
University of
Nottingham
Biodiscovery Institute
We are the
Biodiscovery Institute
Shaping the future of health and biotechnology
nottingham.ac.uk/go/biodiscovery-institute

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Foreword

Director, Chris Denning (right); Deputy Directors, Neil Thomas (centre) and Amanda Tatler (left)

Welcome to the Biodiscovery Institute (BDI), a £100M world-leading hub of interdisciplinary research excellence that is shaping the future of health and biotechnology. This brochure is a snapshot into our six research themes, designed to improve human, animal and planet health.

The BDI houses 1,000 researchers, clinicians, support staff and collaborators. This includes 10 more companies we recently supported to spin-in/out; they access our state-of-the-art facilities to accelerate their progress and reinforce the discovery-to-translation mission of BDI.

Our open ethos stimulates collaborations across ~130 countries, whilst strengthening local ties with Nottingham Trent Univ. and the Midlands. BDI researchers have leveraged >£400M funding since 2014. This includes strategic investment into state-of-the-art multiphoton and single cell spatial transcriptomic systems (see 'Our Facilities', page 4). We celebrated surges in fellowship successes from junior researchers – BDI now houses 90 independent groups, featured in 'Our Research Leaders' (page 19) – showing dedication to career progression.

The six research themes have celebrated recent successes. For translation, LifeArc supported a £9.4M National Centre for Rare Respiratory Diseases (Demystifying Biomolecular Complexity Theme), complemented by a £3.5M MRC Programme on asthma. LifeArc also funded a £4.5M venture on polymicrobial infections (Pioneering Therapeutics Theme), while Innovate UK and SBRI supported £4M of programmes on gene therapy and vaccines.

The Engineering Biology Theme secured a £12.5M UKRI GlycoCell Mission Hub and a £1.8M UKRI Mission Award on drug delivery for cancer. A £14M UKRI Carbon-Loop Sustainable Biomanufacturing Hub (C-Loop) will 'bio-upcycle' industrial wastes, while a £6.5M EPSRC Doctoral Training Centre is on 'Resilient Chemistry: Feedstock to Function' involves BDI groups.

The Regenerating and Modelling Tissues Theme attracted EPSRC support for manufacturing via a £14M Stem Cells Hub and a £7.2M 'on demand' Programme. This theme will pioneer new *in vitro* approaches via a £4.4M BBSRC 'GlycoWeb' sLOLA and a £3.5M MRC Training Partnership on Advanced Interdisciplinary Models.

A further £3M of investment into the National Biofilms Innovation Centre will be used to develop lateral flow devices to detect *Pseudomonas aeriginosa*, a hospital 'superbug' (Taming Microbes Theme). The Defeating Cancer Theme won $21M from the NCI-CRUK Cancer Grand Inequalities Challenge. Charity and philanthropy has funded a £2.6M Brain Tumour Research Centre of Excellence on glioma and a £3M Naaz-Coker Ovarian Cancer Research Centre (NOVARC).

The re-energised BDI Early Career Researcher Committee continues to re-building post-COVID communities via research/careers symposia, sports events, bake sales, and various outreach events and activities. BDI's newsletter, '*Beady Eye*', is a quarterly highlight that communicates diverse researcher led activities, personal and group successes, and advice. This knits with the BDI 2023-2028 strategy, where evolving our facilities and research culture ensures the Institute is greater than the sum of its parts.

- Defeating Cancer
- Engineering Biology
- Regenerating and Modelling Tissues
- Taming Microbes
- Demystifying Biomolecular Complexity
- Pioneering Therapeutics

Neil Thomas
Deputy Director of the Biodiscovery Institute

Brief history of the Biodiscovery Institute

The Biodiscovery Institute - or BDI - evolved from the Centre for Biomolecular Sciences (CBS), a pioneering purpose-built multidisciplinary facility created to synergise cross-faculty research at the University.

Opening in 2003, CBS Phase 1 housed 150 researchers focused on medicinal chemistry, microbiology, chemical and structural biology. Expansion in 2007 opened CBS Phase 2, where capacity reached 350 researchers and broadened thematic areas to include stem cells and regenerative medicine, tissue engineering and synthetic biology. Major successes required further expansion. By 2019 an interlinked building complex housed 850 staff, students and companies, with major footprint in cancer sciences and respiratory disorders.

Reflecting the increased scope of research spanning three Faculties and five Schools, rebranding to the Biodiscovery Institute provided an umbrella facility for multiple centres of scientific and translational excellence. Collectively, 20 years of intensive research activity in discovery science, engineering biology, and pre-clinical and clinical research founded the six core scientific themes, delivered by over 1000 people.

Looking forwards from 2025, we showcase scientific, translational and career development successes, and preview strategy for the coming decade by leveraging foundations in exceptional facilities, capabilities and research culture.

1,000 researchers, clinicians, support staff and collaborators

Our Facilities

A £100 million suite of buildings housing world-class capabilities

Our exceptional facilities include mammalian cell culture suites with capacity exceeding most academic facilities globally via 120 class two microbiological safety cabinets and huge dual automated cryogenic systems storing ~400,000 samples.

Strengths in molecular analysis are supported by microscopes that stretch the art-of-the-possible of optics. The Zeiss Elyra PS1 super resolution system, the Zeiss 980 confocal with AiryScan2 microscopes offer a wide range of super resolution techniques. The Evident FluoView FV4000MPE-BX63L microscope has two pulsed multiphoton, 10 confocal lasers and Next Generation SilVIR™ detector with capability for *in vivo* whole rodent imaging. A Zeiss Cell Discoverer 7 microscope system provides automated high-content environmentally controlled live cell imaging.

HTA licensed labs house the world's largest tissue microarray for breast cancer. Three robotics suites provide capabilities in stem cell culture, recombinant protein production and a bespoke 83,000 library of high chemical diversity. Fermentation systems facilitate industrial and academic research, including novel capabilities to re-engineer bacterial strains that capture and convert carbon-based greenhouse gases into protein for animal feed, tackling climate change.

Bioprinting in 2D/3D spans length-scales from macro- (cell behaviours, physical attributes) to micro- and nano-scale. The latter includes protein crystallisation and highfield (800 and 600 MHz) NMR optimised for challenging systems (proteins, RNA, lipids etc) to enable reaction monitoring, metabolomics and automation for screening.

Our spatial platforms include the NanoString's CosMx and GeoMx, Miltenyi's Macsima, and Akoya's Fusion, which are revolutionising study of biological systems. By moving beyond 'bulk' analysis, which averages molecular signals from entire tissues, these platforms provide spatial context, offering deeper and nuanced understanding of cell biology.

Watch the BDI Virtual tour

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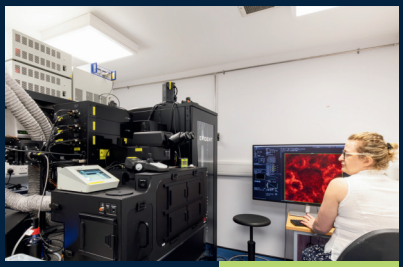
Automated cryogenics

Spatial transcriptomics



Multiphoton microscopy

Our Community

The Biodiscovery Institute is a world-leading hub of interdisciplinary research excellence that is shaping the future of health and biotechnology.

We take pride in our diversity of researchers, technical and support staff, and students who make this research happen. Their dedication to advancing solutions to global challenges is testament to the value of multidisciplinary collaboration and the importance of all roles in scientific development. This includes training the next generation of scientists and entrepreneurs through under-/post-graduate courses, including the UK's first Cancer Sciences BSc/MSci degree.

We house staff, students, researchers and collaborators from the Schools of:

- Chemistry
- Engineering
- Life Sciences
- Medicine
- Pharmacy
- Veterinary Medicine

Our scientific and translational strengths are amplified by creating a positive environment and research culture, integrating communities, including the building support team, administrative and technical staff, and a broad spectrum of researchers.

- **PhD Students (30%)**
- **Academic and Research Staff (26%)**
- **MSc and Undergrad Students (24%)**
- **Associate Staff (7%)**
- **Technical Staff (4%)**
- **Professional Services Staff (4%)**
- **Building Support Staff (2%)**
- **MRes Students (2%)**
- **Visitors (2%)**

Our Research Themes

We are globally respected leaders across six key research themes

Defeating Cancer

Demystifying Biomolecular Complexity

Engineering Biology

Pioneering Therapeutics

Regenerating and Modelling Tissues

Taming Microbes

Defeating Cancer

We advance the prevention, diagnosis, and treatment of cancer. We bring together biologists, oncologists, pathologists, and surgeons with the aim of detecting the disease early and stopping it from spreading. We pioneer research and treatments and train a new generation of cancer researchers to tackle the disease. We have developed innovative immunotherapies for cancer that stimulate the body's immune system.

Extensive cancer research is undertaken in BDI across many disciplines, focused in five key centres:

- Centre for Cancer Sciences
- Nottingham Breast Cancer Research Centre
- The Children's Brain Tumour Research Centre
- The Naaz-Coker Ovarian Cancer Research Centre
- The Brain Tumour Research Centre of Excellence

We bring together scientists and clinicians with diverse experience in biological and translational areas of oncology and stem cell biology.

Expertise includes cell and molecular biology, genomics and integrated omics, endothelial biology, immunology, the tumour microenvironment, clinical cancer medicine and therapeutic cell biology.

Our staff and students educate the next generation of researchers by teaching on the first tailor-made undergraduate Cancer Sciences programme in the UK.

Theme Leads: Cinzia Allegrucci, Sheela Jayaraman and Ruman Rahman

Research Highlights

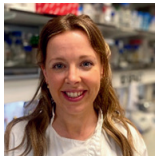
- Nigel Mongan. NCI-CRUK Cancer Grand Challenge; $21M. SAMBAI: Societal, Ancestry, Molecular and Biological Analyses of Inequalities
- Sophie Kellaway. MRC NIRG; £836k; ICF - Understanding Acute Myeloid Leukaemia stem cell growth: Prediction and prevention of relapse
- Srinivasan Madhusudan. Naaz-Coker Foundation, USA-UoN; £3M. Naaz-Coker Ovarian Cancer Research Centre (NOVARC)
- Ruman Rahman. Brain Tumour Research Centre of Excellence; £2.6M. Precision glioma radiogenomics for enhance prognostication and therapy
- Emad Rakha. NIHR i4i; £1.9M. Integrated autofluorescence-Raman spectroscopy for intra-operative assessment of lymph node biopsies in breast cancer
- Guruprasad Aithal with 18 BDI Co-Is. UKRI Cross Council; £1.2M. Snake robots for spatial mapping of cholangiocarcinoma therapy resistance
- Beth Coyle. Children with Cancer UK; £349K. Establishing tumour microenvironment models of paediatric brain tumours
- Nigel Mongan. Prostate Cancer UK; £678K. Epitranscriptomic Mechanisms in ADT Resistance
- Judith Ramage. MRC Equipment; £525K. High plex spatial biology profiling
- Alan McIntyre. CRUK Multidisciplinary Award; £498K. The sound of Cancer: towards characterisation of elasticity

