



**Biotechnology and
Biological Sciences
Research Council**

BBSRC Community Webinar

24 November 2023

10.00 - 11:30

Agenda

1. Introduction - Executive Chair
2. 'Spotlights' – Commercialisation and Peer Review
3. Panel discussion with Executive Leadership Team



Professor Guy Poppy
Executive Chair
(Interim)



Dr Amanda Collis
Deputy Executive Chair
(Interim)



Dr Karen Lewis
Executive Director
Capability & Innovation



Dr Sarah Perkins
Executive Director
Strategic Planning,
Evidence & Engagement



Dr Jef Grainger
Executive Director
Research Strategy &
Programmes
(Interim)

BBSRC: what we do



- Invest in world-class **discovery** and **strategic bioscience research** to advance the frontiers of biology and drive towards a healthy, prosperous and sustainable future
- Invest in **bioscience training and skills** for the next generation of bioscientists
- Invest in **cutting-edge infrastructures** to support bioscience research
- Drive the widest possible **social and economic impact** from our bioscience in industry, policy and public goods
- Promote **public dialogue** and **engagement** on bioscience

8 BBSRC-supported Research Institutes

Providing **national capability/expertise** in strategically important areas: sustainable agriculture, plant & crop science, animal health, food & nutrition, healthy ageing, advanced genomics and bioinformatics

