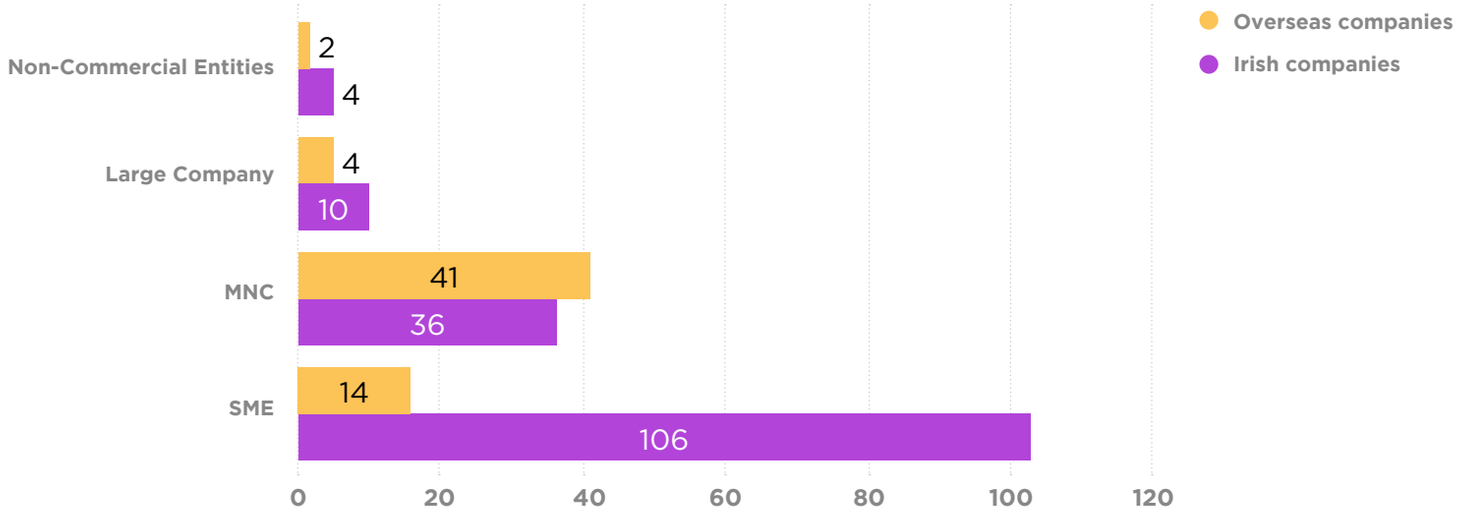
Licensing

Licences, Options and Assignments (LOAs) have all increased when compared to the previous year, in total by 10% (217, 2021) with the aggregate revenue from licences being €2.2m (€2.3m, 2020). Looking at the last 5 years there have been 1,006 LOAs executed, split across Licences (42%), Options (37%) and Assignments (21%).

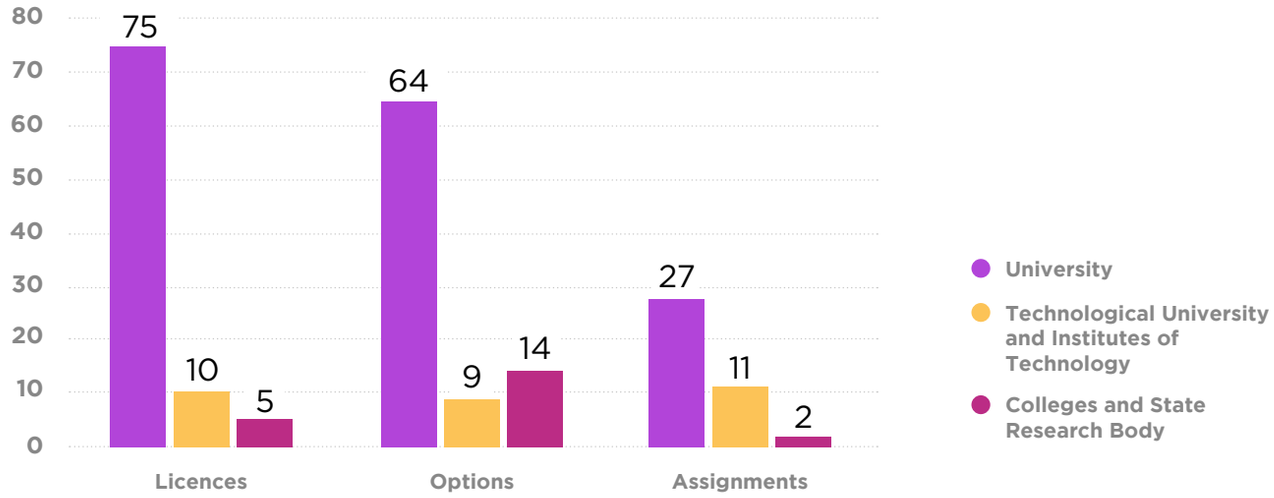
Total number of licences, options and assignments executed, 2017 – 2021



