Issue 1 | Autumn 2026

BioYork

RESEARCH NEWS FROM THE DEPARTMENT OF BIOLOGY

A career shaped by structural biology

Celebrating five years of GenerationResearch

Campus ecological managment plan launched

Welcome

Professor James Chong, Head of Department

Welcome to the first issue of BioYork, a new magazine celebrating the people and research shaping the Department of Biology at the University of York.

We are excited to launch this initiative, which we hope will give alumni, colleagues and friends a snapshot of life in the Department. It is also part of our wider efforts to amplify our research impact and build more local, regional and international partnerships. As I write, the new academic year is just around the corner. While we prepare to welcome our largest ever cohort of students (over 500 in first year alone!), I want to take the opportunity to reflect on some of our recent achievements and milestones of the past year.

Our newly-launched Neuroscience degree (a joint endeavour with Psychology) has enabled us to recruit **Katharine Smith** from the University of Colorado, who will join the department as Professor of Molecular and Cellular Neuroscience in January 2027. We also welcome new academic staff members in structural biology (**Alex Cook**) and photosynthesis (**Pallavi Singh**).

Biology research continues to be recognised at the highest level with a flurry of prestigious awards: **Jane Hill** and **Reidun Twarock** were made Fellows of the Royal Society, **David Kent** a Fellow of the Academy of Medical Sciences, and **Chris Hill** was awarded the £300,000 Lister Institute Prize. Chris's ground-breaking work (see the article on page 6) has recently been further recognised with an eight-year Wellcome Trust grant. He joins an impressive group of independent research fellows winning recent awards totalling over £8 million across structural biology (**Oliver Bayfield**), microbiology (**Alan Cartmell**), plant pathogens (**Bob Mason**), photorespiration (**Ousmane Dao**), gene therapy (**Anastasia Conti**), immunology (**Alyssa Cull**), cancer biology (**Simon Baker** and **Vicki Jennings**), ecological communities (**Jack Hatfield**), and mechanobiology (**Rasha Rezk**). Blazing a trail for these early career award holders, **Luke Mackinder** (in the Centre for Novel Agricultural Products, CNAP) has been awarded a highly prestigious ten year Faraday Discovery Fellowship by the Royal Society to explore carbon fixation in phytoplankton, and his world-leading research has been further recognised by a five year BBSRC Longer-Larger collaborative grant.

> **"York Biology is a large and thriving department that is going from strength to strength thanks to the hard work, enthusiasm and talent of all our staff and students."**

Our centres of research continue to thrive, with **Katherine Denby** appointed as Director of CNAP and **Will Brackenbury** leading the Jack Birch Unit for Molecular Carcinogenesis (which you can read more about on page 9). Both have stepped up seamlessly into these leadership roles, which hold substantial local and regional community linkages. We hope that this magazine will be your continued source of information about these globally excellent research units and the people and stories behind our research. Much of this work also passes through our world-class Biosciences Technology Facility, a true model for open-access research facilities supported by outstanding experts in technologies.

It is an immense privilege to be the Head of Department and share this progress with you, but it is really a testament to those conducting and enabling the research. Biology is a large and thriving department going from strength to strength thanks to the huge amount of hard work, enthusiasm and talent of all our staff and students. I know I've only scratched the surface of what's going on and I have omitted many successes (some of which are detailed in this magazine). We will continue to bring you these stories and strongly encourage our readers to get in touch to help shape the future of this magazine. Keep up the amazing work!

Celebrating five years of GenerationResearch

GenerationResearch won the STEM Initiative Award at the Educate North Awards 2026. L-R Phil Lang, Dr Jillian Barlow, Lydia van den Dries

In the beginning

When **Dr Jillian Barlow** arrived at the Department of Biology at York in 2019, she noticed that summer research placements were sometimes unpaid and often given to students with an existing connection to supervisors. As a result, students from underrepresented groups were often left out of these early CV-building opportunities. Barriers such students may face include financial constraints, self-doubt, or feeling that these placements are not 'for them'.

Jillian discussed her concerns with **Professor James Moir**, who was Head of Department at the time. While James was supportive, it became clear that the University didn't have the funds for an initiative to address this so the Department would need to build one from scratch.

GenerationResearch (GenRes) was born to connect the best talent with placement opportunities and develop a more diverse community of future researchers, technicians, and support staff in STEMM (Science, Technology, Engineering, Maths and Medicine).

In Jillian's words: *"When I started GenRes, a lot of students were working voluntarily over the summer, which felt wrong to me. It's a massive barrier to them because they need to earn money and know that their living costs are covered. We spend a huge amount of time trying to get funding to pay the students to provide really authentic experiences. I love seeing how that results in a practical step up for students who just want to get on and do really well."*

Creating meaningful change

GenRes provides 6 to 12 week long paid summer studentships in STEMM projects at universities and organisations across the UK and USA, alongside an accommodation bursary. Studentships are open to any undergraduate (second year onwards) attending university in Yorkshire, Humberside or Teesside, with a focus on underrepresented groups. Students receive mentorship from dedicated supervisors and join a community of diverse alumni who have benefitted from the programme. GenRes also offers stipends for Masters by Research and PhD degrees, which are open to graduates from any UK university.

To do this, GenRes relies on donations and support from businesses, academic institutes and initiatives, research councils, charities, and individual donors. Behind the scenes, the initiative is run by a team of eight volunteers at the University of York, a mix of academic and professional services staff who share the passion Jillian has for ensuring career-enhancing opportunities are available to talented students from all backgrounds.

