

# International



**Our aim is to ensure that the UK remains a world-leader in the biosciences, and that academic research, industrial R&D and the UK economy benefit from the increasing scientific activity across the globe.**

Over the next five to 10 years we will deliver our international strategy through four inter-related areas of activity:

- Promoting the movement of people
- Enabling international research and collaboration
- Ensuring access to world-class infrastructure and information
- Discharging our global responsibilities



# Promoting the movement of people

Whether or not the UK has experienced a net ‘brain drain’ or ‘brain gain’ over the past 30 years, UK bioscience and bioindustries have burgeoned and benefited from the flow of scientists between countries.

BBSRC will continue to ensure that the very best UK researchers have opportunities to work with laboratories overseas. At the same time, we will encourage and enable their counterparts from around the world to work in the UK by helping to maintain an attractive and supportive research environment for bioscientists. Critical to this is our commitment to support the highest quality of research in UK universities and research institutes, and to facilitate new and multidisciplinary approaches to working and the development and provision of cutting-edge tools and resources.

- We will:**
- support scientist exchange through European Framework Programmes and through contributing to the Human Frontiers Science Program (HFSP), the European Molecular Biology Organisation (EMBO) and the European Science Foundation (ESF)
  - explore opportunities, through the EuroHORCs network<sup>1</sup>, to transfer grants between funders in the European Research Area under the ‘Money Follows Researcher’ scheme

**Rothamsted Research** enjoys a long tradition of collaborative research with scientists from China. Examples include: a project partly funded by the **British Council** with scientists at the **Institute of Genetics in Beijing** to evaluate phosphorous efficiency in different wheat varieties; studies with the **Chinese Academy of Agricultural Sciences** Oil Crops Research Institute on stem rot and stem canker of oil seed rape; and cooperation with Nanyang University through a joint **Nanyang-Rothamsted** Laboratory on Insect Biology.



BBSRC’s new **Centres for Integrative Systems Biology** are at the forefront of building multidisciplinary research teams that combine conceptual and experimental skills, and which are driving innovation in bioscience research. These international centres attract high-calibre researchers from around the world.

The Centre for Integrated Systems Biology of Ageing and Nutrition at **Newcastle University** has attracted top scientists from **Japan, Australia** and **China** as part of its 40-strong team.



<sup>1</sup> European Heads of Research Councils



“UK bioscience research is very strong<sup>2</sup>. But only 10% of the world’s science and innovation happens in the UK. International interaction helps sustain the vibrancy of UK research, by promoting the free-flow of ideas and researchers. UK scientists make a major contribution to international projects that advance national research agendas and underpin commercial and technological innovation worldwide”

Dr Doug Yarrow  
BBSRC Director of Corporate Science

The intellectual stimulation of working in leading teams across the world and the chance to gain new skills and expertise is particularly beneficial for researchers at the start of their careers.

BBSRC welcomed the relaxation in eligibility rules that makes it easier for students across Europe to conduct postgraduate research in the UK. We support the HFSP Fellowship scheme that enables scientists, from participating countries, to work in laboratories overseas, and gain training and experience in different fields.

Our five-year postdoctoral fellowships (**David Phillips Fellowships**) are available to the very best scientists, whatever their country of origin. Over the past five years, 43% have been awarded to non-UK nationals. **RCUK Academic Fellowships** also provide a significant opportunity for new researchers to establish themselves in the UK.

**We will:**

- ensure that our PhD studentships continue to attract the highest calibre students
- work with other Research Councils and industry to offer Dorothy Hodgkin Awards, enabling students from developing countries to undertake PhDs in the UK
- promote the scientific and wider benefits of working with leading research groups overseas, and monitor trends in the uptake by British scientists
- increase the promotion of research opportunities in the UK to researchers worldwide
- provide new funding to enable PhD students in major centres supported by BBSRC to work with groups overseas
- provide a common framework with other funders to promote and enhance the attractiveness of UK fellowships

<sup>2</sup>The Office of Science and Innovation’s Evidence report on the performance of the UK Research Base ([www.ost.gov.uk/research/funding/psa\\_metrics\\_report.pdf](http://www.ost.gov.uk/research/funding/psa_metrics_report.pdf)) showed that, in terms of indicator outcomes, the UK remains second only to the USA in the biosciences, and that specifically in the area of high-impact research publications the UK has now moved ahead of the USA in pre-clinical and health and biological sciences.



# Enabling international research and collaboration

We must recognise and harness the mutual benefit that derives from regarding international research competitors as research collaborators.

We support international collaborations at the level of individual researchers, research centres and funding bodies – both bottom-up and top-down approaches. We aim to respond flexibly to address researchers' needs and emerging scientific opportunities.

BBSRC does not directly fund research proposals from overseas. However, we encourage the development of international partnerships, and fund their UK component, with the aim of catalysing new, longer-term research collaborations. We plan to increase our efforts to help UK scientists win funding from international agencies, by supporting overseas visits and international workshops to identify and seize opportunities for joint research.