Number of Licences Options & Assignments Executed by Company Type, 2021

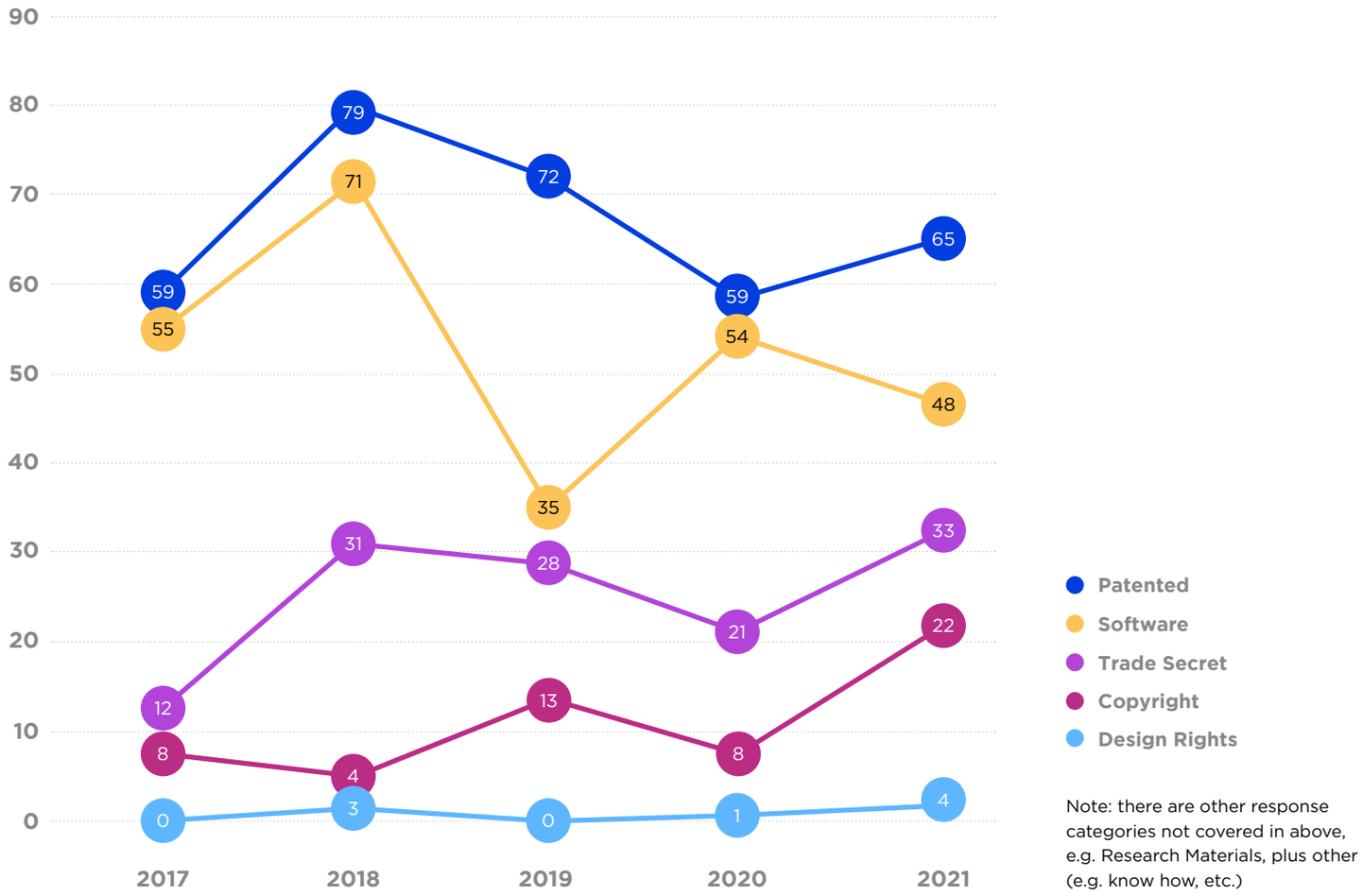


Number of Licences, Options & Assignments Executed by RPO Type, 2021



Main types of intellectual property in LOAs, 2017-2021

In 2021 Patented IP accounted for 30% of the total LOAs executed which is consistent with the previous year and Software accounted for 22% of the total which is a decrease when compared to the previous year (27%, 2020).



Note: there are other response categories not covered in above, e.g. Research Materials, plus other (e.g. know how, etc.)

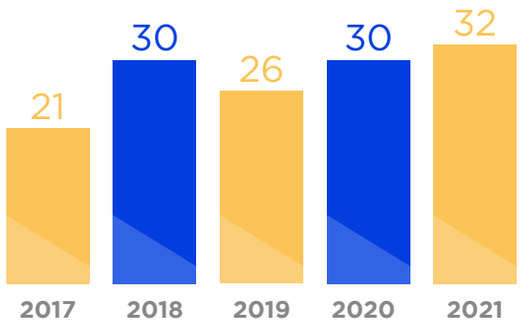
7 New Company Creation

New Company Creation

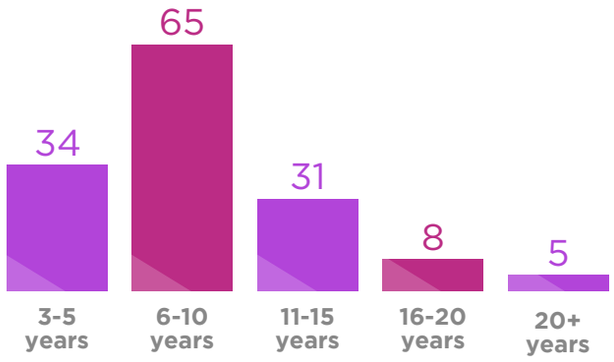
In 2021 32 new companies spun-out from 11 of the RPOs. In the previous year this figure was 30 from 8 RPOs. The total number of new companies that spun out from RPOs over the past five years is 139, with an average of 28 companies spinning out per annum. Five spin-out companies were either acquired or merged with another company in 2021.

The aggregated number of companies across all RPOs where the RPO holds equity or share options was 202 in 2021, an increase of 1 on the previous year. In 2021, there were 143 Active Spin-Outs (at least 3 years post formation) which employ a combined 1,218 Full Time Equivalents. It is important to note that this figure relates to the employment as at the end of 2021 and does not take account of people employed over the lifetime of the spin-out.

Spin-outs established, 2017 – 2021



Active Spin-outs – Number of Years Incorporated



8 Success Stories

CONSULTANCY

BioPharmaChem Skillnet

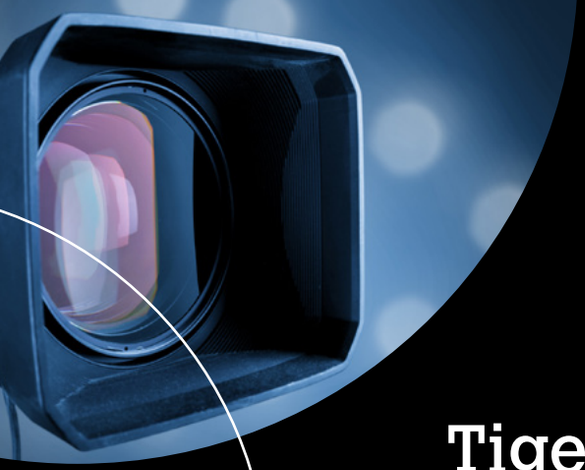
(TU Dublin)

BioPharmaChem Skillnet is a leading representative body for the biopharma and chemical sector in Ireland. In 2020, BioPharmaChem issued a tender seeking to develop and deploy VR training across the industry. The Innovation Office at TU Dublin recognised this as an opportunity for the university and brought it to the attention of Dr Brian Vaughan, Founder of the Virtual Interactive Research Lab at TU Dublin who was ultimately appointed to work with BioPharmaChem on a consultancy basis. The Innovation Office then facilitated a contract with BioPharmaChem and provided project management support to all parties throughout the engagement.

The research team at TU Dublin drew on its significant experience in the design of VR training tools to develop a detailed, immersive and engaging training application for BioPharmaChem incorporating interactive 3D models and practical modules. BioPharmaChem successfully launched its VR training programme in 2021 with the technology having been trialed by 16 organisations. The company continues to work with TU Dublin to further develop its VR training.

> This programme demonstrates how bringing together industry and higher education can provide cutting-edge skills solutions and new business opportunities for companies. Virtual reality is showing remarkable results in terms of operational excellence and efficiencies with Skillnet Ireland, BioPharmaChem Ireland and TU Dublin at the forefront of skills development through VR. Digital learning models, including virtual reality are now a core element of skills development, with Ireland well-placed to seize the many opportunities they bring.

Paul Healy, Chief Executive, Skillnet Ireland



CONSULTANCY

Tiger Aspect Productions

(Trinity College Dublin)

Tiger Aspect Productions is a leading, independent television production company that required an historical consultant to advise on scripts for Domina, an historical TV drama series. The company engaged Dr Rebecca Usherwood, Assistant Professor in Late Antique and Early Byzantine Studies at Trinity College Dublin having previously worked with her during her time in the Classics Department at St Andrews in the UK. Rebecca sought the support of the Consultancy Office at Trinity College's Innovation Office which helped in the negotiation and development of a contract with Tiger Aspect as well as providing support throughout the project around invoicing and the disbursement of fees.

