



**RUSSELL
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Transforming the Economy

**Russell Group Research and
Commercialisation Activities**

Case Studies



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Through world-class research in fields such as AI, genomics, advanced materials and behavioural science, Russell Group universities are helping to build a bright future for the UK. This research, the knowledge we share with business and others, and the spin-out companies we create and nurture, provide skilled jobs, boost productivity and enhance UK competitiveness.

Analysis carried out by London Economics shows that in 2021/22, research and related commercialisation activities at Russell Group universities contributed £37.6bn to the economy and supported more than ¼ million jobs – in addition to the impact of their teaching and learning activities.

These case studies show some of the ways Russell Group universities work to help researchers and founders turn breakthroughs into new products and services, and highlight a few of the thousands of innovative businesses which started with university R&D.



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Northern Gritstone

Driving investment in science and innovation-based businesses

Launched in July 2021 by Russell Group universities **Leeds, Manchester** and **Sheffield**, Northern Gritstone is an independent investment company that supports science and innovation-based businesses located in the North of England, including spin-outs emerging from the three founding university partners.

The company provides not only the capital, but also access to the people and business services that help academic spin-outs to thrive. It does this by being part of a collaborative ecosystem that works with academics, specialists and service providers.

In October 2023, Northern Gritstone achieved its final close fundraising target of £312 million. It has so far made 15 investments in some of the most exciting future science and technology-enabled sectors such as advanced materials, energy, health technology and cognitive computation. These investments are based on its Profit with Purpose philosophy, aiming to combine strong returns for investors with wider positive, societal and economic impact, such as high-skilled job creation in the North of England.



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Midlands Mindforge

Turning Science into Successful Businesses

Russell Group universities **Birmingham, Nottingham** and **Warwick** are co-founders of a new investment company that will accelerate the commercialisation of university spinouts and early-stage IP rich businesses in the midlands.

Established with the support of other university partners from Midlands Innovation, Midlands Mindforge Limited is a patient capital investment company with plans to raise up to £250 million from strategic corporate partners, institutional investors and others. It aims to transform ground-breaking science and technology into successful businesses with real-world impact through equity investment and acting as a partner to entrepreneurs .

The new fund will help close funding gaps for early-stage technology companies located in the midlands, providing founders with access to capital investment and other resources to support businesses as they are established and grow. Priority areas include Clean Technology, AI and Computational Science, Life Sciences and Health Tech.



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Salinity Solutions

Making Water Treatment Energy Efficient

University of Birmingham spin-out Salinity Solutions has developed a water treatment system that will dramatically reduce the energy footprint of a wide range of industrial processes.

Salinity's patented Batch Reverse Osmosis (Batch RO) water treatment technology – the first in the world to be manufactured commercially, uses 50% less energy, typically purifies more than 95% of the wastewater, creates 80% less waste and is more compact and portable than traditional reverse osmosis (RO) systems.

It provides a wide range of solutions including environmental clean-up, water recycling and the extraction of minerals such as lithium, which is vital for achieving global net zero goals.



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Science Creates

Backing high potential new businesses

The **University of Bristol** has an established partnership with Science Creates - a deep tech ecosystem that offers high potential new businesses access to specialised incubator spaces, a dedicated Venture Capital fund (SCVC), and a comprehensive network of strategic partners to nurture science and engineering start-ups and spin-outs.

Since opening the first incubator in 2017, 40 of the 83 member in Science Creates' ecosystem – past and present – have been University of Bristol affiliated companies.

Its two central Bristol incubators offer 45,000 sq ft of laboratory, office and event space for deep tech start-ups, and member companies have created more than 370 jobs, adding £125m to the UK economy each year. Science Creates is also home to the Science Creates Accelerator Programme, a UKRI-funded accelerator programme for engineering biology. With backing from the Research England Development (RED) fund, a third £8.5 million incubator, OXM, will open later this year, providing capacity to incubate a further 275 new companies.