At the core of research and innovation campuses

BBSRC Institute Strategy centres on **Capability, Connectivity & Culture**

BBSRC: part of UKRI – transforming tomorrow together



Arts and Humanities Research Council



Biotechnology and Biological Sciences Research Council



Economic and Social Research Council



Engineering and Physical Sciences Research Council



Innovate UK



Medical Research Council



Natural Environment Research Council

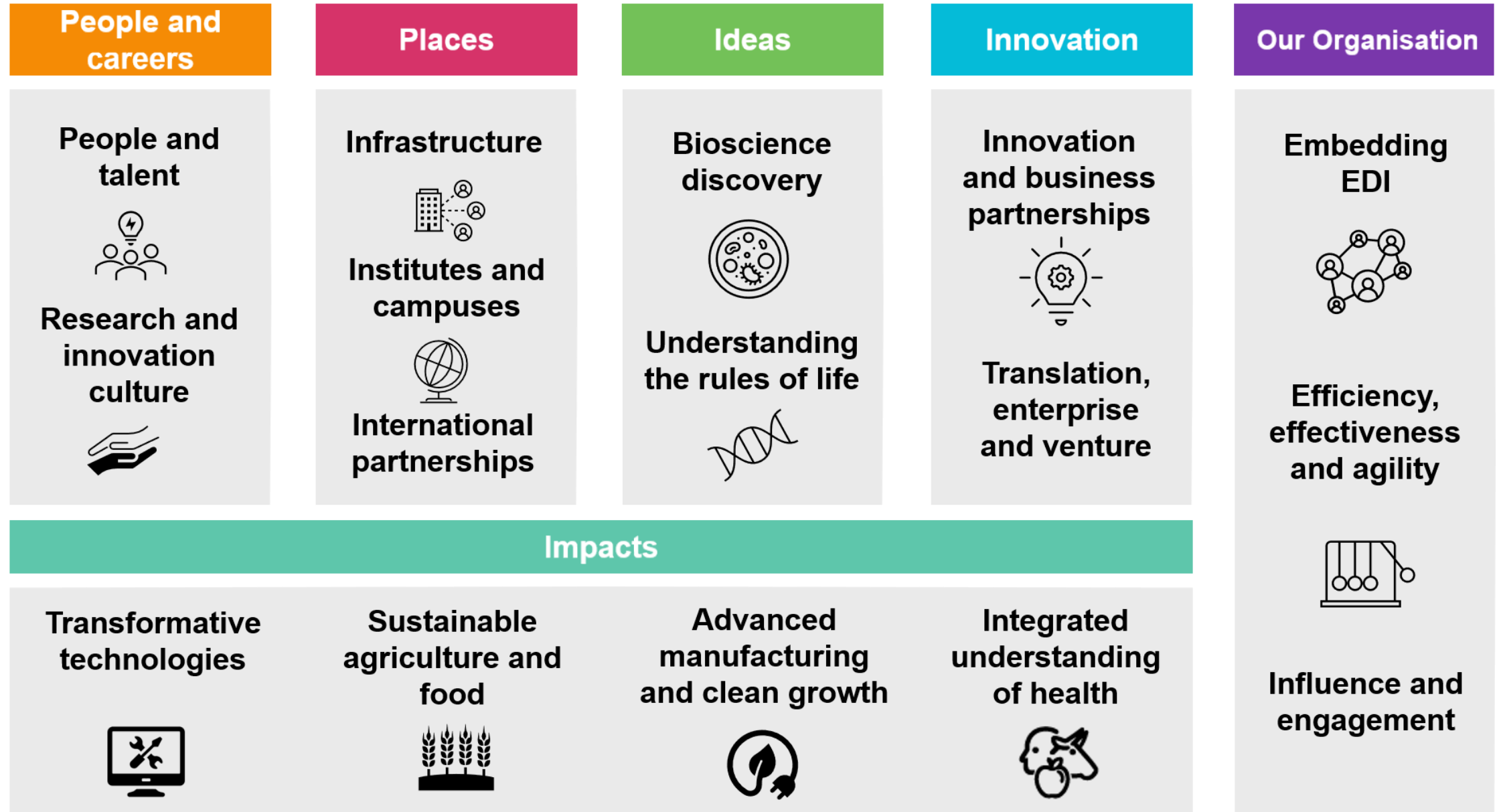


Research England



Science and Technology Facilities Council

BBSRC Research and Innovation Priorities – Delivery Plan 2022-25



People and Careers

Attracting, retaining and developing a highly skilled, diverse and mobile bioscience workforce

BBSRC Discovery Fellowships – 2023 competition in progress

Policy Fellowships – supported the 2023 programme, facilitating deeper and more enduring connections between researchers and policymakers (Defra, DESNZ, DHSC, FCDO, devolved administrations)

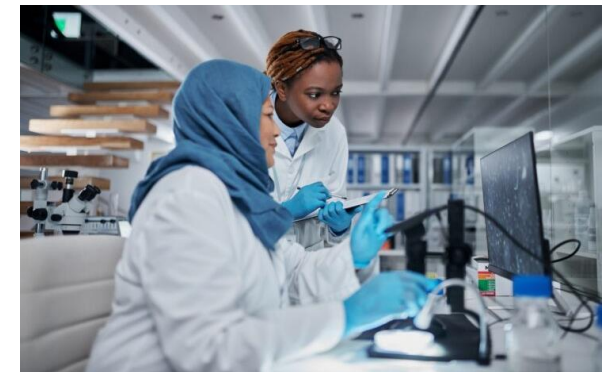
UKRI Collective Talent – engaging in transition, new Doctoral Investment Framework - re-shaping our future doctoral provision from 2024 (**Learn more: webinar 7th Dec**)

<https://www.ukri.org/news/re-shaping-bbsrcs-future-doctoral-provision/>

Mobility and Porosity

BBSRC has launched programmes aiming to increase porosity between sectors and institutions as well as providing a platform for training, skills and career development.

Examples include our **Flexible Talent Mobility Accounts** and **Professional Internships for PhD Students (PIPS) placements**.



Places

Strengthening our capabilities, resources and infrastructure for the benefit of all

Institutes - Significant investment in **strategic research programmes** and **infrastructure** to support critical national capabilities.

Biotech Business Incubation Centre (Bio BIC) – in partnership with STFC, supporting biotechnology start-ups in the North-West.



Revolutionising wheat

Sustained investments in wheat research to safeguard one of the world's most vital crops and strengthen global food security.

Flagship programmes include those led by **institutes** and the **International Wheat Yield Partnership**



Ideas

Prioritising **investigator-led research** – supporting fundamental bioscience to expand the frontiers of our knowledge and understanding.

Responsive Mode - ~£150M investment for 2022/23

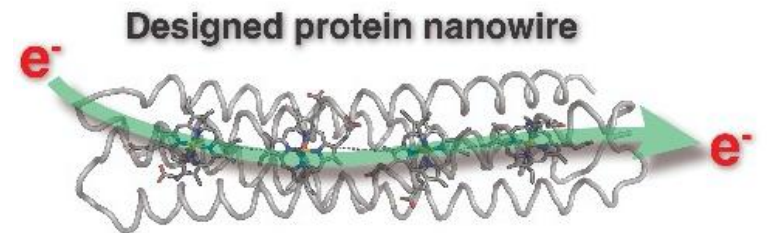
sLoLas – £18M investment for 2022/23, supporting 4 projects

Pioneer awards – £12M supporting **62 early-stage projects** with potential to transform our fundamental understanding of biological systems

Tools for bioelectronics

Advances in structural genomics have provided fundamental knowledge regarding the mechanisms and machinery involved in photosynthesis and cellular energy production.

Allowing researchers to develop conductive, biodegradable wires from designed proteins.



