

## BBSRC Annual Delivery Report 2005/06

### Executive Summary

**Recent successes:** UK bioscience is thriving, with increasing numbers of researchers and students, and excellent bibliometric indicators. However, this success places significant pressure on bioscience funding and there is a challenge going forward to maintain the UK's world-leading position. Notable scientific achievements in BBSRC-funded areas have included research in stem cells, identification of possible drug targets in the sleeping sickness parasite, and in potential to improve drought resistance in crops.

**Progress in management:** In 2005/06 BBSRC has moved to four grant rounds per year and has supported this with the introduction of an electronic workflow system, leading to increased efficiency in the administration of research grants. The introduction of electronic documents and records management will increase efficiency still further.

### **Progress to date against targets and milestones:**

BBSRC completed all but one of the targets set for 2005/06. Achievements include:

- Established three more Centres for Integrative and Systems Biology (CISB),
- New scheme to encourage and support longer and larger research grants.
- Key new Initiatives in priority areas such as Crop Science and Combating Avian Influenza.
- All studentships awarded through the Quota competition were in the form of flexible, four-year Doctoral Training Grants.
- Launched the Enterprise Fellowship Scheme to provide researchers with an opportunity to explore the exploitation potential of their research.

**Future targets/milestones on Objective 1 and Objective 2:** Going forwards, BBSRC will build on investments in a number of areas. We will:

- Improve communication between the established CISB;
- Establish a new funding stream to sustain essential underpinning Tools and Resources;
- Continue with an ambitious programme of evaluation of responsive mode funding;
- Expand the undergraduate vacation bursary scheme;
- Continue to ensure that research relevant to industry is funded through various mechanisms, including the Bioprocessing Research Industry Club;
- Enhance activities to identify the exploitation potential of research funded by the Council.

**Gershon Efficiency Programme:** Efficiency savings have been delivered in 2005/06 and BBSRC remains committed to future targets for further savings achieved through reduced administration costs and reprioritisation of existing programmes. The Council is closely involved with the establishment of the Next Generation Back Office system and the cross-Council Shared Services Centre

**Science and Society:** During 2005/06 BBSRC contributed to the development and delivery of the RCUK Science in Society Strategy, as well as the Council's own targets. BBSRC has also supported a number of activities coordinated by the RCUK Science in Society Unit. BBSRC chaired the Research Careers and Diversity Group in 2006, enabling the Council to have significant input to the Group's activities.

# BBSRC Annual Delivery Report 2005/06

## **Introduction**

This Report records BBSRC's progress against its objectives as defined in the BBSRC Delivery Plan 2005/08 as published in May 2005, and the Outputs 1 and 2 of the OSI Performance Management System. Further detail is available in the BBSRC Annual Report and Accounts 2005/06 ([www.bbsrc.ac.uk/about/pub/policy/annrep.html](http://www.bbsrc.ac.uk/about/pub/policy/annrep.html)).

## **Recent successes**

### **A healthy UK science base**

UK bioscience continues to thrive. Research capacity, particularly the number of postgraduate students, has increased hugely over the last ten years. Bibliometric indicators show that UK biomedical research remains second in the world overall, and has just surpassed the USA on the measure of the impact of its published research papers. With this success come a number of challenges, not least to enhance exploitation of our excellent science base and to maintain the UK's leading position against stiff international competition.

BBSRC funds high quality basic and strategic research that both adds significantly to the knowledge base and underpins developments in the healthcare, pharmaceutical, agri-food and other sectors. Recent examples of high quality science supported by BBSRC include:

- Stem cell research at University College London is providing insights into the evolution of neck and shoulder tissues in vertebrates, as well as the origins of human diseases such as Chiari's malformation that accounts for the about a quarter of sudden infant death syndrome cases (*Nature 2005, 436, 347-355*).
- Analysis of proteins that make up the flagellum of the sleeping sickness parasite, by researchers at the Universities of Lancaster, Manchester and Oxford, has identified components that are essential for the parasite's survival in the human bloodstream and could therefore be useful as potential drug targets. (*Nature 2006, 440:224-227*)
- Research at the John Innes Centre has revealed new information about the structure and workings of a gene complex that stops the chromosomes of wheat and some other crops from pairing effectively with those of wild relatives; this offers the first realistic prospect for developing new varieties with traits such as tolerance to drought (*Nature 2006, 439:749-752*)
- Scientists in the Universities of Cambridge and Kent have found a surprisingly common mutually beneficial relationship in aquatic ecosystems: more than half of all algae require an external source of vitamin B<sub>12</sub>, which they appear to get from bacteria, in return providing fixed carbon. (*Nature 2005, 438:90-93*)