Science Creates is the brainchild of Dr Harry Destecroix, who co-founded spin-out Ziylo while studying for his PhD at Bristol. Ziylo, which is developing one of the first smart insulins to help people suffering with diabetes, was purchased by pharmaceutical giant Novo Nordisk in 2018 in a deal potentially worth \$800 million.



ScienceCreates



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Cyted

Giving the NHS new ways to help detect cancer

University of Cambridge spin-out firm Cyted has developed a non-invasive test which uses AI to help NHS clinicians identify the early signs of oesophageal cancer in tissue samples.

Oesophageal cancer is one of the world's most lethal cancers - with only 13% of patients diagnosed with oesophageal cancer surviving for more than five years.

More than half of all cases are preventable, if a condition known as Barrett's oesophagus is found and treated early. Cambridge researchers have invented a simple, cost-effective early oesophageal cancer detection test to help do just that.

A patient swallows a capsule which collects cells from the oesophagus in a process that takes just ten minutes. Cyted then digitises cell samples which are analysed by its pathologists.

Normally, analysing samples creates extra work for an already overstretched health service. Cyted uses deep learning pathology techniques, reducing burden for NHS staff with human pathologists only required to look at cases that aren't clear cut.

More than 10,000 of Cyted's early oesophageal cancer detection tests have been rolled out to NHS services across the UK.



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Broken String Biosciences

Developing Safer Cell and Gene Therapies

Cardiff University spin-out Broken String Biosciences is building a new technology platform designed to make cell and gene therapies safer, more efficient and more affordable for patients and health services such as the NHS.

Broken String's Next Generation Sequencing (NGS)-based DNA break mapping platform, INDUCE-seq, will offer researchers working on cell and gene therapies the opportunity to speed up analysis of how genome editors interact with and alter human genomes. Providing researchers with this information earlier in the drug development process will help reduce the chance of clinical failures during testing at later phases.

Broken String Biosciences was founded by Professor Simon Reed, a specialist in cancer studies at the Cardiff University School of Medicine, and two Early Career Researchers, Felix Dobbs and Patrick van Eijk. Spun out in 2020, the company completed a six-month residency at the Illumina Accelerator in Cambridge, UK, and closed a Series Seed financing of around \$4m USD with investors from the UK, Germany and the US in September 2021. In 2023, the company closed a successful \$15m USD funding round to support future growth.



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Low Carbon Materials

Making Net Zero Construction a Reality

Spun out in 2019 from **Durham University**, Low Carbon Materials (LCM) has 13 employees and is based in Seaham, County Durham. The company develops new solutions for the built environment, applying science-led product innovations to produce environmentally friendly building materials to make net-zero construction a reality.

Low Carbon Materials (LCM) was set up by three young Durham University scientists, with support from Northern Accelerator, a six-university partnership driving research commercialisation in the North East. The company is shaping the green construction sector with its science-based, lower carbon, new-age building materials. OSTO.

OSTO, LCM's flagship product, is a carbon-negative lightweight aggregate for concrete produced out of waste and by-products. The product is designed to be a 'drop in' solution for easy integration into current manufacturing processes and can be used in a variety of concrete applications. works by making traditional carbon-intensive blocks carbon-zero, thereby reducing their environmental impact. The team has gone on to partner with National Highways and Skanska to develop a second carbon negative aggregate to produce net zero asphalt. This will help to decarbonise the road network and is set to roll out in the coming months.

The company was named as one of three international finalists in the Fix Our Climate category, in the world's most prestigious environmental prize, The Earthshot Prize, 2022. All 15 Earthshot Prize finalists announced by HRH Prince William, are recognised as an accomplished group of entrepreneurs and innovators spearheading groundbreaking solutions to the biggest environmental challenges our planet faces.



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Bioliberty

Helping People Live Independently

University of Edinburgh start-up Bioliberty is harnessing soft robotic technology and a virtual therapy environment to assist and rehabilitate people who have experienced a stroke, empowering them to live independently.

Breakthrough technological advancements in machine learning, robotics and biomedical processing in recent years have made it possible for Bioliberty to deliver new solutions to support people post stroke. The company has developed its first product: a soft robotic glove called Lifeglov that helps increase the dosage of high intensity therapy whilst also tracking progress.

