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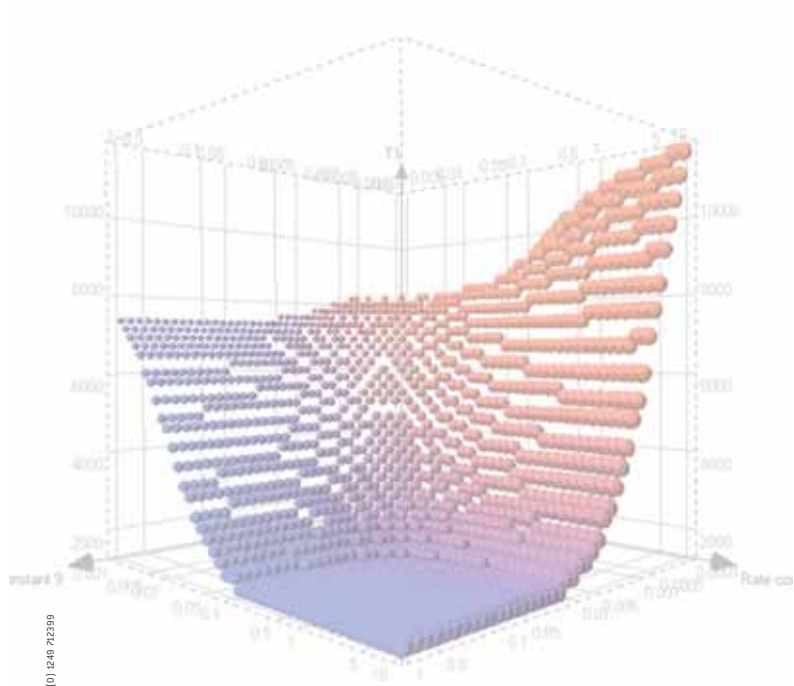
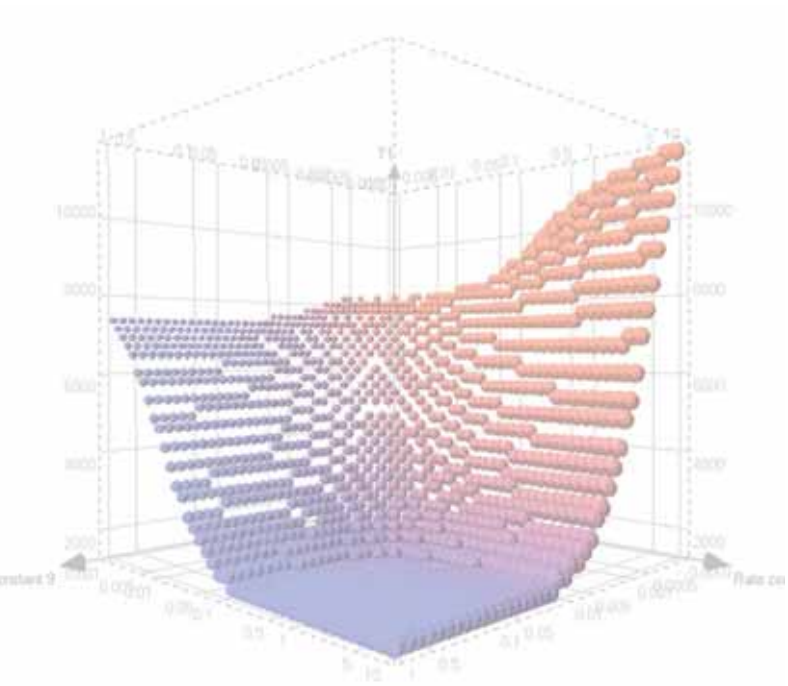
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Biotechnology and Biological Sciences Research Council

Annual Report & Accounts 2005-06



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Computational modelling is an important element in a systems biology approach across the biosciences, including as illustrated here in understanding key elements of signalling pathways in cells. (Original image courtesy: Professor Douglas Kell, University of Manchester)

Biotechnology and Biological Sciences Research Council

## Annual Report & Accounts

2005-06

Presented to Parliament by the Secretary of State, and by the Comptroller and Auditor General, in pursuance of Schedule 1, Sections 2 [2] and 3 [3] of the Science and Technology Act 1965.

Ordered to be printed by the House of Commons 13 July 2006

The Biotechnology and Biological Sciences Research Council, as required by Schedule 1 to the Science and Technology Act 1965, submits the following Report on its activities during the period 1 April 2005 to 31 March 2006.

**Dr Peter Ringrose**  
Chairman

**Professor Julia Goodfellow CBE**  
Deputy Chairman and Chief Executive

BBSRC works in partnership with sister Research Councils through Research Councils UK (RCUK):



Arts & Humanities Research Council **AHRC**

Biotechnology & Biological Sciences Research Council **BBSRC**

Council for the Central Laboratory of the Research Councils **CCLRC**

Engineering & Physical Sciences Research Council **EPSRC**

Economic & Social Research Council **ESRC**

Medical Research Council **MRC**

Natural Environment Research Council **NERC**

Particle Physics & Astronomy Research Council **PPARC**

This Annual Report records progress in meeting the objectives of the BBSRC Delivery Plan 2005-08 ([www.bbsrc.ac.uk/about/pub/policy/delivery.html](http://www.bbsrc.ac.uk/about/pub/policy/delivery.html)). Figures in the Report have been adjusted to take account of full economic costing for grant awards, which BBSRC introduced in September 2005.

The Biotechnology and Biological Sciences Research Council (BBSRC), established by Royal Charter in 1994, is the UK's principal funder of basic and strategic research across the biosciences ([www.bbsrc.ac.uk](http://www.bbsrc.ac.uk)). It is funded primarily by the Science Budget through the Office of Science and Innovation (OSI). BBSRC's mission is to support high class science and research training and to promote knowledge transfer in support of bio-based industries and public engagement in bioscience.

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# Chairman's statement



I am very pleased to record that BBSRC has had an outstanding year in meeting its objectives across the board, for example: in support for top-class research and training; in innovative new partnerships with industry and business; in evolving and developing the UK bioscience base and in contributing to the wider societal debate about scientific opportunities and challenges. It is particularly noteworthy that this has been done within a strict financial framework, which has generated savings that we are already re-directing to fund frontline research.

One of the strongest features this year has been the increase in cross-Council and interdisciplinary working under the auspices of Research Councils UK (RCUK), which has generated many positive and innovative outputs, not only in terms of new science, but also in research training, in knowledge transfer and in public engagement with science.

In BBSRC we deal with some of the most exciting and fast-moving areas of science, which, like areas such as bioinformatics and new research tools and technologies, are increasingly resource hungry. I am very pleased that we are able to draw upon and work with the UK bioscience research community in addressing such challenges. In addition I am very encouraged by the synergy in ideas and the common sense of purpose that we see across the different

disciplines, and between academic scientists and those working in strategic R&D and in industry. This is undoubtedly an important determinant of the strength of UK bioscience in its broadest context, and it augurs well for the future. Commitment to the highest quality research training and early career development for scientists is an example of an area where this consensus is particularly prominent.

I am pleased to record the Council's gratitude to the BBSRC Chief Executive, Julia Goodfellow, and all those who have worked closely with her across BBSRC – including the Boards, Committees and the sponsored institutes – for all their hard work over the year. I would also like to personally thank the Council Members for their insights and advice throughout the year.

**Dr Peter S Ringrose**  
Chairman  
July 2006

## Council membership [as at 1 April 2006]

Dr Peter Ringrose	Chairman
Professor Julia Goodfellow CBE	Deputy Chairman and Chief Executive
Professor Simon Bright	Warwick HRI
Dr David Brightman	Brightman Farms
Professor Howard Dalton FRS	Department for Environment, Food and Rural Affairs
Professor David Delpy FRS	University College London
Professor Robert Freedman	University of Warwick
Professor Peter Fryer FREng	University of Birmingham
Professor Chris Gilligan	University of Cambridge
Mrs Sarah Haywood	Department of Trade and Industry
Professor A Jackie Hunter	GlaxoSmithKline
Professor Quintin McKellar	Royal Veterinary College
Dr Alistair Penman	Independent
Professor Dame Nancy Rothwell FRS	University of Manchester
Professor Cheryl Tickle CBE FRS	University of Dundee
Dr Malcolm Weir	Inpharmatica Ltd
Mr John Neilson	OSI, Department of Trade and Industry (observer)

Professor Douglas Kell, University of Manchester, also served on the Council during 2005-06.

# Chief Executive's report



■ The year 2005-06 has seen the culmination of several reviews, evaluations and consultations that have provided us with the evidence on which we have made a step change in developing and delivering our vision for 21st century bioscience in the UK. Central to this has been our success in identifying core priorities that meet the scientific, business and policy needs of our stakeholders. These provide a focus around which we have successfully channelled our many different activities to provide an unparalleled coordination of effort that serves the UK bioscience community in its broadest context. We have, for example, taken forward our vision of a systems approach to bioscience through further large scale investment in university-based centres, European partnerships, cross-institute collaborations and support through individual responsive mode grants, and through a new dedicated training programme. Similarly, we are complementing science-driven initiatives, for example in plant and crop research, with ring-fenced support for industrial partnerships and training.

This integration is much more than an administrative arrangement. It reflects the extent to which we have been able to draw upon insights from researchers, business and industry leaders, as well as policymakers and the wider public, to achieve a consensus on the big issues and challenges in biosciences and to develop a way forward. For this reason we can be confident that we are developing the bioscience base in ways that will be sustainable in terms of: international scientific excellence and competitiveness; providing the highly skilled individuals needed in academic research and UK bio-industry; underpinning industrial and commercial innovation; and addressing wider societal aspirations and concerns.

Naturally we are encouraged that our confidence in UK bioscience is borne out by firm data. For example, the Office of Science and Innovation's (OSI's) Evidence report on the performance of the UK research base, published in 2005 ([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 & health and biological sciences. This Annual Report gives several examples of world-class science supported by BBSRC in both the university and institute sectors (page 5).

The 2005 Institute Assessment Exercise found that, of the total of 55 programmes assessed across six of our sponsored institutes (the Institute for Animal Health is being assessed in 2006 following its refocusing around a new science strategy in 2004-05), 45 were

judged as either high international/international quality on the quality of science or outstanding/good on strategic relevance. This has provided a strong evidence base on which we have planned major investment and new strategic research alliances that will take forward institute science (page 8). We are continuing to work with Institutes' Governing Bodies and Directors to determine the future governance arrangements for institutes (page 9). For several institutes, current and projected falls in contract income from the Department for Environment Food and Rural Affairs (Defra) pose a serious threat to sustainability. We are continuing to pursue this at the highest level and are seeking to secure strategic investment from Defra in line with the RIPSS\* principles.

In taking forward recommendations from our reviews on crop science and livestock genomics (pages 12 and 13) we are again building on science that is recognised as world-leading. I look forward to the outputs from new reviews that we have commissioned during the year on microbiological sciences, bioenergy (pages 6 and 12), and mathematical bioscience in the institute-base, so that we can build these into our planning.

I am extremely grateful to all of those who have contributed to BBSRC's consultation and planning procedures during the year. Our joint strategy meeting in summer 2005, in which discussions on priorities and future directions were shared by members of our Council and Strategy Board, Institute Directors and Chairs of our grant awarding Committees, was highly constructive and productive. I am also grateful to all who have taken part in reviews and consultations; and for opportunities to present our vision to the wider community through our annual Open Meeting, at which we invite scrutiny and questioning by any interested individuals and organisations, and through the Royal Institution's discourse programme where I was delighted to accept an invitation to speak on the challenges of science funding.

In May 2005, we published our 2005-08 Delivery Plan, which details how we will take forward our priorities over this period, including in those areas I have indicated above. In November 2005, we published our ten year vision for Science and Innovation in BBSRC-sponsored institutes (page 8).

\* Final Report of the Research Council Institute and Public Sector Research Establishment Sustainability Study (RIPSS) Steering Group (2004).





BBSRC's Open Meeting in Manchester Town Hall in February 2006



Basic bioscience contributes significantly to our understanding of ageing (page 7). I am delighted that BBSRC Professorial Fellow Linda Partridge CBE FRS has been recognised with a Help the Aged Living Legend-Research into Ageing award, which she received from Her Majesty the Queen. Professor Partridge is a world-leading pioneer in the genetics of ageing, using the fruit fly as a model organism.

Collaborative research and research training in partnership with industry remain key elements of our business. Through our Bioscience for Industry Strategy Panel we are building on our track record in these areas, and in knowledge transfer and the commercialisation of research outputs (pages 22 – 27).

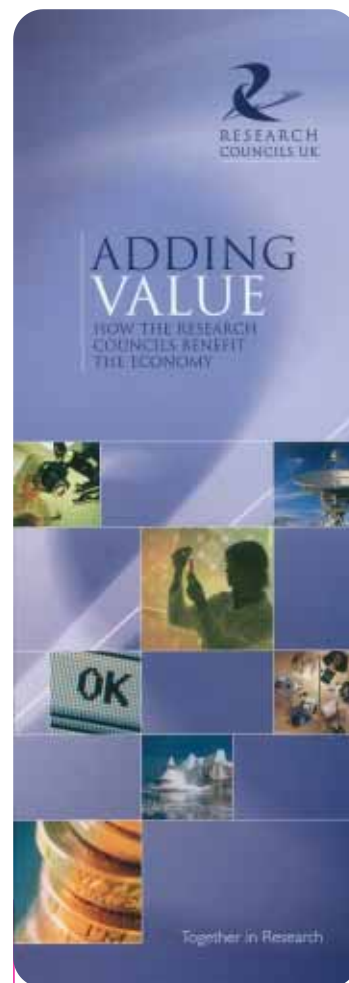
A twin theme during 2005-06 – matching the integration of support mechanisms for bioscience – has been the increase in integrative, multidisciplinary and cross-Research Council approaches. These encompass research funding (page 6), knowledge transfer (page

22) and science in society activities (page 29). Increasingly, major challenges in the biosciences are becoming amenable to research that crosses scientific disciplines, and different organisational levels in bioscience, from molecules and cells to whole organisms and populations. This is reflected in our growing collaborative research portfolio with our sister Research Councils. We are supporting these with increasingly harmonised support mechanisms within RCUK (page 32).

During the year, we have introduced this collaborative approach into new international partnerships (pages 12 and 14). This includes co-funding with agencies in other countries, and bringing together early-career researchers through support for the Human Frontiers Science Program and the European Molecular Biology Organisation.

It is easy to write with enthusiasm about new research partnerships and centres, which are supporting the new multidisciplinary of bioscience research and helping to provide longer-term sustainability. I do not, however, underestimate that change inevitably brings uncertainty and, in cases such as the withdrawal of funding to the Silsoe Research Institute (SRI), which closed in March 2006, has a major impact on people's professional and personal lives. BBSRC works hard to ensure that such impacts are minimised, and that skills and expertise are not lost from UK science. I am pleased to report that a great deal of knowledge and expertise from SRI is being retained through a variety of mechanisms (page 19).