Under the engagement, Rebecca applied her academic knowledge and problem-solving skills to work with Tiger Aspect to create a compelling story for the audience. Her expertise provided the company with a factual accuracy that is only made possible through specialist research and has allowed Tiger to deliver a more precise depiction of the period for this historical TV series. Such has been the success of this engagement that the consultancy project has been renewed three times with Tiger Aspect.

> We have been endlessly impressed with the enthusiasm, professionalism and creative collaboration we continue to enjoy with Rebecca Usherwood and her team at Trinity College Dublin. Rebecca is an invaluable part of the development and production process.

Muirinn Lane Kelly, Executive Producer, Tiger Aspect Productions

CONSULTANCY

Yakult UK and Ireland Ltd

(University College Cork)

Yakult is an 85 year old company, world famous for its probiotic drinks and its commitment to science underpinning its product. In 2021, Yakult approached APC Microbiome Institute at UCC, seeking expert advice on content development for a new consumer guide on gut-brain axis that it wished to produce. With the support of UCC Consulting at the university's Innovation Office, the team at APC Microbiome Institute negotiated a contract with Yakult and engaged with the company on a piece of consultancy.

The consultancy gave rise to a Gut-Brain Guide that is published on the Yakult website for the UK and Ireland. The guide provides consumer appropriate content to help people understand the relationship between microbes in the intestine and how that impacts on brain function. The APC Microbiome Institute is specifically mentioned in the guide as the content source.

- SCIENCE FOUNDATION IRELAND - APC MICROBIOME INSTITUTE

> Having the support of UCC Consulting was instrumental to building this relationship with Yakult. Their expertise in defining the work involved and capturing true value of my engagement with Yakult was key during the contract negotiation and to the overall success of the project.

Dr Gerard Clarke, Dept. Psychiatry at University College Cork

COLLABORATION

Carbery Food Ingredients Ltd

(University of Limerick)

Carbery Food Ingredients is an Irish multinational food and ingredients company that was interested in developing a novel nutritional product and providing scientific rationale to support consumption of a new ingredient targeted at the sports nutrition market. The company had previously engaged with the university and so was aware of the level of expertise available from across the areas of exercise and nutritional research. The collaborative research project was fully funded by the company and ran from 2017 to 2021. The Innovation Office at UL provided support throughout, helping to put agreements in place and advising on funding and intellectual property considerations.

Following the completion of the project, Carbery successfully launched its new product Optipep 4Power, a hydrolysed whey protein for use in high-intensity interval training and supported by high quality scientific information. Carbery considers this product a "potential game-changer" for brands providing targeted nutritional solutions to consumers. The project has also resulted in benefits to the university that include funding into the lab, a PhD student being funded, the publication of several scientific papers as well as exposure to industry expertise.

> Carbery has had collaborations with the PESS team in UL for almost two decades and this most recent collaboration was a very open and successful one. The degree of co-operation in this recent project was truly collaborative from market research to project design to communications and dissemination of the outputs to aid the commercialisation of a new ingredient in the marketplace.

Aine Hallihan, Director of Innovation, Carbery Food Ingredients Ltd.

COLLABORATION

Exergyn Ltd

(Dublin City University)

Exergyn is a clean energy company whose innovative technology can transform energy systems for heating, cooling and waste heat recovery reducing greenhouse gas emissions and increasing energy efficiency. The company, based at DCU's Innovation Campus DCU Alpha, had previously engaged the university on a consultancy project and in 2021 engaged DCU researchers again through I-Form, the SFI Centre for Advanced Materials Manufacturing, to access expertise in Additive Manufacturing (AM or 3D printing) and materials.

The collaborative research project sought to develop a next-generation heat pump for affordable decarbonisation of heating. The research has resulted in planned improvements to the performance of the company's heat pump technology that will lead to a wider range of applications and a higher rate of return for customers. This, in turn, positioned Exergyn, along with partner company Fort Wayne Metals, to be successfully awarded €2.4m DTIF funding. The company closed its Series A funding round of €31m in January 2022 to bring its thermal management technology to market. The Innovation Office at DCU has facilitated interactions between the company and researchers since the initial consultancy engagement and continues to provide its support.

- SCIENCE FOUNDATION IRELAND - IFORM RESEARCH CENTRE
- DISRUPTIVE TECHNOLOGIES INNOVATION FUND

> Exergyn recently closed a €31m Series A funding round to bring our thermal management technology to market. The collaborations with DCU have consistently supported the company in reaching this milestone.

Kevin O'Toole, CEO, Exergyn

COLLABORATION

J&M Holdings

(IT Carlow)

J&M Holdings develops and sells products aimed at improving safety for runners and walkers at night. The company worked with IT Carlow in 2016 on R&D for its debut product, the Night Runner LED belt and with advances in LED and electronic wearables technology, realised it would be possible to decrease the size and weight of its product to improve usability and wearability. In 2021, working together with IT Carlow again through the Design+ Technology Gateway, the company sought to develop the design concept for a universal housing for the product. The housing had to be able to enclose the battery, the printed circuit and the LEDs. It also had to be adaptable to fit a number of different wearable products. The team produced a 3D printed prototype of the housing for initial user testing, a vital step in determining the commercial success of the device that is now retailing and has been featured on RTE's Nationwide and Late Late Show.

The Innovation Office at IT Carlow was involved from the time of initial enquiry and provided support throughout the project advising, in particular, on the development and management of IP arising from the project. The relationship between IT Carlow and the company is ongoing.

- ENTERPRISE IRELAND - INNOVATION VOUCHER
- ENTERPRISE IRELAND GATEWAY NETWORK - DESIGN+

> IT Carlow come highly recommended because they provide an excellent service and professional experience that results in turning a concept into a product.

Padraig George, MD, J&M Holdings

COLLABORATION

McGeary Engineering

(Dundalk IT)

McGeary Engineering specialises in pipe fabrications for numerous applications including quarry washing plant pipe work, manifold pipe fabrications, spray bars, flanged piping etc. The company wished to develop a new range of components to move itself from sub-contractor to producer in its own right. To this end, McGeary Engineering engaged a team of experts in engineering and fluid dynamics at Dundalk IT to work on a collaborative research project. The research resulted in the company developing a number of important piping and pre-fabricated piping systems for the water services industry with particular focus on water treatment facilities. This has enabled the company to manufacture its own off-the-shelf product and its new product range has been launched to market, positioning the company for growth and development.

The Innovation Office at Dundalk IT facilitated the initial engagement between McGeary Engineering and the research team at DkIT. The office provided project management support throughout the engagement as well as guidance on the management of contracts and agreements and funding of the project.