Growing our impact

What started as an idea at the University of York has grown into an impactful regional grass roots movement. In recognition of this, GenRes recently won the STEM Initiative Award at the Educate North Awards, celebrating the contribution it makes to increasing diversity and widening opportunity in STEMM in the higher education sector.

GenRes began with eight paid summer placements in the Department of Biology at York in 2021. To date, over 200 summer studentships, 11 Masters by Research and 4 PhD opportunities have been funded at a network of partner universities. For our 2026 cohort, GenRes received over 700 applications for 52 placements. The funding for GenRes is by no means guaranteed, and the team continues to fundraise and work with partners to provide more opportunities for students each year.

Reflecting on the past five years, Jillian says, "GenerationResearch wouldn't exist without our funding partners, the support of the University of York who allowed us to build GenRes from scratch, and the hard work of our team and 'Friends of GenRes' who read applications for us and run interviews. We are always looking for more partners to expand our network of placement opportunities. Together we want to keep building a really diverse and talented future for STEMM, and I can't wait to see what the next generation of scientists can do."

By Lydia van den Dries

Donate and find out more at **generationresearch.ac.uk**

Silencing the alarm: uncovering how pathogens evade plant immunity

Researchers led by Dr Federico Sabbadin at the University of York have uncovered a remarkable strategy that one of the world's most destructive crop pathogens uses to evade plants' immune systems.

The interdisciplinary study focused on *Phytophthora infestans*, which causes potato and tomato late blight. The research team discovered a group of specialised enzymes that chemically rewrite the plant's own danger signals, silencing its immune response and helping the infection to take hold.

Few plant diseases have had such a profound impact on human history. *P. infestans* triggered the 1840s Irish Potato Famine, which killed around a million people and forced millions to migrate. Today, it is still one of agriculture's most destructive pathogens, causing over £5 billion in global crop losses annually. Farmers rely heavily on fungicides to try and control the disease, but the pathogen is rapidly evolving resistance. Developing sustainable disease control hinges on our understanding of the molecular mechanisms underpinning infection.

Plants may be rooted in place but are far from defenceless. One of the plant's earliest warning systems is activated when pathogens begin breaking down the cell wall, the plant's first line of defence. During infection, *P. infestans* secretes a wide range of digestive enzymes that degrade this protective barrier. The fragments of the cell wall which are released, like shards of glass after a broken window, act as molecular distress signals that trigger a rapid immune response.

Image: Dr Katrin Besser

Our team examined the genes that *P. infestans* switches on during the early stages of infection, and identified a family of enzymes which accumulate at the site where the pathogen meets the plant. We discovered that these enzymes target and chemically alter alarm molecules produced by the plant. Remarkably, this tiny chemical edit makes the alarm molecules undetectable by the plant's immune receptors, allowing *P. infestans* to escape surveillance and seamlessly invade the host. To test the role of these enzymes, we turned off the genes responsible for them and infected potato leaves with the modified pathogen. The altered strain produced significantly smaller disease spots, proving these stealth enzymes are essential for a successful infection.

By uncovering this stealth strategy, our team has revealed a major vulnerability in one of agriculture's most destructive pathogens, opening new opportunities for sustainable crop protection and enhanced global food security.

By Dr Federico Sabbadin

Read the full paper at
https://doi.org/10.1038/s41467-025-64189-1

New PhD programmes for a sustainable future

The University of York is leading two upcoming flagship PhD programmes after major investment from UK Research and Innovation into doctoral training. Together, the BIO-BOOST and Plant BioDesign programmes will bring together academia and industry to equip a new generation of scientists with the skills to make an impact on key environmental and sustainability issues.

BIO-BOOST: harnessing wastewater treatment

BIO-BOOST will train industry- and government-ready scientists with entrepreneurial mindsets and advanced technical skills to address skills and capability gaps faced by the water industry. By bridging the gap between recent biological innovations and the growing pressures faced by the water sector, the project aims to drive national capability, clean growth, and global competitiveness across the public, private, and third sectors.

BIO-BOOST will embed cutting-edge techniques such as genomics, engineering biology, and artificial intelligence into wastewater treatment systems. The programme's students will advance research across three key pillars: enhancing public health security against infectious diseases, protecting aquatic environments from climate and chemical threats, and driving circular bioeconomy innovations towards net-zero goals.

The programme is a multidisciplinary initiative uniting the world-class academic strengths of the University of York and Newcastle University, together with UK Water Industry Research and the 18 water companies of the United Kingdom and Republic and Ireland, the Environment Agency, Oxford Nanopore Technologies, and Waters Corporation. Through these cross-sector collaborations, doctoral students will gain unprecedented access to infrastructure, industry placements, and state-of-the-art laboratory facilities, positioning them at the forefront of environmental innovation.

By Professor Jason Snape

Plant BioDesign: engineering plants

Plant BioDesign will train the next generation of scientists to design and engineer plants to tackle global challenges in food security, clean growth, and environmental sustainability. The programme is led by the Centre for Novel Agricultural Products (CNAP) in the Department of Biology and brings together world-leading researchers at the Universities of York, Cambridge and Bristol, and the John Innes Centre in Norwich.

We are facing many global challenges and urgently need to shift away from a fossil fuel-based economy to a bioeconomy, where energy and chemicals are produced from renewable biological resources with reduced carbon emissions. Climate change and extreme weather are increasingly threatening our food supplies, while many of our intensive agricultural practices damage the environment and biodiversity.

The Plant BioDesign programme will tackle such challenges, training researchers to work across disciplines and develop skills in commercial innovation and policy, as well as cutting-edge scientific research. Examples of Plant BioDesign research include engineering crops for enhanced disease resistance and increased yield, developing plants to biologically manufacture molecules for pharmaceutical and industrial use, and using plants to recover toxins and heavy metals from the environment.