By combining rehabilitative robotics and digital neurotherapeutics, Bioliberty has created a comprehensive solution for stroke rehabilitation that can be used at home or in a clinical setting. While the company is currently focused on patients who have experienced a stroke, there are other indications which are being explored including spinal cord injury.

Scottish EDGE, the UK's biggest business funding competition that identifies and supports Scotland's up and coming, innovative and high-growth entrepreneurial talent has recognised Bioliberty with an award in 2020, 2021 and 2022. Last year, Bioliberty secured £2.35 million in a funding round led by Archangels, with participation from Eos Advisory, Old College Capital, which is managed by the University of Edinburgh's Edinburgh Innovations service, and Hanna Capital SEZC.



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Minviro

Driving Sustainability in the Mining Sector

University of Exeter spinout Minviro is helping drive environmental sustainability in the mining and raw materials sector.

The company was founded to commercialise methodologies and technologies developed by an Exeter researcher to predict the environmental impact of mining projects during the early planning and development stages. Minviro has since applied these technologies to commercial projects around the world, supporting mining companies in quantifying and reducing their environmental impact.

In 2020, Minviro received a £125,000 investment package from Sustainable Ventures who develop and invest in new sustainable businesses. The company has grown and now employs more than 40 people, and has worked with clients in 46 countries.

In 2023, Minviro raised \$2.6 million in investment from industry leaders which enabled the company to reach new markets and set up offices in Shanghai, China, and Perth, Australia.



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Chemify

Revolutionising Chemistry Through Digitisation

Chemify, a **University of Glasgow** spin-out company, aims to revolutionise the field of chemistry through digitisation, speeding up the development of drugs and medicines by automating the process of designing new molecules and materials for partners.

Built upon 15 years of research from Professor Lee Cronin's Digital Chemistry group at the University of Glasgow, Chemify's platform consists of proprietary synthetic chemistry robotics, the largest and continuously growing database of validated chemical reactions, and AI-enabled tools for the design, manufacturing, and validation of molecules of unprecedented complexity.

Founded in 2019, Chemify plans to expand to more than 100 people within the next 12 months as it starts building scalable pilot plants capable of becoming chemical 'giga factories' for the discovery and manufacture of trillions of chemicals on demand for use in pharmaceuticals, high value chemical manufacturing, new materials, farming, and green energy solutions. Chemify is already generating millions of pounds in revenue locally and is exploring the acquisition of facilities in Glasgow to continue its commercial expansion; training local R&D and manufacturing talent and attracting a global workforce to the Glasgow area.

In August 2023, Chemify announced it had raised over £33m in series A financing from US and Scotland based investors, and support from the UK Government through the Levelling Up Innovation Accelerator programme, aimed at helping transformative R&D projects to accelerate their growth and support new clusters of activity across the Glasgow City Region.



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Ceres Power

Driving Progress Towards Net Zero

The UK's most valuable clean technology company Ceres Power was formed from **Imperial College London** research into fuel cells that can be used to generate low-carbon electricity.

Ceres pursues an asset-light, licensing model that has seen it establish partnerships with some of the world's largest engineering and technology companies, such as Bosch, Doosan, Shell and Weichai, to develop systems and products that address climate change for power generation, transportation, industry, data centres and everyday living.

Ceres is listed on the London Stock Exchange and is classified by the LSE Green Economy Mark, which recognises listed companies that derive more than 50% of their activity from the green economy. It is valued at over £700 million and is in turn investing in other university spin outs.

In 2021 Ceres Power announced a new partnership with RFC Power, an Imperial energy storage start-up. RFC Power will receive access to engineering and commercial expertise that will help scale up storage technology which could make it possible to power a stable electricity grid solely with renewables and without any fossil power to compensate for daily variations in wind and sun.

The company's hydrogen manganese technology is designed to be cheaper to build and run than existing flow battery technologies, and could therefore help keep the cost of sustainable energy low. The deal has also enabled Ceres Power to add value to its technology portfolio and diversify into a complementary field.