Publication Highlights

- Kellaway *et al*., 2024. Leukemic stem cells activate lineage inappropriate signalling pathways to promote their growth. *Nature Communications*. 15, 1359. doi: doi.org/10.1038/s41467-024-45691-4.
- Clark *et al*., 2024. Recipient tissue microenvironment determines developmental path of intestinal innate lymphoid progenitors. *Nat Comm*. doi: 10.1038/s41467-024-52155-2
- Jain *et al*., 2023. Wireless electrical–molecular quantum signalling for cancer cell apoptosis. *Nature Nanotechnology*, 19, 106–114. doi: 10.1038/s41565-023-01496-y.
- Andrieux *et al*., 2023. Spatially resolved transcriptomic profiles reveal unique defining molecular features of infiltrative 5ALA-metabolizing cells associated with glioblastoma recurrence. *Genome Medicine*, 15. doi: 10.1186/s13073-023-01207-1.
- Mendonca *et al*., 2025. The mitotic chromosome periphery: a fluid coat that modulates chromosome mechanics. *Nat Comms*. doi.org/10.1038/s41467-025-61755-5
- Ciscar *et al*., 2023. RANK is a poor prognosis marker and a therapeutic target in ER-negative postmenopausal breast cancer. *EMBO Mol Med*, 15. doi: 10.15252/emmm.202216715.
- Chapman *et al*., 2023. Optimizing biomarkers for accurate ependymoma diagnosis, prognostication, and stratification within International Clinical Trials: A BIOMECA study. *Neuro-Oncology*, 25, 1871–1882. doi: 10.1093/neuonc/noad055.
- Curvello *et al*., 2023. Biomaterial-based platforms for tumour tissue engineering. *Nat Rev Mat*. doi: 10.1038/s41578-023-00535-3.
- Wray *et al*., 2025. Angiogenic and Immune Predictors of Neoadjuvant Axitinib Response in Renal Cell Carcinoma with Venous Tumour Thrombus. *Nat. Comm*. 16:3870. doi.rg/10.1038/s41467-025-58436-8

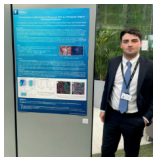
Spotlight on early career researchers:

Training the next generation of research leaders



Hannah Jackson is a Brain Research UK Fellow investigating childhood ependymoma, a rare brain tumour. She focuses on extracellular vesicles (EVs), tiny particles released by all cells into bodily fluids, like blood. Molecular information on EVs is a potential way to detect tumour cells non-invasively. Hannah aims to develop less invasive tools for diagnosing and monitoring ependymomas, enabling earlier detection and precise treatment. Her research could lay the groundwork for innovative therapies, including a tumour vaccine, ultimately improving survival and reducing treatment-related harm for affected children.

Dr Corinne Woodcock has been awarded a Prostate Cancer UK Career Acceleration Fellowship. She studies how prostate cancer uses RNA methylation to bypass tumour suppressor genes, which normally act as a genetic 'handbrake' to stop cells growing out of control. Over time, prostate cancer is able to spread by taking off this handbrake. Corinne's research will work out how to put the brakes back on to slow or prevent the spread of the disease.



Daniele Scotto is an MRC Clinical Research Training Fellow. He investigates the contribution of extracellular matrix glycosaminoglycans to the immunosuppressive myeloid environment of glioblastoma. Daniele's research will determine the composition of the tumour's extracellular matrix and immune microenvironment using a high-resolution analytical instrument called 3D-OrbiSIMS. This will lead to assessment of specific drugs that may alter the glioblastoma extracellular matrix to alleviate immune suppression.

Demystifying Biomolecular Complexity

This diverse theme involves multi-disciplinary approaches to tackle the most important fundamental questions. Solutions can then be translated to new understanding and impact, ultimately including socioeconomic benefit. Specifically, we use our state-of-the-art methodologies to understand why biomolecular structures behave the way they do and how they interact with each other.

From analysis of molecules and genes involved in blood-clotting disorders through to exploring the products generated by microalgae, we provide leading-edge insight into biological processes at a molecular level. We design, generate and evaluate compounds that probe and report on these processes or interfere with their occurrence.

This requires a multidisciplinary approach involving biochemistry, chemistry, pharmacology, molecular and structural biology. As examples, we determine how protein structures form complexes with drugs and natural ligands using protein X-ray crystallography, cryo-electron microscopy and associated techniques, with emphasis on proteases.

To evolve new drugs for respiratory conditions, such as asthma, fibrosis or chronic obstructive pulmonary disorder (COPD), we use genetics, genomics and proteomics to identify new genes and pathways. Our aim is to tailor treatment so that the right drug goes to the right patient. This work extends into gene regulation mediated by epigenetics, transcriptional/translational control, and mRNA processing.

Collaborative projects span a breadth of fields, including neurodegeneration, cancer, antibiotic resistance, respiratory disease and regenerative medicine.

Theme Leads: Rachel Clifford, Ingrid Dreveny and Ellis O'Neill

Research Highlights

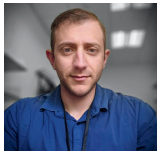
- Alvaro Mata. BBSRC; £1.3M; Manipulating Molecules with unprecedented resolution and control the Lumicks C-trap
- Catherine Jopling. BBSRC; £1.1M; The Role of the CCR4-NOT Complex and mRNA Regulatory Elements in Determining Protein Synthesis and Destination
- Rachel Clifford. MRC NIRG; £1.3M; DeCyFir: Determining functional DNA cytosine modification in idiopathic pulmonary fibrosis pathology
- Ian Sayers. MRC Programme Grant; £3.5M; Understanding and solving mucus dysregulation in severe asthma for better clinical outcomes
- James Dixon. Great Ormond Street Hospital Charity; £242K; RETTune: Self-regulated transgene expression to treat Rett Syndrome
- Jonas Emsley. NIH subcontract; £80K; Structure of VWFA1 binding nanobodies.
- Nick Hannan. NC3Rs; £267K; Understanding mechanisms driving lung disease cause by environmental particulate matter
- Simon Johnson. LifeArc; £9.4M; LifeArc National Translational Centre for Rare Respiratory Diseases
- Simon Johnson. UKRI Cross Research Council Scheme; £1.3M; Advanced Interdisciplinary Models of dEstructive lung Disease: AIMED

Publication Highlights

- Arce *et al*., 2024. Conformational activation and inhibition of von Willebrand factor by targeting its autoinhibitory module. *Blood.* 143, 1992–2004. doi: 10.1182/blood.2023022038.
- Rakkar *et al*., 2024. Mepolizumab Induced Changes in Nasal Methylome and Transcriptome to Predict Response in Asthma. *Am J Resp Critical Care Medicine*. doi: 10.1164/rccm.202308-1477LE.
- Zuffa *et al*., 2024. microbeMASST: a taxonomically informed mass spectrometry search tool for microbial metabolomics data. *Nature Microbiology.* 9, 336–345. doi: 10.1038/s41564-023-01575-9.
- Ogrodzinski *et al*., 2023. Probing expression of E-selectin using CRISPR-Cas9-mediated tagging with HiBiT in human endothelial cells. *iScience,* 26, 107232. doi: 10.1016/j.isci.2023.107232.
- Maurer *et al*., 2023. Ubiquitin-specific protease 11 structure in complex with an engineered substrate mimetic reveals a molecular feature for deubiquitination selectivity. *J Biol Chem*, 299, 105300. doi: 10.1016/j.jbc.2023.105300.
- Velasco *et al*., 2024. MicroRNA biogenesis is broadly disrupted by inhibition of the splicing factor SF3B1. *Nuc Acids Res*, 52, 9210–9229. doi: 10.1093/nar/gkae505.
- Griesinger *et al*., 2023. Multi-omic approach identifies hypoxic tumor-associated myeloid cells that drive immunobiology of high-risk pediatric ependymoma. *iScience*, 26,107585–107585. doi: 10.1016/j.isci.2023.107585.
- Casella *et al*., 2023. Design, Synthesis, and Application of Fluorescent Ligands Targeting the Intracellular Allosteric Binding Site of the CXC Chemokine Receptor 2. *J Med Chem*, 66, 12911–12930. doi: 10.1021/acs.jmedchem.3c00849.

Spotlight on early career researchers:

Training the next generation of research leaders



Luke Schembri began his career as Assistant Professor in Pharmaceutical Medicinal Chemistry in 2023. His focus spans from organic chemistry and method development to analytical chemistry and surface analysis techniques, such as MALDI mass spectrometry. His medicinal chemistry research includes fluorescent GPCR ligands, anti-virals, and oncology.

Luke Shipley is a third year BBSRC DTP student whose PhD research focuses on the unexplored environmental reservoirs of plague bacterium, *Yersinia pestis*. To investigate this, he is conducting field studies in the Madagascan forests where plague is endemic and suffers seasonal outbreaks.

Julie Sanchez is an Anne McLaren Fellow with skills in GPCR pharmacology and medicinal chemistry. Her research is on the interplay between G protein-coupled receptors (GPCRs) and transient receptor potential (TRP) channels to provide insight in better and safer drugs for conditions, such as chronic pain and inflammation.

Peter Aldiss is a Nottingham Research Fellow. His research focuses on obesity and cardiometabolic disease. He is working to understand how loss-of-function mutations in the *ADCY3* gene drive weight gain in the Greenlandic Inuit population. He is interested in how genetics shape our drive to eat and drink, and how signalling across the gut-liver-brain axis regulate appetite, cravings and food preferences.

Engineering Biology

We design and construct microbes and biomolecules to benefit human, animal and planetary health. We are developing new biomedicines, making useful products from wastes and generating sustainable feedstocks that reduce or avoid the need for fossil carbon. We engineer genetic code at levels of single DNA 'letters' through to building whole synthetic genomes of diverse organisms best suited to the application

In organisms such as bacteria, yeasts and microalgae, our researchers are using:

- Combinatorial design to develop performance engineered cells
- Metabolic engineering, bioreactors and fermentations to develop microbes for sustainable biomanufacturing
- Large multi-gene genetic constructs to produce glycoproteins and glycans as prototype biomedicines
- Engineered proteins for industrial and medical applications
- Redesign of entire synthetic chromosomes for specific purposes
- Microalgae for natural product discovery and production
- Conversion of waste gases into single cell protein animal feeds via microbial factories
- Cell-free expression systems for biomedicine manufacturing
- Microbial fuel cells and electrosynthesis
- Advanced synthetic systems to reveal fundamental rules of life

Theme Leads: John Heap, Klaus Winzer and Ying Zhang

Research Highlights

- John Heap. UKRI; £12.5M; GlycoCell Engineering Biology Mission Hub: Transforming glycan biomanufacture for health
- Ben Blount. BBSRC; £49K; Mining natural and synthetic diversity towards sustainable methacrylate production
- John Heap. UKRI; £14M Carbon-Loop Sustainable Biomanufacturing Hub (C-Loop)
- Ruth Griffin. MRC Impact Accelerator Award; £65K; Preclinical testing of a novel outer membrane vesicle (OMV) vaccine platform directed against *Clostridioides difficile*
- Katalin Kovacs. EPSRC; £6.5M; Centre for Doctoral Training in Resilient Chemistry: Feedstock to Function (CDT-F2F)
- Ben Blount. Chan Zuckerberg Donor Advised Fund (DAF) through the Silicon Valley Community Foundation; $600K; Unlocking Modular and Combinatorial Chromosome Assembly
- Neil Thomas, UKRI BBSRC; £1.8M. Evaluation and optimisation of new engineered human apoferritins: protein nanocages for targeted drug delivery and intracellular cargo release
- John Heap. BBSRC; £748K; Full Spectrum Cell Sorter for Nottingham and the Midlands
- Ying Zhang. BBSRC Follow-on Fund; £250K; Ectoine production from methanol fermentation