By Professor Katherine Denby

Chris supervising PhD students Miguel Aracena Velázquez and Jemma Betts preparing samples for cryo-EM

Following the revolution: a career shaped by structural biology

When I started my PhD in 2010, I had little idea where my scientific career would ultimately lead. At the time, I was working to understand Krabbe disease, a rare neurodegenerative disorder, using a technique called X-ray crystallography. I found the science fascinating, but perhaps the most important thing I learned during my PhD was about technology, people, and how both shape the questions we choose to pursue.

During those years, structural biology was undergoing a transformation. What became known as the "resolution revolution" in cryo-electron microscopy (cryo-EM) meant that suddenly, molecular structures that had previously been impossible to visualise could now be seen at near-atomic resolution. Large, flexible molecular machines that had resisted traditional approaches were becoming accessible for the first time. As my PhD drew to a close in 2015, it became clear that this technological shift would fundamentally change the kinds of biological questions we could ask. Rather than continuing to focus on individual proteins, I became increasingly interested in understanding larger molecular assemblies involved in the flow of genetic information through the cell.

> **"Looking back, I realise that my career has been shaped as much by people as by technology"**

This led me to join Professor Lori Passmore's laboratory at the Medical Research Council Laboratory of Molecular Biology. Here, I combined cryo-EM, X-ray crystallography and mass spectrometry techniques to study the machinery responsible for processing messenger RNA. While working on this, I also became increasingly interested in the ways viruses manipulate these pathways in their host to favour their own replication.

Driven by that growing interest, I joined Professor Ian Brierley's laboratory at the University of Cambridge,

where I shifted my focus from RNA processing to translation. There, I became fascinated by the remarkable strategies which viruses use to reprogramme ribosomes and alter how genetic information is decoded. Our work provided new insights into the molecular mechanisms behind viral infection.

Looking back, I realise that my career has been shaped as much by people as by technology. I have been fortunate to work with outstanding mentors and colleagues who challenged me to think differently at key stages of my development. During my PhD, my supervisor Professor Janet Deane fostered an environment in which ideas could be debated openly and critically, but always constructively. That experience taught me that good science is rarely about defending your own viewpoint; it is about being willing to change your mind when presented with a better explanation. Similar experiences throughout my career reinforced the importance of collaboration, intellectual curiosity and the willingness to venture beyond familiar territory.

In 2021, I established my independent research group at the University of York through a Sir Henry Dale Fellowship funded by the Wellcome Trust and Royal Society. More recently, I've been fortunate to receive both a Lister Institute Research Prize and a Wellcome Career Development Award. My laboratory now investigates how viruses hijack and manipulate cells' translation machinery, combining methods from structural biology, biophysics and molecular biology to understand these processes in detail never seen before.

Running a research group has also given me a new appreciation for the importance of training and mentorship. Many of the opportunities I have benefited from arose because senior scientists invested time, encouragement and trust in me. Creating a similarly

The Hill Group (left to right): Ella Warren, Jemma Betts, Leon Walther, Tim Passchier, Miguel Aracena Velázquez and Chris Hill.

supportive and intellectually stimulating environment for students and early-career researchers is therefore something I value deeply. Watching young scientists develop confidence, independence and their own scientific identities has become one of the most rewarding aspects of my career.

The common theme throughout this journey has not been a particular disease, virus or biological pathway. Instead, it has been a desire to follow emerging technologies towards increasingly challenging questions. Today, another technological revolution is underway. Advances in cryo-focused ion beam milling and cryo-electron tomography methods are making it possible to study molecular structures directly inside cells rather than in test tubes. For the first time, we can observe molecular machinery operating in its native cellular environment. Just as the cryo-EM revolution shaped the direction of my career a decade ago, these new technologies are opening the door to an entirely new generation of biological questions. The prospect of understanding not only what molecular machines look like, but how they function inside living cells, remains every bit as exciting today as when I first entered the field.

By Dr Chris Hill

Celebrating 50 years of structural biology at York

The Eleanor and Guy Dodson building houses the York Structural Biology Laboratory, a research centre which in 2026 celebrates 50 years of advancing science. Integrating the techniques of cryo-EM, macromolecular crystallography and nuclear magnetic resonance, the centre gives researchers a toolkit to study any molecule of interest using the best-suited approach.

Advanced structural biology equipment is sensitive and must be kept under specific conditions for optimal performance. Having a custom-built space means that each piece of equipment is in an environment designed for that approach, carefully controlling for humidity, physical stability, and temperature.

The building was funded by the Wolfson Foundation and an early graduate in Chemistry from the University of York, Dr Tony Wild. Equipment was funded by the Wellcome Trust and BBSRC. A part of the Department of Chemistry but found next to the Department of Biology, the Eleanor and Guy Dodson building is a physical manifestation of long-standing and productive collaboration between the two departments.

By Professor Jamie Blaza, Head of the York Structural Biology Laboratory

Molecular hide-and-seek

In the world of *Trypanosoma brucei*, the parasite behind the deadly African Sleeping Sickness, survival is a high-stakes game of molecular hide-and-seek.

To avoid detection by its host's immune system, the parasite wears a "molecular cloak" made of a single Variant Surface Glycoprotein or VSG. While its genetic "wardrobe" contains thousands of these cloaks, it wears only one at a time.