Bioscience research increasingly relies upon researchers having access to new technologies and costly state-of-the-art technologies. BBSRC is helping to ensure that UK bioscience base is appropriately supported. For example:

- BBSRC has established a £3-4M Tools and Resources (T&R) Development Fund to support small or short-duration, pump priming research projects and / or to bring together communities for collaborative purposes.

### Industrial collaboration and knowledge transfer

Examples of where BBSRC has contributed to providing research and training relevant to industrial needs include:

- BBSRC has exceeded its 2005/06 target for investment in collaborative research.
- BBSRC recently published a skills and training framework which aims to attract and retain talented bioscience researchers, to support their personal and professional development needs, and to meet the UK's need for trained bioscientists in both academia and industry.
- BBSRC, MRC, Higher Education Funding Councils, and pharmaceutical companies (AstraZeneca, GlaxoSmithKline and Pfizer) have jointly established an £12.3 million fund for capacity building in integrative mammalian biology, which aims to support institutions with existing strengths in this area to equip the next generation of researchers with the range of expertise and skills required.
- BBSRC has led the development of a new initiative to encourage interaction between biologists and engineers. BBSRC is investing £6M in a Bioprocessing Research Industry Club, which has also attracted £3M support from EPSRC and a total of £1M from a consortium of twenty companies.

### Progress in management

BBSRC continues to manage its administration side very tightly and has again reduced the proportion of its science budget funds spent on administration.

One major activity was the doubling of BBSRC grant rounds per year, from two to four, whilst reducing the level of resource to administer the rounds. This increased efficiency of the grants process was achieved by restructuring a major part of the Science and Technology Group and introduction of an electronic work-flow system. BBSRC has established a Programme Office to manage all major projects centrally in a consistent way according to PRINCE 2 principles. This reinforces the culture of efficiency in the BBSRC Office. Following a review of its document and records management, BBSRC is moving towards fully electronic procedures that will increase efficiency further.

### Progress to date against 2005/06 targets and milestones

BBSRC successfully met the majority of targets and milestones for 2005/06, as shown in the [2005/06 Scorecard](#). Particular highlights include:

#### 1. Healthy Disciplines

The second call for proposals for the **Centres for Integrative and Systems Biology** Initiative was completed successfully. Sixteen proposals were received, six were short-listed and asked to provide full submissions and three (Universities of Nottingham, Edinburgh, and Oxford) were funded after approval by Council in April 2006.

BBSRC launched Initiatives in two priority areas: [Crop Science](#) (£11.6M) and [Combating Avian Influenza](#) (£4.5M).

Two new **Tools and Resources** Initiatives ([T&R Development Fund](#) and the [Technology Development Research Initiative](#)) were successfully established and attracted significant numbers of applications. A third funding stream is being developed for 2006/07 (see below).

BBSRC has developed and launched a scheme to encourage [longer, larger, multidisciplinary research proposals](#) that tackle strategically important problems and that require greater time/staff resources and interactions between the biosciences and other disciplines.

Activities to encourage research and collaboration at the **interface of the biological sciences with the physical sciences** and engineering have included:

- £10M investment in 20 projects under BBSRC's [Selective Chemical Intervention in Biological Systems](#) initiative.
- A 'brokering workshop' between scientists supported by PPARC and those supported by BBSRC to identify opportunities for collaborative new science and the transfer of high tech physics into bioimaging applications. This led to supported projects totalling around £950k.
- Sixteen projects between stem cell biologists and engineers/physical scientists were funded jointly with EPSRC. The total value of BBSRC funding was £4.7M.