Publication Highlights

- Blount *et al*, 2023. Synthetic bacterial genome upgraded for viral defence and biocontainment. *Nature*, 615, 592-594. doi.org/10.1038/d41586-023-00702-0
- Blount *et al*., 2023. Synthetic yeast chromosome XI design provides a testbed for the study of extrachromosomal circular DNA dynamics. *Cell Genomics*, 3, 100418–100418. doi:10.1016/j.xgen.2023.100418.
- Garavaglia *et al*., 2024. Stable Platform for Mevalonate Bioproduction from CO_2. *ACS Sustainable Chemistry & Engineering,* 12, 13486−13499 .doi:10.1021/acssuschemeng.4c03561.
- Harrison *et al*., 2025. Modular Combinatorial DNA assembly of group B *Streptococcus* capsular polysaccharide biosynthesis Pathways to Expediate the Production of Novel Glycoconjugate Vaccines. *Vaccines*, 13, 279–279. doi:10.3390/vaccines13030279.
- Sellés Vidal *et al*., 2021. Versatile selective evolutionary pressure using synthetic defect in universal metabolism. *Nature Communications*, 12. doi:10.1038/s41467-021-27266-9.
- Li *et al*., 2023. Improving the editing efficiency of CRISPR-Cas9 by reducing the generation of escapers based on the surviving mechanism. *ACS. Synth. Biol.* 12, 672-680. doi: 10.1021/acssynbio.2c00619
- Moreira *et al*., 2023. Developing a genetic engineering method for *Acetobacterium wieringae* to expand one-carbon valorization pathways. *Biotechnology for Biofuels and Bioproducts*, 16, 1–16. doi: 10.1186/s13068-023-02259-6.
- Passmore *et al*., 2023. A combinatorial DNA assembly approach to biosynthesis of N-linked glycans in *E. coli*. *Glycobiology*, 33, 138–149. doi:10.1093/glycob/cwac082.
- Schindler *et al*., 2023. Design, construction, and functional characterization of a tRNA neochromosome in yeast. *Cell*, 186, 5237. doi: 10.1016/j.cell.2023.10.015

Spotlight on early career researchers:

Training the next generation of research leaders

Rochelle Aw is an Assistant Professor in Microbiology, uses engineering biology and glycoengineering to revolutionise manufacture antibodies and vaccines. Using both yeast & bacterial enzymes, Rochelle is creating new methods to transfer essential sugars onto these critical medicines using a technique called cell-free gene expression.

Max Armitage is a PhD student using engineering biology to develop a yeast-based platform for antimicrobial candidates. By introducing foreign genes, in combination with other approaches, Max aims to develop new biosynthetic routes to novel antibiotics.

Dimitra Panagiotopoulou is a Research Fellow interested in biotechnological approaches to biomedical research. Following her previous research on genetic regulation, quorum sensing and biofilms, Dimitra recently began work applying Engineering Biology to glycobiology for biomedicine development, as part of the GlycoCell UKRI Engineering Biology Mission Hub.

Antonia Molloy is an Innovation Research Fellow, working to progress & commercialise a new protein-based drug targeting and delivery platform through UKRI Engineering Biology Mission Seed Corn funding. Working with the Business Partnership Unit, she is focusing on collaborative partnerships, protecting intellectual property, and knowledge exchange of a novel Apoferritin drug-delivery technology.

Pioneering Therapeutics

By its nature, our work is highly collaborative and cross-disciplinary. The shared goal of developing new therapeutic approaches to prevent or treat disease brings together experts, specialist capabilities and state-of-the-art technologies. The range of disciplines in this important theme is broad, spanning cancer, respiratory medicine, engineering, regenerative medicine and clinical sciences, to name a few.

To understand fundamental biological processes of conditions that cause mortality and morbidity, we exploit our expertise in biomarker identification, medicine chemistry, high-throughput screening, DMPK, pre-clinical models and advanced drug delivery platforms.

Our goal is to translate mechanistic insights into applied research in the areas of target identification, bioassay development and pre-clinical therapeutic discovery programmes.

We explore treatments that span small molecule drugs, biopharmaceutics and vaccines.

In 2025, we welcomed the Gene Regulation & RNA Biology Group to BDI. This team investigates the mechanisms that underlie cancer, infection and other diseases. In addition to CRISPR editing, transcriptomics, protein structure function, and bioinformatics and bioassays for new pharmacological inhibitors, the team explore RNA therapeutics. This includes targeting mRNA degradation complexes for infections such as hepatitis C.

Theme Leads: Weng Chan and Jacqui Shields

Research Highlights

- Amanda Tatler. Accession Therapeutics; £163K; Investigating the efficiency of trocept to infect fibrotic lung tissue
- Ian Hall. NIHR; £1.4M; Supplement to Biomedical Research Centre (BRC)
- Ingrid Dreveny. BeLAB1407 initiative grant; £597K; Identification of PPI inhibitors targeting a ubiquitin specific protease for the development of anti-cancer agents
- James Dixon. Innovate UK; £1.3M; Innovative technologies for intracellular drug delivery - Gene therapy in a powder
- James Dixon. SBRI; £1.9M; Vaccine development for potential epidemic diseases
- Lodewijk Dekker. Humane Research Trust; £154K; Development of a 3D colorectal cancer patient-derived mini-rings for high-throughput drug screening targeting the microenvironment
- Miguel Camara. LifeArc CF Trust Innovation Hub; £4.5M; Polymicrobial infections: biomarkers, diagnostics & mechanisms (PRECISION)
- Paul Williams. EPSRC; £5M; Designing bio-instructive materials for translation-ready medical devices
- Pavel Gershkovich. MRC IAA; £75K; Pharmacokinetics and anti-influenza efficacy of antivirals thapsigargin benchmarked against oseltamivir (Tamiflu) and baloxavir (Xofluza)

Publication Highlights

- Zaidi *et al*., 2025. Discovery of Highly Potent BET Inhibitors based on a Tractable Tricyclic Scaffold. *ACS Medicinal Chemistry Letters*, 16, 588. doi: 10.1021/acsmedchemlett.4c00621.
- Puthanveedu *et al*., 2025. Drug-like Antagonists of P2Y Receptor Subtypes: An Update. *Journal of Medicinal Chemistry*, 68, 9057–9083. doi: 10.1021/acs.jmedchem.5c00249.
- Lawrence *et al*., 2024. Cordycepin generally inhibits growth factor signal transduction in a systems pharmacology study. *FEBS Letters*, 3, 415-435. doi: 10.1002/1873-3468.15046.
- Al-Hayali *et al*., 2024. Conofolidine: A Natural Plant Alkaloid That Causes Apoptosis and Senescence in Cancer Cells. *Molecules*, 29, 2654–2654. doi: 10.3390/molecules29112654.
- Comeo *et al*., 2024. Ligand-Directed Labeling of the Adenosine A_1 Receptor in Living Cells. *Journal of Medicinal Chemistry*, 67, 12099–12117. doi: 10.1021/acs.jmedchem.4c00835.
- Zimarino *et al*., 2024. Disruption of CD47-SIRPα signaling restores inflammatory function in tumor-associated myeloid-derived suppressor cells. *iScience*, 27, 109546. doi: 10.1016/j.isci.2024.109546.
- Downie Ruiz Velasco *et al*., 2024. MicroRNA biogenesis is broadly disrupted by inhibition of the splicing factor SF3B1. *Nucleic Acids Research*, 52, 9210–9229. doi: 10.1093/nar/gkae505
- Pěnčík *et al*., 2023. STAT3/LKB1 controls metastatic prostate cancer by regulating mTORC1/CREB pathway. *Molecular Cancer*, 22. doi: 10.1186/s12943-023-01825-8.
- Rehmani *et al*., 2023. Orally-delivered insulin-peptide nanocomplexes enhance transcytosis from cellular depots and improve diabetic blood glucose control. *Journal of Controlled Release*, 360, 93–109. doi: 10.1016/j.jconrel.2023.06.006.

Spotlight on early career researchers:

Training the next generation of research leaders

Mahesh Puthanveedu is a Research Fellow in Medicinal Chemistry, currently developing small-molecule modulators and fluorescent probes for clinically relevant G protein-coupled receptors (GPCRs). His research focuses on early-stage drug discovery and the development of chemical biology tools to study GPCR pharmacology.

Merryn Hughes is a final year PhD student on the EPSRC CDT in Transformative Pharmaceutical Technologies. Her research focuses on using targeted protein degradation approaches to investigate the determinants of therapeutic mRNA delivery.

Angela Downie completed her PhD at the University of Edinburgh and is currently working on a BBSRC-funded project in collaboration with the CRUK Scotland Institute to understand how microRNAs and the CCR4-NOT complex function to control translation at the endoplasmic reticulum, with potential implications for microRNA-targeted therapeutics.

Sophie Kellaway is a Leukaemia UK John Goldman Fellow and recipient of a MRC New Investigator Research Grant. Sophie's research is focused on blood cancers. She studies how RUNX1 mutations function in acute myeloid leukaemia, with a view to identifying novel therapeutic targets to improve treatment outcomes and whether signalling pathways identified by her research may be exploited to prevent relapse in leukaemia patients, by repurposing compounds recognising the same targets in other conditions.

Regenerating and Modelling Tissues

We develop new approaches to repair or replace diseased and damaged tissue of the human body. We combine approaches from diverse interdisciplinary fields of research. This spans biomaterials, engineering, nanotechnology, stem cell technology and the emerging field of electroceutics, which seeks to modulate bio-electricity as a novel treatment.

Our discovery and applied research seeks to understand and control the cellular and molecular processes underlying various human diseases for therapeutic benefit.

We create materials that respond to stimuli and self-assemble into micro-structures, which influence cell behaviour. We also guide stem cell differentiation into defined phenotypes.

Combining these biomaterials and cells provides *in vitro* models to understand disease process, hence develop approaches to restore tissue function that has been lost through damage or disease.

Project examples include:

- Bioelectronics for modulating and sensing bio-electricity
- Advanced stem cell-derived technology and gene editing to model human diseases for discovery research and drug development
- Non-viral delivery of DNA, mRNA and proteins for tissue regeneration
- Precision assembly of complex cellular 3D micro-environments with optical tweezers and bio-printing
- Biologically derived wraps for nerve and tendon regeneration (MRC DPFS)

Theme Leads: Mattéa Finelli and Nick Hannan

Research Highlights

- Cathy Merry. BBSRC sLOLA; £4.4M; GlycoWeb is on regulation and function of glycosaminoglycans (GAGs) using advanced non-animal methodologies
- Felicity Rose. EPSRC Research & Partnership Hubs for Health; £14M; MAINSTREAM - Manufacturing Stem Cells for Regenerative Medicine, Immunotherapy and Cancer
- Felicity Rose. EPSRC; £7.2M; Dialling up performance for on demand manufacturing
- Felicity Rose. InnovateUK; £240K; BIOdegradable electroSPINning manufactured FILters for housed livestock farm pollution capture
- Karen Robinson. MRC; £3.5M; Advanced Interdisciplinary Models Doctoral Training Partnership mid-term renewal
- Laura Sidney. MRC IAA; £73,934; Human transplant potential of donated corneas preserved by low-temperature vacuum evaporation
- Lisa White. The Steve Morgan Grand Challenge; £3M; Translating GLP compatible immuno-modulatory and pro-regenerative particles to promote the function of islets following transplantation in humans
- Mattéa Finelli. NC3Rs; £100K; Towards a clinical-trial-in-a-dish: Validating an animal product-free stem cell-derived 3D model of Alzheimer's disease for drug discovery
- Victoria James. BHF; £1M; Do snoRNAs govern genotype-phenotype interactions in hypertrophic cardiomyopathy?