- INTERTRADEIRELAND FUSION PROGRAMME
- ENTERPRISE IRELAND GATEWAY NETWORK - CREDIT

> IntertradeIreland Fusion programme in collaboration with CREDIT Technology Gateway at Dundalk Institute of Technology allowed McGeary Engineering to develop a range a range of new off-the-shelf parts and components that comply with international standards and directives. From this project, the company has benefited from this collaborative project through manufacturing process improvements, ultimately resulting in increased sales

John Paul McGeary, MD, McGeary Engineering

COLLABORATION

Smart Factory Solutions Ltd

(Munster TU)

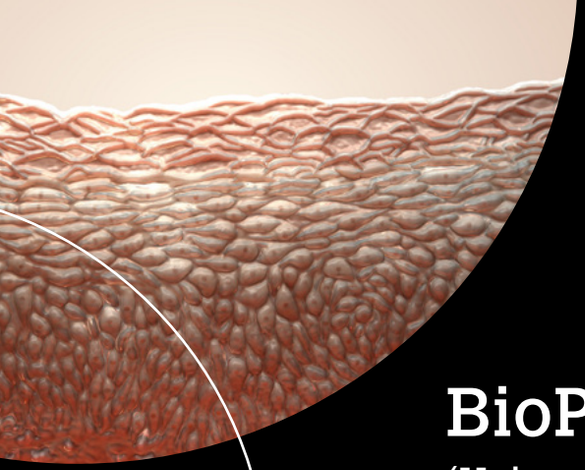
Smart Factory Solutions' IOT platform accelerates digital transformation for manufacturing companies, powered by data analytics, to drive operational excellence through the use of sustainable resources and by adding intelligence into the manufacturing process. In 2021, the company engaged Munster TU in a collaborative research project, the fourth of five such projects between the university and Smart Factory Solutions. The company sought to build on previous research and use Artificial Intelligence to optimise the functionality of its platform. The research resulted in the release of the next version of the company's platform, incorporating new functionality required by industrial clients that positioned the company for future development.

The Innovation Office at the university was involved in all stages of the engagement, from negotiating and executing the collaboration and licensing agreements, management of intellectual property arising and relationship and project management. There is a follow- on project underway with the company and the company is seeking to recruit MTU students as a result of the relationship and expertise received.

- ENTERPRISE IRELAND - INNOVATION PARTNERSHIP PROGRAMME

> Winning the trust of world class manufacturing clients would not have been possible without the knowledge and expertise of the team at MTU

Brendan Sheppard, CEO, Smart Factory Solutions



SPIN-OUT

BioPixS Ltd

(University College Cork)

BioPixS creates innovative tissue mimicking phantoms and standardisation methods for biophotonics applications. These phantoms are stand-ins for human tissues that simulate the interaction of light with tissue, thus reducing time and cost of developing high-tech biomedical devices. They also target the reduction of animal use in pre-clinical trials, providing parallel alternatives. These innovations are set to transform the way biophotonics research is performed by providing solutions that accelerate instrument development and standardisation and monitor day-to-day performance of current devices.

The company spun out of the Tyndall National Institute in Cork and the Innovation Office at UCC was involved from the outset, providing support in identifying, assessing, capturing and managing IP, as well as negotiating licence agreements. In addition, the office has supported the company's funding submissions, facilitated introductions to investors and advised on business strategy.

BioPixS leases lab space at Tyndall to carry out some of its research and is involved in a number of research consortia with leading universities, technology companies and hospitals globally. The company currently has customers in 9 countries worldwide and is in the process of testing the market for its range of products with plans to launch further products in 2023.

- SCIENCE FOUNDATION IRELAND - IRISH PHOTONIC INTEGRATION CENTRE (IPIC)

> The Innovation Office at UCC has championed the growth of BioPixS on multiple fronts, including introducing us to investors, providing valuable strategy advice and networking opportunities, and by supporting our growth requirements inside UCC and beyond.

Dr Sanathana Konugolu, CEO, BioPixS

SPIN-OUT

Class Medical Ltd

(University of Limerick)

Class Medical spun out from the University of Limerick to commercialise its product, the Trans-Urethral Catheter (TUC) Safety Valve. The valve prevents the recurring problem of Catheter Balloon Injury of the urethra associated with catheterisation and of which there are more than 1000 incidences annually in Ireland alone. Since spinning out, the technology has won a series of awards and accolades recognising its potential and in December 2020, Class Medical became the first company to be certified by the National Standards Authority of Ireland under rigorous new EU Medical Device Regulations (MDR). Class Medical was then awarded CE and ISO 13485 under MDR in February 2021 which positioned the company for significant growth.

The Innovation Office at the University of Limerick has been involved with the company since the outset having supported the spin-out and licensing processes at the time of company formation. The Office has facilitated shareholder agreements, supported the company in venture funding applications and negotiated ongoing collaborative research agreements between the company and university.

- ENTERPRISE IRELAND - COMMERCIALISATION FUND

> The Class Medical TUC Safety Valve makes urethral catheterisation much safer and prevents vulnerable patients from being seriously and painfully injured. We are delighted to be the first company to be certified by NSAI under the new regulations and look forward to seeing our device make a real difference for both patients and medical professionals.

Dr Hugh Flood, Consultant Urologist and CMO, Class Medical

SPIN-OUT

Edgeliot Ltd

(Dublin City University)

Edgeliot is a new company that licensed technology from Dublin City University to spin out from the university in 2021. The company is focused on delivering end-to-end anomaly detection solutions for high value telecommunication tower infrastructure. Edgeliot has developed a remote monitoring solution and its working product is called mHalo which is being trialed with Cellnex Telecom, Europe's leading operator of wireless and broadcasting infrastructure. The company is also at advanced stages in commercial negotiations and deployment having successfully raised the first tranche of funding for €250k of a first investment round of €750k and is in the process of raising further investment to maintain aggressive growth plans.

The Innovation Office at the university, DCU Invent, has been involved with Edgeliot from inception. The office provided guidance and support across the licensing and spin-out process including the development of the company business plan, contract negotiation and drafting as well as supporting the successful company application for Enterprise Ireland funding. The Innovation Office continues to work closely with the company to support its development and growth as Edgeliot explores a number of research projects with DCU and other Irish universities in the area of climate monitoring.

- ENTERPRISE IRELAND - COMMERCIALISATION FUND

> DCU Invent has been a huge help in the creation of Edgeliot. DCU's Fusion Programme enabled the project to secure funding from Enterprise Ireland. We hired a great team in DCU through the Insight Centre for Data Analytics. And the licensing and spin-out process was straightforward and professional. We continue to work closely with DCU Invent to explore other opportunities.