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Pheon Therapeutics

Using Antibodies to Target Cancer Cells

King's College London (KCL) spin-out Pheon Therapeutics is developing new drugs that use antibodies to help target cancer cells while leaving health cells unharmed.

The novel Antibody-Drug Conjugates (ADCs) under development by Pheon Therapeutics for use in oncology are designed to avoid significant side effects usually associated with traditional chemotherapy treatments in which the cytotoxic drugs reach healthy cells as well as cancer cells.

ADCs comprise an antibody targeted to an antigen on the surface of cancer cells, joined via a chemical linker to a cytotoxic small molecule known as the “payload”.

Pheon Therapeutics evolved from “Femtogenix Ltd” which was a spin out company from King’s formed in July 2015 to commercialise academic work from researchers based at the KCL Institute for Pharmaceutical Sciences.

Under its new name Pheon Therapeutics in September 2022, a \$68 million Series A financing round has enabled a presence in London and Boston.



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Slingshot Simulations

Delivering Insights Through Data Science

Slingshot Simulations, a spin-out from the **University of Leeds**, delivers insights from pioneering data science.

Using a technique known as digital twinning, the startup's software builds simulations of real-world objects, assets and systems to provide a wealth of information for decision-makers.

Founded in 2019, Slingshot joined Nexus, the University of Leeds' innovation community with a team of three people.

After raising £2.5m of seed funding, and capitalising on Nexus' reach into the University of Leeds, the local innovation eco-system and beyond, Slingshot's headcount has grown substantially.

In 2023, it was announced that Slingshot had secured a £3 million round of investment led by Northern Gritstone, alongside Mercia and the Northern Powerhouse Fund.



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Zinc

Helping Entrepreneurs Tackle Challenges on a Global Scale

Zinc, co-founded by **LSE**, is helping entrepreneurs, including academics, build technology-focussed companies to help tackle major social challenges on a global scale.

Zinc is an accelerator programme, developed to support founders and researchers working in three mission areas: helping people live healthy lives for longer; helping people build economic resilience; and reducing environmental harms.

Since 2017, Zinc has supported more than 350 founders through their talent-led Venture Builder, with diverse cohorts including individuals from a range of backgrounds.

The fifth Zinc cohort, focused on reducing environmental harms, included a chef from a Michelin Star restaurant, a lifestyle journalist, and architects - as well as people from more traditional startup backgrounds spanning technology, development, engineering, academia and product design.

Assistance provided by Zinc includes access to visiting fellows working in fields related to the accelerator's key missions, and targeted coaching to help founders work through challenges associated with building a sustainable, impactful business.

Through the Venture Builder platform, Zinc helps founders to identify their own skills and gaps, connect with others, explore mutually exciting problem areas and experiment together, before committing to a co-founding partnership.

Alongside the work to support founders, Zinc has developed a platform which supports the translation of R&D into scalable solution solutions to global challenges. As part of this, since 2020 Zinc has worked with UKRI on a Healthy Ageing-focused Catalyst programme that helps entrepreneurial researchers unlock the commercial potential of their science and technology research.



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TrophiCell

Harnessing the Power of Stem Cells

University of Liverpool spin-out TrophiCell has developed a revolutionary approach to harness the therapeutic potential of adult Mesenchymal Stem Cells (MSCs) that could provide more treatment options for serious health conditions like osteoarthritis and liver fibrosis.

TrophiCell optimises ‘trophic repair’ – the process by which MSCs secrete factors that promote repair and reduce inflammation in chronic conditions. TrophiCell has patented a new approach to cell therapy production that can reliably treat a range of diseases at a scale never previously possible with MSCs.

TrophiCell’s underpinning science and intellectual property was discovered by the University of Liverpool’s Professor Anthony Hollander and his team, and offers a new way of generating stem cell therapies.