Publication Highlights

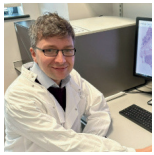
- Goodwin *et al*., 2023. Stretch regulates alveologenesis and homeostasis via mesenchymal Gαq/11-mediated TGFβ2 activation. *Development*. 150. doi: 10.1242/dev.201046.
- Jain *et al*., 2024. Wireless electrical–molecular quantum signalling for cancer cell apoptosis. *Nature Nanotechnology*. 19, 106-114. doi: 10.1038/s41565-023-01496-y.
- Liu *et al*., 2024. A self-assembled 3D model demonstrates how stiffness educates tumor cell phenotypes and therapy resistance in pancreatic cancer. *Advanced Healthcare Materials,* 13. doi: 10.1002/adhm.202301941.
- Monaghan *et al*., 2024. Connecting inflammatory bowel and neurodegenerative diseases: MicroRNAs as a shared therapeutic intervention. *Gut*, 10, 1034-1036. doi: 10.1136/gutjnl-2022-327301.
- Peteni *et al*., 2023. Electrochemical Immunosensor for Ultra-Low Detection of Human Papillomavirus Biomarker for Cervical Cancer. *ACS Sensors*, 8, 2761-2770. doi: 10.1021/acssensors.3c00677.
- Rakkar *et al*., 2024. Mepolizumab-induced Changes in Nasal Methylome and Transcriptome to Predict Response in Asthma. *American Journal of Respiratory and Critical Care Medicine*, 209, 1268-1272. doi: 10.1164/rccm.202308-1477LE.
- Raniga *et al*., 2024. Strengthening cardiac therapy pipelines using human pluripotent stem cell-derived cardiomyocytes. *Cell Stem Cell*, 31, 292-311. doi: 10.1016/j.stem.2024.01.007.
- Sayers *et al*., 2024. Genetics of chronic respiratory disease. *Nat Rev Gen*, 25, 534-547. doi: 10.1038/s41576-024-00695-0.
- Shrine *et al*., 2023. Multi-ancestry genome-wide association analyses improve resolution of genes and pathways influencing lung function and chronic obstructive pulmonary disease risk. *Nature Genetics*, 55, 410-422. doi: 10.1038/s41588-023-01314-0.
- Welsh *et al*., 2024. Minimal information for studies of extracellular vesicles (MISEV2023): From basic to advanced approaches. *Journal of Extracellular Vesicles*, 13. doi: 10.1002/jev2.12451.

Spotlight on early career researchers:

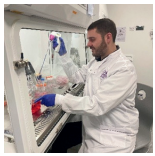
Training the next generation of research leaders

Ana Lilia Serna is a Nottingham Research Fellow. working to develop advanced lung models from human induced pluripotent stem cells (hiPSCs) to support translational research. She aims to create a physiologically relevant platform to understand how respiratory pathogens contribute to the progression of lung fibrosis.

Kamini Rakkar is an Asthma & Lung UK-funded Research Fellow. Her research explores the link between lung and cardiovascular diseases. By integrating large-scale population datasets with advanced stem cell biobank technologies, she is investigating biological pathways through which asthma contributes to heart disease, aiming to identify therapeutic strategies to prevent and repair asthma-induced cardiovascular damage.



William Dalleywater is an NIHR Academic Clinical Lecturer in Histopathology working on using induced pluripotent stem cells to regenerate colonic tissue as a potential therapy, with grant support from MRC Impact Accelerator Account award. He is interested in using stem cell models with gene editing and sequencing techniques to understand interactions between cells in developing tissues and disease.



Harry Jenkins is a research fellow in the Blood Cancer and Stem Cells group. He is developing cellular models of paediatric leukaemia through gene editing in stem cells, facilitating pre-clinical evaluation of novel or targeted therapies and study of blood cells in normal and leukaemic haematopoiesis.

Taming Microbes

Some microbes make us sick, others are important to our health and the environment. Biofilms, communities of microbes that attach to each other and surfaces, are central to our most important global challenges – from antimicrobial resistance and food safety to water security. Our bug-resistant polymers applied to urinary catheters and development of vaccines against pathogenic bacteria are making a difference to people's lives.

Understanding, tracking and predicting microbe evolution and sociology is of critical relevance to antimicrobial resistance.

Multidisciplinary approaches to understand bacterial community dynamics provide new ways to prevent, detect, manage and engineer biofilms.

Our research into how bacteria control virulence by communication (quorum sensing) and environmental sensing gives new insight into mechanisms.

We investigate bacterial membrane biogenesis, protein secretion and the relationship between quorum sensing and metabolism. This provides new approaches to tackle microbial and biofilm-mediated infections.

We use model systems and computation in our research. This includes three dimension skin infection models to understand biofilm micro-niches. Environmental surveillance and molecular genetics gives insight into how plague (black death) spreads.

Artificial Intelligence is used to tract antimicrobial resistance, while biofilm resistant biomaterials are incorporated into medical devices to avoid infections.

Theme Leads: Kim Hardie and Stephan Heeb

Research Highlights

- Jack Bryant. Royal Society; £19K; Consequences of Gram-negative bacterial lipopolysaccharide modifications on outer membrane protein biogenesis
- Ellis O'Neill. EPSRC New Investigator International Collab Award; £157K; Investigating biosynthesis of the newly discovered natural product euglenatide and distribution across the breadth of Euglenoid algae
- Kim Hardie. BBSRC; £1.3M; A brighter future cutting-edge multiphoton imaging at Nottingham
- Miguel Camara. BBSRC; £748K; Full Spectrum Cell Sorter for Nottingham and the Midlands
- Miguel Camara. BBSRC Resource Grant; £1M; Enhancing regional growth at the National Biofilms Innovation Centre
- Miguel Camara. BBSRC; £300K; National Biofilms Innovation Centre FTMA
- Ingrid Dreveny. BBSRC; £698K; Exploring the metabolic diversity of engineered fungal non-ribosomal peptide synthetase-like enzymes for the development of novel antibiotics
- Steve Atkinson. International Science Partnerships Fund (Research England); £18K; Maintenance and transmission of *Yersinia pestis* (plague) in Madagascan forest environments
- Kim Hardie was awarded the Microbiology Society Outreach Prize and received the Freedom of the City of London by redemption

Publication Highlights

- Baker *et al*., 2024. Convergence of resistance and evolutionary responses in *Escherichia coli* and *Salmonella enterica* co-inhabiting chicken farms in China. *Nature communications*, 15. doi: 10.1038/s41467-023-44272-1
- Bryant *et al*., 2024. Bam complex associated proteins in *E. coli* are functionally linked to peptidoglycan biosynthesis, membrane fluidity and DNA replication. eLife13:RP99955. doi.org/10.7554/eLife.99955.1
- Kasza *et al*., 2024. Ciprofloxacin poly(β-amino ester) conjugates enhance antibiofilm activity and slow the development of resistance. *ACS Applied Materials & Interfaces*, 16, 5412–5425. doi: 10.1021/acsami.3c14357.
- Maciel-Guerra *et al*., 2024. Core and accessory genomic traits of *Vibrio cholerae* O1 drive lineage transmission and disease severity. *Nature Communications*, 15, 1–21. doi: 10.1038/s41467-024-52238-0.
- Ottonello *et al*., 2023. Shapeshifting bullvalene-linked vancomycin dimers as effective antibiotics against multidrug-resistant gram-positive bacteria. *Proceedings of the National Academy of Sciences*, 120. doi: 10.1073/pnas.2208737120.
- Soukarieh *et al*., 2024. Design, Synthesis, and Evaluation of New 1H-Benzo[d]imidazole Based PqsR Inhibitors as Adjuvant Therapy for *Pseudomonas aeruginosa* Infections. *Journal of Medicinal Chemistry*, 67, 1008–1023. doi: 10.1021/acs.jmedchem.3c00973.
- Watson *et al*., 2023. Development of biocide coated polymers and their antimicrobial efficacy. *Nano Select*, 4, 442–453. doi: 10.1002/nano.202300005.
- Wu *et al*., 2024. Co-assembling living material as an *in vitro* lung epithelial infection model. *Matter,* 7, 216–236. doi: 10.1016/j.matt.2023.10.029.

Spotlight on early career researchers:

Training the next generation of research leaders

Jack Bryant is a Nottingham Research Fellow using high-throughput genetics, biochemistry and structural biology to advance our understanding of Gram-negative bacterial outer membrane biogenesis, with a focus on surveillance and quality control mechanisms. Jack's fundamental investigations are complemented by development of high-throughput assays to enable discovery and optimisation of antimicrobials in key Gram-negative pathogens.

Voahangy Andrianaivoarimanana is a postdoctoral fellow, who was previously at the Plague Unit, Institut Pasteur de Madagascar. She investigated the immune response to plague (*Yersiniapestis* infection) in humans and rodents, and also helped manage outbreak control. Currently her NERC-funded research aims to understand the interaction between *Y. pestis* and nematode worms and its relevance to *Y. pestis* survival in changing soil microclimates.

Michelle Baker and **Alexandre Maciel-Guerra** are research fellows in Tania Dottorini's group. Their research focusses on understanding the emergence and evolution of antimicrobial resistance

within disease-causing bacteria by studying the genetic signatures of resistance within individual species and microbiomes. Currently, funded by MRC and BBSRC, Michelle and Alexandre are developing innovative machine learning and big data mining tools to build AI-driven frameworks aimed at addressing antimicrobial resistance within the One Health approach.

Our Research Culture

Positive research culture is the central ethos at the Biodiscovery Institute. An environment that values everyone, gives them a voice and maximises their potential, regardless of gender, race, religion, or mental and physical health.

Our mission is to use innovation to tackle global challenges, from climate change and antibiotic resistance to chronic diseases and infections. This would not be possible without the talented researchers, collaborators, and technical and support staff working towards the shared purpose of pioneering research.

For our people, we champion the values of autonomy, mastery and purpose - embracing the idea of freethinking. We strive to create a climate where mistakes are embraced as learning opportunities, and individuals can work together to thrive, innovate and succeed with co-operation and trust.

From this culture, our community has developed numerous initiatives, that help cultivate a positive and inclusive environment. We have spotlighted a few on this page.

Our mantra is "metrics are gold, but people are diamonds".

Find out more about the BDI Committee and read Beady Eye Newsletter

nottingham.ac.uk/go/biodiscovery-institute

The BDI Committee

Interdisciplinary staff and early career researchers foster collaboration and positive culture through events, outreach and fundraising. Projects focus on sustainability, mental health, early career support/progression, and research communication. The Committee created the *Beady Eye* Newsletter, showcasing good news, events and updates in BDI, both inside and outside the lab.

Project period

Launched in 2020 by BDI Director, Chris Denning, and colleagues, Project Period moved from a grassroots pilot to an established university service. Period poverty is a global problem, with millions of women and girls held back and even endangered due to lack of menstrual care. Project Period addresses this imbalance by offering free period products for students and staff across our campuses - with around a million pads and tampons distributed so far. Further details are published in *Perspectives in Public Health*, 'Project period: a workplace health promotion innovation in a higher education setting'.

