



UNIVERSITY OF  
BIRMINGHAM



# University of Birmingham Enterprise

ANNUAL REVIEW - 2021-22

# Welcome to our Annual Review of 2021-22



Metrics matter. But if they are poorly designed, they misdirect resources and incentives in ways that prove counterproductive in the long run. University of Birmingham Enterprise has a mandate to nurture and accelerate the IP and commercial potential of the University but that means more than just the revenue logged.

Our long term goal involves maximising the social, financial and reputational impact of the University's intellectual property and expertise and we need to measure it rigorously. Our commercial impact can be tracked by the number of products and services built or enhanced by our academic expertise and the number of companies we establish and help to grow. But our true impact is much greater when we consider the gravity of the societal issues our academics and companies are tackling. This year, we are proud to have supported teams working on issues as essential and wide-ranging as biodegradable plastics, COVID testing and prevention, and lithium extraction.

Our Annual Review presents some of the stories we are most proud of across our portfolio of support. Some of the case studies are the fruits of many years work and endeavour, such as Michabo Health Science, which started back in 2018 as an Operating Division, an environment in which new service companies can find their feet, and which has now graduated into a fully-fledged spinout. Others are springing up from the networks and communities we have now built, such as the formation of Unit 9, our new incubator for pre-revenue life sciences companies, which we formed based on the logistical challenges we've seen in this critical stage of company formation. Both innovations speak to our focus on finding the weak spots that prevent ideas taking flight in the real world.

In the year to come, we are doubling down our efforts to grow the network effects of our ecosystem and nurture more interactions between the University, the private sector, local government and the West Midlands community, as well as other academic institutions with whom we share a common vision. We look forward to working together to build on our momentum and achieve true, lasting impact.

**David Coleman**  
CEO of University of Birmingham Enterprise



**Professor Dominique Moran**  
Deputy Pro-Vice Chancellor, Research Impact

**The University delivers *Research that Matters*.** University of Birmingham Enterprise makes a distinctive contribution to the university by providing the support, training and expertise required to translate the ideas and insights from that research into products and services. It enables the university to offer solutions to real world needs, through licensing of intellectual property, spinout development, academic consultancy, and the offer of space and facilities to business. It also provides a source of inspiration and support to its enterprising students.

## Commercialising IP

Two achievements stand out over the last year for Dr Jonathan Watkins, Head of IP Services at University of Birmingham Enterprise.

First is the successful maturation of a raft of early COVID-era projects into real world applications through clinical research tools, products and solutions in areas including diagnostics and infection control and Long COVID research tools. Second is the first use of eLUCID, an e-commerce tool that allows quick and easy access to IP.

This has been used on our express licensing website, the MICRA gateway, where physicians and researchers can download the Symptom Burden Questionnaire for Long COVID, for use in clinical trials and real-world evidence studies evaluating the impact of medical treatments and interventions.

We have successfully coordinated multi-university IP agreements for spinouts in health and energy, and seen the flourishing of our Operating Divisions. This unique model for commercialisation helps bridge the gap between promising research results and commercial validation, and generates the data our entrepreneurial researchers need to convey a strong commercial prospect to investors.



### Midlands Investment Vehicle: targeting the UK's regional spinout equity gap

Commercialisation of IP via spinouts requires significant long-term financing and specialist resources but accessing adequate, staged funding dedicated to IP-rich spin-out companies becomes increasingly difficult outside the 'Golden Triangle' of London, Oxford, and Cambridge. This is starving capital in dynamic regions of the UK. The Midlands, for example, accounted for 11% of the UK's total high growth businesses in 2020–21 but garnered just 5% of the investment capital\*. Research by the British Business Bank has also identified this issue.

University of Birmingham Enterprise has taken a leading role in a project exploring the development of a 'Midlands Investment Vehicle' (MIV), a new corporate vehicle through which an anticipated initial £250–£300m could be raised from external investors. University of Birmingham Enterprise chaired the study group that has led the initial design of MIV's operations and a headline potential mandate.

Inspired in part by Northern Gritstone, an investment company bringing together the universities of Manchester, Sheffield, and Leeds, the MIV brings together eight regional research-intensive universities - Warwick, Nottingham, Birmingham, Aston, Keele, Loughborough, Leicester, and Cranfield, who have now signed up to develop the concept further. A significant amount of seed capital has been allocated from the partners to create an initial professional management team and embark on the next phase of development work.

Jerel Whittingham, Head of Enterprise Acceleration, describes a future, fully-operational MIV as 'a company-builder that partners with its associated universities, including through directly investing in their spinouts,' and emphasises that it would invest off its own balance sheet, allowing it to offer patient, long-term capital needed to boost the spinout ecosystem in the Midlands.

