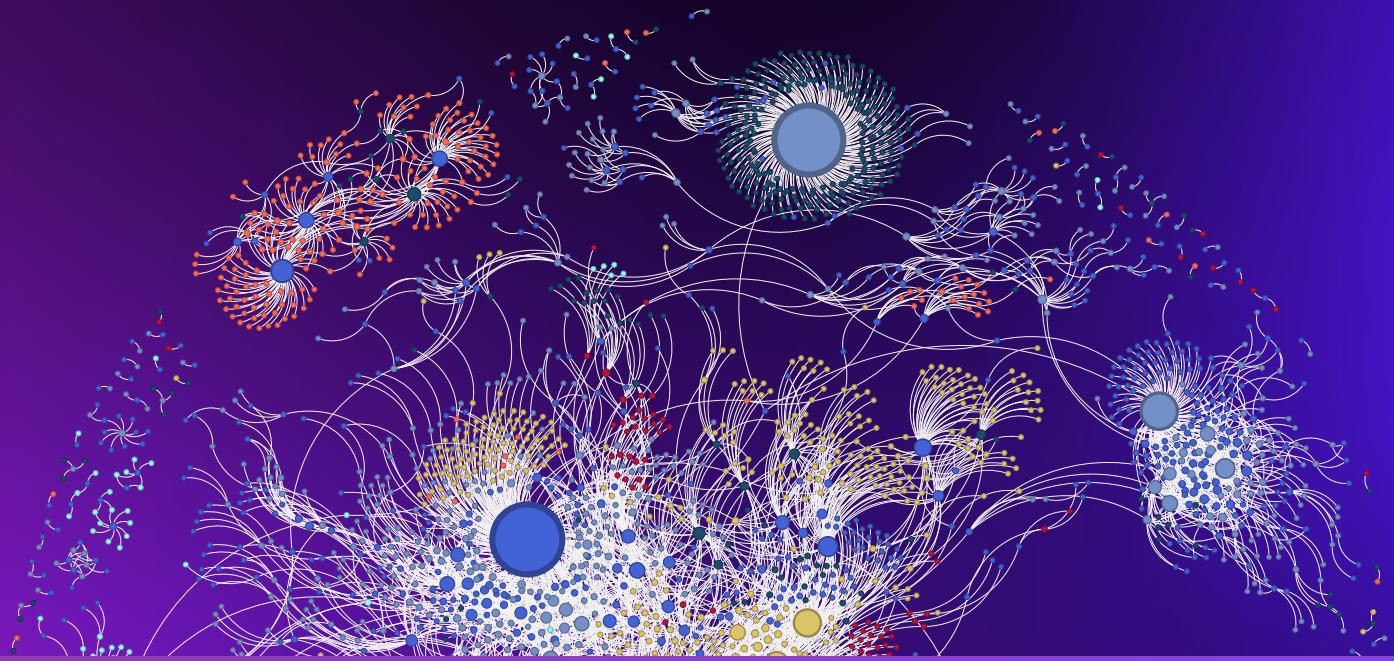
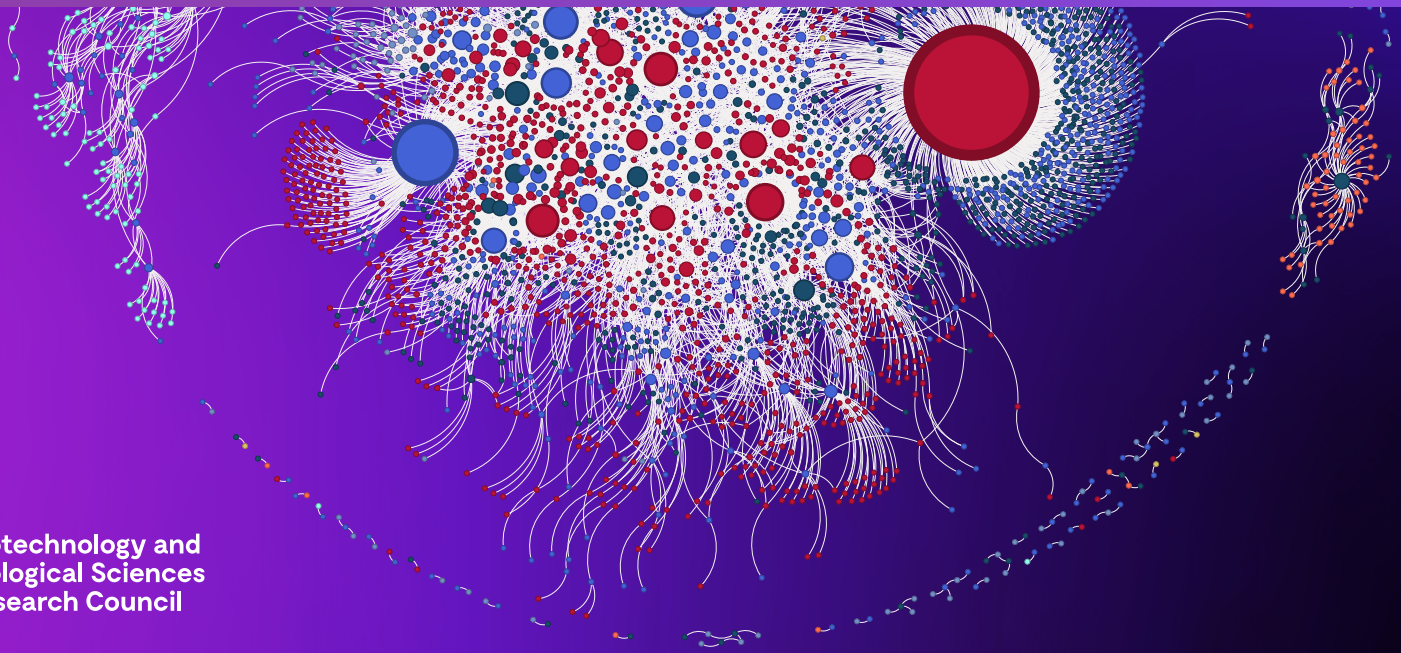