Sustainability

The University signed up to the Laboratory Efficiency Assessment Framework (LEAF) to save water, energy, plastics and other resources. BDI actively contributes to new solutions for sustainable research, including:

- Using Correx Lab bins to increase clean lab plastics and glass recycling by 30%
- Distributing equipment timers to save 35% in energy usage across our buildings
- Installing 25 diaphragm pumps to replace 82 water aspirators, saving 3 million litres of water annually
- Joining the NEB Freezer Programme, hence fewer deliveries and less packaging waste
- Starting a 'Swap Shop' for reusables from packaging waste, including wool, hay, and dry ice
- Collaborating with Nottingham Recycling Ltd to implement polystyrene recycling

Outreach

Our scientists and communicators are active in informative, educational, interactive outreach activities to break down barriers with the public. We have launched and taken part in several initiatives, such as annual discovery days, where primary school children explore BDI, meet our scientists, tour our fabulous laboratories, and engage with science-themed activities.

BDI researchers have showcased their research at 'Science in the Park'. This is hosted at Wollaton Hall and attracts 4,000 visitors each year, giving families the opportunity to learn about our different areas of research.

Our engagament with these and other initiatives has already reached 150 young people and their families, fostering a deeper connection to science within the community.

Kamini Rakkar presenting to Daybrook primary school at BDI Discovery Day 2024

Samna Sagadevan, Hannah Jackson, Alison Whitby, Une Kontrimaite at Science in the Park 2025

Aishah Nasir: Textile book compiled from hundreds of science-inspired artworks by primary school children

Art breaks down barriers to understanding. Exemplified by the HeART Project, we worked with Nottingham City Libraries, Lakeside Arts and Nottingham City Arts. We fostered engagement and improved young people's attitudes to STEM by bringing together local scientists and artists - producing creative tools provides interactive approaches to communicate science.

The HeART Project evolved art-based approaches into schools, libraries, and at national events, such as the Festival of Science and Curiosity. Over 650 young people (ages 7–19) participated in workshops and contributed their artworks to produce a giant-sized textile book, which has toured Nottinghamshire.

'Shaping a sustainable and moral future in translational biodiscovery'; an academic-industrial-public panel discussion with Melanie Welham, Dave Allen, John Heap, Adele Horobin, Andrew French, Jo Francis

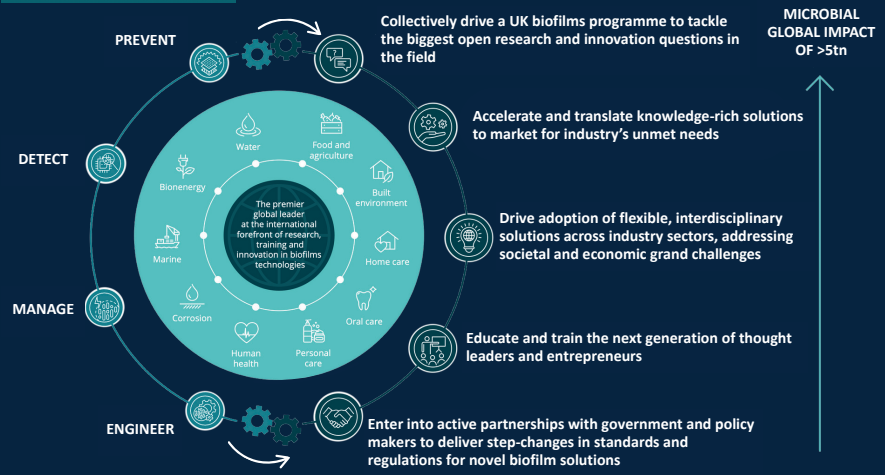
Celebrating 20 years of BDI

Leaders in science, healthcare and industry, and parliamentarians, came together in May 2024 to celebrate BDI's 20th anniversary of pioneering research. Watched by 350 people, Professor Dame Melanie Welham, former Chair of the Biotechnology and Biological Sciences Research Council (BBSRC), unveiled a plaque to mark the milestone. During the celebration, a virtual tour of a drone flying through the BDI was premiered, allowing anyone to see our incredible facilities.

Watch the BDI Virtual tour
nottingham.ac.uk/go/biodiscovery-institute

Our Translational Research

National Biofilms Innovation Centre



In 2017, major BBSRC and Innovate UK funding created NBIC, a consortium comprising the Universities of Edinburgh, Nottingham, Liverpool and Southampton, with a growing industrial presence of 260 global partners and 2,000 business engagements. NBIC, whose director is BDI's Kim Hardie, is a global leader in biofilm research, training, and innovation by tackling key challenges crucial to the UK's future prosperity. NBIC fuses world-class interdisciplinary research and industry partnerships to deliver breakthroughs to control and exploit biofilms.

Biofilms are central to global challenges – from infections, antimicrobial resistance and food safety to water security, marine biofouling and corrosion. They exert economic, social and environmental impacts estimated at $5 trillion a year. NBIC's annual report shows how international partnerships are steering government policies on key questions around biofilm control and resistance, education, study models and polymicrobial Interactions. NBIC has delivered £200M of economic impact, attracted £20M of cash/in-kind contributions from partners, and established 13 spinout companies, including MiDx, featured in the following pages.

ICRS 2025

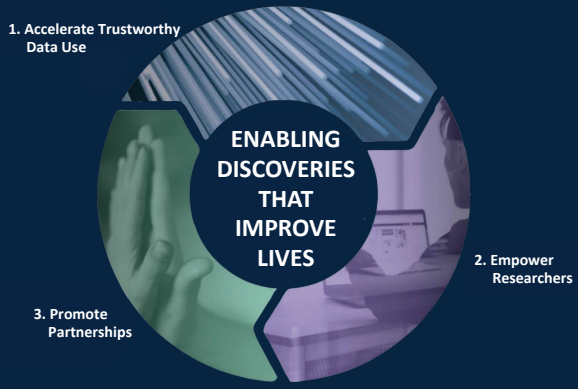
BDI's Defeating Cancer Theme and colleagues from the UoN Malaysia organised ICRS 2025 in Kuching, Malaysia, bringing together 187 participants from 10 countries across South East Asia to discuss cancer multi-omics, AI, diagnosis and treatment.

Rare disease research is hindered by fragmented expertise, patient populations and funding. LifeArc Translational Centres for rare respiratory diseases overcome challenges and will become the go-to place for researching rare diseases by bringing together collaborators from academia, patient groups, charities and industry. The aim is to discover new innovations that improve life quality and expectancy for patients through activities such as developing nationwide biobanks, new models of disease and early clinical studies.

For this £9.4M initiative, Simon Johnson bridges between the BDI and Nottingham's Biomedical Research Centre (BRC). He co-leads this LifeArc consortium in collaboration with the universities of Edinburgh, Southampton, Cambridge and Dundee, and University College London.

Health Data Research UK: 'One City' Health Data Strategy. Researchers need to access large patient datasets to understand diseases and develop new treatments while safeguarding the security of patient health data. This challenges traditional research methods, which rely on sending data from a controller to a data user, and limit collaboration and computational power or artificial intelligence.

BDI's Phil Quinlan leads workstreams on trusted research environments (TREs) that encourage researchers to access data within a single, secure environment. Researchers are given access to data, enabling them to collaborate with global partners, link data, and share code and results. Open ecosystems of networked environments enable analytics across many TREs to enhance public health - in Sept 2025, the team spun-out Qurae as a company to expedite their open research goals.



Our Featured Spinout Companies

Translation of discovery bio-technology and medical sciences into socioeconomic impact is central to the BDI strategy. As the oldest company housed in BDI, Scancell was founded in 1997 to develop immunotherapies, now showing success in clinical trials and seeding licensing deals of *circa* $1.2 billion. Since 2020, BDI has supported more than 10 other new companies; a few are showcased here.

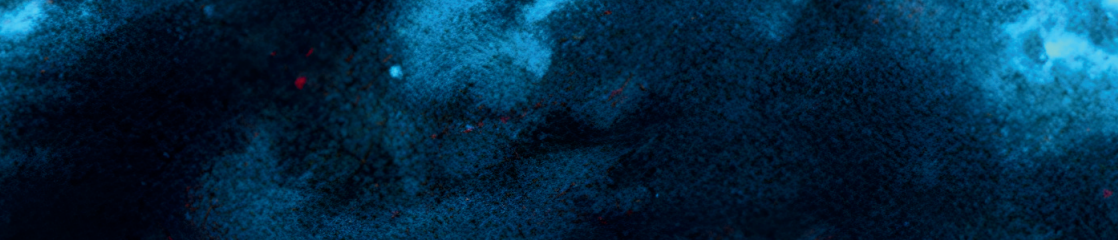
Aerbio pioneers gas fermentation tech to produce sustainable and nutritious protein. We transform CO_2 and H_2 into Proton™, a low-carbon, high-protein ingredient designed to enhance nutrition in animal and human diets. It is cost-competitive, available year round, and requires no arable land, with no impact on the local environment and no weather dependency.

Forge Genetics is a CRO that engineers microbial species, which are technically challenging or difficult to transform. The mission is to support R&D applications in industrially useful or medically significant bacterial species. Forge Genetics was founded by Nigel Minton (emeritus professor), and former postdoctoral researchers, Craig Woods & Chris Humphreys.

IsomAb (isomab.bio/) secured £7.5M Series A investment to advance isoform specific antibodies to treat peripheral arterial disease (PAD), affecting 200 million people globally. The tech specifically inhibits 165b isoform of vascular endothelial growth factor-A, providing an unparalleled approach to treat patients with PAD and also type 2 diabetes.

MiDx develops solutions for rapid detection of cystic fibrosis infections. Revolutionising healthcare to enable timely targeted interventions is made possible by precise, rapid, microbial identification technology and deep understanding of the challenges faced by those with cystic fibrosis. We seek to enhance the quality of life for patients by making early, accurate microbial detection a cornerstone of patient management.

Mintech-Bio uses unique patented biotech to reimagine dental care by remineralising enamel and recreating structure and function of native tissue. Advances are possible by working at the interface of supramolecular chemistry, structural biology, biofabrication, and engineering to develop bioinspired materials and devices for regenerative medicine.



PathfinderBio

New processes are needed for sustainable biomanufacturing. **Pathfinder Bio** is transforming chemical manufacturing by developing high performance enzyme-based processes to produce natural ingredients and fine chemicals. Our unique lab platform develops biocatalysts and biotech processes that use enzymes for scalable biomanufacturing.

Net Zero Nitrogen evolves bacteria known to enhance plant growth and development, including through nitrogen fixation. These beneficial microbes grow synergistically within plant tissues and improve the plant's nitrogen use efficiency. Our bioformulation can replace 40% of the fertilisers needed for maximum crop yields, cutting greenhouse gases and benefiting air/water quality, soil health, and food security.

NZN NETZERONITROGEN

PeptiMatrix™ Next generation peptide hydrogels

PeptiMatrix™ has a mission to reduce and replace animal use in scientific research, hence transform scientific and drug discovery. Innovative peptide hydrogel technology enables researchers to design more ethical *in vitro* models, offering reliable, reproducible, and cost-effective alternatives to animal-derived products.

Phenotypeca revolutionises cutting-edge genomics and biopharmaceutical manufacturing. Yeasts are engineered to efficiently and sustainably produce medicines, including vaccines and treatments for diabetes, obesity, and immune disorders. The tech reduces production costs, making vital biopharmaceuticals more accessible, especially in low- and middle-income countries.