Gary McDarby, CEO, Edgeliot

SPIN-OUT

SilverCloud Health Ltd

(Trinity College Dublin)

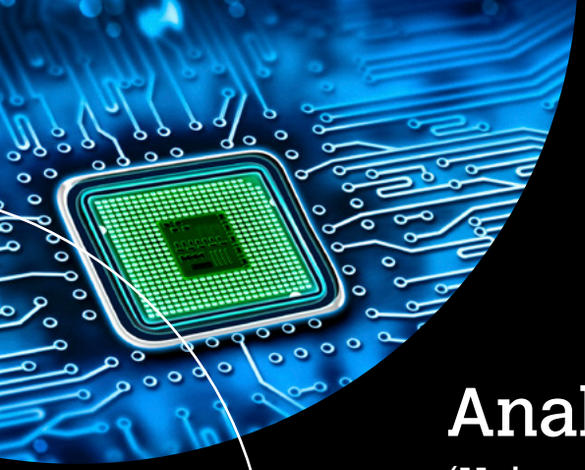
SilverCloud provides a widely used platform for mental and behavioural health interventions. The platform was developed as part of a research project based on human computer interaction at the School of Computer Science and Statistics at Trinity College Dublin and in collaboration with ParentsPlus charity and National Digital Research Centre. The company spun out of the university in 2012 and in July 2021, the company was acquired by Amwell, a leading, US-based telehealth company, for $320m. The platform is now used by hundreds of health services worldwide and has been used to deliver clinician-supported evidence-based treatments to more than 800,000 people worldwide.

The Innovation Office at Trinity College Dublin was involved with SilverCloud from inception through formation and onto acquisition. The office provided guidance around aspects including the protection and management of intellectual property as well as advising on contract drafting and shareholder agreements.

- NDRC

> The Innovation Office helped considerably in ensuring the campus company had clear ownership of the relevant TCD IP. In particular this involved dealing professionally with the complicated and non-standard IP management arrangement imposed by the NDRC.

Gavin Doherty, Co-Founder and Scientific Advisor, SIlverCloud



LICENCE

Analog Devices Incorporated (ADI)

(University College Dublin & University College Cork)

Analog Devices Incorporated (ADI) also known as Analog is an American multinational semiconductor company with several Irish facilities that specialises in integrated circuit device design and manufacturing.

In 2021, ADI licensed two patents as a bundle from two Irish universities in one single IP agreement – one patent arising from research carried out at UCC, the other from research at UCD. The IP enables the company mitigate and reduce noise properties and characteristics in its frequency synthesiser products. Since licensing, ADI has implemented the IP in silicon devices and has tested performance of the noise reducing method with plans to integrate it into products later this year. ADI continues to collaborate with UCD and UCC on several research projects with further IP outputs expected.

The Innovation Offices at both universities provided separate support and guidance relating to the development and protection of the IP and subsequent patent filing. The offices then worked together with the company at the time of licence to agree commercial terms and a formal IP agreement for joint licensing to ADI.

> Flexibility based on an open innovation model was key to the success of the collaboration and eventual licensing agreement. Scheduling flexibility around the sometimes competing needs of commercial product development and the needs for academic publications was key to the success of the collaboration.

James Breslin, Engineering Director at Analog Devices Limerick

LICENCE

Hexafly Biotech

(Maynooth University)

Hexafly Biotech is an Irish company pioneering the use of insects and insect-based products for inclusion in feeds and as plant nutrients. Among other products, Hexafly Biotech produces a soil enhancer called Hexafrass and in 2021 the company worked with Maynooth University on a collaborative research project investigating novel applications for Hexafrass. It was discovered that the application of Hexafrass to soil significantly reduces the reproduction of barley aphids (greenflies) on cereal plants. These are a major pest, difficult to control with chemical insecticides and this discovery creates the possibility of Hexafrass becoming a highly effective and environmentally sustainable treatment for use in horticulture and agriculture.

Hexafly Biotech signed licence agreements with Maynooth University to commercialise the know-how and outputs of the research project. The Innovation Office at MU captured the IP generated during the research project, initiated licence negotiations and supported the successful licensing agreements. The Innovation Office at MU has also led discussions for further development of the IP with Hexafly who continues to work on company-funded collaborative research projects with the university.

- SSPC RESEARCH CENTRE FOR PHARMACEUTICALS

> SSPC funding and collaboration with Maynooth University has allowed us to co develop novel applications for our products that will have commercial value in the coming months and years.We look forward to continuing our partnership with Maynooth university as we continue to advance our R&D program and bring more discoveries to market.

Alvan Hunt, CEO and Co-Founder, Hexafly

LICENCE

Locate Bio Ltd

(Royal College of Surgeons in Ireland)

Locate Bio Ltd is an innovative orthobiologics company based in the UK. In 2020, the company licensed three patented technologies from Royal College of Surgeons in Ireland (RCSI) for the regeneration of bone and cartilage tissues and the treatment of osteomyelitis. Two of the three RSCI-developed products based on this IP have been granted FDA breakthrough device designation and the in-licensing of this high value IP from RCSI significantly added to the company's orthobiologics portfolio and investment proposition. The company recently closed a Series A funding round of £10m.

The Innovation Office at RCSI was critical in the development and protection of the IP. It also supported the successful licensing of the IP to Locate Bio and negotiation of terms. Locate Bio plans to continue its collaboration with RCSI and invest in joint R&D opportunities. The company is also investigating manufacturing sites in Ireland.

- ENTERPRISE IRELAND - COMMERCIALISATION FUND

> In-licensing these high-quality complementary, late-stage assets from RCSI has significantly accelerated Locate Bio's growth trajectory. The end-to-end process of licensing, technology transfer and continued product development has always been very well supported by the RCSI Innovation Team. We have been thoroughly impressed with RCSI's scientific rigor and innovation and we look forward to continuing to collaborate as we advance our products towards market approval.

John Von Benecke, CEO Locate Bio

LICENCE

Miravex Ltd

(Trinity College Dublin)

Miravex Ltd specialises in optics and image analysis. Its product, the Antera 3D is a camera and software tool for skin analysis that provides aesthetic medicine doctors, dermatologists, cosmetic manufacturers and others with a powerful and versatile consultation tool for the analysis of wrinkles, texture, pigmentation and redness. The tool is also supplied to contract research organisations and laboratories as a versatile, accurate and easy-to-use camera for clinical studies. The product is based on cutting edge science developed in the School of Physics, Trinity and licensed from the university in 2009. This licence positioned the company to address significant market need in a growing industry and has led to Miravex growing sales worldwide and achieving Enterprise Ireland HPSU status.

The Innovation Office at Trinity College Dublin was involved from an early stage helping the team secure research funding, advising on IP strategies and ultimately protecting valuable IP through patents. The office worked with the spin-out to conclude an exclusive licensing agreement in 2009 and since then has been providing continued support for post deal management and other research engagements between the company and the University.

- ENTERPRISE IRELAND - COMMERCIALISATION FUND
- ENTERPRISE IRELAND - INNOVATION PARTNERSHIP
- SCIENCE FOUNDATION IRELAND - INDUSTRY FELLOWSHIP

> The licensed IP from Trinity has allowed us to achieve a unique market position and grow our business. We have worked closely with Trinity's TTO since signing the licence agreement in 2009 and will continue to do so given the value we place on this partnership.

Dr Guido Mariotto, CEO Miravex

Appendices

APPENDIX 1. SUMMARY DATA BY RPO

Selected data relating to the returns made by the 23 RPOs are presented in tables A1-C2.