# BBSRC FORWARD LOOK: THE POWER OF BIOSCIENCE



UKRI Biotechnology and Biological Sciences Research Council

# FOREWORD

## A MESSAGE FROM PROFESSOR ANNE FERGUSON-SMITH, BBSRC EXECUTIVE CHAIR

Credit: Dasha Tenditna

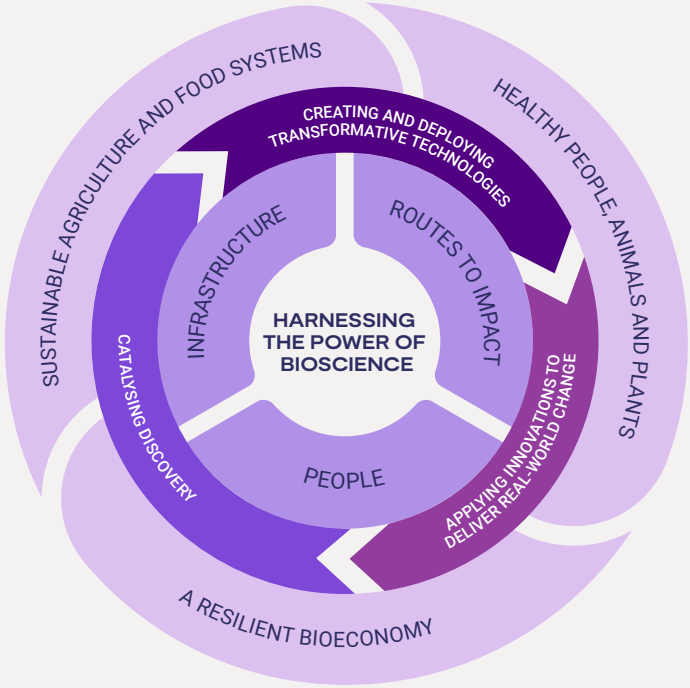
Bioscience and its impacts touch every single one of us. From the food we eat and the medicines we rely on, to the health of our planet and the strength of our economy. Advances in bioscience are delivering real-world benefits that improve lives and livelihoods every day.

At BBSRC, our vision is to harness the power of bioscience to deliver a healthier, more resilient and sustainable future. Our vision is one where the new discoveries we enable provide a strong platform from which better outcomes for society can be generated both now and in the future. Our vision is one where the technological advances that our community create are deployed effectively and with agility to deliver beneficial change. Our vision is one where the channels between discovery and its application are clear and unencumbered.

Consider a future with healthier humans, animals and plants coupled with safe and nutritious food for all. Picture a world with enhanced disease preparedness and resilience, supported by nature-positive agriculture and a thriving circular bioeconomy. These are just some of the ambitions our collective efforts are designed to achieve.

As we look ahead in a digital age, we are committed to the generation and use of high-quality data and evidence that underpin the processes that allow us to fulfil these ambitions. We remain committed to building infrastructure and fostering communities that bring together diverse expertise to bridge disciplines and sectors, resulting in creative opportunities and scalable innovation. As always, we remain firmly committed to people; to investing in the development of a skilled and more versatile workforce to explore, create and implement better outcomes for all.

At a time of unprecedented planetary challenge, this Forward Look is both a statement of intent and a challenge to all of us in the UK bioscience ecosystem. We must work better together in true partnership both nationally and internationally. As part of UK Research and Innovation (UKRI), we are stewards and enablers of UK bioscience discovery and innovation. We value the connections between disciplines and foster collaboration to accelerate progress to deliver research and innovation that makes a real and lasting difference.



# OUR VISION

TO HARNESS THE POWER OF BIOSCIENCE TO DELIVER A HEALTHY, SUSTAINABLE AND RESILIENT FUTURE

Credit: Getty

Bioscience is a dynamic, global endeavour integral to progress in a rapidly changing world. By deepening our understanding of life, bioscience delivers knowledge that can be applied to help to improve lives, support livelihoods and tackle global challenges.

Discovery and innovation in the biosciences are critical to the UK's ability to lead and create new opportunities for growth and progress for everyone. As biosolutions become increasingly integrated into global supply chains, they are reshaping how we produce food, energy, chemicals, medicines, and materials, laying the foundation for more sustainable and resilient economies. Utilising nature's processes through engineering biology and bio-based advanced manufacturing will accelerate this transformation, driving innovation, creating high-value jobs, and positioning the UK at the forefront of emerging global markets.

In addition to new discovery, advances in tools, technologies and data usage are enabling the development of these biosolutions that can tackle pressing societal issues. Bioscience will continue to be vital in building a future where people and animals have healthier lives; where we have more secure, sustainable and resilient agri-food systems; where our environment and ecosystems are enhanced rather than degraded by human activity; and where our economy grows in innovative yet sustainable ways.

## OUR UNIQUE ROLE

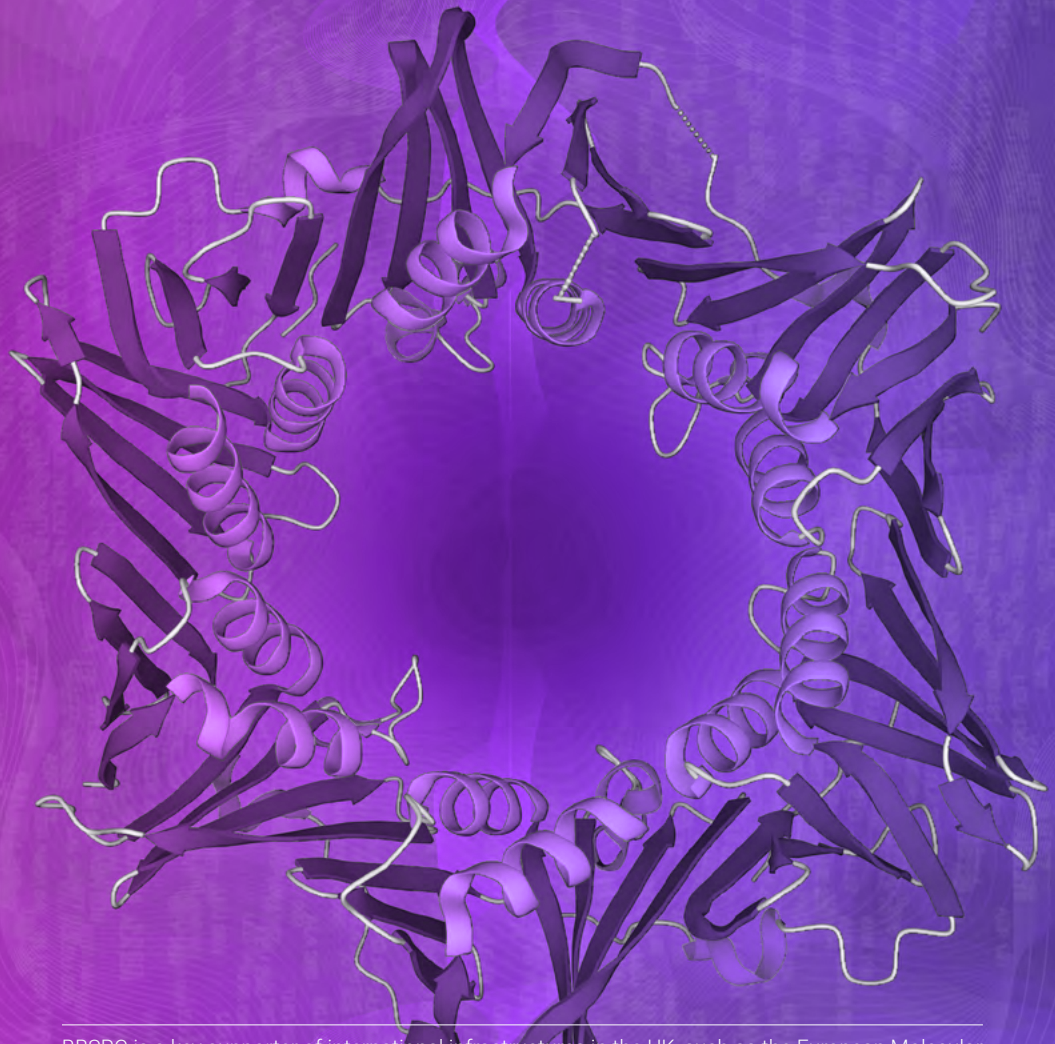
BBSRC is a key steward of UK bioscience. As the UK's major public funder of the biosciences, and as part of UKRI, we provide unique leadership and coordination. We ensure the health of the discipline by investing in a diverse research and innovation community and state-of-the-art infrastructures to drive pioneering discoveries and address global challenges. We work to build a culture where new ideas thrive, knowledge is built up over the long term, and bioscience research and innovation finds routes to deliver wide-ranging and transformative benefits.