University of
BRISTOL

'Circuits of Life'
sLoLa, £4.9M

Innovation

Working towards **incentivising and enabling bioscience innovation**

Strategic partnership with Innovate UK

>£50M joint investment

Novel low-emission food production systems (£16M),
Alternative Proteins Innovation and Knowledge Centre
UK Sustainable Biomanufacturing (£14M)

Business and academia prosperity partnerships

Funding to support research-based partnerships between
business and academia

Call now open, deadline 20th December



Hacking the skin's natural repair process

Developed by researchers at Boots and the University of Manchester, Peptidology™ underpins a new Boots skincare range – **No7 Future Renew** – shown to reverse the signs of skin damage



MANCHESTER
1824

The University of Manchester

Delivering impact

Enabling the use of **bio-based solutions** to tackle national and global challenges

National Engineering Biology Programme

Secured funding boost via **Technology Missions Fund** – Engineering Biology Missions Hubs and Mission Awards (£74M); Engineering Biology Accelerator

Tackling Infections

UK Monkeypox Consortium, Transdisciplinary networks to tackle antimicrobial resistance (AMR)

Call now open, deadline 13th December

Bringing life to colour

Colorifix - one of the finalists in this year's **Earthshot Prize** – is using engineered microbes to produce, deposit and fix pigments onto textiles - providing a much more sustainable solution to traditional dyeing methods.

Their process cuts chemical pollution by 80% and uses 77% less water; without reliance on non-renewable petrochemicals.



BBSRC engaged with UKRI strategic themes

Building a green future

Land Use for Net Zero (cross-UKRI and cross-government)
Biomanufacturing and Circular Economy (with EPSRC, NERC and IUK)
Sustainable Agriculture increased Biodiversity (with NERC)
One Health approach to Food and Nutrition Security (with Defra, FCDO, MRC, ESRC)

Better health, ageing and wellbeing

Immunology and Ageing and **Fundamentals of Ageing** (with MRC, ESRC, BSI, UK ARF, Dunhill)
Biosocial Research and **Addressing Health Inequalities** (with ESRC)
Brain Repair and Neurotechnologies (with MRC, EPSRC, IUK)

Tackling infections

One Health (with Defra, FCDO, Europe, USA (EEID), MRC, ESRC, EPSRC, NERC, IUK)
Zoonoses: Strengthening Research at the Animal-Human Interface (with Defra, UK HSA, MRC, NERC, ESRC, Europe)
Antimicrobial Interface (cross-UKRI and cross-government)

Transformative technologies

National Engineering Biology Programme (with EPSRC, MRC, NERC, IUK, Dstl, CPNI)
AI for Biology (with EPSRC, MRC, NERC, STFC)
Bioinformatics and Genomics (with MRC)
Basic Technologies (with AHRC, EPSRC, MRC, NERC, STFC)

Looking ahead

An exciting time for bioscience – ‘Age of Biology’

New opportunities, can provide solutions to tackle many of the challenges faced by society

Big Ideas Pipeline – transform bioscience with your big ideas.

Open for submissions* until **12 January 2024**.

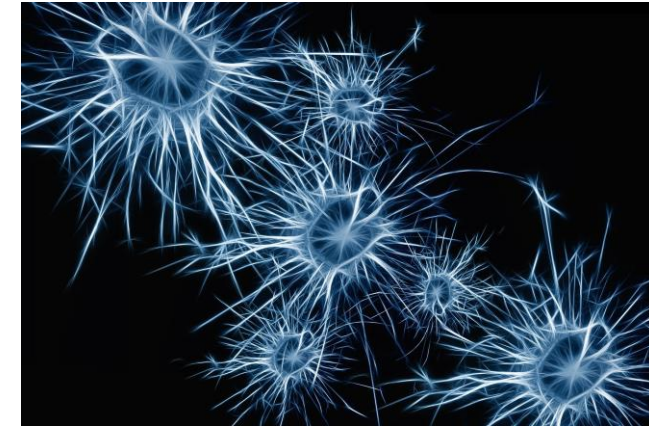
<https://www.ukri.org/who-we-are/bbsrc/who-we-are/bioscience-big-ideas-pipeline/>

Looking ahead

Opportunities to (re)connect – value input from the community

Partnership working – important to enable us to deliver our shared ambitions for bioscience