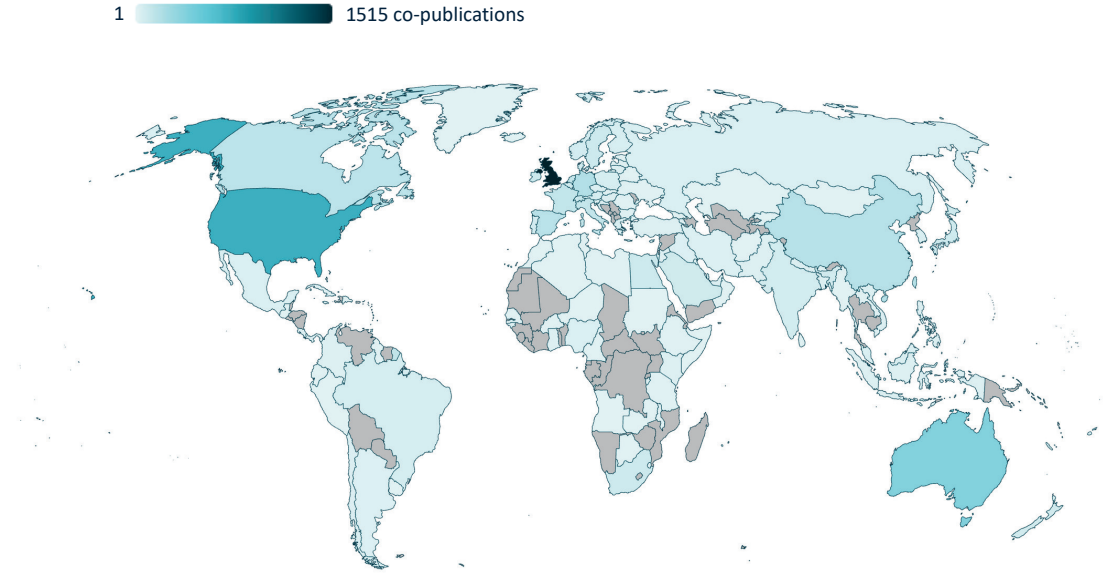
phenotypeca®

SCANCELL

Scancell evolves immuno-therapy via four distinct tech platforms that encompass oncology vaccines and antibodies. Two cancer vaccines are in clinical development, with SCIB1 reporting exceptional Phase 2 results for advanced melanoma - progression free survival of 80% at 6 months. A second cancer vaccine, Modi-1, has shown efficacy for renal cell carcinoma/head and neck cancer. Other portfolio assets have been licensed to Genmab, worth up to $1.2 billion.

Our research by numbers: Collaborations

BDI Principal Investigators have published nearly 2,000 articles in the last 5 years, with a mean citation of 10.2 per article. Shown below are our collaborations are with more than 130 countries across 6 continents.



Top 26 Countries: United Kingdom (1651), United States of America (670), Australia (344), Germany (151), China (143), Spain (132), Canada (143), France (99), Italy (94), Netherlands (89), Switzerland (73), Egypt (66), South Africa (64), Sweden (59), Saudi Arabia (56), Japan (54), Belgium (51), Qatar (43), Denmark (42), India (42), New Zealand (40), Singapore (40), Norway (39), Portugal (39).

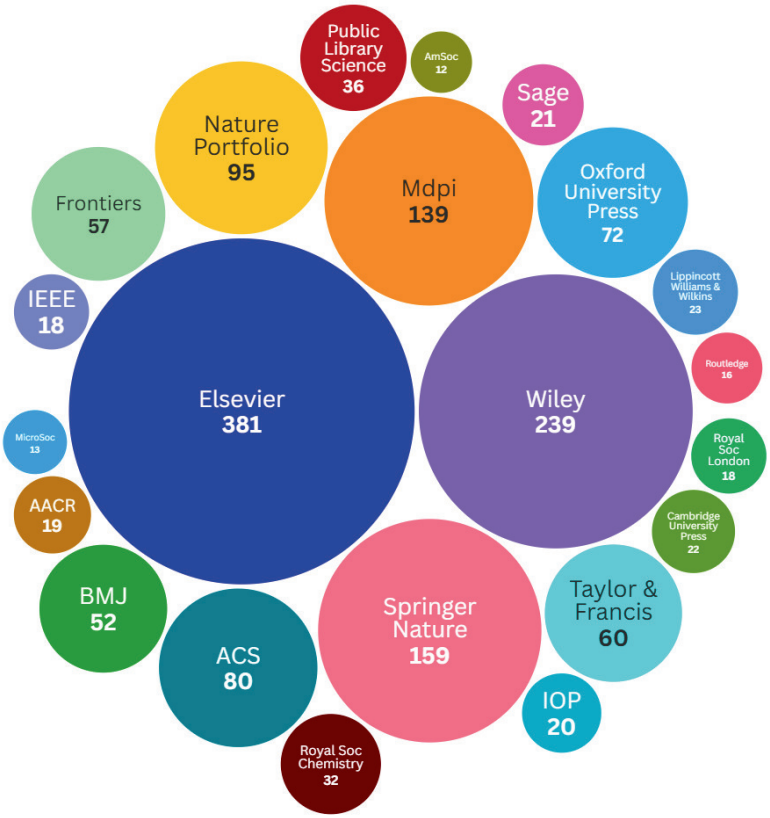
BDI researchers have published collaborative works with 446 organisations, totalling nearly 10,000 co-authors globally. Shown below are those who we have worked with most frequently.

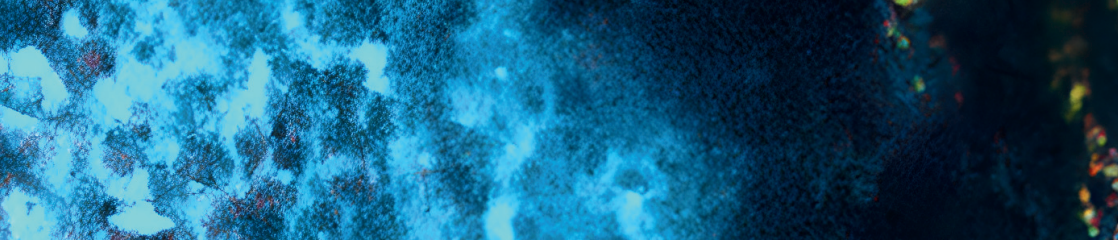
Top 22 Institutions: University of Nottingham (649), NHS (230), St Vincent's Health Australia (189), University of London (141), University of Oxford (123), University of Birmingham (116), Imperial College London (93), University of Manchester (91), University of Melbourne (88), University of Exeter (80), Cornell University (75), University College London (75), NSW Health (67), University of Leeds (66), Centers for Disease Control Prevention USA (66), Egyptian Knowledge Bank EKB (62), Monash University (62), Weill Cornell Medicine (62), University of California (60), University of Tasmania (59), University of Cambridge (55), University of Sydney (54).

Our research by numbers: Publications

Our research has been presented in journals from more than 150 publishers, with the most frequent shown below

- Elsevier (381)
- Wiley (239)
- Springer Nature (159)
- Mdpi (139)
- Nature Portfolio (95)
- American Chemical Society (80)
- Oxford University Press (72)
- Taylor and Francis (60)
- Frontiers Media (57)
- BMJ Publising Group (52)
- Public Library Science (36)
- Royal Society of Chemistry (32)
- Lippincott Williams & Wilkins (23)
- Cambridge University Press (22)
- Sage (21)
- IOP Publishing (20)
- American Association for Cancer Research (19)
- IEEE (18)
- Royal Society of London (18)
- Routledge (16)
- Microbiology Society (13)
- American Society (12)





Our scientists have published in 25 different research areas. Shown below are our most researched areas

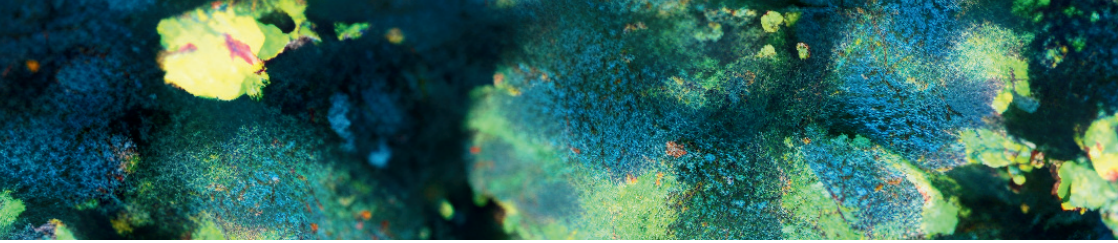
- Multidisciplinary Sciences (129)
- Oncology (126)
- Environmental Sciences (106)
- Biochemistry & Molecular Biology (94)
- Cell Biology (92)
- MultiD Chemistry (81)
- Public Envr Occ Health (77)
- Ecology (75)
- Pathology (64)
- General Internal Medicine (63)
- Microbiology (61)
- Pharmacology (61)
- Biology (53)
- Biodiversity & Conservation (37)
- Neurosciences (37)
- Biomaterials (36)
- Multidisciplinary Materials Science (36)
- Medicinal Chemistry (35)
- Clinical Neurology (35)

Our Research Leaders

- Defeating Cancer
- Pioneering Therapeutics
- Demystifying Biomolecular Complexity
- Regenerating and Modelling Tissues
- Engineering Biology
- Taming Microbes

Name	Research Themes	Research Keywords	Research Techniques
Cinzia Allegrucci		Cancer, stem cells, epigenetics, disease modelling, genetics	iPSC technology, 3D cell culture models. *in vitro* assays, epigenetic analysis
Kenton Arkill		Vascular permeability, endothelial glycocalyx, electron microscopy, correlative microscopy techniques, glycosaminoglycans	Functional permeability assays, 3D TEM, correlative microscopy techniques
Jennifer Ashworth		Biomaterials, imaging, 3D culture, collagen, extracellular matrix	3D cell culture, biomaterials design and fabrication, primary cell/organoid culture, confocal imaging, micro-CT analysis
Steve Atkinson		Plague, virulence, molecular genetics, antimicrobials, soil survival mechanisms	Microbial molecular genetics, insect infection, soil infection, biohazard containment level 3, bacterial transcriptomics
David Bates		Angiogenesis, vascular remodelling, cholangiocarcinoma, renal glomerular physiology, diabetes	*In vivo* imaging, RNA splicing, molecular and cellular biology, drug discovery
Andrew Benest		Anginogenesis, lymphangiogenesis, transcription factor, endothelial	Proteomics, transcriptomics, disease modelling, ocular disease, vascular disease
Benjamin Blount		Synthetic genomics, synthetic biology, microbial strain engineering, genome engineering, yeast genetics	DNA assembly, CRISPR, chromosome design, SCRaMbLE
Daniel Booth		Chromosomes, mitosis, aneuploidy, cell-division, Ki67	3DCLEM, proximity proteomics, super resolution imaging, optical tweezers