\* Source: Beauhurst

# Maturation of COVID-19 projects

## A global benchmark for Long COVID research

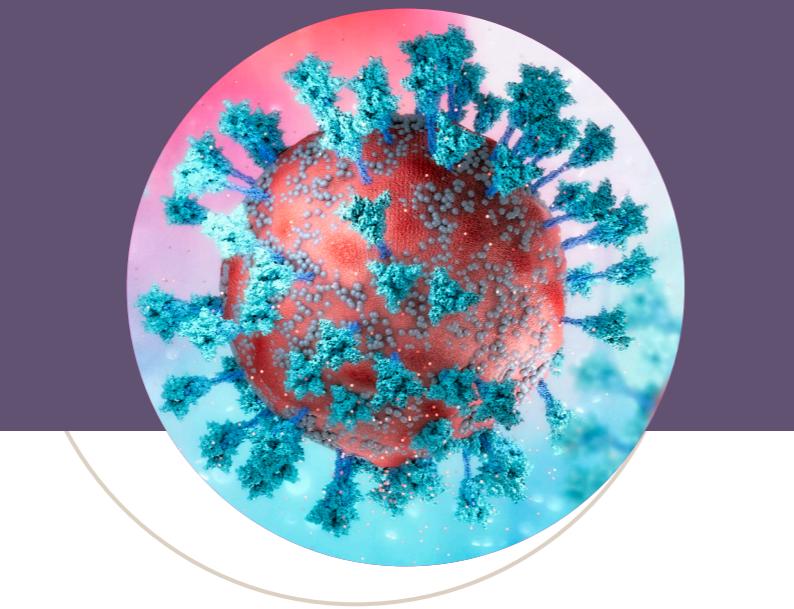
Over 100 million people are thought to be affected by 'Long COVID', a constellation of over 200 symptoms including breathlessness, fatigue and brain fog which can linger for months after an infection has gone. This huge patient population urgently needs support services and clinical breakthroughs to return them to full health.

Until recently, attempts to conduct rigorous Long COVID research have been hamstrung by a lack of appropriate patient-reported symptom tools. A team at the Centre for Patient Reported Outcomes Research, which is directed by Melanie Calvert, PhD, Professor of Outcomes Methodology at the University of Birmingham, has now developed the first rigorous symptom burden questionnaire allowing patients to report on symptom severity and how it impacts their life.

'Long COVID is a heterogeneous and complex condition; in fact, it is probably a number of conditions,' says Dr Sarah Hughes, Research Fellow at the Institute of Applied Health Research and a lead on the project. 'There were no validated questionnaires for Long COVID specifically and when we looked at questionnaires for similar conditions, we found that they could not provide the coverage of this constellation of symptoms'.

The new patient-reported outcomes tool is critical for clinical studies, trials and real-world evidence studies that evaluate the impact of medical treatments and interventions. It is now available on the University's express licensing website, the MICRA Gateway, for physicians and researchers to download.

University of Birmingham Enterprise helped develop the licence protocol that encourages wide dissemination while preserving the integrity of the tool, including across languages. 'Having a licensing agreement that is drafted specifically, and sets up terms and conditions of use, is really important to maintaining the quality and rigour of the instrument, and University of Birmingham Enterprise have been critical to that process,' says Dr Hughes.



## Rapid roll-out for new testing method

Since the invention of a COVID-19 test that reduces testing time from 30 minutes to under five while delivering accurate results, University of Birmingham researchers have now confirmed the speed, accuracy and simplicity of their highly sensitive testing method, that can be deployed at entertainment venues, airport arrival terminals, and in remote settings where clinical facilities are not available.

The method, published in the Proceedings of the National Academy of Science (PNAS), was developed in a collaborative effort involving Professors Tim Dafforn from the School of Biosciences, Professor James Tucker, and graduate student Jake Carter from the School of Chemistry, among others. It combines the ease and speed of lateral flow testing while remaining as sensitive as an RNA test able to detect even low levels of the virus. The assay has been tested at the Surgical Research Laboratory at the University of Birmingham.

The new method can utilise a one-pot assay, among other assay methods, compatible with more basic, benchtop equipment than what is normally required for conventional methods. It can be quickly adapted for testing other viral pathogens such as Influenza, Respiratory Syncytial Virus (RSV), Ebola, or new variants of COVID in settings where quick results are required to prevent more widespread transmission.

The University has now signed an exclusive licence with the Innova Medical Group, Inc., the world's largest COVID-19 test provider to commercialise the novel testing method, and the company is aiming to accelerate global rollout for widespread use by 2023.

## COVID-fighting nasal spray hits Singapore's shelves

A novel antiviral nasal spray that protects against the inhalation of infectious airborne viruses launched in Singapore and Hong Kong in May 2022, with planned expansion into the UK, Europe, and Latin America expected later this year.

Engineered by a team led by Professor Liam Grover, from the University of Birmingham's Healthcare Technologies Institute, the spray forms a gel barrier that sticks to the layers of mucus on the cells of the nasal passages. It is designed to work by encapsulating the virus while still in the nose, preventing its wider uptake by the body.

Birmingham Biotech Ltd and the University of Birmingham have signed a licensing agreement to commercialise the innovation. The formula – a winner at the 2022 Med-Tech Innovation Awards – 'plumes' rather than 'jets' when sprayed, offering up to six times more surface coverage than other nasal sprays. It uses materials commercially approved for use in humans, allowing the company to move quickly to commercialisation. Laboratory tests conducted by Dr Zania Stamatakis and her research team at the Institute of Immunology and Immunotherapy have shown that the spray formula can prevent infection of cells in culture with several variants of SARS-CoV-2.