BBSRC has a broad remit, from microbes to humans to the development and application of groundbreaking tools and technologies. We support investigations on all scales, from molecules, cells and tissues to whole organisms, populations and landscapes. Within this broad portfolio, there are areas for which we have a particular responsibility and leadership role in the research and innovation system, such as human and animal health and welfare; agriculture and food security; plant science; and engineering biology.

As part of UKRI, we work to maximise the potential of UK bioscience. BBSRC is a powerful catalyst for interdisciplinary and cross-sector collaborations. Our support extends the reach of bioscience, influencing and advancing multiple sectors and supporting inward investment. We strive to foster a more porous and interconnected research and innovation ecosystem: building national and international collaboration to enable mutually beneficial partnerships; enhancing coordination of endeavour around major research challenges; leveraging unique expertise and resources, and removing barriers to deliver meaningful, real-world impact nationally and globally.

Immunology researchers working together.
Credit: Babraham Institute

# OUR AMBITION



BBSRC is a key supporter of international infrastructures in the UK, such as the European Molecular Biology Laboratory (EMBL) - European Bioinformatics Institute (EBI). The AlphaFold Protein Structure Database, co-developed by EMBL-EBI and Google DeepMind, contains over 200 million protein structure models predicted using AI. The structure featured in this image is the DNA polymerase sliding clamp from E-coli. This is a tiny helper ring in bacteria that helps copy DNA quickly and accurately. Credit: Karen Arnott/EMBL-EBI

## Our ambition is to deliver three high-level and interconnected impacts:

- Healthy people, animals, and plants
- Sustainable agriculture and food systems
- A resilient bioeconomy

## A collaborative approach to impact

Bioscience is a powerful driver of knowledge generation and innovation. However, it cannot achieve these impacts in isolation. Real progress demands an interdisciplinary, systems-based approach, one that opens doors and builds meaningful connections across disciplines, sectors and borders.

## BBSRC's role as a catalyst

We will employ our convening power to catalyse collaboration and foster effective partnerships across UKRI, universities, research organisations, industry, government, the third sector, and end-users of research. Together we will co-design and co-deliver the enabling pathways to meaningful and relevant impacts.

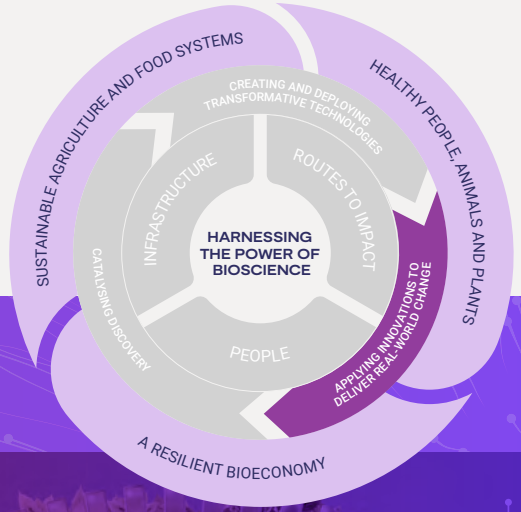
## Flexible delivery and future focus

Our shorter-term strategic delivery plans and aligned strategic frameworks will outline our research and innovation priorities as we work flexibly and with agility to respond to opportunities and emerging needs, ensuring that UK bioscience continues to thrive and find routes to impact.

We will achieve our ambition through:

- Applying innovations to deliver real-world change
- Catalysing discovery
- Creating and deploying transformative technologies

# APPLYING INNOVATIONS TO DELIVER REAL-WORLD CHANGE




## THE VITAL ROLE OF BIOSCIENCE IN TACKLING CHALLENGES FACING HUMANITY AND THE PLANET

Our ambition is to address key challenges facing the world. Bioscience can offer solutions to climate change, infectious diseases, and ageing populations while unlocking new possibilities for shared prosperity. Our ambition is also to maximise the positive impact of bioscience research and innovation to revolutionise industries and grow our economy.

### The need to address complex health challenges facing the planet's populations

The world faces complex health challenges: ageing human populations; poor nutrition; increasing infectious disease outbreaks; antimicrobial resistance; and food-borne disease. Environmental changes such as habitat loss, climate change, and pollution are impacting the health of humans, animals and plants, increasing the spread of diseases and disrupting the ecosystem health on which humans depend.

### The need to transform agriculture and food systems

Our agriculture and food systems need to be more sustainable, productive and resilient to achieve secure, healthy food supplies. These systems will need to adapt to and mitigate against multiple, interconnected threats that include pests and disease, climate change/ weather extremes and supply chain shocks. Agriculture is also a major cause of green-house gas (GHG) emissions and environmental degradation including rapid biodiversity decline. We must reduce the impact of the agri-food system on the climate and environment.

### The need to deliver secure, sustainable and resilient resources while protecting the environment

There is an urgent need to reduce our reliance on fossil-fuel based resources and processes, to reduce waste, lower GHG emissions, and conserve natural resources. Conventional sources of critical materials are rapidly depleting, while geopolitical volatility is driving up costs and affecting their availability and the energy required to process them. The UK (and the world) faces severe resource insecurity, rising costs and escalating environmental degradation.

Advances in bioscience and biotechnology will help address all these challenges, enabling us to tap into nature's toolbox and unlock versatile and vital bio-based solutions, products and processes. By facilitating efficient and effective application of bioscience knowledge, tools and technologies, and working with partners to ensure research solutions are translated into societal outcomes, BBSRC investments will equip the UK bioscience community to find synergies and deliver solutions that create fewer trade-offs across the interconnected issues we face.