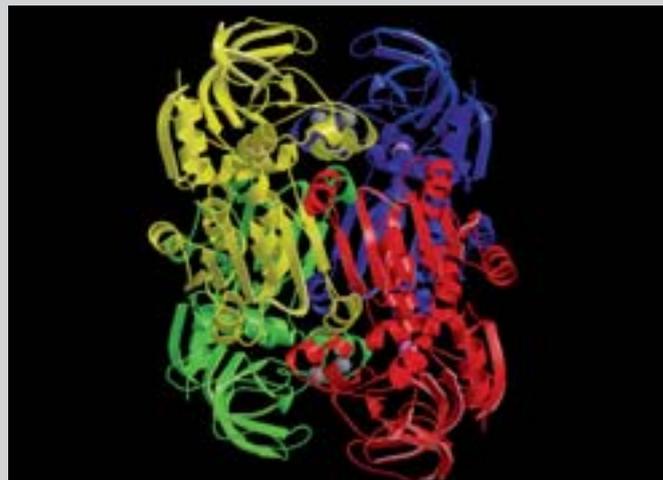
To help researchers and research teams initiate new partnerships we will:

- provide up to £100k per annum for ISIS Awards
- raise international awareness of UK bioscience and increase opportunities for international collaborations
- welcome bids from BBSRC-supported scientists for workshops at which UK and foreign researchers can consider collaborations in emerging or strategic areas

BBSRC, with the other Research Councils, has worked with the Office of Science and Innovation to develop the UK line towards **Framework Programme 7 (FP7)**. BBSRC manages the **UK Research Office (UKRO)** in Brussels on behalf of all Research Councils. The Office publicises opportunities for academic researchers in the UK to access EU programmes. It has also helped to ensure that the Commission will address issues such as UK Full Economic Costing and simplified procedures in future Programmes.

BBSRC provides opportunities for UK bioscientists to access funding for inter-continental research collaborations by providing the UK subscription, with the Medical Research Council, for HFSP that supports research collaborations involving two or more HFSP-member states. The UK strongly supports this unique, high quality programme, which was initiated by Japan in 1987, and will participate at the 2007 Intergovernmental Conference with the aim of securing its long-term future.

Through a Japan Partnering Award, scientists at the Exeter Biocatalysis Centre are collaborating on the structure of heat-stable enzymes that have potential applications in the pharmaceutical industry.



## International Scientific Interchange Scheme (ISIS)

Scientists supported by BBSRC can apply for travel money in connection with their research grants. They may also apply on a year-

round basis for ISIS Awards. These are typically of the order of £1k, and are designed to support short visits to overseas laboratories so that researchers can either gain access to expertise or develop joint research programmes.



BBSRC focuses strategically on promoting collaborations with countries that are rapidly expanding their scientific capability. Our **'Partnership Award' schemes** are successfully enabling leading UK laboratories to link respectively with collaborators in **Japan, China and India**. These awards, of the order of £20-50k, are open to BBSRC grant holders. They provide support over four years for partnering activities including the short-term exchange of postgraduate students, postdoctoral researchers or established scientists.

**We will:**

- launch a new partnering scheme for UK-USA collaborations, aimed at supporting 30 new laboratory-to-laboratory linkages over the next three years<sup>3</sup>
- collaborate through RCUK to explore the need for a formal Research Council presence in certain countries, following the RCUK China Office opening in 2007

To complement these activities, we plan to increase the involvement of UK scientists in 'common pot' funding schemes with international partners. For example, by working with international funders to assess bilateral applications, we intend to eliminate the current 'double jeopardy' in which such applications must succeed in two separate assessments.

BBSRC has already taken a lead in **ERA-Net schemes** in **plant genomics** and **systems biology**. These schemes are currently based on *juste retour*; however, we plan to explore options for expanding the number of ERA-Net opportunities and the possibility of funding the best applications irrespective of *juste retour*.

**European Research Area Networks (ERA-Nets) and other collaborations**



BBSRC contributes to the ERA-Net in Plant Genomics, which has 11 partner countries, and the ERA-Net in Systems Biology (ERA-SysBio), which involves funding organisations in 14 European countries.

In 2007, £18M was awarded in an ERA-SysBio programme to study medically and commercially important microorganisms. With £7.4M from BBSRC, UK scientists are involved in 10 of the 11 projects that range from understanding the biological pathways of extreme organisms living in volcanic springs, through to studying a bacterium that is key to yogurt production.

We are increasing our level of collaboration with the **Institut National de la Recherche Agronomique** (INRA, France) and **Wageningen University and Research Centre** (WUR, the Netherlands). Through a three-way Memorandum of Understanding, we will help develop collaborative working in preparation for FP7.

<sup>3</sup> In line with the report by Sir Gareth Roberts on UK-USA academic collaboration



## Ensuring access to world-class infrastructure and information

Advances in bioscience depend increasingly on new research tools and technologies, and on the capacity to analyse and extract knowledge from huge data sets using informatics and other computational resources. Many of the physical facilities required are complex and costly, and are best provided on an international basis. Some, such as the **European Bioinformatics Institute (EBI)**, a facility of immense value to both the UK and European bioscience communities, are located in the UK. We remain alert to the development of facilities and technologies overseas, and monitor their potential benefit to UK bioscientists, as part of our on-going commitment to help meet researchers' needs.