As Omicron variants augur a future in which COVID is endemic, the nasal spray provides another layer of protection on top of vaccination, masks, and hygiene to limit transmission and help people to enjoy life without lockdowns.



# Invention and reinvention

## Reinventing polymers

**4D Biomaterials**, a University of Birmingham and University of Warwick joint spinout based on research by Professor Andrew Dove at Birmingham's School of Chemistry, is addressing the growing need for materials that can be used in the challenging class of applications where a medical device is implanted in the patient's body.

The company is commercialising a new class of materials – liquid resins that can be printed into complex and highly detailed devices, such as tissue scaffolds with an open cell honeycomb structure. These materials harmlessly degrade while promoting tissue regeneration following implantation and have 'shape memory' which means their structure can be compressed to enable minimally invasive surgical procedures and then recover to their original dimensions on exposure to body heat.

The company closed on a £1.6 million seed investment round in 2021, and, in 2022, launched three new grades of resin.

These resins yield 3D printed structures with distinctive properties. The 'soft and flexible' grade is suitable for soft tissue scaffolds, meshes and films, stents and flexible devices. The 'tough' grade has greater strength, and is suitable for trauma fixation plates, bone regrowth guides and long bone wedges, and the 'strong/rigid' grade is suitable to replace permanent titanium devices such as small bone pins, suture anchors, and bone or ligament screws.

In addition to this product range, the company offers a full product design and prototyping service for medical device innovators, enabling functionality, mechanical properties and degradation profiles to be optimised for a specific application.



Professor Dove's research continues to deliver innovation on other fronts. A joint project with Duke University, US, resulted in a further patent application for a new family of polymers from sustainable sources that retain all the same qualities as common plastics, but are also degradable and mechanically recyclable. In the long term it is possible that these sorts of materials could replace petrochemically-sourced plastics that don't readily degrade in the environment.

University of Birmingham Enterprise helped develop the IP proposition, submitted a joint patent application, and collaborated with Duke University in a burst of activity to market the technology to industry.

For Professor Dove, commercialisation is core to ensuring that academic research has an impact: 'If you want to make a difference, rather than just publishing a paper, you need to have serious conversations with a company and you need to have a patent behind it.'



## Closing the recycling gap

According to the British Plastics Federation, 61% of the plastic packaging collected in the UK is exported for recycling, but the UK plastics industry would like to process far more.

Dr Bushra Al-Duri from the University's School of Chemical Engineering has developed a process for recycling mixed plastic packaging that delivers a greater yield of high quality recycled plastic.

The method is an eco-friendly technology with fewer emissions, fewer processing steps and no solvent residues, generating a sustainable alternative to fossil oil derived feedstocks for the manufacture of plastics. The invention uses supercritical water technology and was developed alongside Stopford, who hold the licensed rights.

Supercritical water technology is the next generation for the treatment and recycling of complex and hazardous waste presently treated by incineration or sent to landfill. Dr Al-Duri and Stopford are excited about the scientific and operational processes required to further develop the technology, which has been awarded funding from UK Research and Innovation's (UKRI) Smart Sustainable Plastic Packaging (SSPP).



## Partnership to deliver next generation lithium batteries

Lithium-ion batteries are essential to clean technologies like electric vehicles, but they have limits in terms of energy density and charge times.

Peter Slater, Professor in Materials Chemistry at the University of Birmingham and Co-Director of the Birmingham Centre for Energy Storage, has an industrial fellowship with Echion Technologies to develop materials for fast-charging lithium-ion batteries for use in challenging e-mobility applications, heavy duty industrial and premium devices such as med-tech.

After six years of research and development with Niobium, a chemical element, Echion has designed unique crystal structures and particle engineering to enable reversible and superfast lithium-ion diffusion within microcrystals, enabling fast-charging battery performance without the need to use nanosized powders. The company, which now employs 30 people, supplies this unique material to battery cell manufacturers, and works with end users to meet their exacting requirements for battery cell designs.

Echion had already benefitted from working with Professor Slater in a consortium-based project. University of Birmingham Enterprise supported this project with contract negotiations and an application for a valuable patent, which has now been granted. In the last year the Enterprise team has filed a further patent application, which resulted from work done by Professor Slater during the fellowship.



# Bringing innovation to market

## Salinity Solutions: treating water better

**Start-ups often over-hype their technology, but sometimes the potential of a new business can surprise even the founders.**

Salinity Solutions, a spinout of the University of Birmingham and Aston University, developed a reverse osmosis water technology to support rural communities in low-income areas. Yet industrial use cases, from water re-use to lithium mining to agricultural slurry treatment, have widened their horizon and could encourage a global, multi-industry business to support their founding goal at larger scale.

Salinity's technique uses batch reverse osmosis, which separates water from ions and molecules using a partially permeable membrane. It requires half the energy of conventional industry water treatment solutions.