Shared endeavour – shared advocacy for the importance of bioscience

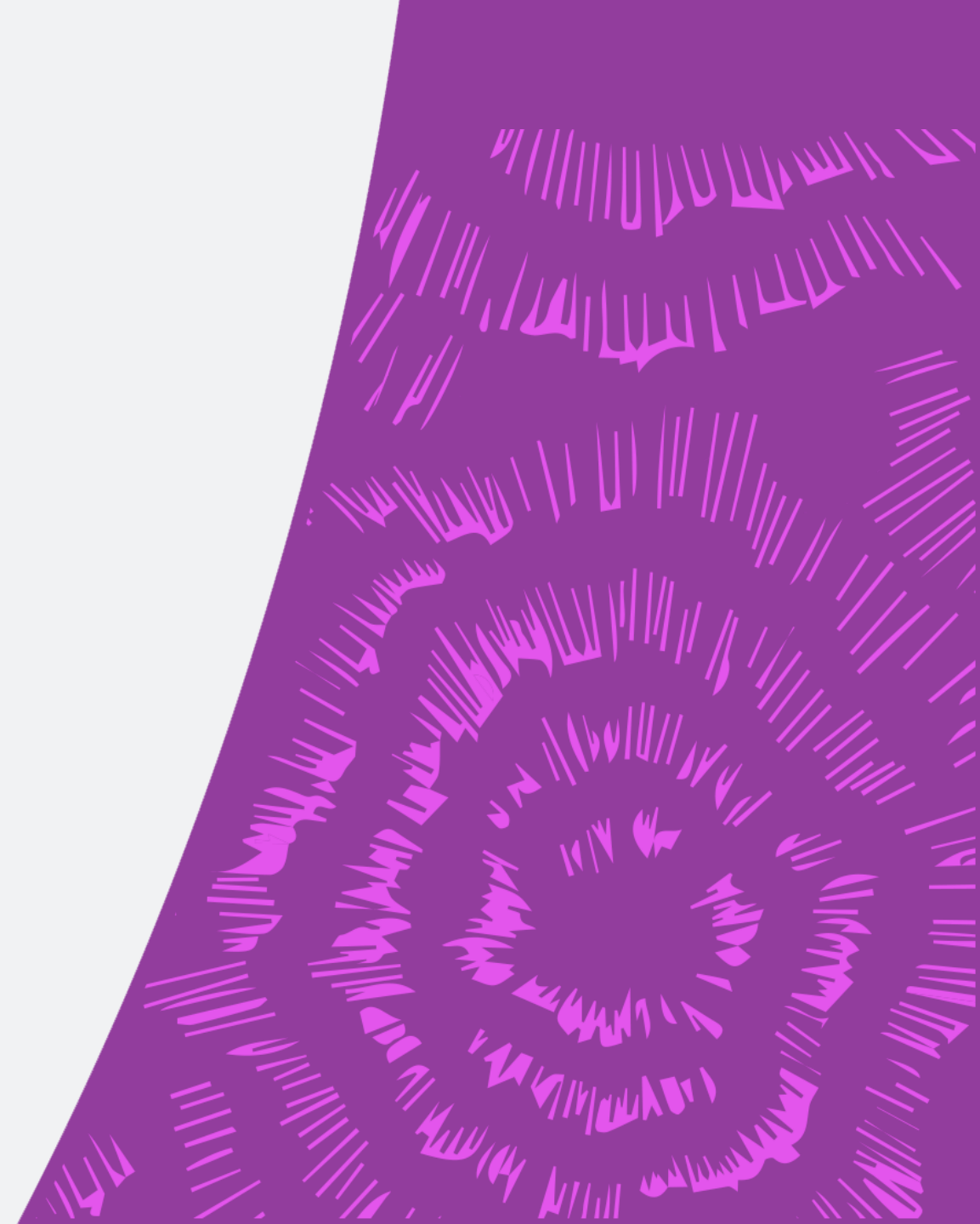




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BBSRC spotlight:

**Research
Commercialisation**



Aim is to highlight:

- UKRI ambitions for research commercialisation
- Specific BBSRC interventions that connect the system
- Examples of bioscience commercialisation

Your feedback:

Q1 – Before today which of the following BBSRC interventions/activities were you aware of?

Q2 – What do you see as the biggest challenge to commercialising bioscience research?



Research commercialisation: why it matters

*“In the coming years, rapid advances in bioscience discovery and innovation will be essential for driving the changes needed to maintain the health and wellbeing of people and animals, and to protect and transform our **economy, society and environment**”*

- Commercialisation is a major route for converting ‘know-how’ into a **usable and accessible** format to drive **positive global impact**
- Bio-based innovation is truly **pervasive and increasingly embedded** across a vast range of markets: agriculture to energy, personal care to sport, transport to wellbeing
- Bio-based innovation is often a **“unseen component”** of the final product or service
- ...fundamental to economic growth, the *‘Economic impact assessment of BBSRC attributable spin-outs’* will show a cohort of **402** are estimated to contribute **£7 billion** over a 20-year time frame



Our ambition is to create a **connected UK research and innovation system** that encourages and supports bioscience innovation and empowers bioscience entrepreneurs.

UKRI's vision for research commercialisation

- ✓ **Influence and incentivise** by fostering an open, inclusive and collaborative culture across the research and innovation system, bringing research organisations, businesses, investors and policymakers more closely together. This will help take early-stage ideas to national and global markets.
- ✓ **Maximise support** through the development of our funding, products and services, UKRI will maximise research commercialisation to address the greatest economic and societal challenges. by
- ✓ **Advocate for research commercialisation** by developing a clear evidence base to increase visibility of the importance of UK research commercialisation to society and the global economy.