Credit: Getty

## Advancing an integrated understanding of health

Comparative organismal bioscience enables exploration of conserved and divergent biological pathways that govern homeostasis, adaptation and resilience across humans, animals and plants. By studying how different organisms respond to environmental challenges throughout their life course, we can uncover fundamental mechanisms of health and wellbeing, identify new targets for prevention and inform innovative interventions. Aligning insights across species and scales allows bioscience to deliver inclusive innovations, reduce inequalities and ease long-term pressures on healthcare and agri-food systems.

## Enhancing preparedness for future disease outbreaks and slow-moving health emergencies

A One Health approach – integrating human, animal and plant health – supports early detection, prevention and control strategies by deepening our understanding of host-pathogen interactions, immune responses, microbial evolution, and environmental drivers of disease. This approach strengthens resilience against infectious and non-communicable diseases, antimicrobial resistance, and threats to human, animal and plant health, safeguarding food systems, economies and ecosystems.

## Safe and nutritious food

Advancing understanding of how food and nutrition influence health across the life course offers opportunities to strengthen connections across the agriculture, food, nutrition and health nexus in support of healthier populations. Bioscience will play a pivotal role in uncovering how dietary components, their interactions and consumption patterns promote lifelong health, while ensuring food safety throughout the supply chain. This holistic approach will enhance the effectiveness of nutritional interventions, thereby reducing the burden of diet-related ill-health on people, the NHS, the workforce and the economy.

Credit: Getty

Credit: Getty

## Productive agriculture and food systems that have a positive impact on the environment

Understanding the biological components of agricultural systems is essential to address complex and interconnected challenges such as our changing climate. Bioscience provides a robust evidence base to guide decision-making across the supply chain, helping stakeholders maintain high productivity, improve animal welfare and enhance ecosystem services like soil health and biodiversity that are key to sustainable food production. Emerging technologies are accelerating this transformation. Engineering biological processes supports sustainable systems; precision breeding enhances climate and disease resilience as well as nutritional quality in crops and livestock; and AI, robotics, and sensors enable efficient, data-driven farming. Together, these innovations reduce environmental harm, restore ecosystems, and build resilient, profitable agricultural systems for a changing world.

## Transition to a circular economy: Reduction of greenhouse gas emissions across agriculture, industry, and energy systems

Bioscience is accelerating the transition to a low-waste economy with reduced environmental impacts. Innovations such as low-emission crop and farmed animal systems, carbon-sequestering agricultural practices, and bio-based alternatives to fossil fuels are helping to reduce greenhouse gas emissions and conserve natural resources. Advances in biomanufacturing and biorefinery technologies are transforming the production of energy, chemicals and materials by using renewable feedstocks. These integrated solutions support global conservation efforts and minimise waste by closing resource loops. By embedding bioscience into industrial and agricultural systems we can reduce reliance on fossil fuels, synthetic fertilisers and imported feeds and build a resilient, innovation-driven economy that supports both planetary and societal wellbeing.

## HEALTHY FOOD, HEALTHY LIVES

BBSRC's remit uniquely spans the breadth of the food system, integrating expertise across soil, crop, livestock, food, microbiology, human physiology and digital bioscience. This systems-level approach is advancing critical research into how nutrients, diet and food structure influence health outcomes across the life course. In the UK, diet-related ill-health has significant economic impact, with an estimated 2.8 million people out of work due to diet-linked conditions. In the context of rising obesity, malnutrition and nutrient deficiencies, BBSRC-supported innovations, such as biofortified crops (vitamin D-enriched tomatoes, for example), improved food composition, and microbiome-informed nutrition, offer scalable, science-based interventions. By fostering collaboration and supporting the translation of bioscience into real-world health solutions, BBSRC helps reduce illness, ease NHS pressures, improve lives and address economic inactivity.

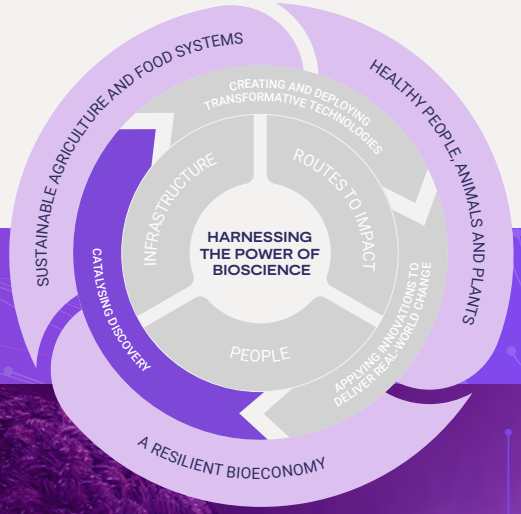
Credit: Getty

## TRANSFORMATIONAL ADVANCES FROM FUNDAMENTAL RESEARCH

Research into plant genomes has transformed agriculture, sustainability and biotechnology. Decoding crops like wheat and rice has revealed genes for yield, resilience, and disease resistance – enabling precision breeding. These advances support food security, greener farming and bio-based innovation. In the UK, wheat genomics has delivered strong returns, boosting agri-tech and economic growth while helping meet the global challenge of feeding a growing population. Economically, BBSRC's investments in wheat research are projected to create £900 million Gross Value Added (GVA) for the UK economy over a 25-year period.

Dr Latifa Greche using machine learning models and data recorded by the field Scanalyzer to build an automatic high-throughput phenotyping pipeline and track the growth stages of wheat germplasm. Credit: Rothamsted Research

# CATALYSING DISCOVERY




## DELIVERING CONCEPTUAL ADVANCES AND FUNDAMENTAL UNDERSTANDING OF BIOLOGICAL SYSTEMS

Our ambition is to deliver new knowledge and revolutionary advances across bioscience laying the foundation for progress across disciplines and sectors.

The UK's excellence in bioscience is built on the creativity and ingenuity of its research and innovation community. We support the free exploration of ideas – recognising that curiosity-driven research will uncover new concepts and unifying principles, laying the foundation for discoveries of far-reaching and lasting significance. Our broad and long-term support for bioscience discovery recognises that not every breakthrough begins with a clear application in mind. Major advancement often emerges from both big and small discoveries that build on each other over time – or were even designed with something else in mind. BBSRC's ambition is to empower researchers to follow their ideas wherever they lead. This freedom is essential to unlocking transformative insights that shape the future in ways we can't predict.