Although MSCs have demonstrated a good safety record in clinical trials over many years, the variation between the small batches derived from different donors has led to an inevitable variability in efficacy. The TrophiCell innovation is based on the ability of MSCs to continue to deliver trophic repair almost indefinitely as they are grown through multiple generations in the laboratory, even when their ability to differentiate into different cell types diminishes.



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Graphene Innovations Manchester

Using Graphene to Tackle Sustainability Challenges

University of Manchester spin-out Graphene Innovations Manchester Ltd (GIM) has signed a \$1 billion deal to help tackle global sustainability challenges.

GIM, founded by Manchester graduate Dr Vivek Koncherry, has signed a Memorandum of Understanding (MoU) with Quazar Investment Company to create a new business that will spearhead an unprecedented scale-up of graphene-based technologies intended to cut global carbon emissions substantially.

The new UK-UAE partnership will be one of the most ambitious projects to date to commercialise graphene. The deal will help fast-track cutting-edge R&D into large-scale manufacturing using advanced 2D materials developed following research breakthroughs delivered by research teams in Manchester. The economic impact of the MoU is forecast to reach \$1 billion over the lifetime of the partnership.

This new venture will develop and produce premium, environmentally-friendly products, including breakthrough graphene-enhanced concrete that does not need cement or water and can be made using recycled materials.



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Atelerix

Helping Researchers Store and Transport Samples

Newcastle University spin-out Atelerix has developed transformative technology that helps researchers and businesses store and transport biological materials safely at ambient temperatures, removing the need for refrigeration.

This overcomes the barriers and limitations of the current need for cryo-shipping. The company, backed by the Northern Accelerator, use a patented process of encapsulating the cells and tissues in a natural alginate hydrogel made from seaweed. The cells and tissues can be recovered when needed by the addition of a gentle, cell-friendly buffer.

The method is practical and adaptable, opening up the market for the supply of cells and assays in a ready-to-use format, allowing cell suppliers to scale up their businesses, increase the range of assays available to consumers and improve access to stem cell therapy. Benefits include predictability and reliability in drug discovery models and for cells used as therapies, the opportunity for customers to use cells and assays immediately on arrival and removing the need for cryopreservation, or the alternative need for cytotoxic or animal-derived supplements.

In May 2019 Atelerix announced they'd closed a second round of funding of £700,000 to accelerate development of its products to market, and in February 2024 the company completed a further funding round of £500,000.



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Cerca Magnetics

Using Quantum Technology to Detect Early Signs of Dementia

University of Nottingham spin-out company Cerca Magnetics is using quantum technology to develop wearable brain scanners that could help detect early signs of dementia.

The company has pioneered the rapid development of a new type of brain scanner that uses quantum technology to measure magnetic fields above the scalp. In 2024, Cerca was backed by a £2m investment from the UK government as part of a £45m support package for the quantum sector.

The wearable OPM-MEG system uses small LEGO-brick-sized optically pumped magnetometers (OPMs) to measure the brain's magnetic field which have been incorporated into a lightweight helmet that allows people to move freely during scanning.

The innovative design means the system can be adapted to fit anyone, from newborns to adults, and sensors can be placed much closer to the head, dramatically enhancing data quality.

Cerca was spun out from University of Nottingham research in 2020. The new UK government support will be used to install a system at the Oxford Centre for Human Brain Activity where it will help enhance our understanding what happens to the function of the brain in people with dementia, which could lead to developing methods for earlier diagnosis and treatment.



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gaitQ

Developing New Mobility Aids

University of Oxford spin-out gaitQ has developed a range of wearable mobility aids and medical technologies that are helping transform the lives of people living with Parkinson's disease.

The company worked to commercialise research carried out by experts in engineering and physiology to address gait freezing, a common symptom of Parkinson's disease. The gaitQ tempo device developed by the spin-out provides wearers with a vibrational prompt or "cue" which prompts the user to walk more fluidly and overcome freezing episodes.

The device has been shown to reduce the risk of falls for users, helping keep people safe and slowing disease progression by allowing individuals to maintain a higher degree of independence and activity while reducing costs for health and social care support.