For forty years, a mystery persisted in molecular parasitology. The genetic manual for *T. brucei's* VSG cloak also contains several "helper genes" needed for survival and immune evasion. Logic suggests that when the parasite follows these genetic instructions, it should produce equal amounts of each protein. However, the parasite produces a mountain of cloak proteins but only a tiny amount of helper proteins. So, how does the parasite so effectively prioritise its VSG cloak?

The "Aha!" moment

We began by identifying proteins found inside the Expression Site Body or ESB, the dedicated "factory" within the cell nucleus where genetic instructions are acted upon. We identified three novel proteins, but our attention quickly centred on one: an enzyme we named ESB2. Using advanced microscopy, we confirmed that ESB2 was exclusively found in this location. Then, the real breakthrough came: when we removed ESB2, the helper proteins significantly increased to match the cloak, while the cloak itself remained unaffected.

We confirmed that ESB2 was acting as a specialised "shredder", selectively editing this genetic manual in real time. What we observed was novel because of where and how it was happening: the parasite couples processing genetic instructions and targeted destruction within a specialised compartment. It is a remarkably efficient, and elegant, way to control genetic messages at the source.

Painting gifted to the Faria Lab by Dr Laura Jeacock (talented artist and former colleague)

It takes a village

While our final paper looks polished, the reality was a gruelling cycle of failed experiments and countless setbacks. However, the milestones made it worth it: the first microscopy images Lianne shared on the lab WhatsApp group, and the moments Leon and Htay confirmed the enzyme activity and where it happens in the cell.

Starting a lab in York from scratch was beautiful but terrifying. I vividly remember the empty benches and the intimidatingly blank whiteboard. Every setback felt magnified when managing the careers of people who relocated countries to join my vision. But that shared struggle built our culture.

Lianne moved from the Netherlands to help me set up the lab, then Leon came from Germany. The true test came at the finish line. As I began maternity leave and Lianne transitioned out of academia, Htay joined us from Singapore. Despite only a month of overlap, Htay and Leon stepped up with incredible dedication, conducting critical experiments while I was away. I navigated manuscript revisions and complex analyses while caring for a newborn. Ultimately, this paper stands as a testament to our curiosity-driven and resilient team.

Outlook

This mystery had been a cold case since my days as a postdoc. Our discovery underscores a broader principle of infection biology: pathogens do not just rely on what they "print", but also what they choose to "redact" to stay one step ahead of their host's immune system. We continue our team efforts to decode the molecular mechanisms that make trypanosomes and other parasites masters of disguise. There are still secrets hiding in plain sight, waiting for a fresh whiteboard and a bit of serendipity to find them.

By Dr Joana Correia Faria

Read the full paper at
https://doi.org/10.1038/s41564-026-02289-4

Driving the next stage of York's fight against cancer

The Jack Birch Unit (JBU) for cancer research is supported by generous funding from local charity York Against Cancer.

Cancer research has always been at the heart of the charity's work, and they have been supporting scientists at the University of York since their earliest days. The JBU has expanded to include five research groups, who are working to understand how different solid tumours develop, progress and respond to treatment, and how we can use this knowledge to benefit patients.

The team

Building on the long-running Directorship of **Professor Jenny Southgate** with a strong focus on urothelial cancers, **Professor Will Brackenbury** recently took over as the new director of the JBU. Work in his group has been focusing on understanding why sodium accumulates in breast cancer, with a view to using drugs to stop this and slow the tumour's spread. **Dr Simon Baker**'s team has been investigating how a common infection, known as 'BK virus', may lead to bladder cancer developing later in life. **Dr Andrew Mason**'s team also works on bladder cancer and is studying how to use machine learning to match patients to the best treatments. **Dr Vicki Jennings**' research engineers specialist viruses to selectively kill only cancer cells and recruit immune cells to the fight to make sure nothing comes back. Professor Dimitris Lagos' group is studying how to improve immunotherapy outcomes in kidney cancer. Through these projects, we aim to accelerate the development of new cancer prevention approaches and treatments that will benefit patients in the future.

It has been an exciting year for JBU research, with new publications including the discovery of natural compounds that may help the immune system to kill cancer cells, and how low-cost microscopes can facilitate cancer research in lower-income countries. We've also been busy recruiting new postdoctoral researchers and PhD students, and members of the team have presented their research at national and international conferences - travelling as far as South Africa!

Grant funding successes

Simon Baker has recently been awarded a major five-year senior fellowship, jointly funded by York Against Cancer and Kidney Research UK, to expand his work targeting the BK virus. Some bladder cancers may be a potential long-term consequence of poorly-controlled BK virus infections, which might happen more commonly as the immune system ages.

Meanwhile, **Vicki Jennings** has secured a £125,000 grant from the Academy of Medical Sciences Springboard scheme, a programme designed to help the UK's most promising scientists launch their independent careers. This grant will enable her team to explore strategies for harnessing the immune system to recognise and destroy tumour cells, as well as understanding how tumour cells hide from our immune system.

These two prestigious grants provide the JBU with a fantastic opportunity to further build on its generous support from York Against Cancer and complement ongoing research projects funded by Cancer Research UK, the Medical Research Council, Bowel Research UK, and the Wellcome Trust. We are looking forward to continuing working with York Against Cancer, building our local and regional connections, and expanding the impact of our research to tackle more cancer types and improve patient outcomes.

By Professor Will Brackenbury

Neuroscience at York Biology: £3M+ in funding and building capacity

Neuroscience has long been part of the Department of Biology: just walk the D, E and F corridors and you'll find it. Building on the hard work and foundations laid in the past decades, the community has grown exponentially in recent years, reflecting a field that's become a growing focus for the department.