Funding was also allocated by Strategy Board in May 2005 for the Mathematics in Systems Biology network to be supported over three years.

**Strategic planning activities** have been taken forward to ensure that BBSRC continues to support research and training to deliver the [10-Year Vision](#). The Strategic Plan 2003-2008 was [refreshed](#) in 2005 to take account of scientific and policy developments, including the 2004 Spending Review settlement. In 2005/06 BBSRC commissioned reviews of [Farm Animal Genomics](#) and of [Bioenergy](#); the results of which have been used to inform the Council's strategic planning.

#### BBSRC-sponsored institutes

In February 2006, BBSRC Council considered the results of the 2005 [Institute Assessment Exercise](#) (IAE) to review the quality and strategic relevance of institute science. Council decisions included:

- Increased overall core funding to institutes by £11M by 2008/09
- The proportion of core institute funding that supports animal health and welfare research will increase from 22% to 26% by 2009/10. This includes an increase of £2.3M p.a. rising to £3.5M p.a. by 2009/10 for the Institute for Animal Health (IAH)
- Capital funding of £35M will be made available for a new research facility, the Edinburgh Bioscience Research Centre (EBRC): the existing core funding of £5.7M for Roslin Institute and the Neuropathogenesis Unit of IAH will be transferred to the centre.
- A recommendation to merge the funding streams for the Institute of Grassland and Environmental Research (IGER) and Rothamsted Research (RRes) to reflect changing policy needs. The core funding for these institutes will increase by £0.5M to £17.4M in 2006/07.
- Core funding to the John Innes Centre will increase from £12M to £14M p.a. over the next four years.
- Funding to the Institute of Food Research (IFR) will increase from £9.6M to £9.9M in 2006/07 to support development of the institute's new science strategy.
- Babraham Institute core funding will increase from £10.5M to £12.8M over the coming four years.

- KT and training support will increase by £1M and £2M respectively.
- Institute Fellowship schemes will be established with funding of £1.5M p.a.
- The cap on funding from responsive mode that can be acquired by the institutes has been removed for applications that are in collaboration with a university department.

In December 2005 BBSRC published the [Institute Science and Innovation Strategy](#), outlining the strategic importance of institute-based research and where this work will contribute to BBSRC's overarching aims and objectives for the coming decade.

It is essential that UK bioscientists are able to collaborate [internationally](#) with the best groups world-wide. BBSRC continued to support several schemes to fund workshops, fellowships and overseas visits to provide a range of opportunities for UK bioscientists. In 2005 a high-level delegation from BBSRC visited research institutions in India. As a result BBSRC has launched India Partnering Awards that complement existing schemes for collaborations with researchers in China and Japan. BBSRC continued to manage UKRO on behalf of sponsoring Research Councils to sustain high levels of UK participation in EU programmes.

The 2005/06 Quota competition for **studentship funding** made all awards as [Doctoral Training Grants](#) (DTGs), based on four-year studentship costs. The DTG mechanism provides flexibility for departments to use studentship funding to maximum strategic effect, and also recognises that in the biological sciences PhD students now require four years for their research degree. BBSRC led the harmonisation of cross-Council Terms and Conditions for DTGs with the other Councils that deploy them.

The Review of **Fellowship schemes** was completed early in 2005/06 and changes agreed for the call in September 2005. The recommendations sought to ensure that BBSRC's fellowship schemes remain fit for purpose in view of the move to full economic costing of grants and fellowships, and to ensure that research career support is in place at early stage, mid-career, and senior levels.

## 2. Exploitation of Research

BBSRC has initiated several schemes to support **research of relevance to industry** and to implement its [Technology Strategy](#). As stated above, the Bioprocessing Research Industry Club was launched with 20 industrial members; 36 research proposals were assessed by the steering group in February 2006 after the initial call for proposals was launched in October 2005. A call for proposals also was issued by BBSRC in conjunction with MRC, DTI, HEFCs and industry to encourage research in the priority area of Integrative Mammalian Biology.

BBSRC met its targets to increase support for **industrially-relevant training** through the modular training scheme, and 113 new Industrial CASE awards were funded, against a target of at least 100. Working with the RDA's, new SME's and ME's have been identified as potential partners for applications to the Industrial CASE scheme.