Professor Julia Goodfellow CBE  
3 July 2006



The Research Councils are increasingly working together to promote knowledge transfer and the commercialisation of research outputs. [www.rcuk.ac.uk/documents/addingvalue.pdf](http://www.rcuk.ac.uk/documents/addingvalue.pdf)

# A healthy UK science base

## Healthy disciplines

■ We have introduced several measures to ensure that the UK remains an attractive location for bioscience research and so retains its world-leading research community. These cover increased funding, including money for new research tools and equipment and access to facilities, as well as support that enables researchers to sustain critical mass and impact by crossing traditional organisational and discipline boundaries in new collaborative and multidisciplinary partnerships. We are implementing our announced commitment to increase our responsive mode funding by at least 4% p.a. over the period to 2007-08. This funding enables researchers to explore new ideas in basic curiosity-driven research, wherever they arise, and is crucial in attracting and retaining high calibre scientists in the UK. It provides agility, enabling scientists to seize new opportunities rapidly and to establish a leading position. We have simplified and increased the flexibility of our procedures, to help reduce the amount of scientists' time taken up in applying, by introducing electronic submissions jointly with other Research

Councils, and by moving to four funding rounds each year from July 2005. We introduced grant funding at full economic cost from September 2005.

Progress in the biosciences depends increasingly on researchers having access to new technologies and costly state-of-the-art facilities. We are addressing this in several complementary ways to ensure that bioscientists in the UK can remain at the cutting edge. For example, we have announced a major investment of a further £23M for research on new tools and resources to advance bioscience (page 20); we are continuing our funding stream for research equipment; and where appropriate, we are working with other funders. For example, in partnership with the MRC and the Wellcome Trust, we are investing a further £950k in the European Bioinformatics Institute to help ensure that scientists in the UK retain access to leading-edge facilities for analysing the massive amounts of biological data being generated around the world.

### Research Funding Analysis of Gross Expenditure

(£M)	Universities	BBSRC-sponsored Institutes	Other Organisations*	TOTAL
Responsive Research Grants	101.25	8.99	5.14	115.38
Core Strategic Grants (CSG)	-	66.57	-	66.57
Research Initiatives	33.95	6.23	5.07	45.25
Equipment and Facilities	11.44	0.90	0.62	12.96
Capital and Buildings	0.03	19.45	5.22	24.70
Training Awards and Fellowships	35.83	2.48	0.82	39.13
	<b>182.50</b>	<b>104.62</b>	<b>16.87</b>	<b>303.99</b>

\*Includes other Research Councils

### Summary of grant applications and success rates

	2004-05		Spring	2005-06		Winter
	Spring	Autumn		Autumn		
Number	892	998	776	668	404	
% success	25	26	25	27	25	

### Application and success rates by gender

Percentage of successful applications from total applications	2003		2004		2005	
	Male	Female	Male	Female	Male	Female
Project grants	28.3	25.0	26.3	24.1	27.0	24.5
Programme grants	35.2	31.8	44.9	37.9	42.9	39.7
New investigators	34.6	19.2	41.8	50.0	40.8	33.3
Fellowships	11.5	12.8	9.3	17.4	16.9	5.6

Percentage of female applicants for peer reviewed funding	2003		2004		2005	
Project grants		19.7		19.8		21.4
Programme grants		17.5		14.1		19.4
New investigators		24.3		21.2		29.7
Fellowships		31.0		32.2		35.6

\* Council for the Central Laboratory of the Research Councils



**BBSRC funding to Universities - Top 25 Universities by grant funding**

	University	Research and capital grants (£M)
1	Manchester	12.38
2	Cambridge	11.37
3	Glasgow	8.50
4	Imperial College London	8.28
5	Oxford	7.43
6	Edinburgh	6.50
7	Sheffield	6.03
8	Nottingham	5.74
9	University College London	5.12
10	Bristol	4.53
11	Leeds	4.37
12	Birmingham	4.14
13	Newcastle upon Tyne	4.14
14	York	3.76
15	East Anglia	3.04
16	Liverpool	3.02
17	Warwick	2.98
18	Cardiff	2.91
19	Aberdeen	2.63
20	Leicester	2.57
21	St Andrews	2.35
22	Dundee	2.27
23	King's College London	2.07
24	Southampton	1.81
25	Bath	1.77

**Analysis of final reports on grants**

	2003-04	2004-05	2005-06
Research grants delivering high class work adding significantly to knowledge in the field (%)	75	77	78

■ A striking feature of much of the UK's world-class bioscience is that, whether undertaken in universities or within strategically focused institutes, it often combines the enhancement of fundamental knowledge and understanding with practical relevance to contemporary challenges - from the impact of climate change, to feeding a growing world population, to human healthcare. This is exemplified by some of the BBSRC-supported research published in *Nature* during the year.



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■ Stem cell research is providing insights into the evolution of neck and shoulder tissues in vertebrates, as well as the origins of human diseases such as Klippel-Feil Syndrome and Chiari's malformation that account for about a quarter of sudden infant death syndrome cases. (University College London) *Nature* (2005) 436, 347-355

■ Scientists 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. (Universities of Cambridge and Kent) *Nature* (2005) 438, 90-93

■ Systematic protein analysis of the flagellum, the structure that allows the sleeping sickness parasite to move, has identified some proteins that are essential for the organism's survival in the human bloodstream - making them potential targets for novel drugs. (Universities of Lancaster, Manchester and Oxford) *Nature* (2006) 440, 224-227

■ 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, offers the first realistic prospect for developing new varieties with traits such as tolerance to drought. (John Innes Centre) *Nature* (2006) 439, 749-752

■ Identification of a gene in rice blast fungus that is essential for its ability to infect rice plants opens up the possibility of developing targeted fungicides to control infection. (University of Exeter) *Nature* (2006) 440, 535-539

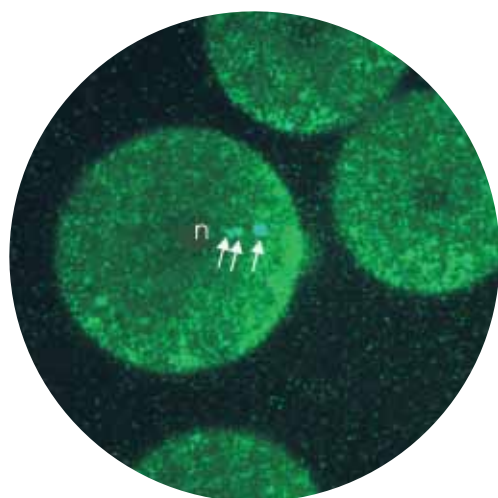
## Multidisciplinary and cross-Council research

■ Bringing together researchers from different scientific disciplines to tackle complex biological problems is central to our vision of bioscience research. A prime example is our focus on systems approaches (page 10). We are also facilitating multidisciplinary research through collaborative programmes with our sister Research Councils. BBSRC has pioneered 'brokering workshops' to bring together researchers from different disciplines to identify new opportunities for collaborative new science. From such a partnership with the Particle Physics and Astronomy Research Council, we launched an initiative in 'Innovative Biological Imaging and Signal Analysis', and have made eight grants totalling just under £1M for 18-month projects. The topics supported range from using parameters from cosmology for molecular structural determinations in nanotechnology, at the University of Edinburgh, to measuring the interactions between fluorescently-labelled proteins during pollen development, at the University of Nottingham.

### Cross-Council programmes:

- Systems Biology
  - Stem Cells
  - Brain Science
  - Rural Economy and Land Use
- (Research on ageing is another cross-Council area)

Researchers at the Marine Biological Association are using a 2-photon system for spatial imaging of events inside cells. This new technology is allowing the group to obtain images of nuclear events, including sperm-egg pronuclear fusion, S-phase onset and nuclear-associated calcium ion signals in multi-cellular algae that were not possible previously with confocal studies.



An overlay of three sequential images of the sperm pronucleus (arrows) moving towards the egg pronucleus during fertilisation of a Fucus egg. These images were obtained in this optically dense and highly pigmented egg using fluorescently labelled sperm.

■ As part of our support for research at the interface between chemistry and biology, we made the first twenty grants, totalling £10M, under our Selective Chemical Intervention in Biological Systems initiative. Grants include support for identifying chemical agents, and their molecular targets, that determine the fate of embryonic stem cell cultures (University of Sheffield); identifying causes of premature ageing in Werner syndrome cells using selective chemical inhibitors (Cardiff University); and using a novel approach to build chemical tools for biology from 'molecular fragments' (University of Cambridge). The Engineering & Physical Sciences Research Council (EPSRC) contributed over £730k in support of four of the initiative grants.

■ Advances in healthcare often require multidisciplinary approaches – typically, an underlying biological principle, a physical device or process for exploiting it, and translation into clinical applications. BBSRC funds several areas of research that will underpin tomorrow's treatments, in partnership with EPSRC and the Medical Research Council (MRC).

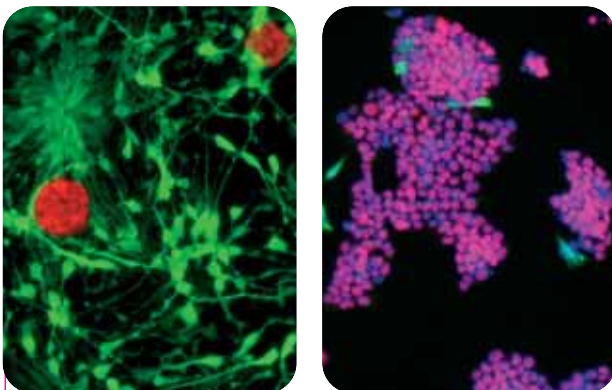
Supported by the £1M BBSRC and EPSRC-funded Tissue Bioreactor Sciences Project, researchers have developed a rapid and inexpensive way of making tissue-like 'grafts' out of collagen and using them to introduce cells to repair diseased or damaged tissues. (University College London, Queen Mary and Imperial College London).

■ BBSRC is co-funding (£650k) with NERC and EPSRC a large consortium project (£2.5M) led by scientists at Imperial College London under the renewable energy theme of the Towards a Sustainable Energy Economy Programme. The project is "A whole systems approach to analysing bioenergy demand and supply; mobilising the long-term potential of bioenergy". BBSRC has conducted a review, under the chairmanship of Professor Douglas Kell, of how basic bioscience can contribute to renewable energy, as a first step in identifying scientific priorities that offer the best options for future development of bioenergy.

In addition to these partnerships with other funders, we have also supported multidisciplinary approaches through our sponsored institutes (page 8) and centres for integrative systems biology (page 10).

■ BBSRC is leading for the Research Councils in establishing a UK Stem Cell Cooperative to facilitate links between researchers and encourage development of an integrated national stem cell research community, in response to the Pattison (UK Stem Cell Initiative) Report. Consultation with the community on the activities and management of the Cooperative is underway. BBSRC is also leading the provision of focused communications training for UK stem cell scientists.

Sixteen research projects totalling £6M have been funded under the BBSRC/EPSRC Stem Cell Science and Engineering initiative. Each is funded 75% by BBSRC, and reflects the need for parallel advances in understanding the cells' biology and in being able to manipulate them with precision in a range of environments. Examples include: exploration into the potential for long-term frozen storage of stem cells; the use of engineered scaffolds to improve the effectiveness of implanted cells in brain repair; and new technology for marking and tracking stem cells.



*When the protein Notch is active most embryonic stem cells turn into nerve cells (green); without it, they remain as stem cells (pink).*

Scientists at the Institute for Stem Cell Research (ISCR) at the University of Edinburgh have discovered a protein (Notch) that directs unspecialised embryonic stem cells to become cells of the nervous system. This finding, from research funded by BBSRC, MRC, The Wellcome Trust with EuroStemCell (an EU Framework 6 project) is among the latest of a series of discoveries made by ISCR scientists about the biology of stem cells, which is paving the way for the controlled laboratory growth of stem cells for uses such as modelling diseases and testing the effects of new drugs.



*BBSRC contributed to a Research Councils UK exhibition at the 2005 International Symposium, "Human Embryonic Stem Cells-Progress Towards Cell Therapy".*

■ Traditionally, research on ageing has focused on single disciplines, for example on biological changes associated with increasing age, or engineering devices such as mobility aids to compensate for age-related decline. In an innovative new venture, BBSRC and EPSRC are jointly funding a more joined-up approach; this is aimed at enabling researchers to switch direction within the field, and attracting new researchers. The first thirteen grants, totalling just under £500k, have been made under this programme, the Strategic Promotion of Ageing Research (SPARC).

The role of ageing, alongside that of diet and other environmental factors, on the development of gut cancers, is being explored in collaborative research at the Institute of Food Research with scientists and clinicians at the University of Newcastle. Proteomic analyses of mucosal cells indicate changes that could act as biomarkers of individuals' susceptibility.



*In June 2005, in partnership with the Natural Environment Research Council (NERC) and Defra, we presented the outcomes of the BBSRC/NERC programme on Gene Flow (2000) to the media and over a hundred stakeholders including policymakers, NGOs and regulators at a special discussion meeting.*

**We contribute to the Local Authority Research Council Initiative (LARCI) that facilitates knowledge exchange between the Councils and the Authorities. Seminars that form part of this have included: Climate change research; and Research for education.**

## Sponsored institutes



*Our strategy document illustrates the contribution of institute science in: Providing crucial national capability; Supporting the knowledge-based economy; Linking scientific excellence and knowledge transfer; and providing independent research and advice for Government.*

Our ten year vision for science and innovation in BBSRC-sponsored institutes ([www.bbsrc.ac.uk/about/pub/policy/institutes.html](http://www.bbsrc.ac.uk/about/pub/policy/institutes.html)) sets out how they will provide new knowledge, capacity and trained people in three overarching strategic areas of research: Animal Health and Welfare; Biomedical and Food Sciences; and Sustainable Agriculture and Land Use. Institutes characteristically provide specialist, long-term, and in some cases unique, experimental expertise and resources. We have established an Estates and Equipment strategy, with planned investment of over £200M over the decade from 2004-05 to 2015. This will enable rationalisation, modernisation and improvement of institute infrastructure.

As presaged in “Science and Innovation in BBSRC-sponsored Institutes – The Next Ten Years”, and in addition to the BBSRC investment of £23M in re-development of the Pirbright Laboratory of the Institute for Animal Health that we recorded in last year’s Annual Report, we have announced our intention to invest £35M in capital funding for a new facility (EBRC). This would provide a major focus for animal bioscience in the UK to encompass research currently undertaken at the Roslin Institute and the Neuropathogenesis Unit of the Institute for Animal Health, alongside research at the University of Edinburgh, Scottish Agricultural College, and other centres.