The company received an Innovate UK grant and venture backing, and was the first University of Birmingham spinout to run a crowdfunding campaign, which hit nearly double their original target. Business-to-business campaigns are rare on crowdfunding platforms which tend to orient towards consumer products and services, and many of the original investors have since increased their stake. University of Birmingham followed on with a £75,000 investment.

In March 2022, Salinity proved its potential in a successful field trial with eco-technology company Cornish Lithium, to concentrate the salts in groundwater to extract a mineral-rich brine, which promises to improve lithium yield at higher efficiency. 'Last summer, just after spinning out, we thought water would be our golden solution but our first application was brine. The idea the UK could become self-sufficient in lithium is really attractive from an economic and political perspective,' says founder Tim Naughton.

Salinity has assembled an advisory board with experts in water, brewing, mining and water treatment and is raising interim funding via CrowdCube to support further field trials, with a Series A planned for 2023. They are exploring licensing deals with a pan-European engineering company for industrial wastewater treatment, a market valued at \$12bn, and global waste management companies.



## Spinout brings high-end battery performance modelling software to industry

Battery models are used in the design of cells and battery packs to improve performance and cut costs, but they require input parameters that describe a battery's electrochemical, physical and thermal properties. Accurate models rely on high quality lab measurements that require complex technical skills and access to high-end instrumentation.

In late 2021, PhD students Gavin White from Imperial College and Kieran O'Regan from the University of Birmingham formed a spinout, About:Energy, to commercialise a battery modelling capability that can increase the speed of battery prototype development. 'The purpose of About:Energy is to parameterise battery models to help companies lower the costs and timelines of new technologies and reduce the burden of physical prototypes and testing,' says co-founder Kieran O'Regan. The company's leadership team includes Professor Emma Kendrick, chair of Birmingham's Energy Materials Group.

University of Birmingham Enterprise worked with Imperial College, who took the lead in the commercialisation of About:Energy, supporting the formation of the spinout and access to the University of Birmingham IP needed. The Enterprise team also provided advice and support for business planning activities, from pitching advice to introductions to investors to facilities that could house the company as it expands.

About:Energy, whose backers include Rishi Khosla, OBE, co-founder and Chief Executive of OakNorth, began trading in January 2022. The battery modelling capability was developed by the Faraday Institution's Multi-scale Modelling Project, which has built fast, reliable, accurate and versatile design tools called digital twins. About:Energy plans to work with industry by analysing and testing sample batteries and sending high quality data inputs for modelling. Automotive is the company's initial market as they recruit their first subscribers and early validators of the battery database and software platform, called The Voltt, says Kieran.

## Taking metals innovation to market

**Dr Baio Cai, Associate Professor in Metallurgy and Materials, secured a £1.5 million four-year UKRI Future Leaders Fellowship grant to take his patented metals research into commercial applications.**

Dr Cai has developed one patented technique for removing impurities in recycled aluminium and a second with industry partners allowing the development of new, stronger precious metals for industrial applications.

'This fellowship will help me take these patents to market,' says Dr Cai. University of Birmingham Enterprise supported the patenting process in the UK, Europe, the US, and China and helped Dr Cai build an extensive network of industrial partners that provided strong evidence of the importance of his research for the national and regional economy. 'Those patents strengthened the case for the fellowship funding,' says Dr Cai.



# Innovation in Life Sciences

## A new era in bone marrow research

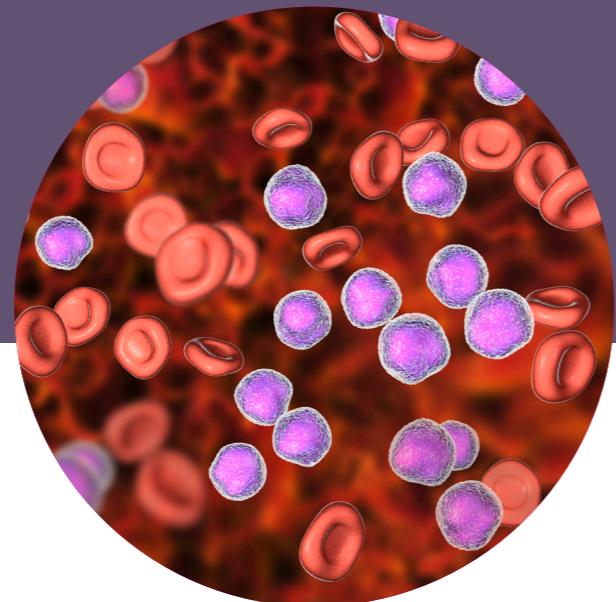
Bone marrow produces blood cells, and bone marrow disorders lead to devastating diseases, most notably blood cancers, a number of which remain untreatable.

Dr Abdullah Obaid Khan, a Henry Wellcome Research Fellow at the University of Birmingham's Institute of Cardiovascular Sciences, developed a vascularised 3D bone marrow model into which blood cancer cells can be engrafted, expanded, and differentiated. This allows therapeutic agents to be tested for efficacy in a human system which recreates the bone marrow's native complexity.