Name	Research Themes	Research Keywords	Research Techniques
Tracey Bradshaw		Cancer, pharmacology, drug discovery, drug delivery, quantum imaging	Cell biology, tissue culture, experimental drug testing, viability/cytotoxicity tests, mechanism elucidation
Jack Bryant		Genetics, biochemistry, structural biology, gram-negative bacterial outer membrane biogenesis, fundamental biology	Transposon directed insertion-site sequencing (TraDIS), CRISPRi, bacterial chromosome engineering, protein purification and biochemistry, microscopy
Lee Buttery		3D cell models, stem cells, osteoblasts, cellmaterials interactions, tissue engineering	3D and ES cell culture, osteoblast culture, immunocytochemistry, optical tweezers for cell biology
Miguel Cámara		Biofilms, quorum sensing, antimicrobials, microbial gene regulation, antimicrobial target discovery	Biofilm model design, biofilm imaging, bacterial transcriptomics, bioreporter design, HTP antimicrobial testing
Weng Chan		Antibiotic discovery, medicinal chemistry, chemical biology, anti-virulence, peptide chemistry	Solid-phase peptide synthesis, organic synthesis, *in vitro* microbial assay, drug design
Rachel Clifford		Respiratory, epigenetics, transcriptional regulation, DNA methylation, inhaled exposures	Primary cell culture, methylomics, histone modification analysis, transcriptomics, molecular biology
Hillary Collins		Molecular and cell biology, Cancer, MYST acetyltransferases, histone modifications, protein-protein & protein-DNA interactions	Confocal microscopy, cell-based assays, chromatin-IP, protein expression for structure/function studies
Beth Coyle		Paediatric brain tumours, resistance, metastasis, tumour microenvironment	3D cancer models, extracellular vesicles, migration assays, drug resistance assays
Madhumita Dandapani		Childhood cancer, clinical trials, tumour metabolism, brain tumours, hepatoblastoma	Immunohistochemistry, western blotting, cell culture, multi-omics, systematic reviews



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Name	Research Themes	Research Keywords	Research Techniques
Cornelia De Moor		RNA biology, poly(A), mRNA, cordycepin, translation	Haploid genetic screens, nanopore sequencing, poly(A) tail size determination, RNA fractionation
Lodewijk Dekker		Drug discovery, cancer, deubiquitinases, protein kinase, protein interactions	Fluorescence polarisation, FRET, Enzyme assays, assay development, high throughput screening
Chris Denning		Human pluripotent stem cells (hPSCs), heart/cardiovascular disease, drug discovery and evaluation, regenerative medicine	Cardiovascular lineage differentiation, CRISPR engineering, phenotype-genotype correlations, automation
James Dixon		Gene therapy, DNA vaccines, orthopaedic regenerative medicine	Molecular biology, nanoformulation, stem cell culture, biomaterials
Tania Dottorini		Artificial intelligence, bioinformatics, big data mining, antimicrobial resistance, infectious diseases	AI, deep learning, machine learning, bioinformatics, big data mining
Ingrid Dreveny		Proteases / ubiquitin system, protein structure - function relationships in healthcare and disease, structure-aided drug design, enzyme specificity, proteins in biotechnology	Protein-X-ray crystallography, single-particle cryo-EM, biophysics e.g. isothermal titration calorimetry, enzymology, protein engineering
Jonas Emsley		Structural biology, protein crystallography, protein structure, cell receptor structure, coagulation enzyme structure	Protein crystallography, cryo-EM, protein expression and purification, SPR ITC

Name	Research Themes	Research Keywords	Research Techniques
Mattéa Finelli		Neurodegenerative diseases, redox mechanisms, oxidative and nitrosative stresses, post-translational modifications of proteins	Quantitative/redox/PTMs proteomics, cell and recombinant protein-based assays, stem cell derived disease models, various cells (cortical, cerebellar, DRG hippocampal, motor neurons)
Hester Franks		Cancer, immunotherapy, macrophages, tumour microenvironment, melanoma	Primary immune cell isolation and culture, flow cytometry, RNAScope, clinical data
Kevin Gaston		Gene regulation, transcription, bile duct cancer, prostate cancer, protein kinase C2	Protein-DNA interactions, RNA sequencing, footprinting, protein purification
Pavel Gershkovich		Pharmacokinetics, pharmacodynamics, drug delivery, lymph nodes targeting, lipid-based drug delivery	*In vivo* pharmacokinetics in rodents, bioanalytical techniques such as HPLC or LC-MS, *in vitro* DMPK, pharmacokinetic modelling and simulation
Amanda Goodwin		Development, regeneration, respiratory, extracellular matrix	Cell stretch, live imaging, co-culture
Andrew Green		Breast cancer, molecular pathology, glutamine metabolism, amino acid transporters, prognostic factors	Immunohistochemistry, tissue microarrays, image analysis
Ruth Griffin		Mucosal vaccine platform delivery systems	Production of recombinant fusion proteins, formulation, performing preclinical studies, ELISAs, *ex vivo* and *in vitro* assays
Ian Hall		Genetics, respiratory disease, COPD, transcriptomics, GWAS	Functional genetics, transcriptomics, CRISPR, human tissue work, GWAS
Nick Hannan		Stem cells, disease modelling, lung disease, tissue engineering	Stem cell biology, tissue engineering, cell phenotyping, genome editing, single-cell RNA-sequencing
Kim Hardie		Biofilms, antimicrobial resistance, bacteria, pathogenicity, protein secretion	Fluorescent microscopy, infection models, microbiology, protein biochemistry, metabolite detection

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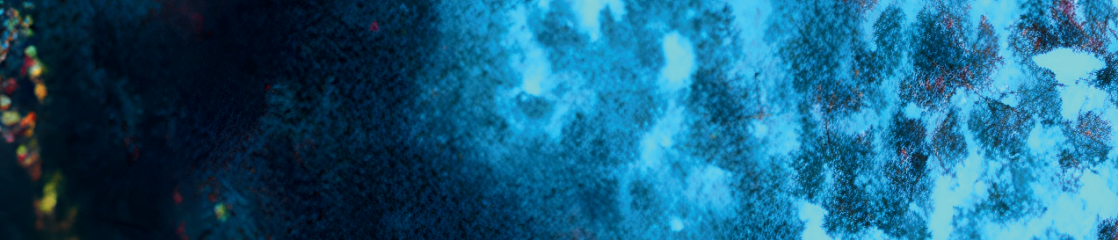
John Heap		Engineering biology, metabolic engineering	Biomanufacturing, biocatalysis, enzyme evolution
Stephan Heeb		Bacterial genomics, RNA-Seq, RNA-protein interactions, construction of bacterial vectors	Bacterial infections, virulence, quorum sensing, gene expression, antimicrobials
David Heery		Gene expression, epigenetics, histone modification, cancer, protein-protein interactions	Molecular biology, CRISPR editing, yeast two hybrid, RNA Seq.
Naoto Hori		Biophysics, RNA folding, RNA therapeutics, biomolecular condensates, RNA-protein complexes	Molecular simulations, coarse-grained models, machine learning, single-molecule experiments
Mohammad Ilyas		Gastrointestinal cancer, cancer biomarkers, cancer diagnosis, *in vitro* modelling	PCR, histopathology, immunohistochemistry, *in vitro* culture, functional assays
Andrew Jackson		Immunology, myeloid cells, T-cells, signalling, immunotherapy	Primary leukocyte isolation, intracellular signalling biochemistry, spatial immunology
Victoria James		Extracellular vesicles, RNA biology, cancer metastasis, epigenetics, inter-cellular communication	Nanoparticle molecular biology, RNA biology, cell biology, epigenetics
Sheela Jayaraman		Cholangiocarcinoma, nanoparticle, gene manipulation, PRH, transcription factor, HHEX	Transcriptomics, ChIP-seq, Nanostring spatial proteomics, tumour invasion, extravasation
Simon Johnson		Rare lung diseases, proteases, extra-cellular matrix, tissue remodelling	Complex tissue culture, molecular pathology, protease and ECM assays
Catherine Jopling		MicroRNA biogenesis, function; RNA localisation, protein degradation, mRNA delivery, inflammatory gene expression	RT-qPCR, microRNA analysis, CRISPR.Cas9, mRNA design and synthesis, molecular biology

Name	Research Themes	Research Keywords	Research Techniques
Barrie Kellam		Medicinal chemistry, fluorescent ligands, G protein-coupled receptors, drug discovery	Medicinal chemistry, molecular modelling, biospectroscopy, HPLC, fluorescence imaging
Sophie Kellaway		Blood cancer, acute myeloid leukaemia, gene regulation, stem cells, chromatin accessibility	Genomics and bioinformatic analysis (RNAseq, ATACseq, CHIPseq), primary blood cell isolation and culture, cell tracing, proximity ligation assay
Laura Kilpatrick		Molecular pharmacology, G protein coupled receptors, receptor tyrosine kinases, signalling complexes, protein-protein interactions	Bioluminescence resonance energy transfer (BRET), fluorescence correlation spectroscopy (FCS), fluorescence imaging, pharmacological assays, CRISPR/Cas9 gene editing
Katalin Kovacs		Engineering biology, metabolic engineering of aerobic and anaerobic microorganism, CO_2 utilisation, gas fermentation, biolelectrochemical systems	Plant and microbial molecular biology, metabolic engineering, gas fermentation
Charles Laughton		Biomolecular structure, molecular recognition, drug design, formulation design, molecular dynamics	Molecular dynamics simulations, protein structure prediction, virtual screening, machine learning, software development
Srinivasan Madhusudan		Translational cancer research, ovarian cancer, breast cancer, DNA repair, drug discovery	Target validation studies, small molecule chemical library screening, FACS assays, DNA repair assays, biomarker studies
Anna Malecka		Macrophages, cancer, immunology, tumour microenvironment, immune-stromal interactions	Primary immune cells isolation and culture, flow cytometry, multicellular models
Robert Markus		Advanced microscopy, image analysis, sample optimisation, high content imaging	Super resolution (Zeiss Elyra PS1), confocal (Zeiss LSM980 & AiryScan), high content (Zeiss Cell Discover 7)
Stewart Martin		Cancer - breast, brain, and ovarian, radiotherapy, metastasis, novel drugs, redox homeostasis, calpain proteases	Radiation biology, immunohistochemistry, cell and molecular biology, RNAseq, hypoxia



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Alvaro Mata		Biomaterials, tissue engineering, regenerative materials, *in vitro* models, biomineralization	Self-assembly, bioprinting, hydrogels, electron microscopy
Alan McIntyre		Cancer, hypoxia, acidosis, transcription, cancer models	Cancer modelling, CRISPR CAS9, RNA-SEQ, ChIP, Hypoxia and acidosis investigations
Cathy Merry		Glycobiology, matrix biology, biomaterials, developmental biology, *in vitro* models	Structural glycoscience, *in vitro* models of development and disease
Shailesh Mistry		Drug discovery, chemical biology, medicinal chemistry, G protein-coupled receptors (GPCRs), orthosteric/allosteric tool compounds	Medicinal chemistry, compound purification, spectroscopic analysis, ligand/structure-based drug discovery
Nigel Mongan		Prostate, breast, overcoming, treatment, resistance	Epitranscriptomics, genomics, precision medicine
Abhik Mukherjee		Digital/molecular pathology, gastrointestinal/ pancreaticobilliary cancers, IBD	Histopathology and immunohistochemistry, digital pathology and image analysis, molecular pathology, functional biology
Ellis O'Neill		Algal biotechnology, bioengineering, analytical chemistry, enzymeology	Mass spectrometry, analytical chemistry, protein engineering, synthetic biology
Paloma Ordóñez Morán		Stem cells, inflammation, differentiation, cancer, tumour heterogenity	3D organoids, primary mouse and human cell culture, stem cell-based approaches, *in vivo* assays, gene expression
Anna Piccinini		Matrix biology, innate immunity, inflammation, cellular senescence, gene regulation	Primary cell culture, extracellular matrix models, molecular and cell biology, CRISPR, multi-omics