In February 2006, and following the outcome of the 2005 Institute Assessment Exercise, we announced institute funding for 2006-07 to 2009-10. This will include an overall increase in BBSRC funding to institutes of £11M on a recurrent baseline of £63M by 2007-08, excluding capital funding. Other significant changes include an increase in the proportion of core institute funding that supports animal health and welfare, from 22% to 26% by 2009-10. Also, we will increase total core funding to the Babraham Institute and to the John Innes Centre in recognition of their scientific excellence; and for these institutes, and for the Institute of Food Research and Rothamsted Research, we have waived the limit on income for joint grants with university-based scientists, to promote further collaborations. We will increase total core funding to the Institute of Grassland and Environmental Research and to Rothamsted Research; and BBSRC Council has indicated that it is minded to move to a single funding stream for multiple sites across these two institutes in the future.

Scientists at Rothamsted Research have tracked honeybees with radar and found new evidence that supports the sometimes disputed theory that ‘waggle dances’ direct bees to food sources. The results were published in *Nature* in May 2005 (*Nature* 435, 205-207).



Honeybee equipped with a radar transponder

### BBSRC-sponsored institutes

#### Animal Health and Welfare

Institute for Animal Health (IAH)  
Roslin Institute (RI)

#### Biomedical and Food Sciences

Babraham Institute (BI)  
Institute of Food Research (IFR)

#### Sustainable Agriculture and Land Use

John Innes Centre (JIC)  
Institute of Grassland and Environmental Research (IGER)  
Rothamsted Research (RRES)



## Institute funding (£k)

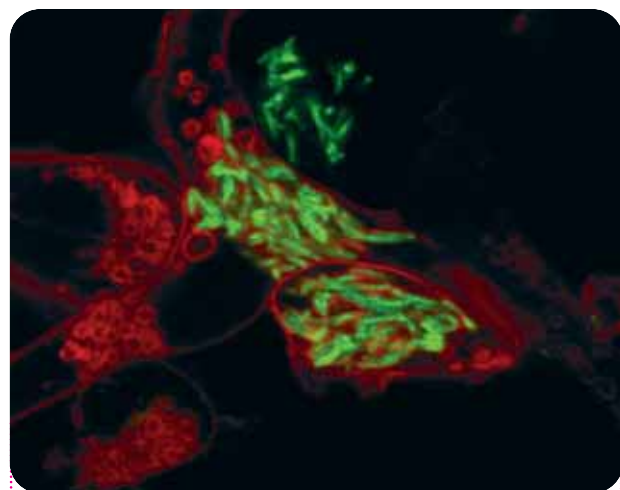
Institute	BBSRC CSG	BBSRC Other Funding	Defra/ FSA	Industrial Contract Income	Other Research Income*	EC/ International	Other Sources	TOTAL REVENUE INCOME	BBSRC Capital Funding
<b>Animal Health and Welfare</b>									
IAH	9,416	3,476	7,991	1,017	2,392	1,013	6,812	32,117	7,341
RI	4,449	2,216	1,205	2,175	1,036	408	1,629	13,118	421
<b>TOTAL:</b>	<b>13,865</b>	<b>5,692</b>	<b>9,196</b>	<b>3,192</b>	<b>3,428</b>	<b>1,421</b>	<b>8,441</b>	<b>45,235</b>	<b>7,762</b>
<b>Biomedical and Food Sciences</b>									
BI	10,870	2,706	-	444	2,147	156	3,725	20,048	1,834
IFR	9,585	1,501	1,801	391	535	1,301	677	15,791	807
<b>TOTAL:</b>	<b>20,455</b>	<b>4,207</b>	<b>1,801</b>	<b>835</b>	<b>2,682</b>	<b>1,457</b>	<b>4,402</b>	<b>35,839</b>	<b>2,641</b>
<b>Sustainable Agriculture and Land Use</b>									
IGER	5,220	580	7,128	1,335	1,162	493	1,551	17,469	1,437
JIC	12,374	5,127	1,024	144	583	1,985	2,923	24,160	4,271
RRES	11,841	3,010	5,108	2,194	826	1,034	1,379	25,392	3,150
<b>TOTAL:</b>	<b>29,435</b>	<b>8,717</b>	<b>13,260</b>	<b>3,673</b>	<b>2,571</b>	<b>3,512</b>	<b>5,853</b>	<b>67,021</b>	<b>8,858</b>
Silsoe Research Institute**	2,818	(13)	102	362	112	52	428	3,861	185
<b>TOTAL</b>	<b>66,573</b>	<b>18,603</b>	<b>24,359</b>	<b>8,062</b>	<b>8,793</b>	<b>6,442</b>	<b>19,124</b>	<b>151,956</b>	<b>19,446</b>

\*Including Charities and Government Departments

\*\*Closed 31 March 2006

BBSRC is encouraging closer research collaborations between institutes, in some cases through cross-institutes programmes (page 12). Professor Keith Goulding of Rothamsted Research has been appointed director of the Cross-Institute Programme for Sustainable Soil Function, which brings together BBSRC-funded research on soil science at Rothamsted Research and the Institute of Grassland and Environmental Research to advance understanding of sustainable soil function in managed landscapes. It has already secured four interdisciplinary responsive mode grants including research on the mobilisation and release to waters of nutrients in the soil microbial biomass, and the impact of this on eutrophication; and on the influence of *Festuca* and novel *Lolium* cultivars on soil structure and the variability of soil hydrological functioning. Integrated research programmes are being developed with research groups in Scotland and with the NERC's Centre for Ecology and Hydrology.

BBSRC is correctly implementing the findings of previous reviews by Government on institute governance. However, these are no longer best practice. A review published by OSI in January 2006 recognised BBSRC progress, but called for changes. We have commissioned an independent options appraisal and review, under the chairmanship of Professor Sir Brian Follett FRS, which is expected to report in October 2006.

Bovine dendritic cells infected with *M. bovis* (green)

Research at the Institute for Animal Health could lead to targeted vaccines for bovine tuberculosis through a better understanding of the biology of cells that trigger protective immunity in cattle. Studies of bovine dendritic cells have shown that only a minor subset can be infected by *Mycobacterium bovis*, the cause of this disease.

## Scientific priorities

### Integrative and systems biology

■ It is recognised worldwide that the combination of experimental and conceptual skills will drive the next wave of innovation in bioscience. BBSRC's first centres for integrative systems biology are beginning to realise their potential as world-leading centres in this area by attracting the high calibre, multidisciplinary teams needed to provide this mix of skills and expertise. The field of systems biology has emerged out of the post-genomics era, with a growing understanding of how genes and their resulting proteins give rise to biological form and function. At its essence is the co-evolution and integration of mathematical and experimental data that describe interacting biological processes. The **Centre for Integrated Systems Biology of Ageing and Nutrition (CISBAN)** at the University of Newcastle upon Tyne has built a 40-strong team and attracted top scientists from Japan, Australia and China. At the **Centre for Integrative Systems Biology (CISBIC)** at Imperial College London nine postdoctoral fellowships on the innate immune response to infection are among new posts that have attracted researchers from nine different countries and with backgrounds in bioscience, computing and mathematics. At the **Manchester Centre for Integrative Systems Biology (MCISB)**, University of Manchester, new appointments have included microbiologists, chemists, computer scientists and a chemical engineer, from several European countries.

We have announced awards totalling over £22M for three further centres, at the Universities of Edinburgh (cell processes); Nottingham (root biology) and Oxford (signalling in bacteria). These are being supported additionally by a total of just under £5M from the EPSRC.



Over 70 researchers participated in a workshop on Systems Biology, run jointly by BBSRC and EPSRC in March 2006. Keynote speaker was Professor Hiroaki Kitano of Sony Computer Science Laboratories Inc.



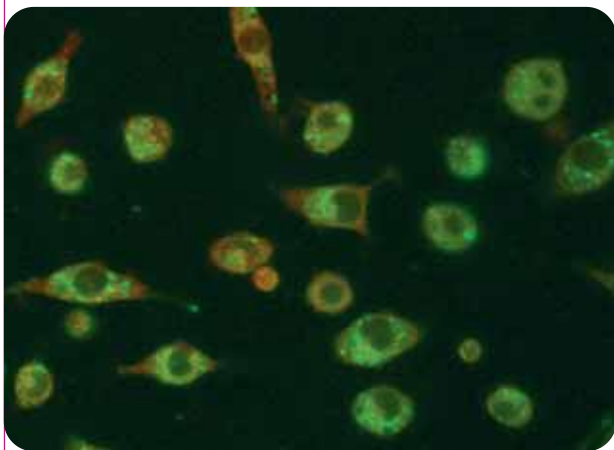
Research into ageing is a BBSRC priority area. In March 2006, we reported the outcomes of the 49 projects funded by two BBSRC initiatives that totalled over £9M – the Science of Ageing (1998) and Experimental Research into Ageing (2001). These included a project under the former that helped to establish the biology component of the Centre for Integrated Systems Biology of Ageing and Nutrition. From the left Dr Colin Miles of BBSRC and speakers Professor Janet Lord, Professor Julia Goodfellow and Dr Richard Faragher.

■ We have announced our participation in an international programme on Systems Biology in Micro-organisms (SysMO), to which we will contribute up to £3M over 5 years. This collaborative project, with partners in Germany, Austria, the Netherlands, Norway and Spain, seeks to pool expertise across these countries to create the resource necessary to develop a quantitative systems approach to single cell organisms. It will focus particularly on micro-organisms relevant to health, biotechnology, nutrition, bioenergy and environmental protection. We have received over thirty applications for support.

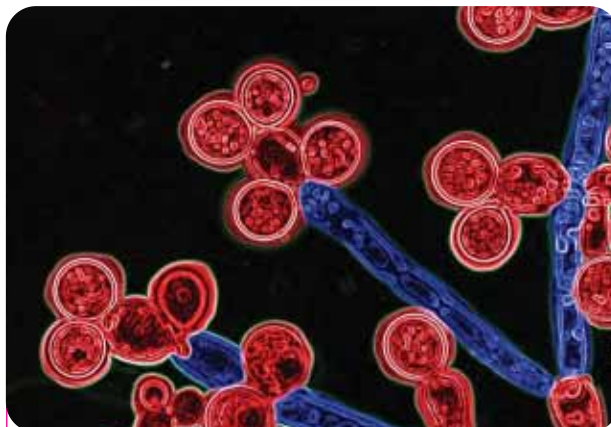
We have provided additional funding to the research consortia on *Arabidopsis* and *Streptomyces*, which were established under the Investigating Genome Function initiative (1999) to investigate the potential of collegiate and systems approaches both within the UK research community and internationally.



Scientists at CISBIC at Imperial College London are aiming to provide a platform for systems biology research through studies of host-pathogen interactions. One of the main objectives is to evaluate the relative merits, and develop hybrid methods that draw upon the strengths, of computer and mathematical sciences, prior to integration at a biological level. For example, research at the Centre on the uptake of the food-poisoning bacterium *Salmonella typhimurium* by immune cells will be used to develop rational and predictive models that will help in the design of improved human and animal vaccines.

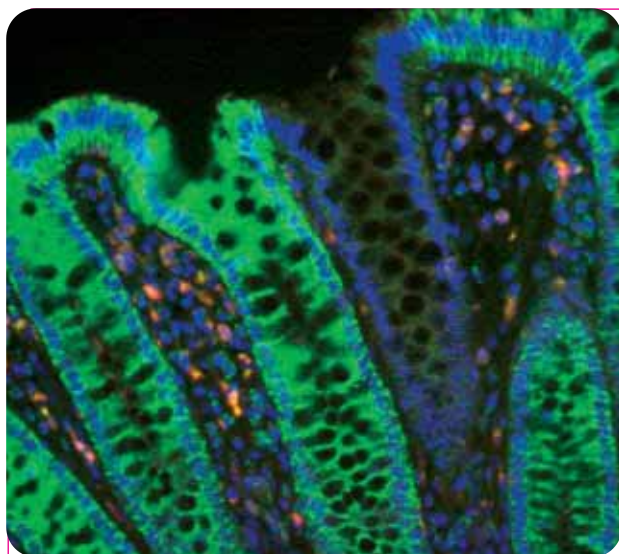


White blood cells, such as the macrophages pictured here (green/red) play an important role in the immune response, engulfing bacteria, including *Salmonella typhimurium* (fluorescent green spots)



Yeast cells. Courtesy of David Coleman, UCD. Reprinted with permission from SGM: Microbiology, 2004.

Research at MCISB is demonstrating the principles and methods of systems biology using the bakers' yeast, *Saccharomyces cerevisiae*, as a model organism. Yeast is highly amenable to genetic manipulation and high-throughput technologies, and so initial experimental work is focusing on the characterisation of purified yeast proteins, which in turn will provide modellers with data to predict enzyme mechanisms of action. One of the major challenges is to 'mine' existing sources of information, e.g. genome sequence databases, and to integrate these with the models and experimental data. Therefore, a further focus will be on the workflow-based inter-operability of the different elements of the systems biology data chain.



Fluorescent labelling of COX subunit-1 (green) shows the absence of cytochrome c oxidase (centre, brown), caused by a mitochondrial mutation in the lining of the human colon (Courtesy of Laura Greaves, CISBAN).

Studies of the molecular and cellular changes that govern the basic processes of ageing are at the heart of research at CISBAN, part of the University of Newcastle upon Tyne. Scientists are assessing adult stem cells in order to understand progressive damage in ageing tissues. They have shown that acquired, 'somatic' mutations increase sharply with age. For example, studies of ageing stem cells in the human gut, pictured here, have revealed the effect of a mutation in a single stem cell on the production of the enzyme cytochrome c oxidase (COX). Further studies, involving close collaboration between mathematical modellers and experimental researchers, are now underway to analyse, and predict, the variation in mutations from individual cells within ageing tissues.

## Plant research and crop science

■ We have responded to recommendations of the BBSRC Review of Crop Science, which reported in 2004, by taking several steps to help ensure that knowledge gained from basic plant science can more readily drive research to increase the commercial, environmental and societal value of crops. We are:

- Allocating up to £11.6M for an initiative in crop science, and up to a further £1M for Industrial Partnership Awards (page 22) in this area.
- Contributing £1.7M to a partnership with the Institut National de la Recherche Agronomique (INRA) to support collaborative crop research between scientists in the UK and France over the next four years.
- Acting as the UK's managing partner in a European Research Area Network in Plant Genomics.
- Establishing MONOGRAM, a programme to bring together expertise, facilities and resources at the Institute of Grassland and Environmental Research, the John Innes Centre, Rothamsted Research and the Scottish Crop Research Institute for work on genetic improvement of cereal and grass crops.
- Reviewing bioenergy research which will provide a framework for research on non-food crops and will inform a broader strategy in this area.