Working with Dr Bethan Psaila, Associate Professor of Haematology at the Radcliffe Department of Medicine, University of Oxford, and Dr Kellie Machlus, Harvard Medical School and Boston Children's Hospital, Dr Khan hopes the innovation – the first bone marrow organoid of its kind – can model the cellular, molecular, and architectural features of bone marrow.

'This is a route for precision medicine which so far has not existed for blood cancers, which are prevalent and increasing due to growth of the elderly population,' says Dr Khan. The team is exploring licensing opportunities with the pharmaceutical industry, which is struggling with the translational challenges of bone marrow research. 'Pharmaceutical companies are interested in organoid models to solve the bottleneck in drug discovery and development', added Dr Khan.

Sponsored research agreements can provide vital research finance for researchers. University of Birmingham Enterprise was instrumental in orchestrating IP agreements across three academic institutions, and filed a patent application on the novel method for making the bone marrow organoids. 'We would have struggled without University of Birmingham Enterprise in terms of interfacing between the three universities. It's a much bigger task than I ever thought it would be,' says Dr Khan.



## Transforming how we tissue-type organs

Modern organ transplantation techniques have been made possible by the development of potent immunosuppressive agents which prevent the host immune system rejecting a new organ as a foreign body. Currently, patient-donor matching involves analysing human leukocyte antigen (HLA), the part of the genome that identifies the immune system, but HLA typing is a slow, costly process and delivers low-resolution data.

A team at the University of Birmingham has now developed a technique that tests each of the eight genes at once through nanopore sequencing, which is quick and physically portable, providing an 'ultra-quick, ultra-accurate HLA assay', says Andrew Beggs, Professor of Cancer Genetics and Surgery in the Institute of Cancer and Genomic Sciences. 'We have an assay that can type the entire HLA region to the highest resolution possible within four hours and for about £50, compared to commercial assays which cost £300–400 and take a week.'

University of Birmingham Enterprise protected the IP, and the team is now working to secure a licensing agreement to develop the technology. The protocol is also being released for use in developing countries in Africa and Asia to increase the viability of organ transplantation in resource-constrained settings.

## Better ways to treat male infertility

**Testing an innovation against the market is a norm for start-ups to find 'product-market fit' but academics often lack the time and resources to engage extensively with potential clients.**

Following support from University of Birmingham Enterprise, a fellowship scheme helped Dr Meurig Gallagher, Assistant Professor in the Centre for Systems Modelling and Quantitative Biomedicine, understand the commercial opportunity for products that promise to improve male fertility treatment.

Working with Professor Jackson Kirkman-Brown MBE, lead scientist on the project and leader of Birmingham Women's Fertility Centre in Birmingham's Women's Hospital, and Professor Dave Smith at the School of Mathematics, the team has developed software and a medical device that improve fertility outcomes by optimising how male fertility is measured.

The software tracks sperm tails and analyses the efficiency of their energy and metabolism, while a microchannel device extracts the strongest-swimming sperm from a sample via a microfluidic chamber. 'By better tracking and understanding what the sperm tail is doing, we think we can get a much more holistic readout of its health,' says Dr Gallagher.

'At the moment, if you have a fertility issue, we do something very invasive to the woman - essentially, pump her full of hormones - and do nothing to the man.'

A better technology can stratify individuals to invasive approaches only where needed. Better sperm selection also produces more consistent results and reduces the risk of miscarriage in artificial insemination. While the team had developed a promising prototype, they were unsure about its commercial promise and applications.

University of Birmingham Enterprise supported Dr Gallagher through the Innovation to Commercialisation of University Research (ICURE) programme which trains, funds, and supports teams led by university early-career researchers to determine whether there is a market for products or services that utilise their research.

Gallagher used the fellowship to travel internationally for four months, holding over 80 meetings with manufacturers and fertility clinics all over the world, generating insights into the evidence needed to bring the devices and software to market.

'ICURE gives you an opportunity to explore a commercially promising market and see where it sits, whether people think there is a genuine need and how to take that forward,' says Gallagher. Feedback indicated widespread interest for all potential applications of the research, and a wide range of opportunities to explore further. Currently the team is exploring licensing and collaborative research opportunities with industry leaders.



# Our innovation landscape

**University of Birmingham Enterprise manages the Birmingham Research Park, which provides office space, incubation, and bio-incubation services, and is home to a thriving community of research-led organisations.**

The Park reached full occupancy over the last year and has expanded its physical footprint through the opening of Unit 9, a new incubator for pre-revenue and early stage companies. The Park welcomed seven new tenants last year, increasing the total of on site companies to 34. This is in addition to 40 virtual tenants, five of which emerged from the UoB Elevate Incubator and Business Growth Programme for University of Birmingham students and graduates.

University of Birmingham Enterprise is connecting companies with the University, and helping the campus deepen its ties with the West Midlands region. The team helped Bloomwise, a mental health consultancy start-up, to engage with tenants and promote their business at the UK Science Park Association Conference. Since the conference, the company developed an app, which was demonstrated to park tenants at an on-site engagement event.

The Research Park also hosted visits from DIT India, the Economic Development Board of Mauritius, and West Midlands Growth Company Global Entrepreneurs Programme.