BBSRC launched The Enterprise Fellowship Scheme in May 2005 with the aim of providing opportunities and training that allow researchers to realise the full commercial potential of BBSRC-funded research. Four awards have already been made against a target of ten by the end of the Spending Review period.

BBSRC has also implemented the Industry Interchange Awards scheme to allow flexible short-term exchange of researchers between industry and academia to foster greater knowledge transfer.

(Also see Science in Society section below for details of how BBSRC has successfully met Science in Society targets for 2005/06)

### Missed or Delayed Targets

The only significant missed target was the lack of progress in co-funding proposals with DTI under the national Technology Strategy. BBSRC has worked with DTI to develop more appropriate procedures including a single assessment form and a single assessment procedure which it is hoped will address the problems that have been encountered.

### Future targets/milestones on Objective 1 and Objective 2

Full details of targets and milestones for the 2006/07 period can be found in the [2006/07 Scorecard](#). Examples of future targets and milestones include (see also key plans for sponsored institutes, page 4):

BBSRC will continue to invest heavily in the leading priority of **Systems Biology** over the coming period. The three recently-funded centres will start work in 2006/07 and coordination between the six centres will be initiated. Additional funds will be committed to support Systems Biology research across BBSRC's remit, and is likely to focus on establishing a number of large grants with multiple staff posts and strong industry involvement. The annual commitment target for 2006/07 is £14.5M.

A third funding stream for **Tools and Resources** will be launched in 2006/07 with a focus on sustainable support for resources.

A number of activities will be undertaken to provide **support for researchers** and equip them to deliver BBSRC's Strategic Objectives. We will work with other Research Councils to fund RCUK Academic Fellowships, thereby providing a more secure research career pathway. BBSRC will also publish a HR strategy in 2006/07.

Building on the success of the current Vacation Bursaries scheme it will be expanded to provide 80 awards per year. BBSRC will also pilot a scheme for Vacation Bursaries in Mathematical Biology in 2006 to tackle the challenge of ensuring that graduates in the biological sciences are equipped with relevant and necessary skills for the current research environment.

BBSRC will continue to implement a **rolling programme of evaluations** of the responsive mode research portfolio. In 2006/07 this will include completion of the Biochemistry and Cell Biology and Genes and Developmental Biology areas, initiation of the evaluation of the Engineering and Biological Systems portfolio by March 2007 and evaluation of initiatives as required.

To encourage **research relevant to industrial needs** BBSRC will engage in a number of schemes to provide co-funding alongside industrial and other partners. This includes £3M investment in research through the Bioprocessing Research Industry Club. Also, in conjunction with HEFCs, Industry and other partners, £12.3M will be awarded to establish four centres to encourage research in the priority area of [Integrative Mammalian Biology](#).

The Council will continue to develop the existing portfolio of activities to **identify the exploitation potential of research outputs**. Awards totalling £1.45M will be made as part of the follow-on-fund; a further three Enterprise Fellowships will be supported

in 2006/07 (towards a total of ten by 2008); and support will continue for YES and the Business Plan Competition.

### **The Gershon efficiency programme**

BBSRC delivered efficiency savings worth £4.9M in 2005/06. This was done through a mix of reducing the proportion of funds that were spent on administration as well as growing the level of co-funding of research and increasing efficiency at the institutes. Looking forward, BBSRC's target for 2006/07 is £22.2M. This will be delivered through:

- Reprioritisation of programmes including training £8.6M
- Proportional reduction of administration costs £1.1M
- Increased efficiency of BBSRC-sponsored institutes including better use of capital infrastructure £10M
- Greater co-funding £2.5M

These savings are planned to rise further to £39.2M in 2007/08 and will be achieved by a number of activities including reprioritising programmes and reducing the percentage share of administration costs. This will be part of the overall target for the Research Councils as a whole to deliver £170M efficiency savings a year in 2007/08.

Following the deduction of programme expenditure, administration costs for 2005/06 were £9.3M. This represents 2.78% (2.95% in 2004-05), of the Science Budget Income (resource and capital - including non-cash) received during the year, against an OSI target of 3.4% by 2007-08.