During the year there have been many examples of BBSRC-funded research generating new knowledge relevant to crop improvement. For example, scientists at the John Innes Centre have discovered a barley gene that helps the plant measure daylength and so optimise its time of flowering. Using this information and that from expected counterpart genes in other species could lead to varieties adapted to changed climate.

Molecular tools for wheat research, developed at the University of Bristol, in collaboration with scientists at Rothamsted Research and Advanta Seeds, are enabling plant breeders to rapidly characterise new material and speed up the breeding process. A microarray of 10,000 wheat genes has been used to identify differences in patterns of gene activity in wheat grown under organic or non-organic conditions. This could lead to a diagnostic test for organic produce.



To develop effective new ways to control crop diseases we need to know more about how plants respond to attack by disease-causing agents. Working with the model species *Arabidopsis*, scientists at Imperial College London have found a novel protein, RIN13 that occurs in tiny amounts in cells. Raised levels of RN13 enhance plants' ability to resist infection to specific bacterial strains without requiring them to commit suicide – the normal response. Plants were also shown to modify their resistance response to different types of invading bacteria by switching on genes in different combinations.

Also using *Arabidopsis*, researchers at the John Innes Centre (JIC) have shown how individual genes influence and control the size of plant cells and their direction of growth, factors that ultimately determine plant shape and structure. Collaborating with scientists in Germany, JIC researchers identified a signalling molecule from leaves, called florigen, which helps control the flowering season in plants and trees.

Scientists at the University of Sheffield have identified a genetically determined mechanism by which *Arabidopsis* protects itself against strong sunlight. The information is being used as a guide to help breeders in South America and South East Asia to improve yield in beans and rice.

## Animal health and welfare

Animal health and welfare is not only intrinsically valuable, it also has direct impacts on human health and on important social issues, including those surrounding the use of animals in research; and it impacts economically on the livestock and related industries. We have announced increased support for collaborative research with industry in this area (page 22). There are strong scientific, economic and ethical grounds for bringing together complementary animal research in world-class centres of expertise and in ensuring that advances in basic science feed through to practical health and welfare issues. Following the announcement in our 2005-08 Delivery Plan that we will invest £6M in animal health and welfare, we have begun planning for a new initiative in 2006 that will focus on research into endemic infectious diseases of farmed animals in the UK, including those caused by internal and external parasites. We are increasing support for institute-based research on animal health and welfare (page 8). We have also announced support of over £0.5M to the National Centre for the Replacement, Refinement and Reduction of Animals in Research, over the period to 2007-08.

In October 2005 we reported the outcomes of the consultative review of priorities for future research in farm animal genomics, in which a panel chaired by Professor Cheryl Tickle CBE FRS sought and considered input from the scientific community, policy and commercial end-users, animal welfarists and NGOs. Animal health was clearly the top priority, with the effect of genetic variation on factors affecting animal welfare also viewed as an important research area.

Multidisciplinary research on a small wading bird, the Kentish Plover, is giving insights into the agreed levels of care that male and female parents provide to their young. Unlike most birds, the male Kentish Plover provides more parental care than the female. A collaborative project between mathematical modellers at the University of Bristol and field researchers at the University of Bath has shown that nest temperature, specifically egg cooling, changes the behaviour of the brooding parent leading to a response by its mate. This work has implications for understanding parental interactions in other animals.



Many of the challenges in this area are international. Animal health, including general and specific disease resistance, is an important part of the 2025 vision document of the European Technology Platform on Sustainable Animal Breeding and Reproduction to which BBSRC is a signatory.

In January 2006 we launched a £4.5M initiative for research aimed at understanding the basic biology of avian flu. This will complement new funding by the Medical Research Council, and will cover a diverse range of aspects including epidemiology, the virology of influenza infection, host-pathogen interactions and vaccine development.



Emerging findings from BBSRC's consultation and review of future directions in farm animal genomics research were presented to industry representatives and researchers at the 2005 Royal Show, where Dr Graham Plastow of Syngen International Ltd, who had been a member of the independent review panel, led a lively discussion.



## International science

■ We support a range of activities to develop and sustain interactions with priority international partners, to further strengthen the UK science base. For example, following our high-level mission to India in November 2005, we are launching a partnership award scheme that builds on the success of our China and Japan Partnership Awards (CPAs and JPAs respectively). This year we awarded seven CPAs, for topics including: the effectiveness of natural products in traditional medicines; improving stress tolerance in cultured mammalian cells; harnessing wheat genetic diversity for improved diet and health; and biomaterials for tissue engineering.

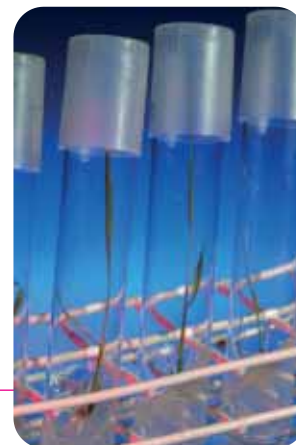


*Dr Kin-Chow Chang (left) at the University of Glasgow will be working with Professor Yuhong Su and colleagues at the Jinzhou Medical College and the Huazhong Agricultural University Veterinary School to develop collaborations in pig genomics and genetics to improve muscle growth and disease resistance.*

BBSRC is also supporting collaboration between scientists at the Institute for Animal Health and researchers in China on the biology of avian flu, and contributing to high-level negotiations with the Chinese Ministry of Science and Technology.

We awarded four JPAs for research including the regulation of systems that underlie stress, anxiety and depression; and the development of collaborative approaches in fermentation technology and metabolic network modelling. We participated in a UK-Japan symposium on neuroscience.

*Researchers at the John Innes Centre were part of an international team that mapped the rice genome (Nature (2005) 436, 793-800). This has already helped in identifying genes that underlie important agronomic traits. Apart from its immediate relevance - rice sustains over half the world's people - the genome is expected to provide a guide to the more complex genomes of wheat, sorghum and maize.*



■ BBSRC scientists continue to make a major contribution to European research. We have advised on the structure and content of the EU's forthcoming Framework Programme 7 (FP7). BBSRC contributed to the European Research Area Network (ERA-Net) in Plant Genomics which announced a call for proposals in February 2006, and organised an international workshop held at the John Innes Centre with representatives of the eleven partner countries. BBSRC has also joined a new ERA-Net in Systems Biology (ERASysbio), involving research funding organisations in 14 European countries. Reflecting our increased level of collaboration with INRA and Wageningen University Research, BBSRC has signed a Memorandum of Understanding between the three organisations, which is intended to help develop further collaborative working in preparation for FP7.



*A recent BBSRC publication illustrates how our research helps advance agriculture, food production and healthcare in developing countries.*

■ We have explored with the Department for International Development how BBSRC-supported research can best contribute to the development agenda, and look forward to closer working. Professor John Pickett CBE FRS of Rothamsted Research has been appointed to the Governing Council of the International Centre of Insect Physiology and Ecology in Nairobi, Kenya.

We have awarded 37 grants totalling £85.2k through our International Scientific Interchange Scheme. These have included support for scientists at the Institute of Grassland and Environmental Research to work with researchers in the Sudan to develop plant ecosystems to stabilise soils and landscape.

## Training and career development

BBSRC's Human Resources Strategy Board held its first meeting in April 2005. It identified and is taking forward as strategic priorities:

- Management and leadership for culture change.
- An holistic approach to performance management.
- Employee-led, proactive learning and development.

Our new Human Resources Strategy will support staff and students in our sponsored institutes and, where appropriate, the wider research community. It aims to deliver our vision for recruiting and developing highly skilled individuals who will maintain and develop the UK's world-class science and innovation base. It includes: promoting good HR practice, managing performance, providing appropriate rewards and flexible opportunities that allow individuals to manage their own development.

BBSRC contributes to several UK-wide deliberations on career development. Professor Julia Goodfellow represents RCUK on the OSI's Research Base Funders Forum and has led the development of projects promoting research career paths and analysing the current situation for researchers, following the publication of the Roberts' Review, *SET for Success (2002)*.

The RCUK Research Careers and Diversity Unit was established in April 2005 and leads for the Research Councils on the implications and implementation of the EU Charter for Researchers and the Code of Conduct for their Recruitment that was launched in September 2005. The Unit is supported by a cross-Council Research Careers and Diversity Group, of which the BBSRC is an active member.



*In November 2005, 130 postgraduate students and postdoctoral researchers attended BBSRC's second "Next Generation of Researchers" meeting. This provided an opportunity for early career scientists to meet and discuss a range of career development issues, including how to obtain grant funding, training opportunities and moving between academic and industry-based research.*

BBSRC's ten year vision for science and innovation in the sponsored institutes (page 8) describes how we will support and train staff and students. In addition to institute-led training courses, BBSRC's Training and Development team has increased its training course provision by 61%.

■ For the third consecutive year, BBSRC has part-sponsored a practical residential summer school for researchers working on human embryonic stems cells at the University of Sheffield Centre for Stem Cell Biology.



*The first of three annual courses on practical proteomics was held at the University of York. The course enables BBSRC-supported scientists to gain hands-on experience of proteomic technologies and hear about the latest technical developments and their applications. It is supported by BBSRC through the Proteomics and e-Science Training initiative, and draws upon the expertise of tutors from the Universities of York, Leeds, and Cambridge, and Nonlinear Dynamics Ltd. Over 20 scientists from university departments and BBSRC-sponsored institutes participated.*

Following a successful pilot scheme in 2004, BBSRC is continuing to provide Vacation Bursaries that enable undergraduates to undertake research. We are currently supporting 80 bursaries p.a. and have announced a further 20 awards for 'Vacation Bursaries in Mathematical Biology'. Bursaries are awarded to university departments, including veterinary schools, and BBSRC-sponsored institutes, largely in line with BBSRC Quota PhD studentships, ensuring that undergraduates can work in departments with a strong training environment.

## Studentships and Fellowships

■ We have introduced several changes aimed at providing greater flexibility in the training of postgraduate students. For the first time, all of our quota studentships, starting in October 2006, have been awarded as Doctoral Training Grants (DTGs). Funding is calculated on the basis of four-year studentships; but departments have discretion to allocate studentships for either three or four years' duration and to use monies as part-funding in joint-supported studentships. This provides research supervisors with much greater flexibility than previously, enabling them to optimise their training profile to meet scientific needs. We have harmonised terms and conditions for DTGs with the two other Research Councils that deploy them, EPSRC and MRC.

The Quota Competition for DTGs was assessed in December 2005 through BBSRC's Studentships and Fellowships Panel, as part of BBSRC's commitment to the peer-review of training quality. The competition tests a wide range of aspects of a department's, or institute's, training strategy, including the selection and training of supervisors; research facilities and research environment; generic and transferable skills training; PhD submission rates and students' first destinations.

We have introduced greater targeting so that more studentships help to provide the future supply of researchers in priority areas of research, including those where we are investing in order to enhance UK research capacity. We awarded a total of 40 Targeted Priority Studentships this year, (these replace our Strategic Research Studentships) that will commence in October 2006. These are in integrative mammalian physiology (page 22); crop science (page 12); Selective Chemical Intervention in Biological Systems (page 6); and Bioinformatics.

In partnership with EPSRC we are funding three Doctoral Training Centres (DTCs) in Systems Biology, at a total cost of over £11M. BBSRC is supporting a total of 30 studentships at the Centres as follows: University of Manchester 12; University of Oxford 9; University of Warwick 9. In the cases of Manchester and Oxford these will complement Centre funding (page 10). The DTC at Warwick will focus on mathematical, statistical and computational modelling of the components of biological systems, coupled with experimental data collection.

We increased the standard BBSRC PhD stipend to £12k (from October 2005) and will increase this to £12.3k from October 2006.



*Maria Eckert of Rothamsted Research was awarded the University of Nottingham 2006 Edward Cocking Prize for the most outstanding postgraduate student in plant sciences in 2005-06: Investigating fungal disease in winter oilseed rape.*

### All studentships\*

Type	Number
DTG CASE	151
DTG Research	395
Industrial CASE	272
Other CASE	194
Other Research	927
Masters	111
<b>Total</b>	<b>2050</b>

\*Current as at 31 March 2006

Education and training in support of commercial exploitation of research outcomes are described on page 26.



## DTG studentships awarded in 2005-06 by scientific area

Area	Number
Agri-food (AF)	39
Animal Sciences (AS)	59
Biochemistry & Cell Biology (BCB)	159
Biomolecular Sciences (BMS)	87
Engineering & Biological Systems (EBS)	31
Equipment and Facilities	2
Genes & Developmental Biology (GDB)	74
Plant & Microbial Sciences (PMS)	95
<b>Total</b>	<b>546</b>

## First destination data of PhD students

(% of known destinations)	Starting in academic year		
	1998-99	1999-00*	2000-01*
Permanent academic employment	1	5	3
Fixed-term academic employment	39	31	32
Further training (excl. teaching)	2	2	3
School teaching or teacher training	3	2	1
Private sector, industry or commerce	21	17	17
Government/ other public sector	8	12	7
Other employment	2	1	1
Not employed	6	17	27
Overseas	18	12	9

\*Collected by HESA

## Training first rate people

	2002-03	2003-04	2004-05
Students qualifying from Masters courses (%)	86	96	97
	1999-2003	2000-04	2001-05
Students submitting PhD theses within 4 years (%)	84	80	73

## Top twenty five Universities - by postgraduate funding from BBSRC

	University	Postgraduate Funding (£M)	No. Post-graduates as at 31.03.06	No. of Fellowships as at 31.03.06
1	Cambridge	3.33	165	9
2	Manchester	2.95	189	4
3	Leeds	1.97	105	5
4	Nottingham	1.91	112	2
5	Imperial College London	1.67	85	1
6	Oxford	1.66	77	3
7	York	1.62	90	3
8	University College London	1.52	85	3
9	Edinburgh	1.28	88	1
10	Birmingham	1.26	77	1
11	Sheffield	1.24	78	
12	Warwick	1.12	79	1
13	Bristol	1.04	69	
14	Newcastle upon Tyne	0.99	55	2
15	Glasgow	0.91	49	1
16	Dundee	0.89	52	2
17	East Anglia	0.87	79	1
18	Leicester	0.73	42	
19	Aberdeen	0.69	42	
20	Liverpool	0.67	37	1
21	Reading	0.58	44	
22	Southampton	0.57	38	
23	Bath	0.56	33	1
24	Sussex	0.53	33	
25	Kings College London	0.45	28	

We have reviewed our portfolio of Masters studentships which are awarded in a quota competition every three years. The review concluded that future awards should be made in strategic priority areas through a training account system. The competition will be held in 2006, for training starting in October 2007.

We are funding full economic costs for Fellowships that were awarded in the 2005-06 competition and which will be taken up in 2006-07. The Fellowship competition this year also reflected the outcomes of the Review of Fellowships that was undertaken in 2004-05, which recommended a number of changes. Fellowship applications were also received for the first time through the Joint Electronic Submissions (Je-S) system.