From molecules to behaviour

Our neuroscience research in Biology covers a wide range of exciting topics including exploring how neurons develop, how they adapt to environmental stresses and genetic challenges, and changes during ageing and disease. Recent hires in areas such as neurodegeneration, leukodystrophies and cellular neuroscience have built on our existing strengths, making it easier to connect ideas across scales from molecules to behaviour.

Led by **Professor Sean Sweeney**, we launched our induced pluripotent stem cell (iPSC) facility in 2025 with substantial internal and external funding, adding a human-relevant model to our existing portfolio, which includes rodents, zebrafish, fruit flies, and cell cultures.

A thriving neuroscience community

What really stands out is the community itself. It's a vibrant mix of six research groups with offices full of Master's and PhD students, postdocs, and technicians, creating a highly dynamic, collaborative atmosphere. Conversations happen everywhere, ideas take shape quickly, and new projects often start from simple shared questions.

The community holds social events like karaoke nights, giving people a chance to connect and have fun. Our Early Career Researchers (ECRs) launched the Brain Neuroscience Society, bringing together ECRs from Biology, Biomedical Sciences, Health Sciences and Psychology. Initiatives like NeurobioUK, a UK neuronal cell biology conference which happens in York every September, connect us to the wider neuroscience community and help us grow collaborations beyond the University.

L-R: Han-Jou Chen, Noémie Hamilton, and Ines Hahn

Supporting the next generation of discovery

Neuroscience in the department is also achieving increasing national recognition, particularly through the success of its researchers in securing over £3 million in funding in recent years.

Dr Han-Jou Chen has just secured a £1.35 million Medical Research Council (MRC) grant and a £314,000 Motor Neurone Disease Association project grant to investigate the molecular causes of neuronal cell death and develop new treatments for diseases such as Alzheimer's and Motor Neurone Disease. These awards support multidisciplinary collaborations between York researchers, external partners and drug discovery institutes.

Dr Ines Hahn was awarded a BBSRC New Investigator Award in 2025, recognising the promise of her research on how signalling controls when and where neurons develop. This £730,000 award brings together international collaborators to use cutting-edge imaging tools to measure the activity of a molecule linked to dementia and neurodevelopmental disorders.

Dr Noémie Hamilton secured an MRC New Investigator Award of £808,000 in 2024, supporting her research into developing novel understandings of the role of immune cells into rare white matter diseases such as leukodystrophies. She has started working with human iPSCs to make her research as relevant as possible to human health.

Looking ahead

Our recent grant successes are clear indicators of the supportive and collaborative culture we have developed. Looking ahead, the opportunities are enormous. We have strong links to many other departments, a new Neuroscience degree programme, and an expanding and well-connected community. Our energy and ambition are continuing to grow, and neuroscience in the department is steadily expanding its impact.

By Dr Ines Hahn

Technology Facility approaching 25 years!

The Bioscience Technology Facility opened in the summer of 2002 and will soon reach its 25th anniversary.

In this time, the team has expanded from a dozen staff to 30 dedicated experts. Meanwhile, the facility's inventory has grown from £5 million worth of equipment to over 80 high-end instruments with a total value of more than £20 million, including five instruments worth over £1 million each.

The six labs within the Technology Facility have evolved over time, and now encompass Data Science, Genomics, Imaging and Cytometry, Metabolomics and Proteomics, Molecular Interactions and Biophysics, and Protein Production. One of the biggest developments is how these labs are now working in a more integrated manner to solve more complex problems, with staff being fluid across the facility.

York Imaging Day

The Imaging and Cytometry Lab recently hosted York Imaging Day to celebrate and highlight its new capabilities and industrial collaborations. Thanks to direct funding and strategic partnerships with companies, in the past few years the lab has brought in over £3 million in new investment and added six new instruments to its lineup. This expansion has been backed by three new specialist staff, ensuring that researchers at York and external collaborators alike get the most out of these advanced capabilities.

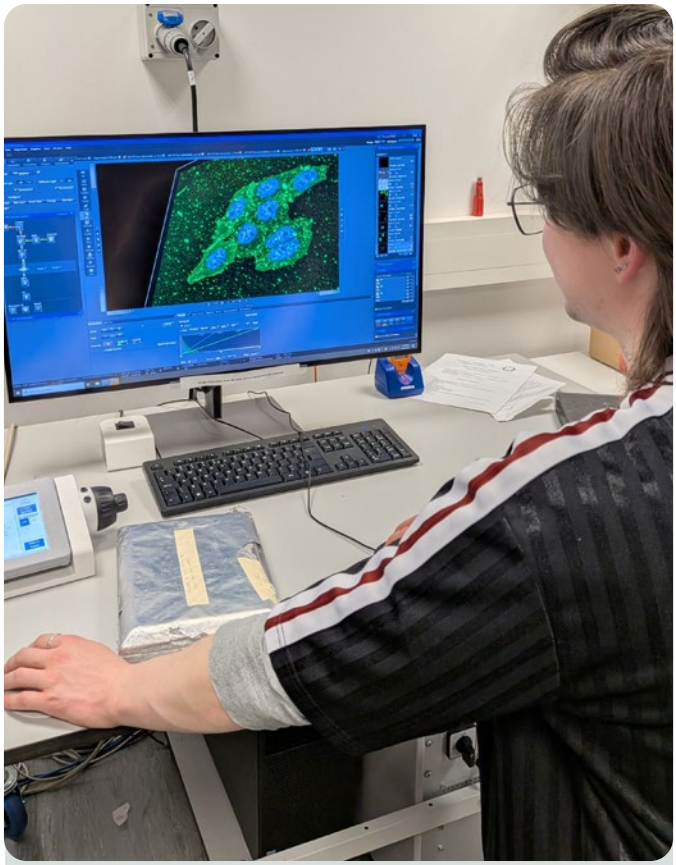
York Imaging Day attracted around 70 delegates from over 30 companies and not-for-profit organisations, including representatives from UK Research and Innovation. The day started with a tour of the facility, followed by short snapshot talks on the latest technologies. Our cutting-edge equipment allows researchers to analyse samples in levels of detail which were not previously possible, such as through advanced 3D imaging and elemental analysis. The event allowed us to showcase plenty of real-life examples of how we are using these tools, and to demonstrate how the lab's work connects with the wider facility.