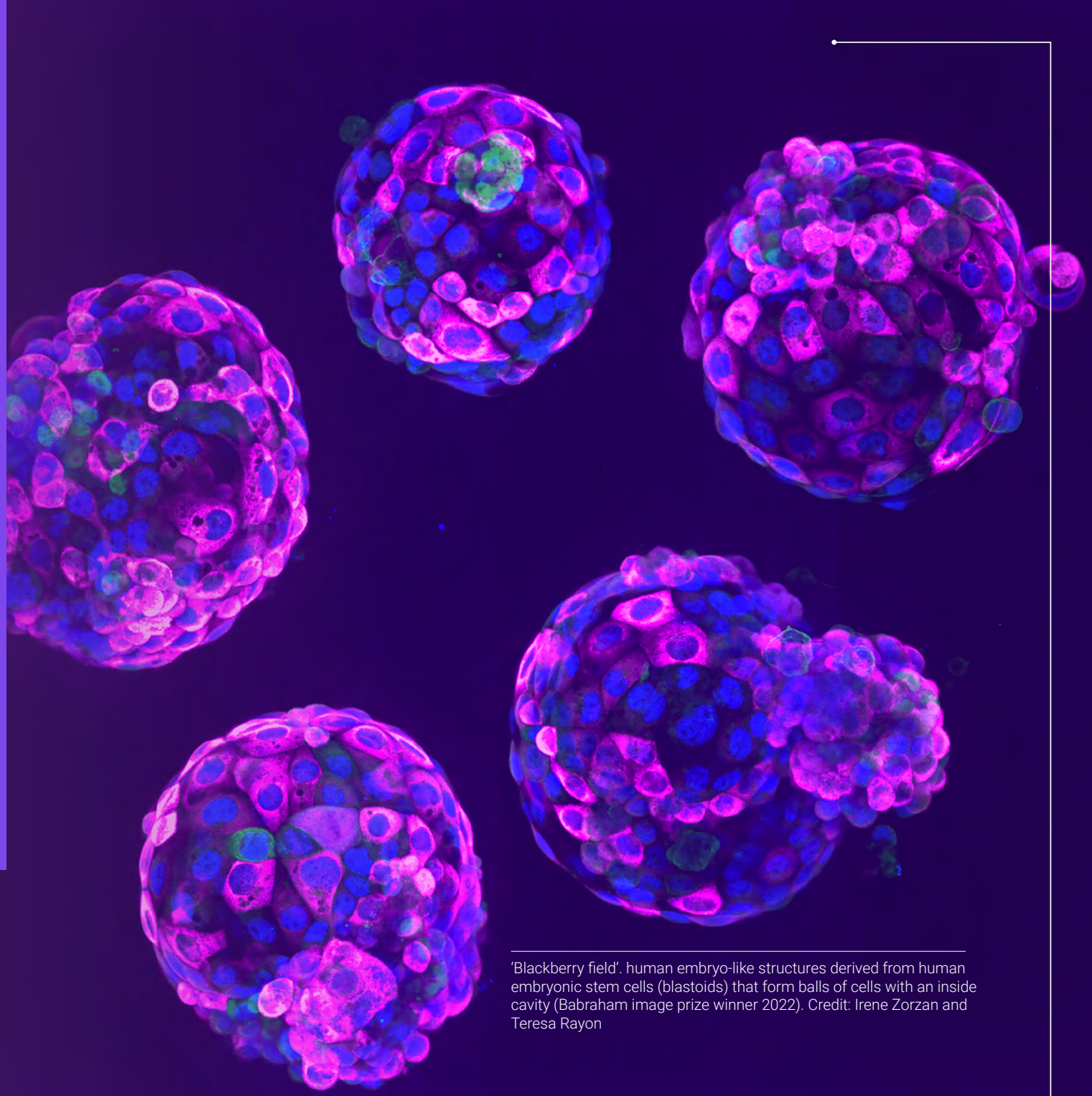
Despite major advances, much remains to be discovered about how life works. Bioscience continues to reveal novel and often unexpected insights into living systems. Fundamental knowledge drawn from discovery research enables better understanding, utilisation and management of biological processes, and represents the roots from which our innovation-led economy can grow.

The diversity of living organisms that has arisen through evolution and the complexity of biological systems provide endless opportunities for exploration and discovery. This curiosity about ourselves and our world will deliver understanding of the structure, function and coordination of biological systems, from molecules and cells to populations and ecosystems, and inspire the development of new technologies and new ways of tackling challenges. Our investment in fundamental bioscience ensures the UK remains at the forefront of contemporary developments, for example in proteomics, RNA biology and microbiome science. The advanced disciplinary expertise and national capabilities sustained through BBSRC funding ensure the UK can respond to emerging needs and remain globally competitive.

The development of synthetic cells that mimic natural cellular functions from fundamental components are unlocking new avenues for discovery, furthering our understanding of life and enabling innovations in medicine, biotechnology, and environmental science. Credit: Yuval Elani and Zehua Hu, Imperial College London

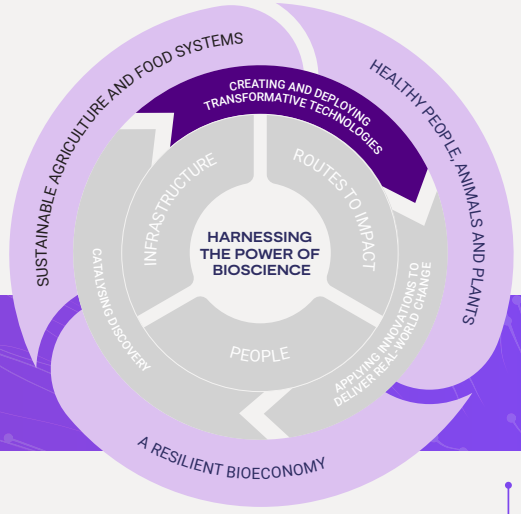
## UNANSWERED QUESTIONS: OPPORTUNITIES FOR DISCOVERY AND INNOVATION

Unanswered questions in bioscience hold potential to reshape our understanding of life. We are only beginning to understand how proteins behave and interact inside our cells, or how plant cell walls are constructed, regulated and adapted in real time – knowledge that could help us improve our health or develop better crops and materials. In the brain, the mystery of how thoughts and feelings arise from networks of neurons remains one of science's greatest puzzles. These questions aren't just about solving problems – they're about curiosity, discovery and pushing the boundaries of what we know. By empowering researchers to explore these unknowns, we open the door to breakthroughs we can't yet imagine.



'Blackberry field'. human embryo-like structures derived from human embryonic stem cells (blastoids) that form balls of cells with an inside cavity (Babraham image prize winner 2022). Credit: Irene Zorzan and Teresa Rayon

# CREATING AND DEPLOYING TRANSFORMATIVE TECHNOLOGIES




## A TOOLKIT TO UNLOCK ADVANCEMENT

**Our ambition is to drive the responsible discovery, development and deployment of transformative technologies that accelerate scientific progress and innovation and deliver lasting societal and economic impact.**

Innovative technologies are reshaping the bioscience landscape, unlocking new frontiers across disciplines and sectors. From engineering biology and genomics to artificial intelligence (AI) and advanced imaging, these tools are enabling researchers to tackle previously insurmountable challenges and deliver biosolutions that address health, agriculture, environmental and productivity needs. The convergence of bioscience with engineering, data accumulation and AI, coupled with enabling investments in infrastructure, is transforming research practices and opening new opportunities for economic growth. These technologies are essential to future-proof the UK's research and innovation ecosystem.