A1: Research Expenditure, research agreements and consultancy with Industry 2021: University, Colleges & State Research Organisations

	Research expenditures (€) (less block grant) in the reference year	Research Expenditure derived directly from Industry	Number of collaborative research agreements with industry	Number of innovation voucher project agreements with industry	Number of consultancy services agreements with industry	Total Number of Collaboration, innovation voucher and consultancy services agreements with industry
University						
Dublin City University	€35,676,651	€1,890,863	47	10	1	58
Maynooth University	€32,101,412	€1,239,115	30	10	7	47
NUI Galway	€77,735,013	€4,664,101	53	6	1	60
Royal College of Surgeons in Ireland	€24,380,696	€2,194,263	33	0	3	36
Trinity College Dublin	€109,397,832	€6,563,870	75	28	27	130
University College Cork	€96,260,870	€11,551,304	115	7	25	147
University College Dublin	€89,611,402	€5,932,275	164	10	30	204
University of Limerick	€38,628,952	€6,296,519	50	5	9	64
Total	**€503,792,828**	**€40,332,310**	**567**	**76**	**103**	**746**
College & State Research Organisations						
Irish Manufacturing Research (IMR)	€9,555,279	€955,528	44	4	25	73
National College of Art and Design	€167,707	€63,729	19	14	17	50
National College of Ireland	€105,000	€0	0	3	0	3
Marine Institute	€10,730,000	€0	0	0	0	0
Teagasc	€51,100,000	€9,198,000	39	9	141	189
Total	**€71,657,986**	**€10,217257**	**102**	**30**	**183**	**315**

A2: Research Expenditure, research agreements and consultancy with Industry 2021: Technological University & Institutes of Technology

	Research expenditures (€) (less block grant) in the reference year	Research Expenditure derived directly from Industry	Number of collaborative research agreements with industry	Number of innovation voucher project agreements with industry	Number of consultancy services agreements with industry	Total Number of Collaboration, innovation voucher and consultancy services agreements with industry
Technological University						
TU Dublin	€18,840,807	€1,015,519	20	19	45	84
Munster Technological University	€23,695,058	€3,177,507	99	70	81	250
TU of the Shannon	€10,614,656	€1,273,759	28	45	125	198
Total	**€53,150,521**	**€5,466,785**	**147**	**134**	**251**	**532**
Institutes of Technology						
Dundalk Institute of Technology	€4,000,000	€400,000	11	13	1	25
Galway-Mayo Institute of Technology	€4,336,348	€260,181	11	10	1	22
Dun Laoghaire IADT	€892,450	€0	0	5	0	5
Institute of Technology Carlow	€3,855,683	€115,670	7	62	19	88
Institute of Technology Sligo	€6,130,000	€38,006	19	5	0	24
Letterkenny Institute of Technology	€1,967,281	€255,747	14	14	18	46
Waterford Institute of Technology	€22,508,045	€562,701	64	48	206	318
Total	**€43,689,807**	**€1,632,305**	**126**	**157**	**245**	**528**
Grand Total A1 & A2	**€672,291,142**	**€57,648,657**	**942**	**397**	**782**	**2121**

A3: Research Expenditure, research agreements and consultancy with non-commercial entities 2021: University, Colleges & State Research Organisations

	Research expenditures (€) (less block grant) in the reference year	Research Expenditure derived from non-commercial entities	Number of collaborative research agreements with non-commercial entities	Number of consultancy services agreements with non-commercial entities	Total Number of Collaboration and consultancy services agreements with non-commercial entities
University					
Dublin City University	€35,676,651	€3,992,217	4	0	4
Maynooth University	€32,101,412	€564,985	6	45	51
NUI Galway	€77,735,013	€0	7	3	10
Royal College of Surgeons in Ireland	€24,380,696	€4,632,332	6	1	7
Trinity College Dublin	€109,397,832	€5,469,892	76	19	95
University College Cork	€96,260,870	€3,850,435	64	18	82
University College Dublin	€89,611,402	€8,342,822	99	27	126
University of Limerick	€38,628,952	€1,313,384	4	1	5
Total	**€503,792,828**	**€28,166,067**	**266**	**114**	**380**

College & State Research Organisations					
Irish Manufacturing Research (IMR)	€9,555,279	€0	0	0	0
National College of Art and Design	€167,707	€0	4	11	15
National College of Ireland	€105,000	€0	0	0	0
Marine Institute	€10,730,000	€0	0	0	0
Teagasc	€51,100,000	€4,088,000	1	44	45
Total	**€71,657,986**	**€4,088,000**	**5**	**55**	**60**

A4: Research Expenditure, research agreements and consultancy with non-commercial entities 2021: Technological University & Institutes of Technology

	Research expenditures (€) (less block grant) in the reference year	Research Expenditure derived from non-commercial entities	Number of collaborative research agreements with non-commercial entities	Number of consultancy services agreements with non-commercial entities	Total Number of Collaboration and consultancy services agreements with non-commercial entities
Technological University					
TU Dublin	€18,840,807	0	2	0	2
Munster Technological University	€23,695,058	0	0	24	24
TU of the Shannon	€10,614,656	€106,147	6	3	9
Total	**€53,150,521**	**€106,147**	**8**	**27**	**35**
Institutes of Technology					
Dundalk Institute of Technology	€4,000,000	€0	0	0	0
Galway-Mayo Institute of Technology	€4,336,348	€0	18	10	28
Dun Laoghaire IADT	€892,450	€1,696	0	0	0
Institute of Technology Carlow	€3,855,683	€308,455	11	2	13
Institute of Technology Sligo	€6,130,000	€0	32	0	32
Letterkenny Institute of Technology	€1,967,281	€0	0	0	0
Waterford Institute of Technology	€22,508,045	€225,080	7	2	9
Total	**€43,689,807**	**€535,231**	**68**	**14**	**82**
Grand Total A3 & A4	**€672,291,142**	**€32,895,445**	**347**	**210**	**557**

B1: IP and IP Transactions 2021: University, Colleges & State Research Organisations

	Total number of invention/ software disclosures received during the year	Total number of new patent applications filed during the year	Previously filed priority patent applications filed progressed to PCT in year	Total number of patents granted in year	Total number of patent families owned by the RPO at year end	Total number of licences, options and assignments executed (LOAs)	Market launches of products or services in year based on RPO licence
University							
Dublin City University	48	9	75%	4	62	25	2
Maynooth University	14	5	20%	1	15	7	N/A
NUI Galway	43	5	75%	10	111	19	2
Royal College of Surgeons in Ireland	15	7	72%	2	32	7	2
Trinity College Dublin	53	11	50%	12	143	26	2
University College Cork	66	13	38%	11	94	45	6
University College Dublin	79	19	36%	10	132	25	0
University of Limerick	37	12	69%	13	77	12	1
Total	**355**	**81**		**63**	**666**	**166**	**9**
College & State Research Organisations							
Irish Manufacturing Research (IMR)	4	0	0%	0	0	0	0
National College of Art and Design	2	1	0%	0	0	1	1
National College of Ireland	7	1	0%	0	1	2	1
Marine Institute	0	0	0%	0	0	0	0
Teagasc	26	6	100%	1	29	18	3
Total	**39**	**8**		**1**	**30**	**21**	**4**