In 2023, gaitQ announced a new collaboration with the University of Exeter backed by a £1.4m NIHR award that will explore the broader potential of the gaitQ tempo on various conditions affecting mobility, including post-stroke recovery and hip and knee replacements.



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RoEx

Transforming Access to Professional-level Recording

Queen Mary University of London spin-out RoEx is using AI to transform the way musicians of all skill levels produce and record new music.

The technology developed by RoEx is designed to widen access to tools which allow more people to achieve professional level sound recordings without the need for expensive studio equipment or complex plugins.

RoEx's flagship product, Automix, lets musicians produce professional-level mixes in minutes. By removing barriers, this pioneering technology can democratise professional music creation, making it accessible and intuitive for all.

Automix built on insights and breakthroughs delivered by founder David Ronan in the course of completing his PhD in Electronic Engineering and Computer Science from Queen Mary University of London's Centre for Digital Music (C4DM).

RoEx aims to level the playing field in audio production, striving to achieve for music what Instagram filters did for photography.



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CV6 Therapeutics

Developing New Cancer Drugs in Northern Ireland

Queen's University Belfast (QUB) spin-out CV6 Therapeutics (NI) has received approval from the UK's medicines regulator, the MHRA, to begin a UK-wide clinical trial for its first of a kind anti-cancer drug called CV6-168 that could help the NHS treat more patients successfully.

The new drug, developed by researchers based at QUB, is one of the first novel cancer drugs developed in Northern Ireland. The trial is scheduled to begin in the first quarter of 2024 with sites including Belfast, Glasgow, Newcastle, and the Royal Marsden in London.

Pre-clinical studies have already shown that CV6-168 works alongside standard cancer therapies to activate a unique action that induces cancer cell DNA damage and cell death while at the same time activating the patient's own immune system to further enhance its anti-cancer effect.

This UK multi-centre clinical trial will further test the drug and will combine CV6-168 with a chemotherapy drug, infusional 5-FU, to treat gastrointestinal cancer patients, such as colon, gastric, and pancreatic cancers, as well as other tumor types such as melanoma, lung, and ovarian cancers.

CV6 Therapeutics (NI) is headquartered in the Patrick G. Johnston Centre for Cancer Research at QUB and employs a team of researchers who specialise in leading edge cancer research.



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Opteran

Using Neuroscience to Transform Robotics

Following more than £6m of EPSRC research funding, Opteran was spun out from the **University of Sheffield**, raising a further £12M investment and growing to 42 employees.

Opteran has pioneered a concept called brain biomimicry which uses neuroscience to reverse-engineer biological brain algorithms directly from insects such as bees and ants.

Opteran's vision is to commercialise these brain algorithms, an untapped natural resource to solve hard problems such as machine autonomy. This could enable machines to operate as efficiently as nature in consumer, commercial and industrial robotics such as warehousing, security and mining applications.

Opteran secured significant investment from IQ Capital, Join Capital, Seraphim, Episode One, plus Northern Gritstone, the investment company founded by the universities of Sheffield, Leeds, and Manchester to help boost the commercialisation of university spinouts and start-ups in the north of England. Northern Gritstone announced in October 2023 a final close of £312M with a broad base of investors.



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Radii

Improving the Impact of Prosthetic Limbs and Orthotics

University of Southampton spin-out Radii Devices empowers clinicians to make evidence-based predictions of the most comfortable fit during the design of prosthetic limbs and orthotics.

Radii Devices have developed software which enhances existing processes involved in the design and production of assistive technologies, leveraging data from patients and clinicians on previous fits to inform decisions about new devices.

As a result, Radii's software aims to support clinicians in greatly reducing the time taken to find the most comfortable, highest quality fit for wearers of prosthetic and orthotic devices. Getting the fit of new devices right quickly helps maximise the benefit of clinical interventions for patients, reducing discomfort that can limit quality of life and cutting production timescales and costs.

Since spinout in 2020, Radii Devices have raised more than £1m in equity investment and grants, including from the Innovate UK Biomedical Catalyst and the UK Office for Veterans' Affairs' (OVA) Health Innovation Fund, with commercial projects now underway with veterans' charities, government departments, and major clinical service providers in the UK and USA.