Academic-led BBSRC interventions



BBSRC Impact Acceleration Accounts

Flexible, responsive and creative funding through a **harmonised UKRI call**

Enables tailored **bioscience innovation** activities in line with RO **strategic goals**

Areas covered:

- translational research
- collaboration & strategic partnerships
- user engagement
- knowledge exchange
- skill development

BBSRC supported 23 organisations through the most recent call



BBSRC Follow-on Fund

BBSRC Follow-on Fund (FoF) enables the technical development of bioscience discovery into practical applications

Open to current or previous BBSRC supported projects – **including prior BBSRC IAA and BBSRC ICURe recipients**

Funding supports researchers to innovate and to generate outcomes such as products, services, spin-outs, and licensable IP.

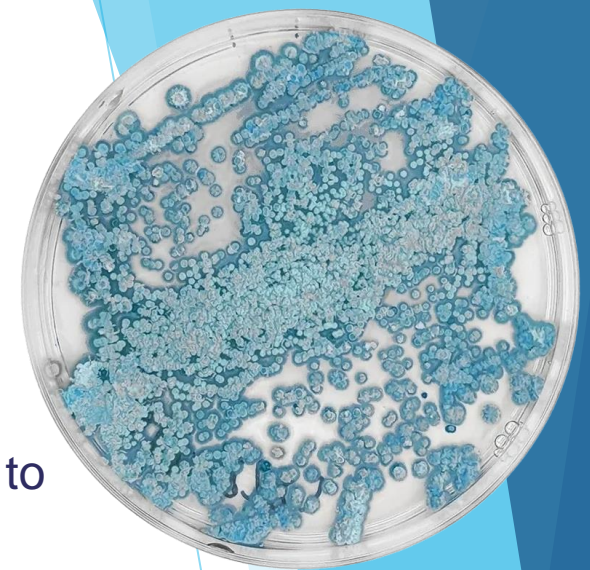
Applications must demonstrate a clear understanding of market opportunity and describe a programme of work to optimise the economic and societal benefit from the grant

Grant award: **£100,000 to £800,000** at 80%fEC, up to 2 years

Assessment process: Panel only



- Building on research undertaken at the University of Warwick
- **Automated platform technology** combining a range of tools (inc. bioinformatics, microbial engineering, synthetic biology, synthetic chemistry) to **discover and develop new bioactive compounds**
- Applications in a range of **therapeutic and agrochemical areas**, e.g. new medicines and crop protection compounds. Hit rates **20x better** than synthetic chemicals
- Completed the **ICURe programme** in 2019
- The ideas and skills needed were further supported by **BBSRC IAA** funding, **BBSRC Pathfinder** and **Follow on Funding**, and a **BBSRC RSE Enterprise Fellowship**, as well as local and institutional support
- Erebagen have since filed their initial patent and attracted significant Venture Capital investment to develop the company
- Named by Sifted as **one of 13 TechBio start-ups to watch in 2023**



Erebagen microbial research, taken from erebagen.com

UKRI Research and Innovation Campuses

Developing bioscience research and innovation clusters around BBSRC strategically funded Institutes and beyond...



BBSRC invests in research and innovation capabilities to scale clusters

- > 200 innovative tenant companies across the BBSRC campuses
- > 2,300 people employed by companies on BBSRC campuses
- > £1.2 bn private investment raised by BBSRC campus companies

BBSRC Campus Innovation Awards (Yr 1):

1.4M invested, supported 43 companies, > £1.1m leveraged funding

BBSRC-STFC Bioscience Business Incubator Centre (Bio BIC)



Biotechnology and Biological Sciences Research Council



Science and Technology Facilities Council

Located at STFC's Daresbury laboratory, Bio BIC supports **early-stage biotech start-ups**, built on leading bioscience research, bridging the gap between science and market to achieve their full commercial potential.

Bio BIC Offering

- ✓ Up to £45k targeted R&D funding
- ✓ Up to 100 hrs access to R&D facilities and technical advice
- ✓ IP protection support
- ✓ Networking and introductions to investors, customers, sector stakeholders and next stage funders
- ✓ Unlimited business coaching provided by dedicated business experts

SUGAROX

- Based on 20 years of research and founded by Cara Griffiths and Matthew Paul at Rothamsted Research and Ben Davis at the University of Oxford.
- Developing **bio-stimulants to help farmers optimise productivity** and **improve the resilience** of crop systems to adverse weather conditions. First product showed wheat yield increases of 20%.
- Technical development supported by **BBSRC Follow-on Funding**.
- Supported by the Rothamsted **SHAKE** Climate Change accelerator and seed investment programme.
- Now based at **Rothamsted Enterprises'** Agri-Tech Business Centre.
- Between 2020 and 2022, SugaROx attracted over **£1.4M** of investment from angel and VC investors, as well as **£1.7M** grant funding from Defra and Innovate UK.
- Has just completed a **Seed investment round** co-led by UKI2S.



Proof-of-concept work on drought-stressed sorghum.
Left: the effect of T6P application on stressed plants. Right: control.