Following the 2005 Institute Assessment Exercise (page 8) BBSRC has announced a new Institute Fellowship scheme: £0.5M will be allocated in 2006-07, rising to £1.5M p.a. by 2008-09. This 'new blood' funding will strengthen priority areas in institute science by attracting high calibre researchers and providing career development opportunities.

We have announced our intention to fund a further two projects through the MRC-administered Career Development Fellowships in stem cells. These will be made in 2006.

Professor Mary Bownes OBE, Chair of BBSRC's Studentships and Fellowship Strategy Panel chaired the assessment panel for the second round of RCUK-administered Academic Fellowships. The Panel awarded 400 Fellowships to researchers in 73 universities and colleges across the UK, bringing the total number to 800 since the launch of the scheme by OSI in 2004. These awards provide career paths for researchers to move from short-term research contracts to tenured academic positions.

BBSRC has launched a monthly electronic news bulletin on postgraduate training and career development issues, which provides up to date information on developments and training opportunities for the research community ([www.bbsrc.ac.uk/funding/training/bulletin.html](http://www.bbsrc.ac.uk/funding/training/bulletin.html)). We have also developed a new 'People' leaflet, summarising the many ways in which BBSRC seeks to support training and career development in the wider bioscience community.



*Dr Raghu Padinjat, BBSRC David Phillips Fellow at Babraham Institute, is leading research into the functional genomics of the fruit fly, Drosophila melanogaster, to improve understanding of the actions of a number of hormones and neurotransmitters in other animals. This work was assessed as of the highest international standard during the 2005 Institute Assessment Exercise. Dr Padinjat was invited to be a member of the Alliance for Cellular Signalling, an initiative funded by the USA National Institute of Health, and organised an EMBO workshop at the National Centre for Biological Sciences in Bangalore, India in 2005.*

**people**

**Training and development are key to maintaining a healthy UK bioscience sector.** There is an increasing need for scientists to learn new skills, collaborate with experts from other disciplines, and share knowledge with scientists in other parts of the world.

**Our Vision**

We aim to provide an integrated and coordinated framework that enables and creates learning opportunities for bioscience scientists. This will be achieved by providing development and career training, to meet the needs of scientists across the whole spectrum of organisations.

We aim to provide a strategic development framework that meets the needs of the training, learning and development community. This will be achieved by providing a strategic framework for training, learning and development across the whole spectrum of organisations.

## BBSRC staff

On 1 April 2006, 2,366 staff were employed on indefinite contracts in institutes sponsored by BBSRC and in the BBSRC Office. Of the indefinite staff 1,094 were in the science category, of which 93% were graduate or equivalent level. A further 348 members of staff, mainly scientists, held period appointments funded by BBSRC directly (179) or by industry and other external sources (169). Women now occupy 20% of senior posts in BBSRC (Band 1 to Band 4). The comparable figure for 2004-05 was 15.7%. We are reducing the number and proportion of researchers on fixed-term contracts (often funded externally e.g. by Defra). This peaked at almost 1,300 in 2001-02 and has decreased by 79% in four years.

Silsoe Research Institute closed on 31 March 2006. Over twenty scientific and technical staff moved to BBSRC-supported research at Rothamsted Research (biomathematics and soil science) and Royal Veterinary College (animal behaviour and welfare). Early evidence indicates that over 60% of scientific and technical staff are working in scientific posts. These include science-based consultancy and small businesses; five engineering based businesses established by institute staff are based on the institute site at Wrest Park.

■ The BBSRC's policy in relation to the employment of disabled persons is, where practicable, to continue to employ employees who become temporarily or permanently disabled. As with all members of staff full regard is given to their training needs, career development and promotional potential. Full and fair consideration is also given to the recruitment of applicants who are disabled, taking into account their aptitudes and abilities.

■ BBSRC received a Silver Award from Opportunity Now for encouraging inclusiveness for women. We are further embedding workplace diversity through: an audit of policies and practices; continued support for Daphne Jackson Fellowships for returners to science; participation in national surveys; training on disability and transgenderism awareness.

■ In line with new legislation we are developing Action Plans for Disability, Race and Gender Equality Duties and, together with other Research Councils, are improving the gathering and use of diversity data.

■ We utilise a range of practices to communicate with staff locally and nationally. Senior management meets regularly with Trade Union representatives in Central and Institute Negotiating Consultative Committees to discuss conditions of service and other matters that bear on BBSRC operations. Bulletins, circulars, briefings and corporate publications are also used to communicate with staff, in addition to direct letters to individuals.



*Professor Sir Michael Berridge FRS, Emeritus Professor at the Babraham Institute was awarded the 2005 Shaw Prize for his pioneering research on cell signalling.*



*Dr Giles Oldroyd, a BBSRC David Phillips Fellow at the John Innes Centre was among 17 European scientists recognised under the Young Investigator Programme of the European Molecular Biology Organisation. He was also one of five outstanding British scientists invited to take part in 'Celebrating British Science', a joint Royal Society/ DSI event in National Science Week 2006.*



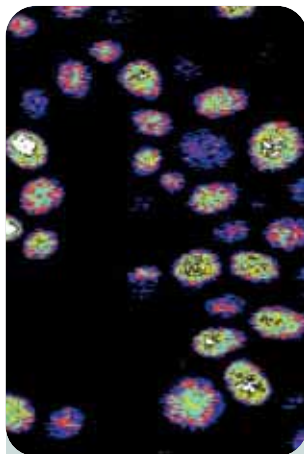
*Professor Ian Crute, Director of Rothamsted Research has been awarded the BCPC Medal, which recognises individuals who have made an outstanding contribution to crop protection.*

## UK facilities and infrastructure

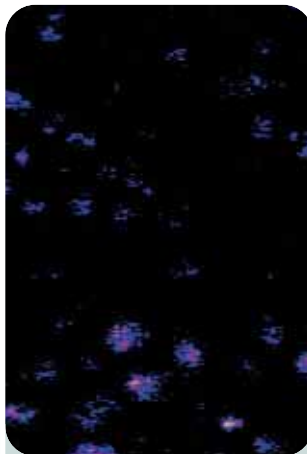
Contemporary bioscience depends increasingly on new research tools resources. We have made £23.2M available to support this. Our Tools and Resources Strategy Panel has identified three priority funding streams:

- Technology Development Research Initiative\*  
(joint with EPSRC)
- Tools and Resources Development Fund.
- Bioinformatics and Biological Resources Fund.

We support a number of national research facilities; and in 2005 we renewed funding for ARK Genomics at Roslin Institute for three more years and agreed to continue co-funding the National Stem Cell Bank for five more years with MRC.



Fluorescence from labelled protein

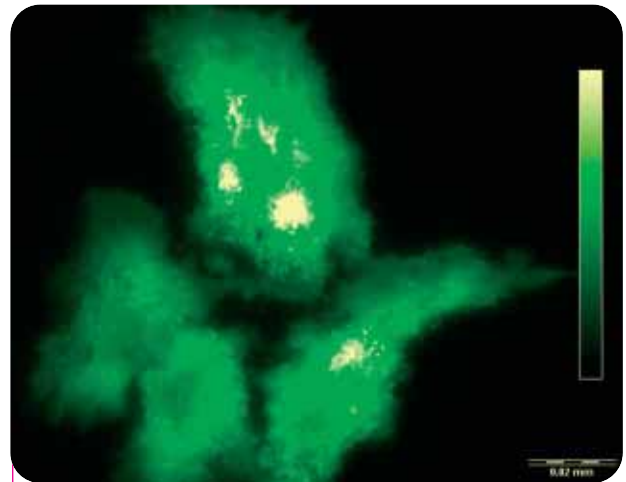


Fluorescence from misincorporated label, unincorporated label and background

*Collaborative research between bioscientists at the University of Cambridge and researchers at the CCLRC Central Laser facility has developed a new method for observing proteins at work inside living cells. Unlike conventional approaches that tag proteins by attaching them to fluorescent proteins whose fate can be tracked, the new technique inserts a tiny fluorescent label direct into the protein of interest. This means that the protein is closer to its natural state and therefore is more likely to interact normally with other molecules in the cell. Funded by BBSRC, Wellcome Trust, Royal Society and EU Marie Curie Fellowship.*

## Research Equipment Initiative

■ We awarded a total of £5.8M under the Research Equipment Initiative in 2005, supporting 40 projects within UK universities (£5.1M) and eight projects within BBSRC-sponsored institutes (£750k). Topics included: support for multicollector isotope radio mass spectrometry facilities at the University of Aberdeen; imaging near-membrane processes in living cells using total internal reflection microscopy at the Babraham Institute; equipment for sorting and analysis of diverse cell populations for novel applications in diet, health and microbiology at the Institute of Food Research; equipment to measure the impact of environmental variation on plant disease and development at the John Innes Centre; a state-of-the art facility for the study of protein trafficking *in vivo* at the University of Leeds; a high brilliance X-ray generator with CCD detector at the University of Manchester; and imaging of 3D engineered tissues at the University of Sheffield.



*Movement of Capri protein (green) to the plasma membrane in HeLa cells stimulated with histamine (Babraham Institute).*

\*Complementing the Initiative is our £3.4M Tools and Resources Development Fund that will support small or short-term pump-priming projects and facilitate collaborations.

## e-Science Programme

■ Since 2002 we have awarded more than £23M in the Bioinformatics and e-Science Programme, funding 61 projects in 44 different universities and institutes. For example, the joint e-Protein project between Imperial College London, University College London and the European Bioinformatics Institute, in collaboration with Sun Microsystems, aims to provide a structure-based annotation of all proteins in major sequenced genomes, pooling computational and database resources at the three sites using Grid technology. With a system to manage this huge, combined computational power and a web-based 'front end' system now in place, a key achievement to date has been the annotation of 32,000 unique protein sequences in the human genome within one day, accessing 500 'nodes' at University College London and Imperial College London.

In 2005 we allocated remaining funding to specific initiatives within the Bioinformatics and e-Science Programme, including the £1M e-Science Development Fund and a fund for pump-priming and scoping activities, for training in proteomics and e-science under which £286k has been allocated. (page 15).

BBSRC is continuing to support the European Molecular Biology Open Software Suite (EMBOSS), which provides bioinformatics and tools for the bioscience research community. We are continuing to support the European Bioinformatics Institute (page 4).

■ In October 2005, we held a workshop to review outputs from BBSRC's Bioinformatics and e-Science Programme phases I and II. These included:

- Developments towards an e-Science infrastructure for exploring pathogenicity determinants so that fungi which have the potential to cause disease may be readily distinguished from those that do not (University of Manchester).
- A prototype model that will enable scientists to map genome information from different sources and across different species (Roslin Institute).



*Examples of some of the achievements of the first five years of the UK e-Science Programme have been published by the Research Councils.*

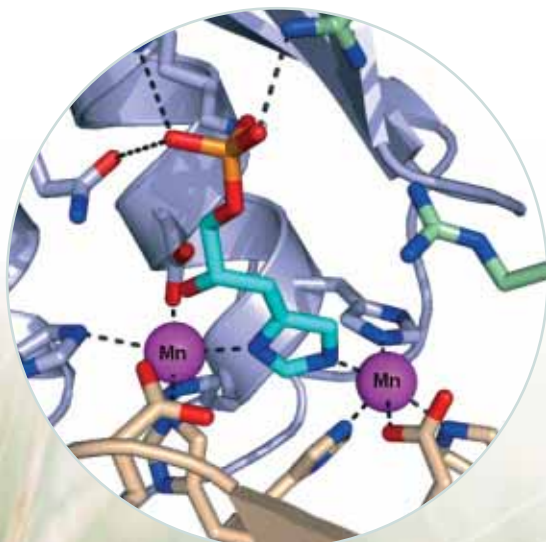


# Enhancing exploitation of research outcomes

## Technology Strategy and collaborative research with industry

■ In the successful UK pharmaceutical and biotech sectors, commercial advantage arises directly from, and close to, advances in fundamental scientific understanding. Such sectors rely heavily on the nation's strong academic base in bioscience. BBSRC has announced its intention to double grant support for collaborative research with industry to £8M by 2007-08. Specifically, we are increasing our support for collaborative research through Industrial Partnership Awards (IPAs), in which industrial partners contribute 10% cash support to responsive mode grant awards. We have earmarked a further £1.5M for IPAs in the area of animal health and welfare (page 13) and a further £1.5M for IPAs in plant and crop science (page 12).

An IPA between scientists at the University of Sheffield and the agrochemical company Syngenta is successfully combining the academics' structural biology expertise with the company's development of new chemicals that have potential as new generation herbicides. The partnership advances understanding of how molecular structure determines herbicide activity, and at the same time offers the industry the opportunity of novel targeted compounds capable of killing weeds that have become resistant to conventional herbicides.



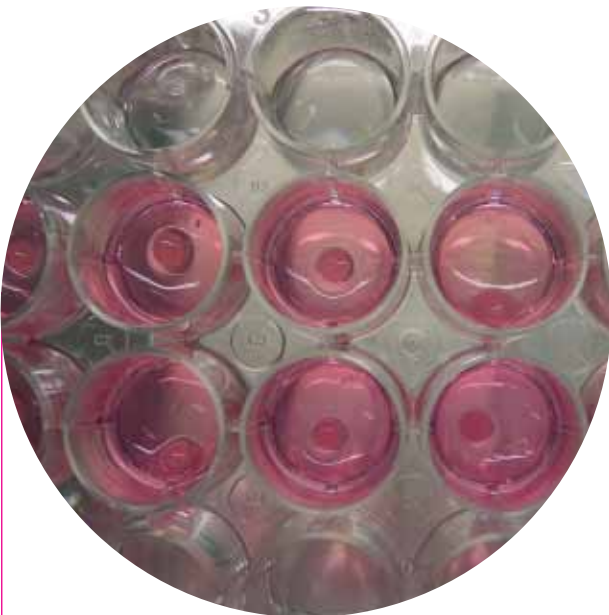
*The active site of a novel herbicide target (imidazoleglycerol phosphate dehydratase), which binds its substrate between two manganese ions (University of Sheffield/Syngenta).*

We have made progress on priority areas of our **Technology Strategy** – through which we work with industry and other stakeholders to help ensure that high quality research is in place to support the needs of UK industry. Specifically, within a funding partnership with the Department of Trade and Industry, Higher Education Funding Council of England, MRC, Scottish Funding Council and industrial companies that totals up to £12.3M, we are funding four major projects to improve understanding at the whole organism level of complexity of systems in mammalian physiology. We have also invested £6M to launch a Bioprocessing Club that will support innovative research including that needed for the efficient manufacture of complex biopharmaceuticals. The Club is also being supported by EPSRC (£3M) and a consortium of industrial companies (£1M). It is being managed by BioProcessUK with funding from DTI.