B2: IP and IP Transactions 2021: Technological University & Institutes of Technology

	Total number of invention/ software disclosures received during the year (sole and joint)	Total number of new patent applications filed during the year	Previously filed priority patent applications filed progressed to PCT in year	Total number of patents granted in year	Total number of patents families owned by the RPO at year end	Total number of licences, options and assignments executed (LOAs)	Market launches of products or services in year based on RPO licence
Technological University							
TU Dublin	28	8	47%	1	40	11	2
Munster Technological University	20	3	33%	1	13	8	4
TU of the Shannon	8	2	100%	0	0	1	0
Total	**56**	**13**		**2**	**53**	**20**	**6**
Institutes of Technology							
Dundalk Institute of Technology	5	0	0%	0	1	2	1
Galway-Mayo Institute of Technology	0	0	0%	0	0	0	0
Dun Laoghaire IADT	14	1	0%	0	1	0	0
Institute of Technology Carlow	1	0	100%	0	1	1	0
Institute of Technology Sligo	3	0	50%	1	8	0	0
Letterkenny Institute of Technology	0	0	0%	0	0	0	0
Waterford Institute of Technology	13	3	100%	1	18	7	0
Total	**36**	**4**		**2**	**29**	**10**	**1**
Grand Total B1 & B2	**486**	**106**		**68**	**778**	**217**	**20**

C1: Spin-out companies, incubation and use of facilities 2021: University, Colleges & State Research Organisations

	Number of spin-outs established during the year	Number of staff or student start-ups established during the year	Number of Active spin-outs in existence at the end of the year	Number of spin-outs merged or acquired during the year	Number of contracts with companies for use of facilities and equipment at the RPO
University					
Dublin City University	3	0	14	0	10
Maynooth University	1	0	6	0	74
NUI Galway	5	0	15	1	0
Royal College of Surgeons in Ireland	2	0	1	0	0
Trinity College Dublin	5	6	32	1	9
University College Cork	4	5	15	0	23
University College Dublin	5	0	21	1	0
University of Limerick	1	0	16	2	37
Total	**26**	**11**	**120**	**5**	**153**
College & State Research Organisations					
Irish Manufacturing Research (IMR)	0	0	0	0	6
National College of Art and Design	0	0	0	0	0
National College of Ireland	2	0	0	0	0
Marine Institute	0	0	0	0	0
Teagasc	0	0	3	0	10
Total	**2**	**0**	**3**	**0**	**16**

C2: Spin-out companies, incubation and use of facilities 2021: Technological University & Institutes of Technology

	Number of spin-outs established during the year	Number of staff or student start-ups established during the year	Number of Active spin-outs in existence at the end of the year	Number of spin-outs merged or acquired during the year	Number of contracts with companies for use of facilities and equipment at the RPO
Technological University					
TU Dublin	3	0	6	0	2
Munster Technological University	0	2	6	0	114
TU of the Shannon	0	0	0	0	17
Total	**3**	**2**	**12**	**0**	**133**
Institutes of Technology					
Dundalk Institute of Technology	0	0	2	0	0
Galway-Mayo Institute of Technology	0	0	0	0	43
Dun Laoghaire IADT	0	0	0	0	3
Institute of Technology Carlow	1	0	1	0	1
Institute of Technology Sligo	0	0	0	0	1
Letterkenny Institute of Technology	0	0	0	0	1
Waterford Institute of Technology	0	0	5	0	0
Total	**1**	**0**	**8**	**0**	**49**
Grand Total C1 & C2	**32**	**13**	**143**	**5**	**351**

APPENDIX 2. LIST OF RESEARCH PERFORMING ORGANISATIONS (RPOs)

Reporting Sector	Institution	Year of foundation of TTO /Innovation Office
University		
	Dublin City University	2007
	Maynooth University	2005
	National University of Ireland Galway	2005
	Royal College of Surgeons in Ireland	2007
	Trinity College Dublin	1987
	University College Cork	1982
	University College Dublin	2003
	University of Limerick	2005
Technological University		
	Munster Technological University	2009
	Technological University Dublin	2000
	TU of the Shannon	2008
Institute Of Technology		
	Dundalk Institute of Technology	2012
	Dún Laoghaire Institute of Art, Design and Technology	2012
	Galway-Mayo Institute of Technology	2008
	Institute of Technology Carlow	2008
	Institute of Technology Sligo	NA
	Letterkenny Institute of Technology	1998
	Waterford Institute of Technology	2008
College and State Research Organisations		
	Irish Manufacturing Research (IMR)	N/A
	National College of Art and Design	2013
	National College of Ireland	2011
	Marine Institute	N/A
	Teagasc	2011

APPENDIX 3. IRELAND'S INTERNATIONALLY RECOGNISED TECHNOLOGY TRANSFER PROFESSIONALS

2012	Mr Tom Flanagan	University College Dublin
2015	Mr Ronan Coleman	Munster Technological University
2015	Dr David Corkery	University College Cork
2015	Mr Kevin Dalton	University College Cork
2015	Mr Paul Dillon	University of Limerick
2015	Dr Gordon Elliott	Trinity College Dublin
2015	Dr Carolyn Hughes	Dublin City University
2015	Dr Andrew Marsh	TU Dublin
2015	Dr Graham McMullin	Trinity College Dublin
2015	Dr Anthony Morrissey	University College Cork
2015	Mr Patrick O'Boyle	Dublin City University
2015	Dr Peter Olwell	Dublin City University
2015	Ms Emma O'Neill	Trinity College Dublin
2015	Dr James O'Sullivan	Waterford Institute of Technology
2015	Dr Karl Quinn	Genomics Medicine Ireland ex. University College Dublin
2015	Dr Tim Roche	Formium ex. University College Cork
2015	Mr Richard Stokes	Dublin City University
2015	Dr Jacinta Thornton	NUI Galway
2015	Dr Paul Tyndall	Maynooth University
2015	Dr Emily Vereker	Health Research Board ex. Trinity College Dublin
2015	Dr Ena Walsh	University College Dublin
2016	Dr Seamus Browne	Royal College of Surgeons in Ireland
2016	Mr Peter Conlon	Maynooth University
2016	Dr Aoife Gallagher	Royal College of Surgeons in Ireland
2016	Mr John Gleeson	University of Limerick
2016	Dr Derek John	Royal College of Surgeons in Ireland
2016	Dr Margaret Lawlor	University of Limerick
2016	Ms Breda Lynch	Athlone Institute of Technology
2016	Mr Neil McLoughlin	Dundalk Institute of Technology
2016	Mr Conor Morris	University of Limerick
2016	Mr Kieran O'Connell	TU Dublin
2016	Dr Miriam Walsh	Teagasc
2017	Dr Stacey Kelly	University College Dublin
2017	Dr Paul Maguire	TU Dublin
2017	Dr Kieran Ryan	NUI Galway
2017	Dr Siobhan Mac Sweeney	Munster Technological University
2018	Mr David Murphy	NUI Galway
2018	Dr Joan O'Sullivan	University of Limerick
2019	Mr Aidan Browne	Dundalk Institute of Technology
2019	Mr Ian Gallivan	NUI Galway
2019	Mr Brian Ogilvie	Institute of Technology Carlow
2020	Dr Samantha Williams	Trinity College Dublin
2020	Ms Josette O'Mullane	Munster Technological University
2020	Dr Stephen Donoghue	University College Dublin
2020	Mr David Gardiner	TU Dublin
2021	Brian Callaghy	Trinity College Dublin

APPENDIX 4. GLOSSARY

Active Spin-out
An Active Spin-out is an RPO created spin-out company that is at least three years post-formation (three years since being reported as an RPO spin-out) and, as at the end of the reference year, has at least one paid employee and has raised equity and/or has booked sales revenue. It is an incorporated entity which at the time of formation was dependent on the exploitation of specific intellectual property rights of the RPO. The RPO will have executed a licence to the spin-out for the IPR and/or will hold equity in the spin-out.