BBSRC interventions



High risk, early-stage patient Venture Capital

- Building & growing **tech companies** stemming from the UK's research base
- **£100M+** national **pre-seed and seed** stage fund
- Linking public sector **research to private** capital
- UKRI (**BBSRC**, MRC, NERC, STFC) is a core partner

Scope includes:

- Projects & companies arising from **BBSRC Institutes**
- Tenant companies based on **BBSRC R&I Campuses**
- UK-based **engineering biology** companies
- UK-based companies working with a **Catapult Centre**



Support to identify potential market for products or services that utilise their **bioscience-based idea, research, or technology**, with up to **£35k of funding** to 'get out of the lab'

Open to:

- **Bioscience** innovations or those addressing bioscience challenges that build on any **prior UKRI funding**
- All researchers and technical research staff at **any career stage** (inc. PhD students)
- All UKRI eligible research organisations **and institutes**

Currently open - apply [here](#):

- BBSRC ICURE Explore: 1 Nov 2023 – 15 Jan 2024
- BBSRC ICURE Discover: 15 Nov 2023 – 30 Jan 2024

Innovation Bulletin

[click here to subscribe](#)

- Academic led innovation
- Collaborative research and development with industry
- Industry collaboration in training



2005: Professor Kylie Vincent secures BBSRC funding for fundamental research on hydrogenase, unveiling its potential for cleaning up fine chemical manufacturing

2016: Professor Vincent's group secures £2.9 million funding from EPSRC, Innovate UK and BBSRC's Industrial Biotechnology Catalyst

2023: HydRegen and the University of Nottingham secure funding from BBSRC, EPSRC, and Innovate UK's sustainable biomanufacturing feasibility competition

2014: A Business Interaction Voucher from BBSRC's Metals in Biology Network supports a partnership with GlaxoSmithKline

2022: HydRegen secures £385,000 funding from UKI2S to scale up the platform

2013: HydRegen technology wins the Royal Society of Chemistry's Emerging Technology competition

2020: Dr Holly Reeve becomes HydRegen's Entrepreneurial Lead on Innovate UK's ICURe scheme

2021: HydRegen spins out from the University of Oxford

Commercialisation is a connected 3D system...it is not a linear pathway



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“If you have invented a
sundial, please do not
leave it in the shade”

Knowledge Exchange and
Commercialisation Unit

Get in touch

kcu@bbsrc.ukri.org





Biotechnology and
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Spotlight on Peer Review

Dr Jef Grainger

Executive Director (interim)
Research Strategy and Programmes



R&D People & Culture Strategy (2021)

- ask UKRI to undertake a review of how they use expert peer review. This will examine the incentives, strengths and weaknesses of the current approach to identify improvements which would positively impact on the culture of, and people working in, R&D.

UKRI will review its approach to peer review, building the evidence on the ways researchers experience the process as applicants, reviewers and assessors. They will ensure their process and systems are easy to work with and minimise unnecessary bureaucracy. UKRI will do this by exploring the principles, policies and processes underpinning peer review. This is with the aim of ensuring they remain fit for purpose and support the highest quality projects and ideas.

The growing scope of R&I funding

Now

Gen. 1
1945

'Basic' ('curiosity-driven'/'discovery'/'bottom-up') research

Driven by scientists' interests – cf V. Bush, 1945, 'Science – the endless frontier'

Gen. 2:
1960s

Innovation / economic growth

Creation of OECD, creation of innovation agencies

Gen. 3:
2000s

Help solve societal challenges

UN SDGs, R4D programmes, 'impact'

(Gen. 4:
2020s?)