From strength to strength

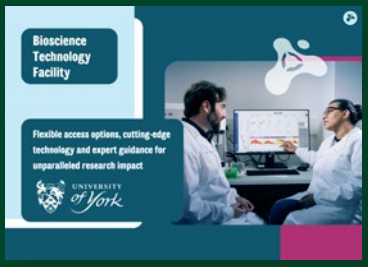
This day highlighted just one of our thriving labs within the Technology Facility. As a whole, we underpin over £45 million worth of funded research grants and support 50 to 70 different external clients each year. We also run many successful courses: these attract over 100 delegates from across the world each year, coming to York to learn directly from our in-house and guest experts and use the very latest technologies.

We are always exploring new opportunities and innovations to ensure York and our wider user base can stay at the forefront of research. More news in future editions!

By Professor Peter O'Toole



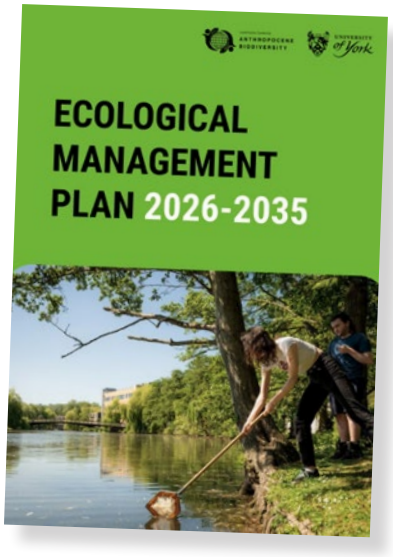
PhD student Jake Henry examines images of cells he tooking using a confocal microscope.



View the Bioscience Technology Facility brochure

A nature-positive campus: Ecological Management Plan launched

The Leverhulme Centre for Anthropocene Biodiversity (LCAB) examines how the relationship between humanity and the natural world is changing, and how we might develop and maintain a sustainable Earth.



Believing that there is no better place to explore the changing relationship between people and nature than our very own campus, members of LCAB have helped to develop a new plan for the management of biodiversity at the University of York. This Ecological Management Plan provides inclusive, sustainable and actionable recommendations to enhance biodiversity, sustainability and wellbeing at the University and for the wider public good.

> **"There is no better place to explore the changing relationship between people and nature than our very own campus"**

The Plan is a University commitment to considering the more-than-human impact of decision-making on campus. It is structured around five interacting pillars: monitoring and managing biodiversity, education, research and wellbeing. "We want a nature-positive campus that supports and facilitates all members of the University community to achieve their full potential, whatever their role, background or species" says **Professor Pen Holland**, who co-led the development of the plan with LCAB Director **Professor Lindsey Gillson**.

Through cross-University collaboration, we are aiming to align our education and research activities with nature-positive decisions. In developing the plan, we included input from a wide range of campus users including estates planning colleagues, staff, students, and local communities, to recognise and connect the importance of biodiversity to core university business.

As part of the plan, LCAB's **Dr Jack Hatfield** and **Kian Hayles-Cotton** designed, led and co-ordinated a plan for monitoring biodiversity on campus, which will be essential in assessing the effectiveness of measures to improve wildlife habitats on Campus East and West.

Things the team have done so far include planting a blackthorn thicket on Campus East to protect nesting habitats for wetland birds, developing a "Nature Bingo card" to enhance staff and student wellbeing, and running an interactive "Connecting with Nature on Campus" event as part of the York Festival of ideas. New floating wetlands have recently been installed at Campus West, which will provide a habitat for wildlife and enhance water quality. Colleagues have also begun assessing the feasibility of introducing regionally significant butterfly species on Campus East.

Read the two page summary or the full plan to find out more, and sign up to the LCAB mailing list to be kept up to date with events and opportunities.

By Professor Lindsey Gillson

Leverhulme Centre for
ANTHROPOCENE
BIODIVERSITY

Acknowledgements

With grateful thanks to all of those who took part in the development of the plan. The process was led by LCAB Director Professor Lindsey Gillson and Professor Pen Holland from the Department of Biology. All of the following helped with the writing and delivery of the plan: LCAB members Kian Hayles-Cotton, Dr Jack Hatfield, Rosie Bibby and Professor Chris Thomas, colleagues in Archaeology, Environment and Geography and Education, the Directorate of Estates, the Environmental Sustainability at York team, and the Sustainability Steering Group.

My journey from scientist to Head of Technical Operations: Dr James Fox

To write about my journey from scientist to my current role as Head of Technical Operations, I have to start with my journey to becoming a scientist, which I do still consider myself to be at heart. Hence my picture in a lab coat!