Through harnessing the power of natural processes, engineering biology is enabling breakthroughs in sustainable bio-based manufacturing. These innovations are transforming food and health systems by generating more sustainable production, turning waste into valuable resources, and creating novel, high-value products. They are advancing low-carbon manufacturing, improving nutritional outcomes, and strengthening the resilience of biopharmaceutical development. Crucially, they are driving economic growth and accelerating the transition to a circular economy by supporting green industries and promoting more efficient, regenerative use of natural resources.

Advanced genetics and genomic approaches are revolutionising plant and animal breeding, driving gains in crop productivity and nutritional quality and increasing resilience and disease resistance. These biotechnologies are supporting the emergence of more sustainable and climate-adaptive food systems. High-resolution, high-throughput and multi-modal imaging and measurement pipelines are enabling unprecedented precision in observing and manipulating biological systems, deepening our understanding of complex cellular processes. Non-animal technologies such as in vitro systems, 3D tissue models, organs-on-a-chip, synthetic cells and computational models are advancing our ability to predict outcomes, aligning with the '3Rs principle' – Replacement, Reduction, and Refinement – improving scientific outcomes while reducing ethical and cost burdens.

Transformative technologies are accelerating discovery, driving sustainable innovation and securing long-term societal and economic resilience.

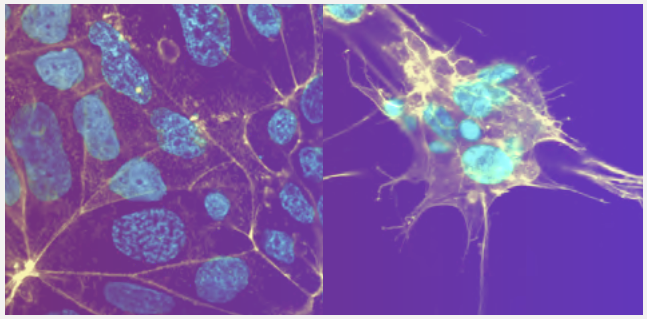


Image of gut cells (left) and brain neuronal cells (right) cultured within the connected microphysiological system (MPS) devices. Also known as 'organ-on-chip' technology, MPS allows researchers to grow human cells or tissues in appropriate conditions to mimic how they look, behave and communicate in our bodies. Credit: Dr Emily Jones and the Quadram Institute Advanced Microscopy Facility

## PROVIDING LEADERSHIP IN ENGINEERING BIOLOGY

Engineering biology is a disruptive technology with the potential to add up to $4 trillion per annum to the global economy over the next decade. Its applications and products have the power to revolutionise many aspects of modern life while creating new avenues for growth and increased productivity in the UK.

For over a decade, BBSRC has provided strategic leadership and coordination in engineering biology, fostering partnerships and alignment across academia, industry and government, nationally and internationally. Through sustained investment in research, technology development, infrastructure and training we have nurtured a thriving, interdisciplinary ecosystem that has positioned the UK among world leaders in the field.

300L CFX Bioreactor.
Credit: Colorifix Ltd.

Modern wheat cultivars share long DNA segments with diverse Watkins landraces - traditional varieties collected globally in the 1920s–30s. Visualized as coloured blocks, this graphic reveals ancestral contributions and highlights key resistance genes from specific subgroups. As featured in Nature. Credit: John Innes Centre / Nature

# OUR COMMITMENTS

We live in a dynamic and rapidly evolving world. Advances in technology, shifting geopolitical landscapes and environmental challenges are reshaping how we undertake bioscience and translate it into real-world impact. These changes bring both opportunities and complex challenges that bioscience must be equipped to address.

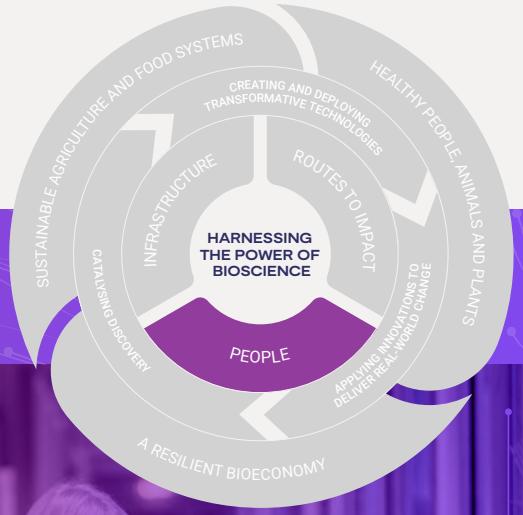
To thrive in this environment, our research and innovation ecosystem must be sustainable, adaptable, resilient and future proof. This requires us to evolve how we work, who we work with, and how we respond to change. It is only by working together, across disciplines, sectors and nations that we can create a connected and efficient bioscience ecosystem capable of delivering transformative solutions.

BBSRC has a critical role to play in driving and advocating for these evolutions. Through our commitments, we will employ the full breadth of our capabilities to provide leadership and catalyse collaborative working to support the people, infrastructure and routes to impact that will drive progress.

Jake Richardson, Bioimaging Platform Manager, loading a sample into a transmission electron microscope. Credit: Phil Robinson, John Innes Centre

# PEOPLE

## A SKILLED, DIVERSE AND RESILIENT WORKFORCE




People are at the heart of the research and innovation system. Their creativity, insight, diversity and dedication drive discoveries that improve lives and underpin economic and societal resilience. To maintain the UK's position as a global bioscience leader, we will support the development of a highly skilled, versatile workforce across all roles and career stages.

We are committed to enabling individuals to thrive in a dynamic, interconnected landscape – whether in universities, industry, professional services, the public sector, or at the interfaces between them. This requires more than disciplinary excellence. Bioscience professionals must be equipped with technical expertise, digital and data literacy, business acumen, and transferable skills to collaborate across disciplines, sectors and nations to undertake high-quality research and innovation.

We will continue to build capacity in core bioscience disciplines through investments in doctoral training, fellowships and continuing professional development of all members of the workforce. Alongside this, we will champion the development of cross-cutting capabilities – including leadership, innovation and entrepreneurial mindsets – to support satisfying careers, the advancement of bioscience and its translation into real-world benefit.

As the research landscape evolves, we will use our influence to advocate for the needs of our workforce in the wider system. We will foster a more porous, inclusive and supportive research environment where everyone can contribute and thrive. Equity, wellbeing and collaboration are essential to attracting, retaining and unlocking the potential of successful talent. We will support people to lead themselves and others with insight and integrity. Whether directing research, convening diverse teams or advocating for bioscience as a public good, inclusive leadership will help shape a positive research culture.

By promoting the movement of people and ideas, and deepening international networks and partnerships, we will boost the UK's power to attract talent and collaborate with skilled individuals from around the world. We will champion team science to enable innovative solutions to complex challenges that no single researcher or field could solve alone. By integrating diverse expertise and fostering a culture of shared discovery, we will accelerate innovation, enhance research quality and amplify impact.