Emergency support

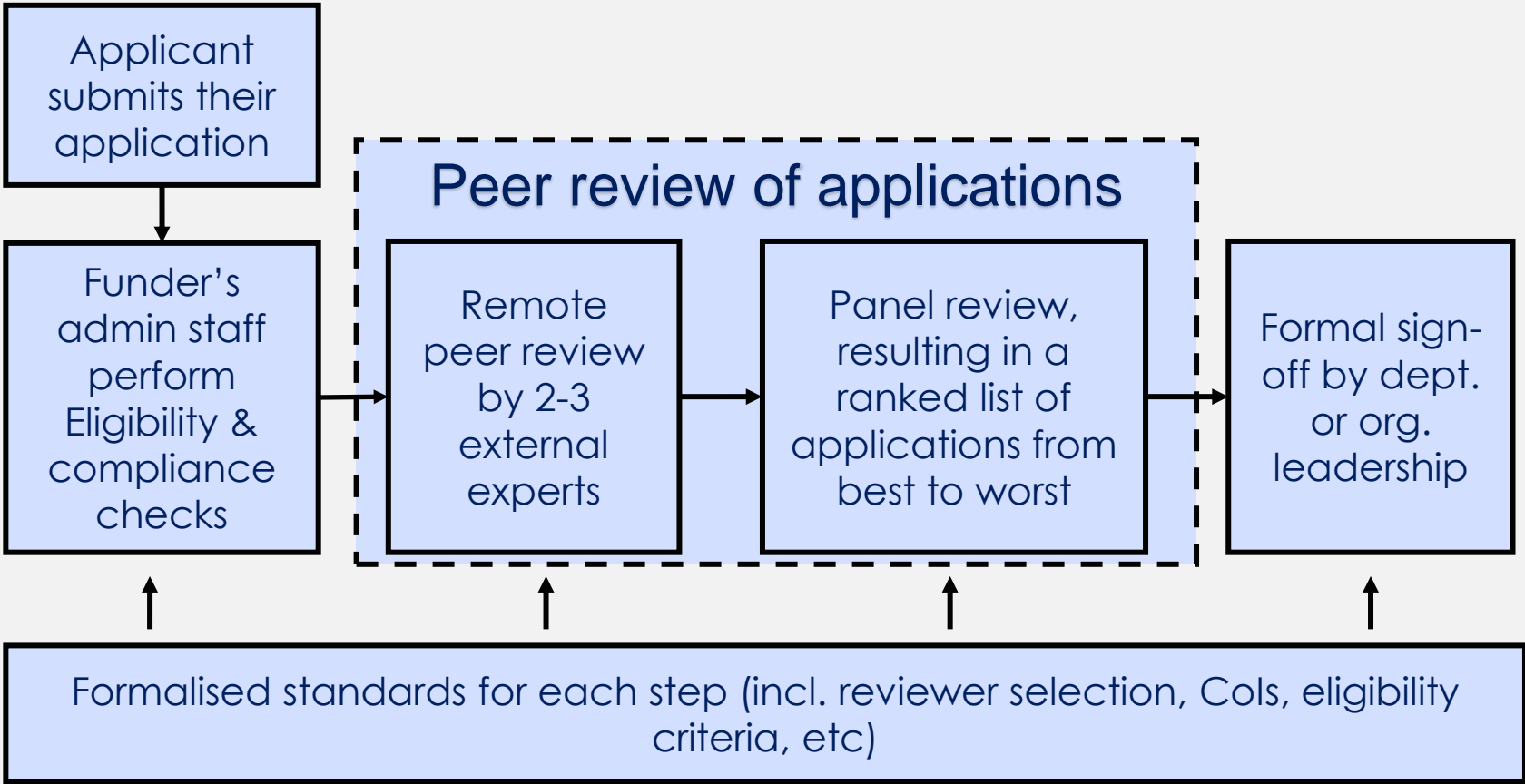
Covid-19, future crises?

Throughout

Increasing interest in research culture/ landscape/ careers

Internationalisation, gender equality, research infrastructures, ECRs, etc.

Almost all funders use roughly this 'baseline' process most of the time:



The 'baseline' process

Large literature characterising peer review and exploring its strengths and weaknesses

Key issues with peer review include:

- **It's burdensome** Guthrie et al 2018, Herbert et al 2015, RAND 2013, Nuffield 2014
- **It's partially arbitrary** Mutz et al 2016, Abdoul et al 2012, Graves et al 2011, Clarke et al 2016
- **It tends towards conservatism** Kuhn1970, Wessely 1998, Horrobin 1996, Roy 1985, Luukkonen et al 2015
- **It may be biased** Tomkins et al 2017, Magua et al 2017, Mutz et al 2015
- **It struggles to reward factors other than excellence** OECD 2018

Review of Peer Review

- Independent piece of work undertaken by Technopolis, commissioned by UKRI
- Based around 38 “interventions” or changes that could be made to a baseline peer review process (not specially UKRI processes)
- Evidence gathered through
 - A broad review of the published literature
 - Sourcing studies/reports/papers/analyses from UKRI
 - UKRI staff survey
 - Interviews with UKRI staff and other funders
- Outputs:
 - Comprehensive report presenting evidence
 - Supporting online tool for exploring data
 - Full reference material/bibliography

Examples of the 38 interventions considered

- Pre-call e.g. **demand management**
- Application-design and parameters e.g. **expression of interest, reducing application length**
- Process design e.g. **sandpits/matching events, 2-stage application process, anonymisation, external review only (no panel), interviews**
- Decision-making e.g. **partial randomisation, sequential application of criteria, use of quotas**
- Training and feedback e.g. **open review/rebuttal, expanding or reducing the amount/detail of feedback given**

Outputs

An independent report and a 'tool to explore the data' to help funders think about the design of peer review.

Search for UKRI + Review of Peer Review to find the report

<https://www.ukri.org/news/review-of-peer-review-published>



9 Summary and recommendations

Our headline findings are noted at the outset of this report. However, before we conclude with our list of recommendations resulting from our research, we briefly summarise our research in the table below. It shows how each of the 38 interventions relates to the 7 main aims posited at the start, as well as the main hazards of each intervention, and our evidence strength rating.