The University has extended its internship scheme to include businesses at the Research Park, helping start-ups build capacity. Matoke Holdings, a biotech start-up was the first tenant company to engage, giving students valuable career experience. The Enterprise team also brokered introductions to the University's Postgraduate Taught (PGT) Knowledge Exchange Pathway (KEP), which partners postgraduate students with West Midlands businesses. This benefits both students and partner organisations, who get access to a team of talented PGT students who can work with them to scope persistent challenges and seek innovative solutions.

The BioHub is also supporting youth outreach, including through a planned collaboration with In2ScienceUK, and BioHub tenants participated in the Greater Birmingham and Solihull Local Enterprise Partnerships British Science Week.



## Unit 9 - a new incubator space

**Biotech and med-tech companies often hit an early stage growing pain: finding affordable and flexible facilities to test their product and business proposition at the seedling stage. Life sciences facilities are in short supply and those that exist are often expensive and come with burdensome contractual obligations that many start-ups are not in a position to fund or make full use of.**

Unit 9, a new incubator space in Birmingham Research Park, has built the bridge to help promising pre-revenue businesses get on their feet. The concept was tabled in September 2021, funding was secured and the space was refurbished in November and December.

A collaboration between University of Birmingham Enterprise, Greater Birmingham and Solihull Local Economic Partnership and the West Midlands Combined Authority, Unit 9 opened in January 2022 and now has four occupants: wound-healing pioneer Healome Therapeutics; Quest Meat, which is exploring ways to make meat production more sustainable using cell culture technology and knowhow from the bioprocess industries; Fallouh Healthcare, a surgical device company; and Biotica, which is developing environmentally friendly products for the agriculture and food sector.

Healome Therapeutics is a new spinout established to commercially deploy a platform that delivers a pro-healing microenvironment for the leading causes of preventable blindness. Dr Richard Williams, CEO of Healome, says Unit 9 has given the company the infrastructure to navigate its first chapter. 'One of our biggest frustrations was lack of affordable, simple industrial space to start-up in,' says Dr Williams, who co-founded Healome with Professor Liam Grover, director of the Healthcare Technologies Institute, Professor Tony Metcalfe, and Dr Richard Moakes.

'There are lots of life sciences parks and facilities which come at a hefty monthly charge and contractual burden which are too excessive for our needs at the moment,' says Williams. 'We needed a basic space we could set up and get going as we worked out the best operating model for the future. This arrangement minimises the liability on the company while testing and refining and gives us the platform to grow onwards to the usual life science spaces.'

Unit 9's first cohort are forming a tight-knit community. 'Everyone is working hard to get their start-up to the next milestone and usually has some knowledge of another sector. We have made introductions, exchanged consumables, shared experience on the start-up journey, and generally keep each other going. It's becoming a hive of activity which is quite refreshing,' says Dr Williams. The incubator is the latest asset contributing to the regionalisation of the life sciences industry in the Midlands.

## BioHub: A year of growth - and clinical breakthroughs



The BioHub has welcomed new tenants including infectious disease diagnostics company Genetic Signatures, which makes molecular diagnostics kits, chose BioHub as its first physical footprint within the UK, and the launchpad for expansion into Europe, the Middle East and Africa.

Genetic Signatures' molecular diagnostics kits are now accessible in over 30 countries. In the UK, it provides unique EasyScreen™ detection kits to the NHS to test for respiratory and gastro-intestinal diseases, and sexually transmitted infections.

Matoke Holdings took space at the BioHub to develop an entirely synthetic range of antimicrobial wound care formulations, which are expected to deliver a major advance in acute, surgical and chronic wound management.

The BioHub reported significant breakthroughs among its existing residents. Nonacus joined in 2016, with three researchers working on cell-free prenatal testing for Rhesus D, and now employs 50 people. During COVID, it pivoted to deliver COVID testing for 'test to release' and forged a partnership with researchers from the University's Bladder Cancer Research Centre, whose work on biomarkers is expected to yield a new, highly sensitive liquid biopsy test for the disease, reducing invasive and time-consuming diagnostic procedures.



# Enterprise training programmes

In November 2021, the University of Birmingham's Careers Network launched a student incubator, UoB Elevate (UoBE), located at The Exchange, to nurture the best student and graduate start-up ideas to become thriving businesses. University of Birmingham Enterprise supports the Student Elevate programme by providing our Entrepreneur in Residence to mentor at The Exchange. Final year undergraduates, postgraduate students and recent graduates can apply for Start-Up Scholarships of up to £15,000 to help them develop and scale-up their businesses.

'Elevate has been our turning point,' says Frankie Lewns, co-founder of Bloomwise, a mental health consultancy, and a scholarship recipient, which recently won their first client and launched an app. 'We always believed in our idea, but Elevate helped us hone in on how to approach it in the right way. There is an unbelievable amount of support and I can't fathom how you can get all that for free in the university'.

Lewns, a materials science PhD student, credits the mentors that helped her and co-founder Paris Alexandros Lalouis – Petros Rokkos, Head of human resources at HSBC and Tim Pile, ex-chair of Greater Birmingham and Solihull Enterprise. 'To have that advice and network has been amazing, they are always there to help and having Petros Rokkos as one of our mentors gives us a glimpse of the world we're trying to enter,' says Lewns. Bloomwise also welcomed two interns through a University of Birmingham-funded initiative, both of whom stayed on for a second stint thanks to additional funding.