Assignment
Contract transferring ownership of right in IP to a third party.

Collaborative Research
A research project/programme between an industry party and an RPO. The project/programme may be:- wholly-funded by the industry party or; part-funded by the industry party (in cash and/or in kind, including participation in the research itself) and part-funded by the State or other external sources. Collaborative research may involve two or more parties. Characteristics of collaborative research with industry: The purpose of collaborative research is the generation of new knowledge. Typically, there will be an expectation of publication although the project may be governed by aspects of confidentiality. Intellectual property may be created and how the company benefits will be determined in the collaboration agreement and will depend on the contribution to the project made by the company. (Excludes contract services, consultancy, innovation vouchers, academic collaborations and research grants).

Consultancy Services
RPO provides professional-level work to an external client organisation through an academic, researcher or other member of RPO staff in exchange for a commercial fee. The work is specified (or agreed) by the client against deliverables agreed with the RPO. May include Consultancy agreements, "Contract services" agreements and projects contracted under a work order. Characteristics of consultancy services: The purpose of consultancy is not typically the generation of new knowledge, rather it draws on existing knowledge. There will usually be no expectation of publication, results will be confidential and will be transferred to the client. The type of work might typically involve one or more of the following: advice; analysis; production of a report. Projects will generally be of a short term. (Excludes collaborative research, research grants, Academic collaboration, Training and provision of Continuing Professional Development (CPD)).

Equity
Shareholding in a legal entity.

FTE
Full Time Equivalents - People working part-time are only included for the fraction that they are employed.

Incubator
A dedicated facility on the RPO campus in which early stage companies are housed and supported (pre- and post-formation). The facility may offer desk space, laboratory space or a mix of both.

Innovation Vouchers
Innovation Vouchers worth €5,000 are available to assist a company or companies to explore a business opportunity or problem with a registered knowledge provider (i.e. higher education institutes, public research bodies).

Invention disclosure
The invention disclosure is the first actual recording of potential new intellectual property (IP). The researcher/inventor and TTO/ILO will complete an Invention Disclosure Form (IDF) which is a written, signed and dated record. The IDF contains basic information, including supporting data, which helps to evaluate and subsequently, potentially, protect and commercialise the intellectual property. For avoidance of doubt, the IP may be software.

ILO
Industry Liaison Office – the team responsible for managing KT services, including intellectual property management, licensing, partnering with industry and the creation of new companies.

Joint invention/Software Disclosure
Simultaneous reporting of an Invention Disclosure for the same invention or software to more than one RPO that has been created jointly by more than one RPO via the TTO/ILO.

KT
Knowledge transfer – the sharing of expertise, capability, technology and intellectual property between the research base and industry or the public sector with the aim of developing new or improved products, processes and services that deliver societal and economic benefit. Knowledge Transfer Ireland.

Large Company
A company which is based in one country only and which has more than 250 employees and has either an annual turnover greater than €50m or an annual Balance Sheet total greater than €43m.

Large Company - Irish
A Large Company which is based in Ireland. Licence
A contract under which IP rights are transferred from one party to another for the purpose of commercialisation.

Licence
Contract transferring intellectual property rights for the purpose of commercialisation in accordance with contractual terms and conditions.

LOA - Licence, Option or Assignment
A contract under which IP results are transferred, or agreed to be transferred, from one party to the other for the purpose of commercialisation.

MNC
A multi-national corporation that has its facilities and other assets in at least one country other than its home country. Such companies have offices and/or factories in different countries and usually have a centralised head office where they co-ordinate global management.

MNC Irish
An MNC which has its HQ based in Ireland and/or which has a significant R&D presence in Ireland.

Non-commercial entity (NCE)
Public sector organisation or charity.

Option
A contract under which a potential licensee is granted a period of exclusivity during which it can decide whether it may wish to take a licence to the intellectual property and negotiate the terms of a licence agreement. The option period may include evaluation of the IP by the potential licensee (including assessing the technology). This may be called an Option & Evaluation agreement.

PCT
Patent Cooperation Treaty - the Treaty makes it possible to seek patent protection for an invention simultaneously in each of a large number of countries by filing an "international" patent application.

Priority filing
The first filing of a patent application which will establish a priority date from which all national patents will derive. Depending on patent strategy the priority filing may be done as a provisional application or national patent application or regional or international (PCT) patent application.

R&D Agreements
Research Collaboration Agreements (wholly and part-funded) plus Innovation Vouchers.

R&D&C Agreements
Research Collaboration Agreements (wholly and part-funded), Innovation Vouchers and Consultancy Agreements.

Reference Year
The twelve-month reporting period from January 1st to December 31st.

Research Expenditure
This represents the total expenditures on all types of basic and applied research in Irish RPOs from all funding sources: government, industry, non-profit foundations, etc. It excludes any academic costs dedicated to research, costs of administrative support and capital expenditures on new equipment, buildings or land.

Research grant
An academic grant not involving industry. An award to an RPO by a research funding agency (e.g. government agency, charity) to perform a programme of research with the intention of disseminating the research results and in which an industry party is not involved. Typical research funders may include: SFI, ERC, Welcome Trust etc.

RPO
Research Performing Organisations. Universities, institutes of technology and other research institutions funded primarily by public funds.

SME
Has less than 250 employees and has either an annual turnover not exceeding €50m or an annual Balance Sheet total not exceeding €43m.

SME Irish
SME which has its head office in Ireland. Sole invention / software disclosure. An Invention Disclosure for an invention or software created by one RPO and reported to that RPO via the TTO/ILO.

Spin-out
A spin-out company is an incorporated entity which at the time of formation was dependent on the exploitation of specific intellectual property rights of the RPO. The rights to the company can be linked to a specific researcher who was within the RPO at the time of company formation and who would be considered an academic founder. The RPO will hold equity in the spin-out and/or has issued the company with a licence to the IP.

Start-up
Company formed by staff or students from the RPO not based on knowledge or IP generated by the RPO and where there is no formal IP licence or equity share with the RPO.

TTO
Technology Transfer Office – the team responsible for managing KT services, including intellectual property management, licensing, partnering with industry and the creation of new companies.

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