Our commitment is to work with others to build a motivated and future-ready bioscience workforce capable of delivering high-quality research and innovation with real-world impact.

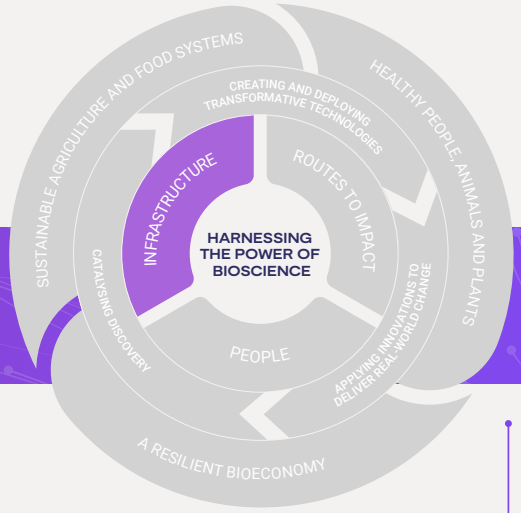
Scientists walking in Roslin Lab.
Credit: Laurence Winram

## A SKILLED AND DIVERSE WORKFORCE

BBSRC is committed to supporting and championing the vital role of Research Technical Professionals (RTPs) in bioscience research and innovation. Their specialist expertise drives technology adoption and accelerates innovation, enabling research across academia, industry and the public sector. RTPs also provide critical insight into BBSRC Strategy Advisory Panels, funding decisions and peer review, particularly in instrumentation and technology development, ensuring the UK remains at the forefront of scientific advancement.

On site at AberInnovation's biorefining centre, which is co-located with the Institute of Biological, Environmental and Rural Sciences at Aberystwyth University's Gogerddan Campus, and provides world-leading facilities and expertise in the biotechnology, agri-tech, and food and drink sectors. Credit: Aberinnovation

# INFRASTRUCTURE




## ACCESSIBLE, SUSTAINABLE AND INTEGRATED NATIONAL CAPABILITIES AND INFRASTRUCTURES

Through investment in research and innovation, as well as national capabilities and infrastructure, BBSRC plays a central role in shaping a bioscience ecosystem that is not only world-class but also fit for the future.

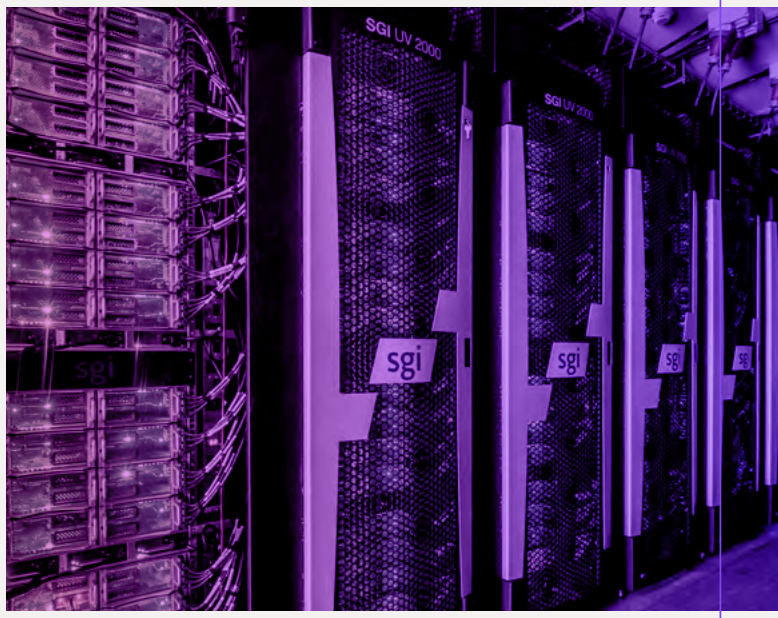
We will make strategic investments across the UK to support a broad spectrum of research needs, from individual laboratories, distributed infrastructures for scale-up, to nationally significant capabilities. These investments, often in partnership with others, will drive our research and innovation priorities, serve as anchors for vibrant communities, attract and retain talent, promote interdisciplinary collaboration and help drive economic prosperity.

BBSRC will invest in increasingly integrated and agile national capabilities across the UK, such as universities, strategically supported institutes, research and innovation campuses and large-scale multi-user facilities. Through long-term support for programmes, infrastructure and expertise we will foster connected innovation ecosystems that link public and private sectors to co-develop solutions and translate ideas into real-world impact.

By integrating disciplines, technologies, resources and data, and by effectively supporting people, ideas and equipment, we will enhance research productivity. Biological resources such as curated collections, genetic stocks and bioinformatics tools and services are integral to this vision, supported through coordinated networks that ensure quality, accessibility and added value.

We champion long-term availability of infrastructure and operational support of critical assets to preserve functionality and scientific value. In doing so, we also recognise the importance of environmentally sustainable practices that ensure these infrastructures remain resilient and responsible for future generations. These assets serve as vital training grounds, supporting the development of skilled talent across the biosciences. We will continue to promote in the diverse community that underpins bioscience infrastructure, including professional development, retention and clear career pathways for research technical professionals, research software engineers and infrastructure managers.

In partnership across the UK and internationally, we will continue to seek opportunities for co-investment and sharing to foster networks that maximise the added value of infrastructure. By embedding environmental responsibility, open access, long-term planning, and data-informed, user-driven decision-making, BBSRC will ensure that UK bioscience infrastructure remains resilient, responsive and globally competitive.




High-performance computing infrastructure. Credit: Earlham Institute

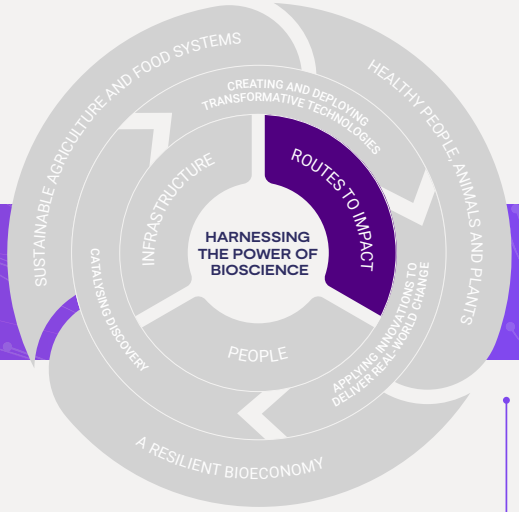
## BBSRC AT NORWICH RESEARCH PARK: DRIVING INNOVATION IN BIOSCIENCE

The Norwich Research Park is one of the largest single-site concentrations of food, genomics and health research in Europe. It is home to three BBSRC strategically supported institutes: the John Innes Centre, Quadram Institute and Earlham Institute, alongside the University of East Anglia, Norfolk and Norwich University Hospital and The Sainsbury Laboratory. This unique environment helps research-intensive businesses to grow and scale by providing access to specialist facilities and world-class research expertise on the BBSRC Research and Innovation Campus. A flagship initiative is the Next Generation Infrastructure at the John Innes Centre, which is establishing a world-class centre for UK plant and microbial science. More than new facilities, it will transform how science is done, advancing interdisciplinary research, integrating cutting-edge technologies, and training future leaders to tackle global challenges.