Table 3 Summary of aims, hazards and evidence strength

	Intervention	Save time	Increase	Manage app	Reduce bias	Reduce burden	Fund high-risk	Increase review	Hazards	Evidence strength rating
Pre-call	Assessment criteria definition		X						Reviewers may not follow guidance; too many criteria risk over-complicating decisions	***
	Demand management: individuals (1)			X	X				Shifts burden to other funders, savings are minimal	*
	Demand management: individuals (2)			X		X			May simply shift re-submission to other funders, somewhat centralized	**
	Demand management: institutions			X		X			Large; shifts burden to institutions; potential additional bias, depending on institutional processes	****
	Working with underrepresented groups					X			May take some time to show effect; may entail administrative burden	****
Application design & parameters	Applicant behaviours				X				None known	*
	Expression of interest/pre-proposal		X			X			Longer time-to-grant, influx of out-of-scope apps limits information to inform decision-making	***
	Reducing applications length/cutting sections	X				X			Limits information to inform decision-making, may not always save burden for applicants	***
PRO	'Sandpits'/Matching events						X		Problems for access, EDI issues; can be partially resolved through remote events	****

Recommendations (include):

- that information technology (IT) systems need to have the necessary flexibility and function
- that some interventions have the potential to become a 'new normal' in order to save burden and reduce bias across the board
- that funders should monitor any interventions they undertake
- that investigations into wider research culture must continue alongside the process interventions discussed in the report

What is next?

A springboard to develop the idea of a 'centre of excellence' in Peer Review.

- Further ensure that UKRI peer review leads to high quality outcomes
- Peer Review tools and processes, and their impacts, are understood
- Better utilise the huge amount of data (trials, experiments, and evaluations)
- Facilitate better sharing of good and bad practice
- Better recognise and utilise staff expertise and experience in Peer Review.

As a result of the above, to establish UKRI as a global leader in Peer Review innovation.

BBSRC Peer review

Is evolving...

Managed mode – BBSRC focussed and collaborative calls on behalf of UKRI

- Panel-only or reviewer-only approaches
- Multi-stage processes
- Interviews

Responsive mode

- Pioneered IT-led innovations (e.g. discussion boards)
- Composition and roles of Pool of Experts

An exemplar - Pioneer Awards

- Pilot scheme focussed on early-stage, exploratory, but high-potential ideas
- Huge interest in scheme with 512 EOIs and 327 applications received
- Expert panels had a strong focus on identifying only the most original and potentially transformative projects for funding
- Due to the demand, the budget increased from £4 million to £12 million leading to 62 different projects funded from 32 different ROs
- Article published on BBSRC website this month showing all the funded projects
- We are currently reviewing the call to analyse perspectives of applicants and panellists, and develop key findings for this funding model.

Pioneer Awards – piloting new approaches

Testing capabilities of new UKRI funding service

- This was the first large scale call run by BBSRC/ UKRI through TFS, used for both the EOI and full stage
- TFS allowed us to tailor the application questions, increasing clarity for applicants and assessors
- TFS also meant applications were more consistent – word count, layout, balance of information collected.

Pioneer Awards – piloting new approaches

Increased risk appetite

- Responding to feedback from the community on need for more ‘blue skies’, early-stage funding
- Experiment in how to encourage (and assess) riskier projects, particularly in relation to novel ideas lacking preliminary data
- Use of specific assessment criteria, reducing ‘track record’ information, and a risk-supportive culture within the panel-only assessment process.

Pioneer Awards – piloting new approaches

Randomisation in peer review

- We trialled a version of randomisation in peer review, recognising:
 - some proposals might be difficult to separate in a standard ranking process
 - the benefits of not focusing on minor weaknesses to discriminate the potential of exploratory work
- Allowed the panel the *option* to randomise the ranked order of proposals on the same score, preserving primacy of panel decision-making
- Used by each of the three panels for a small number of ‘tie-breaker’ decisions

Pioneer Awards – piloting new approaches

360 feedback

- We gathered feedback from applicants, panel members and Chairs via surveys
 - Positively received by the community: *‘unique, exciting, distinctive, innovative ideas, transformative, promoting risk-taking, excellent’*
- and from the panel members and Chair survey
 - 93% respondents agreed that the Pioneer Award assessment criteria was supportive of risk
 - 78% of the panel were supportive of the approach taken to randomisation for a call of this nature
- We also gathered lots of useful comments on what made good proposals vs not, and other aspects of the scheme

We welcome your views!

- What are the key aspects of peer review that we should retain to maintain community confidence?
- What innovative approaches would you like to see trialled or more widely adopted?
- If you could wish for one improvement to peer review processes, what would it be?