■ We are partnering EPSRC, MRC and the DTI in a call for proposals in Regenerative Medicine, under the National Technology Programme. This will cover areas such as tissue engineering, drug delivery and biocompatible and biomimetic materials. We are also participating in a call on Bioscience for Industry.



■ BBSRC provides around £3M p.a. to enable academic and industrial groups to work together through LINK projects, in which industry provides 50% of the funding. Currently we support research that includes identifying genetic mechanisms affecting the yield and pest and disease resistance of barley (with Scottish Crop Research Institute, Scottish Executive Environment and Rural Affairs Department, Advanta, CPB Twyford, Dalgety/Secobra, New Farm Crops, RAGT/PBI, Svalof Weibull, Brewing Research International, SWRI, MAGB, COORS, MRS, HGCA, Crop Evaluation Limited) as well as genetic markers for innate immune responses to enteric diseases and food-borne pathogens that could help selection for chickens that are more resistant to infection (Institute for Animal Health, Roslin Institute and the world's leading poultry breeding companies Aviagen and Cobb-Vantress, funded with Defra). We have agreed to co-sponsor a new £5M LINK programme on Renewable Materials with Defra.



Researchers at the University of Bristol have successfully converted adult stem cells from the bone marrow of osteoarthritis patients into human cartilage cells and cultured them in the laboratory. They have also developed a technique to grow the new cells into pieces of cartilage tissue. It is hoped that this advance could lead to pioneering cartilage transplant surgery within a decade. The research was funded by BBSRC through a LINK grant in partnership with Smith and Nephew Group Research, a global medical technology business.

With support under the Analytical Biotechnology LINK programme, which finished in 2005, scientists at the University of Newcastle developed several advanced technology antibody-based diagnostics for small molecules. These overcome previous limitations and provide new opportunities for point-of-need screening, for example for pesticide contamination in patient, industrial and environmental samples.



Programme Chairman Melanie Lee, Executive Vice President R&D UCB SA, speaking at a packed meeting on the outcomes of the Applied Genomics LINK programme at the Royal Society in April 2005. The programme, which was funded by BBSRC, MRC and the DTI, resulted in a range of scientific and technological advances for the development of new therapies and diagnostics for conditions including cancer, Alzheimer's disease and spinal cord injuries as well as drugs for infections such as those caused by MRSA. A further presentation on the programme was made in the Houses of Parliament in November 2005.



The biopharmaceutical drug market is projected to generate over \$50 billion in sales by 2010. A new technology for lower-cost production of many protein drugs is being pioneered at the Roslin Institute, and builds on the institute's long-standing world lead in transgenic animal science. Working with Viragen Inc and Oxford BioMedica plc, Dr Helen Sang's team has succeeded in producing a functional 'humanised' antibody, and an interferon in the white of eggs of transgenic hens.

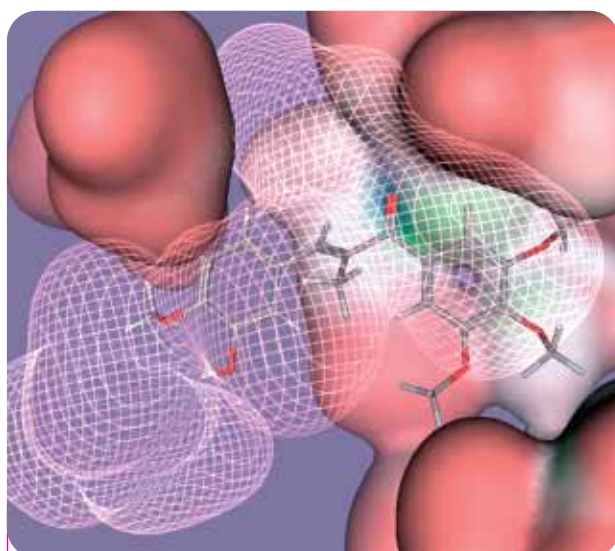
■ Collaborative research between Entercel Ltd and scientists at Rothamsted Research is helping to develop an enhancer technology to restore the effectiveness of commercially important triazole fungicides. The aim is to reduce application levels and control fungi that are developing resistance. Preliminary findings suggest that the new technology could reduce infection levels by up to 32-fold.

■ BBSRC is one of the sponsors and partners of a new Sensors Knowledge Transfer Network (one of a series of networks instigated by DTI to stimulate innovation in key technology sectors in the UK). It aims to help industry to benefit from access to new developments in advanced instrumentation R&D.

## Commercialisation of research

■ BBSRC, in partnership with EPSRC and NERC, has launched the fourth round of support, totalling £1.4M, for the **Follow-On Fund**, which enables scientists to demonstrate the commercial potential of ideas arising from their research, and to secure opportunities for business development. In 2005, we made 17 BBSRC Awards, totalling £1M. These include support for scientists at the University of Salford to explore inhibition of cell scaffolding assembly as a means of starving cancer tumours; and for researchers at the University of Oxford to develop more effective enzymes for industry.

"We are delighted to have been awarded the Follow-On Fund by BBSRC. This has allowed us to explore the commercial aspects of this project. We have now selected several candidate drugs and are looking forward to bringing them to the clinic," Dr Sylvie Ducki.



Targeting tubulin with a view to inhibiting its assembly so that blood vessels to tumours become blocked, effectively starving the tumour to death.



Sylvie Ducki of the University of Salford, photographed with Science Minister Lord Sainsbury (centre) and Brian Iddon MP after presenting her BBSRC-sponsored research at a parliamentary event in 2005.



Dr Martin Wickham

Dr Martin Wickham of the Institute of Food Research is developing a computer-controlled model that could be used by the food and pharmaceutical sectors to predict digestion of real foods and medicines within the human gut. To develop the 'Model Gut' from his knowledge and expertise in human gut behaviour, he was supported by a Follow-on Fund award that enabled him to validate his working prototype. He has since been awarded an Enterprise Fellowship to develop the prototype. He aims firstly to develop the Model to a stage where he can use it for contract service work and then to develop a full commercial version ready for licensing.

We have awarded the first BBSRC Enterprise Fellowships. These provide a salary for one year and business training for scientists to progress their research towards commercialisation.

### ■ A computer-controlled model to predict gut function

Dr Martin Wickham, Institute of Food Research  
Dr Wickham was also awarded support under the Follow-On Fund

### ■ Logic-based drug discovery

Dr Riccardo Bennett-Lovsey, Imperial College London

### ■ Responsive biopolymers for delivering innovative diagnostics and therapeutics

Dr Mark Eccleston, University of Cambridge

### ■ Transforming proteomic data into commercial knowledge

Dr Ian Shadforth, Cranfield University

*The scheme is run in partnership with the Royal Society of Edinburgh*



*Pulling together several types of research, supported through a range of mechanisms is often a feature of successful knowledge transfer. BBSRC is one of several funders supporting research in Dr Dawn Coverley's laboratory (pictured here) at the University of York. Dr Coverley (centre) is one of thirty Bioscience Yorkshire Enterprise Fellows supported by Yorkshire Forward. She is launching her own R&D company, Cizzle Biotechnology Ltd, to develop novel cancer drugs based on the Ciz1 gene. BBSRC supports a PhD studentship to explore the role of Ciz1 in DNA replication. (Courtesy of Simon and Simon Photography)*



*A mixture of BBSRC core support for the Bloomsbury Structural Biology Centre in the late 1990s, a grant under our Exploiting Genomics (ExGen) initiative, and training and support through our Exploiting ExGen programme has helped to establish and develop spin-out company Domainex Ltd. The company is based around novel protein structure technology important for the pharmaceutical sector. Its Research Director, Dr Renos Savva, won the 2005 London Biotechnology Network Young Entrepreneur of the Year award.*

Following the Institute Assessment Exercise (page 8), BBSRC has announced that it will increase support for Knowledge Transfer (KT) activities at institutes by £1M p.a. to enable them to build on their existing work and to strengthen their portfolio approach to KT and innovation.

Bioscience KT activities won over £5M under the Government's Public Sector Research Exploitation Fund. Among the awards was one of almost £2M to Plant Bioscience Ltd, which manages innovation activities across four BBSRC-sponsored institutes (IFR, IGER, JIC and RRES) and in which BBSRC is a major shareholder. Almost £1M was awarded to Genecom, which is led by the Roslin Institute and also covers research at the Institute for Animal Health (and Moredun Research Institute).

In February 2006, Babraham Bioscience Technologies – the business arm of the Babraham Institute, hosted its first “Biotechnology Investment Forum” in which early stage biotechnology from eighteen new businesses across the UK was presented to investor groups, with a view to attracting further investment and identifying new opportunities for scientific and business expertise on the Babraham Research Campus to aid the translation of ideas into commercial reality. The Babraham BioConcepts facility for translating science into business is achieving full tenancy.

**Transferring knowledge (BBSRC-sponsored institutes)**

	2003-04	2004-05	2005-06
Industrial income (£k)	13,351	11,261	8,829
Patents awarded	17	13	19
Commercial licensing agreements	53	56	37
Income from intellectual property (£k)	818	443	415
Spin-out companies trading	13	15	16
Refereed publications co-authored with industry	80	69	65

Financial figures are subject to audit within the sponsored institutes



**The Research Councils Business Plan Competition**

The latest round of the RCUK Business Plan Competition was launched in November 2005. It attracted 130 applications, of which a significant number were bioscience-based.



## Education and training

■ BBSRC supports a variety of mechanisms to help research students and established researchers develop the business and technical skills that will help them to develop productive links with companies, to commercialise their own research and equip them for careers in science-based companies. We work closely with industry to ensure that the specialist training we support provides the highly skilled individuals needed to maintain UK competitiveness. Already, over 20% of BBSRC-funded postgraduates move directly into industry on completion of their PhD.

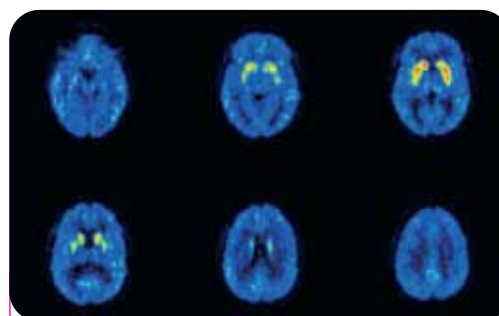
■ We have launched a pilot **Industry Interchange Programme** with support for six short-term exchanges of skilled individuals between the science base and industry. This scheme is designed to increase reciprocal access to facilities, expertise and knowledge, with a view to stimulating longer-term partnerships. The first awards will support exchanges of researchers on:

- Cell signalling (Babraham Institute and UCB Pharma)
- State-of-the-art statistical analysis of large data sets (Imperial College London and AstraZeneca)
- Molecular marker methodologies (University of Bristol and Advanta Seeds) (page 12)
- Heme enzyme activity (University of Leicester and AstraZeneca)
- Computer modelling of biological systems (University of Southampton and Microsoft)
- Technology for prion diagnostics (University of Warwick and Farfield Sensors).

■ Our **Modular Training for Industry** programme helps ensure that graduates who have entered industry can keep their technical and specialist knowledge up to date through flexible, industry-relevant courses. BBSRC supported ten courses in 2005-06, at a cost of £298k. In February 2006 we convened a successful event on sharing experience and best practice in delivering the courses. We have announced our intention to increase support for modular training by 40% by 2007-08.

■ Strong industry demand and commitment to training is a prerequisite for BBSRC support. For example, a contract awarded recently to the Institute of Food Research, for a training module on Predictive Microbiology for the Food Industry, attracted support from sixteen major companies, including food manufacturers and retailers.

What is believed to be the UK's only training module on Positron Emission Tomography (PET) – a new tool for simultaneous, real-time imaging of many different biological molecules in living tissues - is a joint initiative between Imperial College London and GlaxoSmithKline, supported by BBSRC. PET technology is an increasingly important tool for drug development in the pharmaceutical sector, and there is already an international shortage of appropriately trained personnel.



*PET images showing the distribution of 5-HT4 receptor in the living human brain, which is critical to memory and adaptation to the environment (Courtesy of GSK)*

■ **CASE and Industrial CASE Awards** are well established mechanisms for industry-relevant training at the postgraduate level. In some cases these add value to other academic-industry partnerships. For example, the University of Sheffield IPA work with Syngenta (page 22) is supported by complementary work through an Industrial CASE studentship. BBSRC currently supports 345 CASE Awards and 272 Industrial CASE Awards, of which 204 are Industrial CASE Partnership Awards with companies that have a strong track record in training provision.



*BBSRC-supported Industrial CASE student Samantha Passey won the 2005 Ruth Bowden Scholarship from the British Federation for Women Graduates for outstanding performance by a female PhD student in the biosciences. Her studentship is in the Department of Biochemistry at the University of Bristol, where she is studying aspects of the regulation of white blood cells in immune responses. It is supported in partnership with Pfizer.*

■ Since its inception in 1995, the **Biotechnology Young Entrepreneurs Scheme** (Biotechnology YES) has provided business skills training to over 1000 postgraduate and postdoctoral scientists. BBSRC was delighted to welcome the Director General of Research Councils, Sir Keith O’Nions as guest speaker at a celebratory reception in December 2005. This brought together current participants and trainers with representatives of past ‘alumni’, over 40% of whom are now working in private industry, with a further 12% working in technology transfer or intellectual property management roles.

Biotechnology YES is organised jointly by BBSRC and the University of Nottingham Institute for Enterprise and Innovation (UNIEI). It is a competition for hypothetical business plans, in which participating teams receive training from entrepreneurs, patent lawyers, financiers and industry representatives. It is sponsored by BIA, Cancer Research UK, Celtic Pharma, DTI, Eric Potter Clarkson, GlaxoSmithKline, Lonza Biologics, MRC, NERC, Nestle, RAE, Syngenta, and Yorkshire Forward, as well as BBSRC and UNIEI.



Winners of the 2005 competition were a team from the University of Glasgow whose hypothetical business was based around the production of chiral amino acids for use in drug development.



A BBSRC CASE studentship at Warwick HRI, in partnership with the Horticulture Development Council, is exploring options for the biological control of the currant-lettuce aphid, which is of considerable economic significance to the UK horticulture sector and is very difficult to control by conventional methods.



Sir Keith O’Nions speaking at the Biotechnology YES reception.

■ BBSRC and the National Endowment for Science Technology and the Arts (NESTA) have developed and piloted bioscience involvement in NESTA’s Creative Pioneers

Programme, which encourages individuals to design new types of companies. Four early-career bioscientists from the Universities of Edinburgh, Imperial College London and Newcastle, and from Rothamsted Research won places on the two-week residential training course in January 2006.



# Embedding our science in society

■ We have increased our emphasis on opinion gathering, public dialogue and consultation activities, and on embedding the outcomes into BBSRC's planning and decision-making. This has included new ventures in attitude studies, consultations and discussion meetings around future directions of specific programmes of BBSRC-supported research, as well as contributions to national dialogue activities in the field of nanotechnology. With advice from the Bioscience for Society Strategy Panel, we are learning from, and building upon, these new activities so that we can optimise their usefulness in keeping BBSRC aware and responsive to wider social issues.