BBSRC strongly supports the continuing moves to increase harmonisation and thus achieve further savings that can be channelled into the funding of science. This will be accomplished on two fronts, by hosting a range of joint units that provide services across the Swindon-based Research Councils and contributing to a number of cross-Council projects to identify and deliver additional harmonisation. The joint units that BBSRC host include: building services, internal audit and pensions.

BBSRC is closely involved with the development of a Next Generation Back Office system to provide a single grants processing system for all Councils. In addition, BBSRC is providing the lead on a project to harmonise HR Services. These activities and a number of others will be a significant contribution to the setting up of a cross-Council Shared Service Centre which is due to be in operation by March 2009.

In December 2005, RCUK Research Careers and Diversity Group (RCDG) agreed a range of areas in which Councils would be willing to harmonise in relation to studentship operational policy in view of the development of a Joint Grants Processing Function. In January 2006, agreement was given to a JeS project to introduce electronic data submission on studentship processes and competitions; this will in turn lead to further harmonisation.

### **Science and Society**

BBSRC has increased collaborative working with other Councils through RCUK and has contributed to the development of the [RCUK Science in Society Strategy](#) and the beginning of its implementation.

In support of the RCUK strategy and BBSRC plans:

- BBSRC commissioned a study on public attitudes of research into Diet and Health, and a follow-up study of attitudes to industrial funding of research.

BBSRC is contributing to an RCUK public engagement study on Energy research. BBSRC has also supported the Citizens' Jury on nanotechnology and is working with EPSRC on a nanodialogues experiment led by DEMOS. Output will be considered by BBSRC's Bioscience for Society Panel (BSS). Through BSS, BBSRC has also strengthened procedures for monitoring and addressing potential social and ethical issues arising from BBSRC-funded research.

- BBSRC has supported a range of schools-based activities in HEIs and BBSRC-sponsored institutes, including Science Day visits for VIth formers, after-schools science clubs for young girls from ethnic minority backgrounds, and support for 26 local coordinators who link scientists with schools.
- In addition to contributing to, and supporting work by, the RCUK Unit (see below), BBSRC has provided media and communications training and are focusing on specialist topic areas such as nanotechnology and stem cells.
- BBSRC has increased the output of media releases on BBSRC science, and launched a major touring exhibition on Biodiversity (with NERC) as well as contributed to national science festivals. The Council continues to support the Science Media Centre.

#### Interactions with the RCUK Science in Society Unit

BBSRC support and fund the following activities coordinated through the Unit.

**Researchers in Residence** (scientist placements in schools)

**BA CREST Awards** (schools research projects)

**Nuffield Science Bursary Scheme** (school student placements in research laboratories)

**CPD for teachers in Science Learning Centres**

**BA Perspectives** (public presentations by postgraduates)

**Presentation at the Association for Science Education AGM**

**Public Engagement on Energy Research**

**Awards for National Science Week**

**Support for the Royal Society study on barriers to science**

#### Interactions with the RCUK Research Careers and Diversity Unit

BBSRC has chaired RCDG in 2006, and has sought to encourage the group to move towards a more strategic role, supported by a sub-group (the Postgraduate Harmonisation Group), which works on cross-Council harmonisation of studentship operational policy and procedure (See section “The Gershon efficiency programme” for more information). Through this group, BBSRC has played an active role in shaping and advising on the Research Careers and Diversity Unit's activities, including plans for revision of the 1996 Concordat on contract research staff; mapping of the EU Charter for Researchers against existing UK regulation; development of a career paths mapping and advice web-resource; and planning for the retendering of the Research Councils' prestigious UKGrad programme.

#### Summary financial table

2005-06 £M	Outturn*	Allocation	Difference
Near Cash	275.6	270.7	4.9

Non Cash	7.9	15.1	(7.2)
Capital Grants	38.3	33.8	4.5
Capital	1.2	1.7	(0.5)
<b>Total DEL</b>	<b>323.0</b>	<b>321.3</b>	<b>1.7</b>
* Provisional June 2006			