Name	Research Themes	Research Keywords	Research Techniques
Philip Quinlan		International data analysis, data preparation, artificial intelligence, data science, data standards	Federated analytics, data science, ontologies and data standards, artificial intelligence, natural language processing
Ruman Rahman		Neuro-oncology, transcriptomics, metabolomics, radiogenomics, drug delivery	3D tumour co-culture, drug screening, genomic data analyses
Emad Rakha		Breast cancer, pathology, outcome, molecular profiling, prognosis	Immunohistochemistry, AI, digital pathology, PCR, NGS
Judith Ramage		Cancer, immunology, tumour-microenvironment, spatial proteomics, T-cells	Multiplex fluorescence IHC - spatial high plex proetomics
Frankie Rawson		Bioelectronics medicine, wireless electrochemistry, bioelectricity, quantum therapeutics, biosensors	Voltammtery, amperomerty, SECM-AFM
Timothy Ritzmann		Childhood brain tumours, ependymoma, brain tumour immunology, clinical trials, molecular analysis of brain tumours	RNA-Seq, methylation array, immunohistochemistry, spatial profiling, CSF analysis
Karen Robinson		*Helicobacter pylori*, GI infection & immunity, antimicrobial resistance, gastric cancer, bacterial virulence	Flow cytometry, antimicrobial sensitivity testing, bacterial genomics, real-time PCR
Felicity Rose		Regenerative medicine, cell therapies, biomaterials, tissue engineering, cell-material interactions	Electrospinning, 3D bioprinting, bioink formulation, mammalian cell culture
Julie Sanchez		G protein-coupled receptors, transient receptor potential channels, molecular pharmacology, protein-protein interactions, drug discovery	Bioluminescence resonance energy transfer (BRET) assays, fluorescence microscopy, cellular signalling and biosensors, ligand binding

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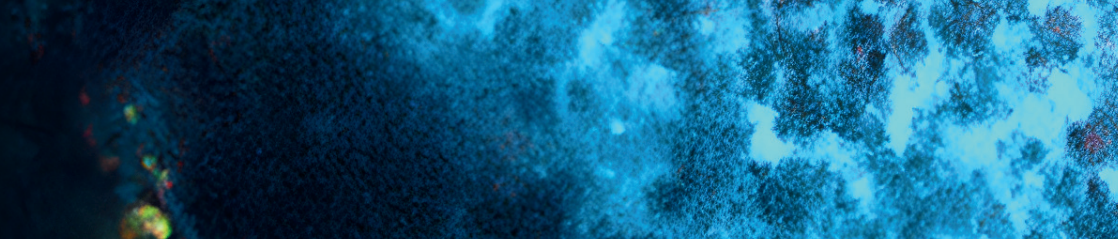
Ian Sayers		Molecular, genetic and cellular mechanisms underlying asthma and chronic obstructive pulmonary disease, virus-host interactions, stratified medicine	Gene discovery, primary airway cell and tissue models, functional genetics, transcriptomics, patient translational studies
Claire Seedhouse		Blood cancers, drug resistance, stem cells, dormancy, DNA damage response	Quantitative, PCR, Flow Cytometry, Primary suspension cultures
Abdolrahman Shams-Nateri		Stem cells in cancer, tumour microenvironment and cellular heterogeneity, cancer gene discovery, targeted cancer therapy, cancer stem cell therapeutics	3D organoids and explants models, *in vivo* assays, stem cell-based approaches, integrating proteomics and transcriptomics, functional genetics
Jacqueline Shields		Tumour microenvironment, lymph node, tumour immunology, cancer-associated fibroblasts, lymphatics	Multi-cellular 3D immune culture systems, *in vivo* modelling, confocal imaging, immune function assays, multi-parameter flow cytometry
Laura Sidney		Cornea and eye regeneration, transplant tissue processing, stem cell therapies, mesenchymal stem cells, regenerative medicine	Primary ocular cell culture, mesenchymal stem cell phenotyping, dry-preservation of biological samples, immunohistochemistry, *in vitro* ocular surface models
Stuart Smith		Glioma, RNA methylation, tumour treating fields, drug delivery, invasion	Cell culture, *in vitro*, direct RNA sequencing, RNA methylation analysis, immunohistochemistry
Ian Spendlove		Tumour immunology, T cells, regulation, novel checkpoint control, immune modulation	Cell culture, *in vitro*, direct RNA sequencing, RNA methylation analysis, immunohistochemistry
Keith Spriggs		Cancer, Alzheimer's disease, drug targets, targeted therapeutics	Molecular biology, gene regulation assays, bioinformatics

Name	Research Themes	Research Keywords	Research Techniques
Michael Stocks		Medicinal chemistry, drug discovery, cancer, antimicrobial resistance, prodrugs	Synthesis, drug optimisation, drug delivery, medicinal chemistry
Sarah Storr		Cancer, breast cancer, DARPP-32, calpain, cell signalling	Cell culture, bioinformatics, immunohistochemistry, molecular biology, protein purification
Amanda Tatler		Respiratory disease, tissue remodelling, fibrosis, matrix, 3D models	Precision cut lung slices, molecular biology, *in vivo* models, TGFb activation assays
Neil Thomas		Enzyme mechanism, nanomedicine, biopharmaceuticals, enzyme inhibitors, self-assembling proterins	Bioconjugation, chemiluminescence, click chemistry, unnatural amino acid mutagenesis, enzyme activity assays, enzyme inhibitor design
Alex Thompson		Blood cancer, stem cell technologies, pre-clinical evaluation, next-generation models, drug discovery	iPSC maintenance and differentiation, haematopoietic colony-forming assays, gene editing, next generation sequencing, stem cell assays
Lisa White		Biomaterials, extracellular matrix, hydrogels, microparticles, regenerative medicine	Decellularization, biomaterials characterisation, supercritical CO_2, micro x-ray computed tomography, *in vitro* assays
Paul Williams		Bacteriology, quorum sensing, biofilms, pathogenicity, antimicrobial agents	Antimicrobial assays, quorum sensing assays, biofilm models, reporter gene fusions, microscopy
Huw Williams		NMR, molecular interactions, molecular structure, analytical chemistry, kinetics	NMR, protein NMR, solid state NMR, molecular dynamics, metabolomics
Sebastiaan Winkler		Gene expression, mRNA degradation, mRNA deandenylation, protein structure and function, drug discovery	Protein expression and purification, fluorescence-based (enzyme) assays, generation of stable mammalian cell lines, gene expression analysis



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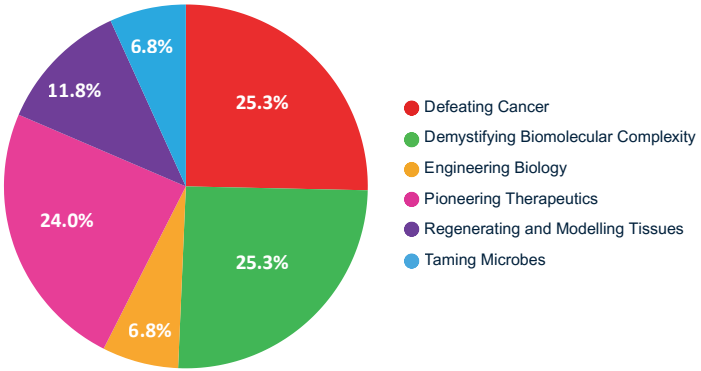
Klaus Winzer		Microbial metabolism, biological engineering, synthetic biology, bacterial carbon capture, quorum sensing	Anaerobic microbiology, gas fermentation, genetic modification of bacteria, adaptive laboratory evolution
Jing Yang		Biomaterials, surfaces, biomedical devices, tissue engineering, 3D printing	Surface modification, surface characterisation, mechanical property characterisation, cell-surface interaction
Mischa Zelzer		Biointerfaces, computational material science, biomaterials, surface modification and analysis, stimuli responsibe materials	Preparation of peptide materials, physiochemical characterisation, polymerisation kinetics, surface characterisation, computational data processing
Ying Zhang		Engineering biology, synthetic biology, metabolic engineering, biotechnology, gas fermentation, sustainable bioproduction	AKTA purifier; CLARIOstar Plate Reader; SBRC robotic suits

Our Research Leaders by Theme



Acknowledgements

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Back Page: Robert Markus. *Confocal cross section of drought resistant grass*.

Theming: Jeni Luckett. *Relationship between a host and the staphylococcus aureus pathogen in a skin infection.*

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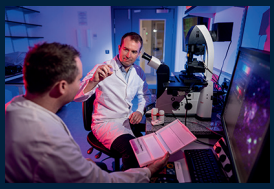

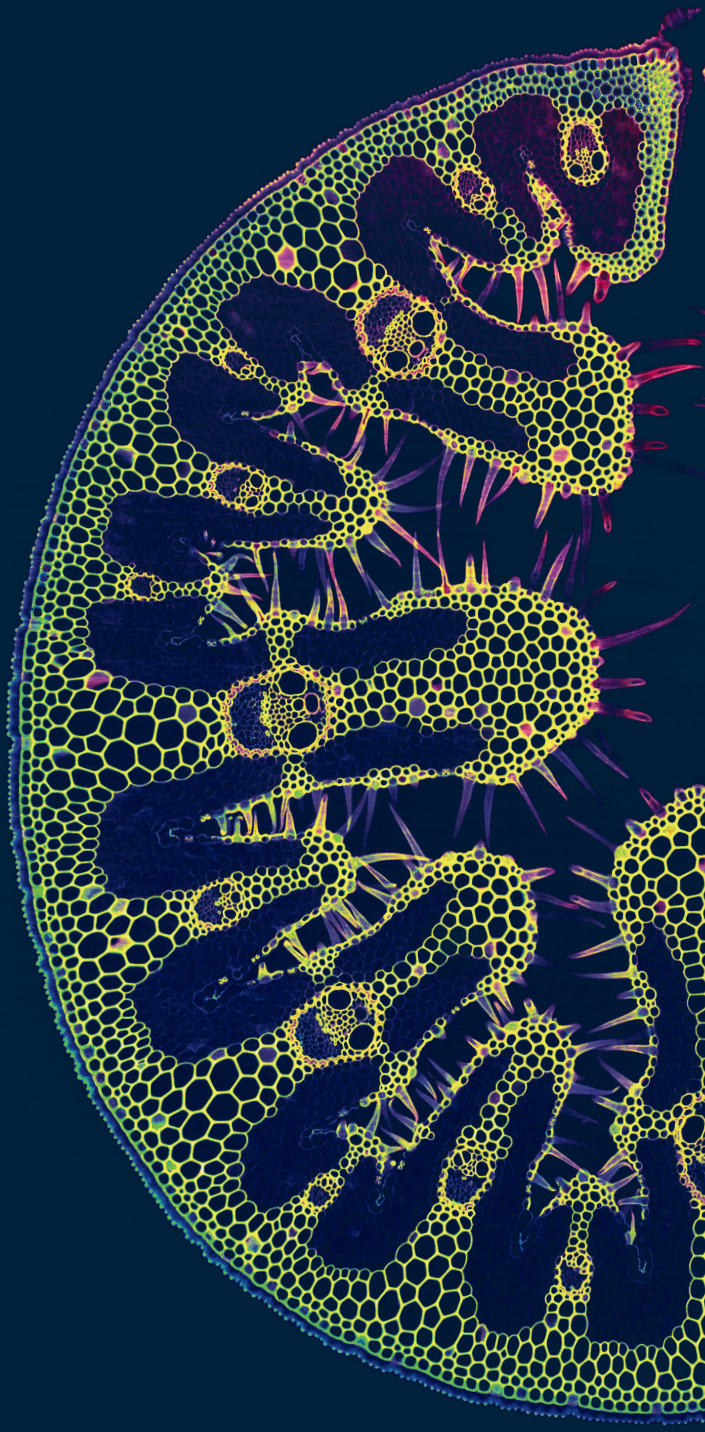

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