My passion for science started with an inspirational A-level teacher, Mr Maddock, who made Biology my favorite subject. A farmer's son in an ex-coal mining community, I was the first in my family to attend university. There, a seminar speaker, Professor Sussan Nourshargh, was my next inspirational figure, which resulted in me pursuing a PhD at Imperial College London in molecular and cellular biology. In the years that followed, I undertook a variety of postdoctoral and research-related positions at Keele, York, Oxford, and Leicester. Along the way, I completed a teaching qualification, published research, and became a bit of a jack-of-all-trades. By 2017, the traditional "academic route" felt both out of reach and not the destination I wanted.

Stepping away from the bench

So in 2017 when another fixed-term contract was coming to an end, I decided the time was right to move into full-time laboratory management. After earning safety qualifications and becoming professionally registered, I became the laboratory manager for the Centre for Immunology and Infection at York. I soon took on other responsibilities, then from 2021 a secondment led to a permanent role working across the whole Biology department, where I managed a team for the first time. In May 2026 I transitioned into my current role as Head of Technical Operations covering Biology, the Hull York Medical School and Health Sciences.

> **"A professional journey is rarely straightforward and it's normal for there to be bumps in the road, so embrace them"**

I'm still finding my feet and two days are genuinely never the same! The role oversees many aspects of research support across the three departments: managing buildings and equipment, overseeing safety and budgets, ensuring we provide an excellent service, and much more. All this needs to be done efficiently, sustainably and inclusively. The role is very collaborative: I work with researchers, technicians, professional support staff and external contractors, to name but a few.

Reflections

Transitioning away from being a scientist is quite the change and, as much as you have to convince others, you also have to convince yourself you're ready for it! People have almost stopped asking me if I miss being a bench scientist. If they do I always say "yes"; it's true that in some ways I do, but I usually quickly follow up to say that I've found other ways to inspire and motivate myself and progress professionally. One of my motivations to move into a support role was that I thought it would be a more stable career. In some ways it has been, but in reality I have changed roles about as frequently as I did when I was on fixed term contracts!

I always advise people to say "yes" to opportunities, invest in training yourself, and to be open to change but to find your own path. A professional journey is rarely straightforward and it's normal for there to be bumps in the road, so embrace them as they help our personal and professional growth.

Centre for Blood Research co-hosts inaugural international blood stem cell conference

The Centre for Blood Research (CBR) at York, in collaboration with the Cambridge Stem Cell Institute (CSCI), recently hosted the inaugural Advances in Experimental and Therapeutic Haematopoietic Stem Cell Expansion (HExaT) meeting. Co-organised by CBR's **Professor David Kent** and CSCI's Dr Adam Wilkinson, the event brought together leading scientists, clinicians, and early-career researchers from across the globe to discuss breakthroughs in blood stem cell biology.

Held in the magnificent surroundings of The Guildhall York, the core scientific symposium provided a vibrant platform for discussing cutting-edge methods in stem cell culture and clinical translation. HExaT featured a distinguished lineup of international keynote speakers and was supported by a wide range of industry partners and the National Centre for the Replacement, Refinement and Reduction of Animals in Research.

A key focus was exploring the newest approaches for growing blood cells in the lab, which is a major area of national and international interest.

Complementing the main symposium, the Biology Teaching Labs and Technology Facility partnered with the hosts to hold two incredibly popular hands-on training workshops, which attracted around 100 attendees in total. These practical sessions equipped delegates with expertise in state-of-the-art blood stem cell protocols and advanced cell sorting technologies, highlighting York as a leader in these skills and its approach to open science. By bridging fundamental biological research with practical technological training, HExaT showcased York's central role in advancing stem cell science. The overwhelmingly positive reception from international attendees establishes the meeting and the CBR as drivers of new technologies and collaborative working, and we plan to host HExaT 2028 in York again.

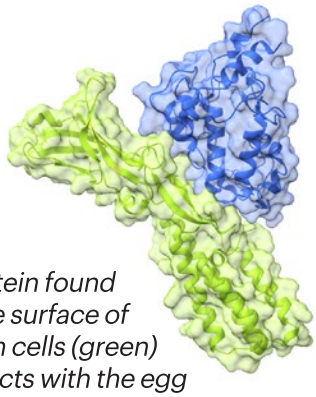
By Professor David Kent

Unlocking the cell surface

Our cells are covered in molecules known as receptors, which act as the primary communication hubs for the human body. These receptors and their molecular interactions are important because the cell surface is the vital entry point for external signals, interacting with pathogens such as viruses and acting as an important target for new antibody-based drugs.

My research group has spent many years developing a large-scale screening technology to map cell surface interactions, which has led to several notable medical discoveries. For example, we identified molecular interactions between the malaria parasite and the surface of red blood cells it infects. We also discovered the specific surface interaction between sperm and egg cells which is essential for fertilisation in mammals.

Recently, our team has successfully used this technology to identify host cell receptors - or entry points - for various dangerous viruses. This has paved the way for a much larger project aimed at identifying host receptors for over 200 different viruses, many of which have the potential to cause pandemics.



A protein found on the surface of sperm cells (green) interacts with the egg receptor protein (blue) at the moment of fertilisation.

Our team's versatile technology can also be used to rapidly test the specificity of a new class of biological drugs called monoclonal antibodies. It allows researchers to ensure that therapeutic antibodies safely hit the intended molecule without causing harmful off-target complications. To bring this high-throughput screening capability to the wider biomedical sector, we are starting a spin-out company called Ectocellect. This translation of academic research into commercial application promises to significantly accelerate drug discovery and improve safety for patients.