Convenient, high-throughput methods for capturing sequence, structural and image data on a large scale (the 'omics' revolution) has turned biology into an information science. There is an urgent need for internationally agreed protocols for managing these large volumes of data, for example in libraries of molecular data and tools.

### We will

- encourage the UK research community to play a leading role in formulating international protocols for data sharing, storage and analysis



### We will:

- collaborate with Science and Technology Facilities Council (STFC) to ensure continued access to state-of-the-art large-scale research facilities and associated expertise for UK life scientists
- lobby for continued investment in, and expansion of, EBI
- contribute to the development, and implementation through FP7, of the European Roadmap for New Large-Scale Research Infrastructures, including the ELIXIR European Biological Information facility and new infrastructure for structural biology
- participate in the identification and development of future European-level large infrastructure proposals through the revision and extension of the European Strategy Forum on Research Infrastructure (ESFRI) Roadmap



With funding from a BBSRC **China Partnering Award**, Chinese and UK researchers collaborated in the area of synchrotron radiation circular dichroism spectroscopy to help establish calibration standards and good practice across facilities, and to disseminate new applications of the technology in bioscience. The partnership provides UK scientists with access to new facilities in Beijing.



# Discharging our global responsibilities

UK bioscience already contributes to strategies for tackling major global challenges such as the impacts of climate change, adequacy of food supplies and the threat of pandemics from livestock-to-human diseases, and to the realisation of the **Millennium Development Goals**.

Much of the science supported by BBSRC, particularly institute-based research on agriculture and food production, has considerable potential to reduce hardship and promote prosperity in the developing world. We also have a £6M programme with the **Department for International Development** (DfID) to translate UK research on **crop science** into practical solutions and benefits in the developing world.

## We will

- work within the UK Collaborative for Development Science for closer coordination between DfID, the Research Councils, and other stakeholders

Building on basic research at the John Innes Centre, the University of Bangor, Wales and the **Institute of Grassland and Environmental Research** (IGER), IGER scientists worked with researchers at the **International Crops Research Institute for Semi-Arid Tropics in India** to develop a new variety of pearl millet that is resistant to the fungal disease downy mildew, which can reduce harvest yields by 80%. This development was funded by **DfID**.

BBSRC supports a range of research relevant to minimising climate change and coping with its impact. We have launched a £20M programme on bioenergy research.

## We will:

- explore with other Research Councils, the need for more research on climate change

## UK-USA collaboration

The **John Innes Centre** is working with the US Departments of Agriculture and Energy to map the relatively small genome of *Brachypodium distachyon* (Purple False Brome). The aim is to apply the data to related species such as wheat, barley and forage grasses in order to identify genes that influence a crop's potential value as a source of biofuels or as biomass.

The **Institute for Animal Health** (IAH) is a world-leader in endemic and exotic diseases of animals, and houses the world reference laboratory for **foot-and-mouth disease virus** at its Pirbright Laboratory. In conjunction with the **Department for Environment, Food and Rural Affairs** (Defra), BBSRC will invest £120M in upgrading the Pirbright facility.

We have launched a collaboration with China relating to research on the transmission of the **avian influenza virus**.

**IAH** scientists developed a pen-side diagnostic test for the viral disease rinderpest (cattle plague). Eye-swab material from infected animals gives a result within five minutes. After successful trials in Tanzania and Asia the test was used extensively in Pakistan to identify the last remaining foci of infection as a vital part of the **Global Rinderpest Eradication Programme**.



Courtesy Peter Roeder, FAO

The last five years of our ISIS scheme has helped BBSRC-funded scientists establish new international contacts and collaborations in over 40 countries around the world.



## BBSRC's International Relations Unit (IRU) co-ordinates and leads on delivering our international strategy.

IRU works closely with funding agencies, government policy and research departments and academic groups in many countries. In liaison with the UK Foreign and Commonwealth Office, it helps to ensure that UK bioscience research is promoted through high-level meetings and partnerships around the world.

Where appropriate, BBSRC seeks to deliver and add value to its international strategy by working within Research Councils UK (RCUK), and with UK Government, for example through its Global Science and Innovation Forum, and with European partners and through the European Research Council.

For further details please see [www.bbsrc.ac.uk](http://www.bbsrc.ac.uk) or email [iru@bbsrc.ac.uk](mailto:iru@bbsrc.ac.uk)

### Further Information

**European Molecular Biology Organisation**  
[www.embo.org](http://www.embo.org)

**European Research Area Networks**  
<http://cordis.europa.eu/coordination>

**European Science Foundation**  
[www.esf.org](http://www.esf.org)

**EuroHORCs Network**  
[www.eurohorcs.org](http://www.eurohorcs.org)

**Human Frontiers Science Program**  
[www.hfsp.org](http://www.hfsp.org)

**RCUK Academic Fellowships**  
[www.rcuk.ac.uk/acfellow](http://www.rcuk.ac.uk/acfellow)

**UK Research Office**  
[www.ukro.ac.uk](http://www.ukro.ac.uk)