We have also strengthened our procedures for monitoring, and responding to, issues of public interest and concern around the conduct and application of bioscience research, following recommendations and advice from the Bioscience for Society Strategy Panel.

At the same time, we have maintained a varied programme of outreach and communication activities aimed at providing information about current research and research outcomes; enabling people of all ages to engage with modern bioscience. We have contributed to the development of the Research Councils UK Science in Society Strategy, increased our collaborative working through the RCUK Science in Society Unit, and with other Research Councils; and contributed to establishment of the RCUK media office.

Making our science accessible:	2004-05	2005-06
Media releases	46	60*
Corporate publications	7	12
Exhibitions	5	11
Grants for National Science Week (awarded through RCUK)	18	13 <sup>+</sup>
Public engagement awards	9	27
Research student placements in schools (through RCUK)	36	26
Local schools coordinators	25	26
Science communication courses (and awards)	5	9 <sup>++</sup>

\* includes two jointly with NERC    <sup>+</sup> out of a total of 33 awards  
<sup>++</sup> includes participation in 2 university-led courses

■ In partnership with MRC and the Wellcome Trust, we have developed and published a joint statement "Managing Risks of Misuse Associated with Grant Funding Activities" that highlights agreed policy changes that strengthen procedures for minimising the risk of research being misused, for example in bioterrorism. The joint statement has been positively received internationally and was, for example, presented by invitation at the March 2006 meeting of the US National Science Advisory Board on Biosecurity.

BBSRC is also supporting the UK Panel for Research Integrity in Health and Biomedical Sciences, which is being led by Professor Michael Farthing. This will promote models for good practice, governance, management and the general conduct of research in these areas.



We have reviewed, updated and re-published our position statement on stem cell research. [www.bbsrc.ac.uk/society/accountability/position-statements/stem.html](http://www.bbsrc.ac.uk/society/accountability/position-statements/stem.html)



BBSRC supports and contributes to the following, which are coordinated through the RCUK Science in Society 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 communication, and for activities of the Science Media Centre**

■ At the Royal Botanic Garden Edinburgh in May 2005, we launched a major new touring exhibition on the science of Biodiversity, produced in collaboration with NERC. This interactive display has since toured Glasgow, Newcastle and Cardiff, with other venues planned for 2006-07. At some of the locations it has provided a focus for public discussion meetings at which visitors can discuss issues with researchers direct.

■ For the first time, BBSRC supported an interactive display and presentation at the National Eisteddfod of Wales. This featured the biology of DNA and was presented by scientists from the University of Wales, Bangor. BBSRC displays were also presented at a range of venues including the ThinkTank Science Centre in Birmingham, and the Edinburgh International Science Festival. We also supported presentations by the John Innes Centre and Rothamsted Research at the Chelsea Flower Show on computer modelling of plant growth and companion planting for crop protection respectively.



*Clockwise from top left: DNA science at the National Eisteddfod of Wales; science of ageing at the Edinburgh International Science Festival; Lord Winston speaking at a BBSRC meeting on closer collaboration between BBSRC-sponsored institutes on public engagement in science; and applied genomics research discussions at a House of Commons meeting in November 2005*



*The Biodiversity exhibition at the National Museum of Wales, Cardiff which was cited several times in the Times' Top Museum listings.*

## Opinion gathering and public dialogue

■ BBSRC supported, and contributed to the oversight panel of, the Citizens' Jury on Nanotechnology, which took place in Summer 2005. Sponsored by Greenpeace UK, The Guardian, The IRC in Nanotechnology at the University of Cambridge and the Policy, Ethics and Life Sciences (PEALS) Research Centre at the University of Newcastle, the jury brought together twenty people chosen to represent a broad cross section of society. The Jury's recommendations were considered by BBSRC's Bioscience for Society Panel, which will advise on BBSRC's response. BBSRC also contributed to a public engagement awareness and training day for young researchers in nanoscience organised by the Cambridge IRC at University College London.



*Some of the participants of the Citizens' Jury on Nanotechnology, which was organised by PEALS (photograph courtesy PEALS).*

In partnership with EPSRC, and the think-tank DEMOS, BBSRC has continued to develop a focus group-based experiment in public dialogue on nanotechnology as part of the DEMOS-led Nanodialogues project. This will be held in Swindon in 2006.

■ A discussion meeting at the Glasgow Science Centre, held alongside the BBSRC-NERC exhibition on biodiversity (page 29), provided an opportunity for participants to contribute to BBSRC's on-line consultation on priorities in biodiversity research.

■ Issues about food safety, quality and manufacture are often the subject of widespread public debate. In 2005, we commissioned MORI to conduct an attitude study of people's views about research into Diet and Health, one of BBSRC's priority research areas in food science. The study, which was supported jointly with the Institute of Food Research (IFR) and led by a steering group chaired by IFR social scientist, Dr Gene Rowe, showed strong support for diet and health research, with prevention of health problems as a priority ([www.bbsrc.ac.uk/about/pub/reports](http://www.bbsrc.ac.uk/about/pub/reports)). Over two-thirds of those

surveyed thought they should have some influence on the direction of diet and health research. The study highlighted some people's concerns about a potential conflict of interest between industrial motives for funding research and public interest. In a separate study commissioned by BBSRC to explore this issue further, Corr Willbourn explored public perceptions of the relationship between industry and public funding of research ([www.bbsrc.ac.uk/society/issues/open](http://www.bbsrc.ac.uk/society/issues/open)). The results were discussed at the BBSRC Open Meeting (page 2) in February 2006.

### Public dialogue on



*A public Café Scientifique, hosted by BBSRC and NERC, provided a forum for people to discuss issues surrounding biodiversity research at the National Museum of Wales in Cardiff. Scientists from the Institute of Grassland and Environmental Research were among those who participated.*

## Schools and young people

■ In addition to supporting school science through programmes coordinated by the RCUK Unit (page 29), BBSRC has supported a number of schools-researchers links through our local coordinators, through work at BBSRC-sponsored institutes and through activities supported by our Public Engagement Awards and the National Science Week Grants coordinated through RCUK. A BBSRC grant to researchers at University College London has enabled them to work with the Baytree Science Club in Brixton that provides an after-school science course for 8-11 year-old girls from ethnic minority backgrounds. Baytree is a non-profit community centre helping unemployed women, lone parents and 3 to 18 year-old girls in the Borough of Lambeth. This project was one of nine supported by BBSRC Public Engagement Awards in 2005.



*Members of Baytree Science Club have studied cells, in part through a drama production.*

Among the 33 awards for National Science Week 2006, funded by BBSRC and three other Research Councils and administered through the RCUK Unit, 13 were awarded to individuals supported by BBSRC. These included grants to the Babraham Institute for a Science Day at the Institute for around 150 A-Level and GCSE students and teachers; a day of practical science and discussions for 30 sixth formers at the Centre for Plant Sciences at the University of Leeds; a hands-on science event at the University of Wales, Aberystwyth for 700 primary school children across the Ceredigion area; and a science fair at the North Wyke site of the Institute of Grassland and Environmental Research (IGER) for 800 primary school students.

■ BBSRC supports the Nuffield Bursary scheme, and several sponsored-institutes provide placements for sixth formers to undertake practical work during the summer school vacation. The John Innes Centre has attempted to follow the careers of the 63 students who held bursaries at the Centre between 1992 and 2001. Of the 39 respondents to a follow-up questionnaire, 20 had undertaken undergraduate or higher degrees, and a further 14 were in science-based careers.

*Young students getting to grips with practical science at the IGER North Wyke science fair.*





# Financial and other information

## ■ Efficiency

This year BBSRC delivered efficiency savings worth £4M. We did this by reducing the proportion that we spend on administration, by more co-funding of research with industrial and other partners, and by increasing efficiency at our sponsored institutes. Our savings target for 2006-07 is £22.2M. This will be delivered through:

- Re-prioritisation of programmes, including training (£8.6M).
- Proportional reduction of administration costs (£1.1M).
- Increased efficiency of our sponsored institutes, including better use of capital Infrastructure (£10M).
- More co-funding (£2.5M).

We are planning for these savings to rise to £39.2M in 2007-08. This will be achieved by several activities including re-prioritising programmes and reducing the percentage spent on administration; and will contribute to meeting the Research Councils' overall target as a whole to deliver £170M efficiency savings a year in 2007-08.

Following the deduction of £1.5M programme costs, BBSRC's 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.

Operational efficiencies from new procedures and workflows, and greater use of electronic communication and databases have enabled us to move from two to four grants rounds a year.

## ■ Research Council harmonisation

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

BBSRC has taken a leading role in developing a Next Generation Back Office system to provide a single grants processing system for all Councils, and in a project to harmonise Human Resources 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.

## ■ Risk management

BBSRC utilises a range of techniques to ensure that risk is managed in a manner that ensures a proper balance is struck between prudent management and innovative approaches to issues. We use a formal structure of operational risk registers, longer term strategic risks and business critical projects. These are regularly reviewed by the executive management of BBSRC and the BBSRC Audit Board, and annually by internal and external auditors. Our procedures are supported by Statements of Internal Control from the Chief Executive, and Group and Institute Directors. In addition, for significant programmes such as the Pirbright Development, the Office of Government Commerce's Gateway process is used.

## ■ Health and safety

The number of accidents reportable under RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995) in the year 1 April 2005 to 31 March 2006 was 16.

Reportable incident category <i>(defined as in RIDDOR 1995)</i>	2005-06
Contact with moving machinery or material being machined	0
Hit by a moving, flying or falling object	0
Hit by a moving vehicle	0
Hit something fixed or stationary	0
Injured while handling, lifting or carrying	5
Slipped, tripped or fell on the same level	2
Fell from a height	1
Trapped by something collapsing	0
Drowned or asphyxiated	0
Exposed to, or in contact with, a harmful substance	3
Exposed to fire/heat/extreme cold or other physical agent	0
Exposed to an explosion	0
Contact with electricity or electrical discharge	0
Injured by an animal	3
Physically assaulted by a person	0
Another kind of accident	2
<b>Total accidents</b>	<b>16</b>
Cases of occupational disease	0
<b>Overall total</b>	<b>16</b>

## ■ Environmental policy

We have formalised and strengthened our commitment to promoting environmental best practice in connection with our operations. We require the same commitment from our sponsored institutes.

Energy efficiency and the minimising of waste are important elements of our policy. Figures for waste recycling on the site of the Swindon-based Research Councils, show that the percentage diverted from landfill rose from 55% to 62% during 2005.



## Financial highlights

- As a result of allocations from the Spending Review 2004, Revenue Grant-in-aid rose by £45.1M to £320.6M, financing an increase in research and capital grants of £30.8M to £264.9M and an increase of £5.5M in training awards and fellowships to £39.1M.

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- The majority of the cash balance of £6M at 31 March 2006 was held to finance property transactions in April 2006.

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- Forward commitment on approved research grants rose by £45.8M to £387.7M. The major redevelopment of IAH Pirbright contributed to a £27.5M increase in capital commitment.

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- An increase in staff numbers and the employer's pension contribution rate led to a rise in staff costs of £1.6M and an associated increase in core grants to BBSRC-sponsored institutes.

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- A downwards revaluation of dwellings at institutes contributed to a decrease of £5.6M on the value of the Council's fixed assets base.

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- The total impairment charge for 2005-06 was £1.1M, including a £0.5M fall in value in investments.

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- The Operating Surplus for the year was £6.5M, resulting in an increase in General Reserve carried forward of £13.5M to £15.6M. Government funds increased by £8M to £212.6M.

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- Revenue Grant-in-aid of £365.8M is confirmed for 2006-07.

## Developments since 31 March 2006

There have been no material events since the end of the financial year which impact on these financial statements.

### Pensions

The BBSRC has responsibility for the Research Councils' Pension Schemes (RCPS) and the Chief Executive of the BBSRC is the Accounting Officer for the pension schemes. Employees of the Council are eligible to either join the RCPS or open a partnership

pension account which is a stakeholder pension with an employer contribution. The RCPS are funded on a pay-as-you-go basis principally through employer and employee contributions and annual Grant-in-aid. The pension schemes provide retirement and related benefits on final emoluments by analogy to the Principal Civil Service Pension Scheme (PCSPS). The RCPS are administered by the Research Councils' Joint Superannuation Services, a unit within BBSRC. Separate RCPS Accounts are published and contain the further disclosure of information required under the relevant accounting standards.

As the RCPS are unfunded multi-employer defined benefit schemes, BBSRC is unable to identify its share of the underlying assets and liabilities. Details can be found in the Accounts of the Research Councils Pension Scheme at [www.bbsrc.ac.uk/about/pub/stats/welcome.html](http://www.bbsrc.ac.uk/about/pub/stats/welcome.html).

Employer contributions are to be reviewed every four years following a full scheme valuation by the Government Actuary's Department (GAD). The last full actuarial valuation was carried out by GAD as at 31 March 2002. The contribution rate reflects benefits as they are accrued, not when the costs are actually incurred, and reflect the past experience of the scheme.

### Creditor payment policy

The Council adheres to the Principles of the Prompt Payers' Code, and makes every effort to ensure compliance with the agreed terms of payment of creditors' invoices and endeavours to pay them within 30 days of receipt of goods or services. During 2005-06 92% of payments were made within 30 days.

The Late Payment of Commercial Debts Regulations 2002 came into force on 7 August 2002 providing all businesses, irrespective of size, with the right to claim statutory interest for the late payment of commercial debts. No such claims were received during the reporting year.

### Council

The Council determines BBSRC policies and strategies. BBSRC Council comprises the Chairman, the Chief Executive and between 10-18 other members, at least half of whom are appointed for their qualification in science and engineering. Users of research, in Government and industry, are also represented.

All Members are appointed by the Secretary of State for Trade and Industry. They are required to abide by a Code of Practice that covers conflicts of interests and general conduct.

The Council approves the membership of the six Boards that report to it, and the Chairs of the Boards are required to report regularly on the work of their respective Boards and to take forward specific tasks as directed by Council.

The six areas dealt with by the Boards are Appointments, Audit, Estates & Equipment, Human Resources, Remuneration and Strategy.

The Council is also expected to ensure that the position of Clerk to Council, which provides an administrative interface between the Chairman, Council and the BBSRC Executive, is of an appropriate standing and experience. The Clerk to the Council is a senior official in BBSRC Swindon Office.

Page 60 contains details of related party transactions. Registers of interest for Council, Boards and Committees can be found at [www.bbsrc.ac.uk/about/gov/](http://www.bbsrc.ac.uk/about/gov/)

### ■ Audit Board

The Council has an Audit Board of which the Chairman and at least three non-executive Committee members are appointed by the Council, being members independent of management and free of any relationship that, in the opinion of the Council, would interfere with the exercise of independent judgement as board members. The Board meets three times a year to monitor standards of risk management, corporate governance, internal control reports from the Research Councils' Internal Audit Service, external audit reports and to review the Council's Accounts.