University of Birmingham Enterprise supported Bloomwise by providing free training and advice from University of Birmingham Enterprise Entrepreneur in residence John Cooke, who helped the team scope out the business model and potential customers. Bloomwise also ran a pilot project at the research park in which Birmingham Research Park tenants could become customers of the consultancy.

Lewns says the community of fellow entrepreneurs is a source of inspiration, lesson-sharing and social support. 'People are at different stages from the idea phase to those with revenue and investment, so you can ask people that are ahead of you in the business journey. It's also a social community of like-minded people'.

Dr Noreen Akram, a medical graduate from the University of Birmingham, explains how UoB Elevate helped get her new enterprise off the ground. 'My interest in entrepreneurship and innovation was sparked at a student event. Now as a graduate I am so excited to be part of the pioneering UoB Elevate programme, with my company Proton Health, the first health-tech start-up in the incubator'. The company is reimagining the management of eczema and other chronic health conditions. University of Birmingham Enterprise supported Proton Health by scoping out their business model, helping them become investor-ready, and providing the opportunity to pitch the business in front of potential investors.



## Medici course sharpens academic's business skills

Medici is the University of Birmingham's flagship training programme for research staff exploring the commercial potential of their research. The programme provides the business skills, knowledge and confidence they need to engage with business and industry in an impactful, professional way.

Kit Windows-Yule, Associate Professor in the University of Birmingham's School of Chemical Engineering, won a grant from the EPSRC Future Manufacturing Hub in Manufacture using Advanced Powder Processes (MAPP), with follow-on funding from the EPSRC Impact Acceleration Account. He is developing a business idea to provide imaging and modelling capabilities to companies that work on particle handling, especially in sectors such as pharmaceuticals, chemicals, personal care and energy as they transition to 'Industry 4.0'. Windows-Yule says the Medici program, run by University of Birmingham Enterprise, helped him develop his business knowledge alongside the technical development of the business.

Medici helps participants turn an idea into a viable business, by articulating the value proposition, developing business models, and understanding sales and marketing.

'I've had a lot of engagement with business but in terms of developing my own company, Medici was extremely useful and well-pitched to hit the areas that we, as academics, would not be familiar with'.

Working with University of Birmingham Enterprise, he is considering creating an Operating Division (see page 17) to lay the groundwork and prove the viability of the idea. 'University of Birmingham Enterprise is helping me plan and conduct market research. They have used their own funds to buy documents concerning the market values in my sector of interest, and have arranged one-to-one business coaching to help develop a Royal Academy of Engineering Enterprise Fellowship application,' says Windows-Yule.

## Perfecting the pitch

University of Birmingham Enterprise supported Minerva Birmingham Pitch Up, a pitching competition that provides the opportunity for ambitious businesses to improve their ability to win investment, while simultaneously boosting their profile.

Co-delivered by the Centre for Growth at Aston University and Minerva Business Angels which is part of the University of Warwick Science Park, the competition kicked off in January 2022, with coaching workshops on how to refine and present a pitch deck, and culminated in March with a live pitching event to an audience of investors. It was won by ExpHand Prosthetics, a company set up by a Loughborough University graduate to make prosthetic limbs that 'grow with the child', which is now based in the Loughborough Enterprise Hub.



# New routes to impact and commercialisation



University of Birmingham Enterprise's academic consultancy division is a £2.5 million a year business handling a broad array of engagements and contracts, such as participation in scientific advisory boards or evaluation of client's technical or scientific specifications, and longer-term assignments such as design and analysis of systems for manufacturing processes.

The team's support package includes negotiating fee rates and contracts, arranging indemnity insurance, and invoicing, with life sciences and engineering two of the high demand disciplinary domains at the University of Birmingham.

Incoming Head of Academic Consultancy Services, Vincent Coole, is now spearheading an initiative to comprehensively track the impact of consulting on outcomes including new research collaborations, relationship-building and real-world societal impact. 'We want to track impact now. This is at the forefront of our objectives rather than just the income stream,' he says. Since November 2021, Coole, who joined from the University of Oxford, has been collaborating with colleagues to craft an impact capture method using categories from the Research Excellence Framework (REF).



## Energised thinking

**Professor Nicholas Wheeler from the Department of Political Science and International Studies and Institute for Conflict, Cooperation and Security (ICCS) is the academic lead on the BASIC-ICCS Programme on Nuclear Responsibilities.**

For the last 18 months, he has been an academic consultant with British American Security Information Council (BASIC), an independent think tank that promotes dialogue to advance global security. This work is anchored in the challenge of developing trust in the difficult space between nuclear armed adversaries and is based on a distinctive offering that is valuable for policy makers, officials, and high-level civil servants wrestling with the challenges of nuclear diplomacy.

Sixty years after the Cuban missile crisis, the nuclear threat is by no means dead.