By Professor Gavin Wright

The 2025 cohort of GenerationResearch placement students

Help us shape the future

We hope that you've enjoyed flicking through our inaugural departmental research magazine. Moving forward, we'd like to hear from our readers so we can make this a collective endeavour. As we celebrate the groundbreaking science happening inside our labs and out in the field, we know that our department's true legacy is built by you: our extraordinary network of alumni, friends and partners. Here's how you can help:

Share your news: Whether you graduated recently or worked here decades ago, your journey after leaving campus remains an essential part of our story. Where has life taken you? Whether it's breakthroughs in research or industry, creative pursuits, environmental advocacy, or personal milestones, we want to celebrate your news. Your stories not only inspire our current students but also remind us of the far-reaching impact of a biology education. We plan to profile the amazing work and successes of our former graduates and staff in future issues.

Stimulate societal impact: We are committed to making a tangible, real-world difference and are actively seeking fresh, creative ways to bridge academia and society. Who better to guide us than those leading the way in the wider world? Share your ideas on how our department's research and resources can best serve local and national communities to bring about public good and spark real change.

Partner with us: We want to build a community of meaningful, active connections and there are many ways to connect with us. Here are just a few possibilities:

- Exploring joint research and development projects and internships with businesses and industry.
- Connecting policymakers and leaders with expert researchers to inform evidence-based environmental policy.
- Opportunities for volunteers and neighbours to join our public events and biodiversity-related initiatives.
- Bringing biology to life for schools and educators with campus visits, guest speakers, and citizen science projects.
- Hosting your training, conferences or meetings in our fully equipped labs and collaborative event spaces.

Start the conversation

Get in touch today at **biol-reception@york.ac.uk**.

Keep an eye out for new issues of BioYork on our departmental news page and social media accounts:

BiologyatYork **biologyatyork**

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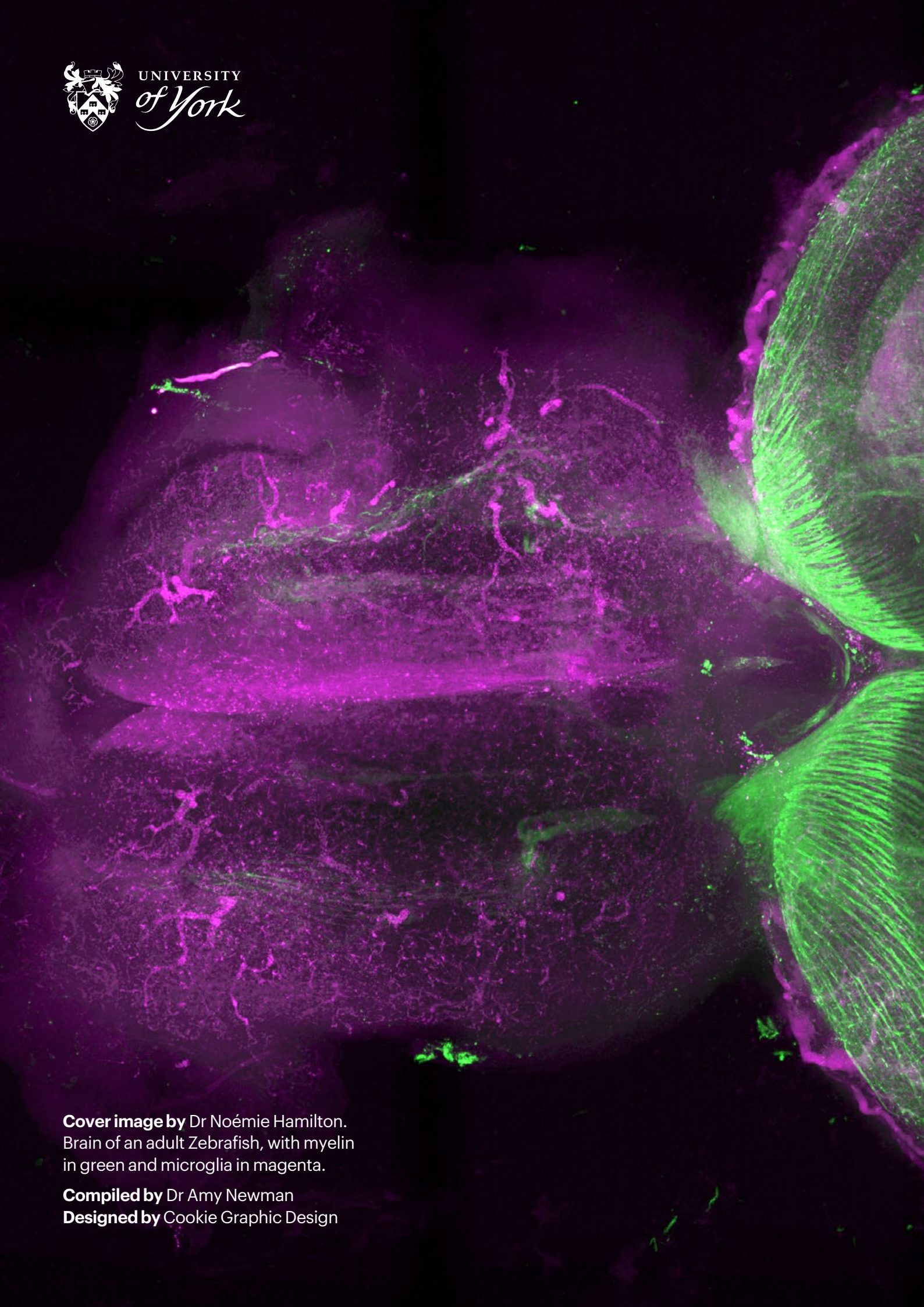
We can't wait to connect with you!



Cover image by Dr Noémie Hamilton.
Brain of an adult Zebrafish, with myelin in green and microglia in magenta.

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