Computer-generated Image of the proposed JIC and TSL plant and microbial science hub. Credit: BDP/Secchi Smith

# ROUTES TO IMPACT

## ACCELERATING THE TRANSLATION OF BIOSCIENCE RESEARCH AND INNOVATION




Bioscience influences society globally and is a key driver of the UK economy. BBSRC is committed to enabling the journey from knowledge to societal impact. We support a dynamic and socially responsible bioscience community that engages with real-world challenges. Engaging early to bring together stakeholders, we will continue to develop and facilitate more effective routes to translate bioscience discoveries into meaningful impacts.

We are committed to working across the research and innovation ecosystem, including through the expansion of our strategic partnership with Innovate UK, to accelerate the translation and commercialisation of bioscience into a broad range of innovations. We work to build an environment that delivers end-to-end connectivity, from curiosity-driven discovery through to development, application and adoption by end users. As a centre of gravity for the bioscience community, BBSRC will incentivise early-stage collaboration and co-create research directions with industry, researchers, regional stakeholders and investors.

Credit: Getty

In collaboration with Innovate UK, we will facilitate access to translational funding, increase visibility of innovation opportunities, and support earlier, more effective engagement between businesses and researchers, and with policymakers and regulators. We will provide diversified support to broker and co-create more holistic stakeholder communities better connected to research and innovation.

By facilitating bioinnovation clusters, incentivising regional partnerships and encouraging private investment, we will promote inclusive growth and shared prosperity – locally, regionally and nationally. This will ensure that the benefits of bioscience innovation are realised across the UK and that they contribute to its global competitiveness in bioscience-driven enterprise.

### High-quality and inclusive bioscience

We are committed to enabling trusted and inclusive bioscience that delivers wide-reaching impact through high-quality research and innovation with meaningful public engagement built in from the start. We will set high standards fostering a responsive research culture grounded in integrity, security and scientific rigour. We will continue to ensure an environment that supports investment in ambitious and high-potential research through a culture of well-managed risk-taking and operational innovation in decision-making processes. Our governance will support the responsible development of emerging biotechnologies, embedding societal considerations early in the research process to ensure that technologies are developed in ways that are ethical, safe, inclusive, equitable and acceptable to society.

We will continue to drive open science and the adoption of FAIR data principles, making data Findable, Accessible, Interoperable and Reusable, to promote transparency, collaboration and reproducibility.

We will work with others across disciplines and communities to share best practice, embed equality, diversity and inclusion, and ensure bioscience reflects the needs and values of the public. High standards will be an enabler of progress, shaping research that is innovative, trusted, and aligned with societal and environmental goals.

Credit: Getty

## A more interconnected research and innovation system

BBSRC will harness its convening power and unique position nationally, internationally and as part of UKRI to champion a more connected, porous and collaborative science ecosystem. This will accelerate discovery, foster inclusive partnerships, encourage mobility and deliver meaningful societal and environmental benefits. We will work to build routes to connect, reduce fragmentation, and maximise the value of public investment by supporting partnerships across disciplines, sectors and borders.

By strengthening the links between citizens, bioscience evidence and decision-making, we will ensure high-quality bioscience is informed by and responds to pressing societal and environmental challenges. We will connect bioscience with the broader research, innovation and policy community by engaging early to co-create shared priorities. This will involve brokering close collaboration with researchers, industry, policymakers, regulators and end users of research. Through national and international partnerships, we will ensure the UK bioscience community can access diverse data, environments and capabilities, enabling collaboration with global counterparts to tackle shared challenges that demand international solutions.

We will empower UK researchers to build partnerships from the ground up, while sustaining strategic bilateral and multilateral collaborations. International initiatives and infrastructures will support the safe and secure exchange of people, data and ideas. This will keep UK bioscience outward-looking, connected, and ready to lead impactful global and domestic partnerships. Sharing ideas, expertise and resources across borders, we will strengthen UK bioscience and extend its global influence.

## A stronger voice for UK bioscience

BBSRC will strengthen its role as a trusted advocate for UK bioscience through strategic engagement and sustained dialogue with diverse stakeholders. We will ensure the benefits and outcomes of bioscience are shared widely, working with others to deliver clear and compelling evidence-based narratives that communicate its value.

We will work to enhance our policy relationship by developing unified messaging that facilitates collaboration. Just as vital is fostering two-way dialogue, listening to stakeholders, recognising their expertise and engaging them as partners early in the research lifecycle. Together we will demonstrate bioscience's contributions to society, the economy and the environment, using accessible language and inclusive engagement to reach diverse audiences.

We will continue to strengthen our international engagement to ensure UK bioscience contributes to and benefits from global research efforts, reinforcing its leadership and influence on the world stage. By aligning evidence with messaging and building mutual understanding, we will amplify the voice of UK bioscience and create the conditions for deeper connection, collaboration and impact.

## POWERING INNOVATION, DELIVERING IMPACT

BBSRC plays a vital role enabling the translation of bioscience research into real-world impact. Over the past decade our strategic investments have supported high-growth spin-outs that have created thousands of jobs and contributed significantly to economic growth. Often unseen but essential, bioscience innovations underpin global markets projected to reach $2-4 trillion by 2040. Looking ahead, BBSRC will continue to build connectivity, catalyse innovation, nurture talent and drive sustainable growth across the UK bioeconomy.


A scientist loading a flow cell into a portable Oxford Nanopore DNA sequencer.
Credit: Oxford Nanopore Technologies plc

## DRIVING CONNECTION: SUSTAINED SUPPORT FOR GLOBAL RESEARCH NETWORKS

BBSRC has a strong legacy of supporting long-term, collaborative research networks. A prime example is the International Veterinary Vaccinology Network (IVVN), co-led by The Pirbright Institute, Surrey and The Roslin Institute at the University of Edinburgh. Launched in 2013/14, this global community now includes over 1,900 scientists and industry partners across 93 countries. Supported by both BBSRC and UKRI's Medical Research Council (MRC), IVVN exemplifies how partnership and strategic investment in networks can drive innovation in animal health, vaccine development, and global disease preparedness.

Tanzania cows and goats.
Credit: The Pirbright Institute

Front cover image: Viruses directly transmitted to their hosts. Nodes (circles) represent viruses or their animal or plant hosts. Links indicate if the virus is transmitted to the host by a direct transmission route. Node size scales with the number of links. Credit: Dr Maya Wardeh, University of Liverpool

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