Professor Wheeler says: 'It is very important that academics think really hard about how their research can speak to policy challenges and public policy issues. Consultancy is a really important way to energise thinking about global public policy challenges such as the nuclear threat and provides a vehicle for connecting cutting-edge research in universities with practitioner communities managing the challenge of reducing distrust and building trust between nuclear-armed adversaries.'

## Operating Divisions

**Operating Divisions allow academics to promote their consulting services as a branded legal trading entity, allowing them to test their IP and business idea prior to a full spinout, and to give the service market exposure and a trading history. University of Birmingham Enterprise carries out all the contracting and management of the Operating Division business.**

This bridging phase is critical since academic grants cover R&D but not the extensive work involved in proving that a product or service could be a viable business. 'A lot of academics rush to start a spinout and it folds in a year because they did not give themselves time to test it and get that market intelligence,' says Vincent Coole. 'We are developing the model so it appeals to academics who are thinking about launching a spinout but unsure about how the market will receive their services'.

New Operating Divisions over the last year include DExTER (Data Extractor for Epidemiological Research), a Software as a service (SaaS) platform for cleaning epidemiology data. University of Birmingham Enterprise supported DExTER through the Enterprising Birmingham Fund, which allowed a specialist advisor to scope out the market, facilitate the customer and partner discussions and refine the marketing and online strategy. The advisor is now working with the Operating Division to gather real-time market intelligence and build the customer base to develop a business plan with the intention of spinning out within the next year.

This year also saw the full spinout of Michabo Health Science, the first Operating Division to reach fully fledged spinout status since launching in 2018. Having built its customer base and business model under the Operating Division model, the company is now taking its business to the next level. Michabo Health Science provides fast, reliable predictions of whether chemicals are hazardous to human health or the environment, using novel methods developed by researchers from the University's

School of Biosciences to assess chemical safety without the need for vertebrate animal testing. The company is working with chemical companies and international chemical regulators to provide hazard prediction for groups of chemicals and expects to further develop and demonstrate new methods of evaluating chemical safety, addressing the needs of the consumer products, cosmetics and agrichemical markets.

We are also proud to see the flourishing of our long-established Operating Divisions. Professor Joan Duda's Empowering Coaching develops and delivers scientifically informed training programmes for coaches, managers, teachers, parents and young people involved in sport/physical activities from recreational through elite levels.

The Empowering Coaching 'train the trainer' model has delivered workshops and courses in countries across the world including Brazil, France, Greece, Norway, Spain, Qatar, Sweden, and Mexico, and is the subject of continual academic testing and evaluation, so the programme can be refined or modified as evidence of successful strategies emerges. In the last year, Empowering Coaching has signed a new three-year contract with University of Valencia, where it has been a partner since 2009, and partnered with Levelling the Playing Field, a UK-based multi-agency project that uses the power of sport and physical activity to engage and improve health and life outcomes for ethnically diverse children who are more likely to enter, or already involved with, the Criminal Justice System.



# University of Birmingham Enterprise works with researchers, businesses, and investors to maximise the social, financial and reputational impact of the University's intellectual property and expertise.

## THE BOARD

### Chairman

John Powell

### CEO

David Coleman

### Directors

Professor David Adams, David Brown,  
Professor Stephen Jarvis, Brenda  
Reynolds, Andrew Sleigh

### Company Secretary

Melanie Kaiser

## ADDRESS

Birmingham Research Park,  
97 Vincent Drive,  
Birmingham,  
B15 2SQ,  
United Kingdom

Email: [info@enterprise.bham.ac.uk](mailto:info@enterprise.bham.ac.uk)

Phone: +44 (0)121 414 9090

### Website:

[www.birmingham.ac.uk/partners/enterprise](http://www.birmingham.ac.uk/partners/enterprise)

### Express licensing website:

[www.micragateway.org](http://www.micragateway.org)

Twitter: @UoBAccelerate

LinkedIn: [www.linkedin.com/company/university-of-birmingham-enterprise](http://www.linkedin.com/company/university-of-birmingham-enterprise)

## KEY CONTACTS

### Chief Executive Officer

David Coleman: [d.coleman@bham.ac.uk](mailto:d.coleman@bham.ac.uk)

### Academic Consultancy Services

Vincent Coole: [v.coole@bham.ac.uk](mailto:v.coole@bham.ac.uk)

### Birmingham Research Park and The BioHub, Birmingham

Angie Reynolds: [a.reynolds.1@bham.ac.uk](mailto:a.reynolds.1@bham.ac.uk)

### Communications

Ruth Ashton: [r.c.ashton@bham.ac.uk](mailto:r.c.ashton@bham.ac.uk)

### Enterprise training and business incubation

Andrew Cruxton: [a.cruxton@bham.ac.uk](mailto:a.cruxton@bham.ac.uk)

### Intellectual Property

Dr Jonathan Watkins: [j.watkins.1@bham.ac.uk](mailto:j.watkins.1@bham.ac.uk)

### Spinouts and funding

Jerel Whittingham: [j.h.whittingham@bham.ac.uk](mailto:j.h.whittingham@bham.ac.uk)



UNIVERSITY OF  
BIRMINGHAM

ENTERPRISE