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Autolus

Creating New Treatments for Cancer Patients

Autolus is using ground-breaking **University College London (UCL)** research into T-cells to create new treatment possibilities for patients with cancers that have failed to respond to standard therapies.

T-cells are a naturally occurring part of our immune system that normally kill infected cells. UCL scientists found a way to reprogramme T-cells so they can recognise and fight cancer cells in the body, just as they would naturally attack an infection. This programming works by taking T-cells from a person's blood sample and introducing a gene for an artificial protein called a chimeric antigen receptor, or CAR.

Autolus was created to commercialise this research in September 2014. The spinout process was supported by UCL Business (UCLB), UCL's commercialisation company, and founded with additional funding from a BBSRC Sparking Impact award.

In 2018 Autolus successfully raised \$160 million through its Initial Public Offering (IPO) on Nasdaq. Autolus is now developing a number of products to treat cancers that start in blood-forming tissue (such as leukaemia and lymphoma), as well as one solid tumour programme.



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Cizzle Biotech

Early Diagnosis of Lung Cancer

University of York spin-out Cizzle Biotech is developing a blood biomarker test for the early detection of lung cancer, which often goes undiagnosed until too late for curative surgical intervention.

CT scanning for lung cancer is currently the standard of care but is a costly and limited health service resource. It also has a false positive rate of approximately 90%, depending on route of referral, which can lead to unnecessary and invasive investigations and cause significant patient trauma over an extended period of time.

The simple blood test developed by Cizzle Biotech can detect a new biomarker which is highly associated with lung cancer even in its early stages, and offers a way to reduce the time required to reach a formal diagnosis. This will benefit patients who can start treatment at an early stage of their disease progression.

The test that has been developed is based on findings from 15 years of grant funded basic research from the Department of Biology at the University of York into the CIZ1 protein and its relationship with cancer. A variant form, CIZ1B, is produced by lung cancer cells and Cizzle Biotech's test exploits this to detect lung cancer.



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NanoSyrinx

Making Medical Treatments More Effective

University of Warwick spin-out NanoSyrinx, founded in 2020, is developing a new cell engineering tool that has the potential to improve the efficacy of existing medical treatments for a range of diseases while minimising drug side-effects for patients.

NanoSyrinx's novel method for targeted drug delivery, direct to the interiors of cells, uses genetically encoded "nanosyringes" to inject bioactive proteins and peptides through cell membranes.

In nature, bacteria use nanosyringes to inject toxins into cells. NanoSyrinx's research has enabled the company to engineer these naturally occurring structures to deliver therapeutics to specific cellular targets. This allows for extremely close targeting of therapeutics and avoids medicines affecting healthy tissue.

Initial applications in testing include new cell and gene therapies, where nanosyringes could be used to deliver effective cancer treatments with lower risk of side effects than established radiotherapy and chemotherapy treatments.

In 2021 the company raised £6.2m of seed financing in an oversubscribed funding round to fully investigate the applications of its technology across a range of therapeutic indications. In 2023, NanoSyrinx was named as one of PwC's UK Life Sciences Future50, a selection of innovative businesses delivering world-class R&D to tackle some of the biggest challenges in human healthcare.

The Russell Group logo is a dark blue circle containing the text 'RUSSELL GROUP' in white, bold, uppercase letters. The logo is positioned in the upper left quadrant of the page. The background features a large, light blue abstract shape on the left side, consisting of several overlapping circular and semi-circular forms. The text of the Russell Group members is arranged in three columns to the right of the logo.

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University of Birmingham

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Cardiff University

Durham University

University of Edinburgh

University of Exeter

University of Glasgow

Imperial College London

King's College London

University of Leeds

University of Liverpool

London School of Economics

University of Manchester

Newcastle University

University of Nottingham

University of Oxford

Queen Mary University of London

Queen's University Belfast

University of Sheffield

University of Southampton

University College London

University of Warwick

University of York