### ■ Auditors

The Accounts of BBSRC are audited by the Comptroller and Auditor General in accordance with Section 2(2) of the Science and Technology Act 1965. The audit fee for the year was £44,000. No non-audit work was performed by the Auditors during the year. In so far as the Accounting Officer is aware, there is no relevant audit information of which the BBSRC's auditors are unaware, and the Accounting Officer has taken all the steps that she ought to have taken to make herself aware of any relevant audit information and to establish that the BBSRC's auditors are aware of that information.

Professor Julia Goodfellow CBE  
*Chief Executive and Accounting Officer*

Date: 3 July 2006

# Boards, Panels and Committees

(membership as at 31 March 2006)

## BBSRC Senior Staff

**Professor Julia Goodfellow CBE**  
*Chief Executive*

**Professor Nigel Brown**  
*Director of Science and Technology*

**Mr Peter Swinburne**  
*Director of Human Resources*

**Mr Steve Visscher**  
*Executive Director*

**Dr Doug Yarrow**  
*Director of Corporate Science*

## BOARD MEMBERSHIP

### Appointments Board

**Professor Robert Freedman (Chair)**  
*Council Member*

**Professor John Pickett CBE FRS**  
*Institute Representative*

**Professor Christine Williams**  
*Chair, BBSRC Agri-Food Committee*

**Dr Malcolm Skingle**  
*BBSRC Strategy Board Member and Chair of Bioscience for Industry Strategy Panel*

**Professor Nigel Brown**  
*BBSRC Director of Science and Technology*

**Dr Doug Yarrow**  
*BBSRC Director of Corporate Science*

### Audit Board

**Dr Alistair Penman (Chair)**  
*Council Member*

**Professor David Delpy FRS**  
*Council Member*

**Professor Robert Freedman**  
*Council Member*

**Mr Mike Samuel**  
*Independent*

**Professor Peter Schroeder**  
*Independent*

### OBSERVER

**Professor Julia Goodfellow CBE**  
*BBSRC Chief Executive*

### Estates and Equipment Board

**Professor Julia Goodfellow CBE (Chair)**  
*BBSRC Chief Executive*

**Professor Sir John Beringer CBE**  
*Chairman, John Innes Centre Governing Council*

**Professor Ian Crute**  
*Director, Rothamsted Research*

**Professor Keith Gull CBE FRS**  
*Independent*

**Dr Alistair Penman**  
*Council Member, Chair BBSRC Audit Committee*

**Mr Andrew Smith**  
*Head of Estates, HEFCE*

### OBSERVERS

**Professor Nigel Brown**  
*BBSRC Director of Science and Technology*

**Mr Geoff Clark**  
*BBSRC Head of Estates*

**Mr Steve Visscher**  
*BBSRC Executive Director*

### Human Resources Strategy Board

**Professor Julia Goodfellow CBE (Chair)**  
*BBSRC Chief Executive*

**Professor Mary Bownes OBE (Chair)**  
*Chair, BBSRC Students and Fellowships Strategy Panel*

**Professor Simon Bright**  
*Council Member*

**Ms Marilyn Gallyer**  
*University College London*

**Professor Quintin McKellar**  
*Council Member*

**Professor Chris Pollock CBE**  
*Institute Director, IGER*

**Professor David Read FRS**  
*Chairman, Rothamsted Research Board of Directors*

**Mr Peter Swinburne**  
*BBSRC Director of Human Resources*

### Remuneration Board

**Dr Peter Ringrose (Chair)**  
*BBSRC Chairman*

**Professor David Delpy FRS**  
*Council Member*

**Professor Julia Goodfellow CBE**  
*BBSRC Chief Executive*

**Professor Cheryl Tickle CBE FRS**  
*Council Member*

**Professor Dame Nancy Rothwell FRS**  
*Council Member*

**Dr Malcolm Weir**  
*Council Member*

### Strategy Board

**Professor Julia Goodfellow CBE (Chair)**  
*BBSRC Chief Executive*

**Professor Mary Bownes OBE**  
*Chair, Studentships and Fellowships Strategy Panel*

**Professor Ian Crute**  
*Independent*

**Dr Ed Dart CBE**  
*Independent*

**Professor Anne Dell FRS**  
*Chair, Tools and Resources Strategy Panel*

**Professor Julie Fitzpatrick**  
*Independent*

**Professor Chris Gilligan**  
*Council Member*

**Professor Barry Keverne FRS**  
*Chair, Healthy Organism Strategy Panel*

**Revd Professor Michael Reiss**  
*Chair, Bioscience for Society Strategy Panel*

**Professor Peter Rigby**  
*Chair, Integrative Systems Biology Strategy Panel*

**Dr Malcolm Skingle**  
*Chair, Bioscience for Industry Strategy Panel*

**Professor Jeff Waage**  
*Chair, Sustainable Agriculture Strategy Panel*

### PANEL MEMBERSHIP

#### Bioscience for Industry Panel

**Dr Malcolm Skingle (Chair)**  
*GlaxoSmithKline*

**Dr John Birch**  
*Lonza*

**Professor John Coggins**  
*University of Glasgow*

**Professor Colin Dennis**  
*Campden and Chorleywood Food Research Association*

**Dr Richard Dyer**  
*Biosciences Federation*

**Dr David Gillham**  
*Syngenta*

**Mrs Sarah Haywood**  
*Department of Trade and Industry*

**Mr Tom Hockaday**  
*Isis Innovation*

**Mr John Lampitt**  
*Thelsford Farm*

**Professor Peter Lillford**  
*University of York*

**Dr Linda Magee**  
*Bionow*

**Dr Fiona Marston**  
*Novacta*

**Dr John Overington**  
*Inpharmatica*

**Dr Nick Shepperson**  
*Pfizer UK*

#### OBSERVER

**Dr Rob Morgan**  
*Department of Trade and Industry*

#### Bioscience for Society Panel

**Revd Professor Michael Reiss (Chair)**  
*Institute of Education, University of London*

**Dr Louise Archer**  
*London Metropolitan University*

**Dr Derek Bell**  
*Association for Science Education*

**Dr David Boak**  
*The Royal Society*

**Professor Ruth Chadwick**  
*Cardiff University*

**Dr Nigel Collins**  
*King Charles I School, Kidderminster*

**Dr David Hardman**  
*Babraham Bioscience Technologies Ltd*

**Dr Robert Hubrecht**  
*Universities Federation for Animal Welfare*

**Professor Alan Irwin**  
*University of Liverpool*

**Dr Brian Johnson**  
*DAH Associates*

**Professor Julian Kinderlerer**  
*University of Sheffield*

**Dr Sue Mayer**  
*Genewatch UK*

**Professor Christine Nicol**  
*University of Bristol*

**Ms Vivienne Parry**  
*Independent*

**Dr Sandy Thomas**  
*Nuffield Council on Bioethics*

#### Healthy Organism Panel

**Professor Barry Keverne FRS (Chair)**  
*University of Cambridge*

**Professor Dianne Berry**  
*University of Reading*

**Professor Julian Dow**  
*University of Glasgow*

**Professor Jane Hurst**  
*University of Liverpool*

**Professor John Mathers**  
*University of Newcastle upon Tyne*

**Professor Linda Partridge CBE FRS**  
*University College London*

**Dr Wolf Reik**  
*Babraham Institute*

**Professor Kevin Shakesheff**  
*University of Nottingham*

**Professor Tim Skerry**  
*University of Sheffield*

**Dr John Tite**  
*GlaxoSmithKline*

#### OBSERVERS

**Dr Alison Tedstone**  
*Foods Standards Agency*

**Dr Morven Robert**  
*Medical Research Council*

#### Integrative & Systems Biology Panel

**Professor Peter Rigby (Chair)**  
*The Institute of Cancer Research*

**Dr Aileen Allsop**  
*AstraZeneca*

**Professor Tim Bugg**  
*University of Warwick*

**Dr Mark Cobain**  
*Unilever Research*

**Professor Enrico Coen FRS**  
*John Innes Centre*

**Dr Greg Elgar**  
*Medical Research Council*

**Professor David Fell**  
*Oxford Brookes University*

**Dr Melanie Lee**  
*UCB Group*

**Professor Ajit Narayanan**  
*University of Portsmouth*

**Professor Jens Nielsen**  
*Technical University of Denmark*

**Professor Denis Noble**  
*University of Oxford*

**Professor Willem Stiekema**  
*Wageningen University, The Netherlands*

**Dr Jens Timmer**  
*Institute of Physics, Freiburg, Germany*

**Professor Hans Westerhoff**  
*Vrije Universiteit, The Netherlands*

#### OBSERVER

**Dr Elizabeth Hylton**  
*Engineering and Physical Sciences Research Council*

#### Sustainable Agriculture Panel

**Professor Jeff Waage (Chair)**  
*Imperial College London*

**Dr Tina Barsby**  
*Biogemma UK*

**Dr David Brightman**  
*Brightman Farms*

**Professor John Crawford**  
*University of Abertay Dundee*

**Professor Steve Edwards**  
*Veterinary Laboratories Agency*

**Dr Laura Green**  
*University of Warwick*

**Professor Graham Jellis**  
*Home-Grown Cereals Authority*

**Professor Ken Killham**  
*University of Aberdeen*

**Professor Chris Pollock CBE**  
*Institute of Grassland and Environmental Research*

**Dr Sarah Rees**  
*Syngenta*

**Professor Bill Sutherland**  
*University of East Anglia*

**Mr Chris Warkup**  
*Genesis Faraday*

#### Studentships & Fellowships Panel

**Professor Mary Bownes OBE (Chair)**  
*University of Edinburgh*

**Professor Nick Brewin**  
*John Innes Centre*

**Dr Michael Carter**  
*University of Surrey*

**Dr Mike Collis**  
*Physiological Society*

**Professor Clive Edwards**  
*University of Liverpool*

**Dr Mark Edwards**  
*Heptagen Ltd*

**Professor Jonathan Elliott**  
*Royal Veterinary College*

**Dr Sheila Francis**  
*Northern General Hospital*

**Professor Mike Geeves**  
*University of Kent at Canterbury*



Dr Jane Memmott  
*University of Bristol*

Professor Ian Roberts  
*University of Manchester*

Dr Barrie Ward  
*KuDos Pharmaceuticals*

Professor Tony Wilkinson  
*University of York*

Professor Susan Wonnacott  
*University of Bath*

### Tools & Resources Panel

Professor Anne Dell FRS (Chair)  
*Imperial College London*

Mr Mike Ambrose  
*John Innes Centre*

Professor Alan Archibald  
*Roslin Institute*

Professor Judy Armitage  
*University of Oxford*

Dr Julian Burke  
*Genetix*

Professor Mark Chaplain  
*University of Dundee*

Professor Jon Cooper  
*University of Glasgow*

Professor Keith Edwards  
*University of Bristol*

Professor Simon Gaskell  
*University of Manchester*

Professor Peter Ghazal  
*University of Edinburgh*

Dr Jerry Lanfear  
*Pfizer UK*

Prof Ernest Laue  
*University of Cambridge*

Professor Justin Molloy  
*National Institute for Medical Research*

Professor Simon Phillips  
*University of Leeds*

Dr John Pillmoor  
*University of York*

Dr Caroline Pung  
*The British Library*

### COMMITTEE MEMBERSHIP

#### Agri-Food Committee

Professor Christine Williams (Chair)  
*University of Reading*

Dr Declan Barraclough  
*Environment Agency*

Dr Steve Beckett  
*Nestle York Ltd*

Professor Keith Edwards  
*University of Bristol*

Professor Sue Fairweather-Tait  
*Institute of Food Research*

Professor Gad Frankel  
*Imperial College London*

Dr Pinder Gill  
*Meat & Livestock Commission*

Professor Barry Hirst  
*University of Newcastle upon Tyne*

Professor Julian Ketley  
*University of Leicester*

Dr Gordon MacPherson  
*University of Oxford*

Professor Simon McQueen-Mason  
*University of York*

Dr Jonathan Powell  
*Unilever Research*

Dr Stephen Rushton  
*University of Newcastle upon Tyne*

Professor Peter Shewry  
*Rothamsted Research*

Professor Colette Shortt  
*McNeill Nutritionals*

Professor Mark Tatchell  
*Consultant*

#### OBSERVERS

Professor Maggie Gill  
*Scottish Executive Environment and Rural Affairs Department*

Dr Sue Pople  
*Department for Environment, Food and Rural Affairs*

Mr Alisdair Wotherspoon  
*Food Standards Agency*

#### Animal Sciences Committee

Professor Russell Foster (Chair)  
*Imperial College London*

Professor John Altringham  
*University of Leeds*

Professor John Barrett  
*University of Wales, Aberystwyth*

Professor Dave Burt  
*Roslin Institute*

Dr Bruce Campbell  
*University of Nottingham*

Professor Mike Denham  
*University of Plymouth*

Dr David Haig  
*Moredun Research Institute*

Dr David Hazlerigg  
*University of Aberdeen*

Professor Celia Heyes  
*University College London*

Professor Glyn Humphreys  
*University of Birmingham*

Professor Alex Kacelnik  
*University of Oxford*

Dr Cahir O'Kane  
*University of Cambridge*

Professor Andrew Loudon  
*University of Manchester*

Dr John McCauley  
*National Institute for Medical Research*

Dr Amanda Parker  
*University of Newcastle upon Tyne*

Professor Eleanor Riley  
*London School of Hygiene & Tropical Medicine*

Dr Lynne Sneddon  
*University of Liverpool*

#### OBSERVERS

Dr Nick Ambrose  
*Scottish Executive Environment and Rural Affairs Department*

Dr Alex Morrow  
*Department for Environment, Food and Rural Affairs*

#### Biochemistry and Cell Biology Committee

Dr Fiona Marshall (Chair)  
*University of Cambridge*

Professor Louise Cosby  
*Queen's University Belfast*

Professor Mark Darlison  
*Nottingham Trent University*

Professor Michael Ehrmann  
*Cardiff University*

Professor Vincent Emery  
*Royal Free & University College Medical School London*

Professor Rob Field  
*University of East Anglia*

Dr Darren Flower  
*Jenner Institute*

Professor David Gilbert  
*University of Glasgow*

Professor Stephen High  
*University of Manchester*

Dr Eric Karran  
*Elli Lilley and Company Ltd*

Dr Wendy MacFarlane  
*University of Newcastle upon Tyne*

Professor Cathy Martin  
*John Innes Centre*

Professor Michael McPherson  
*University of Leeds*

**Professor Peter Piper**  
*University of Sheffield*

**Dr Oliver Rausch**  
*UCB Group*

**Dr David Sansom**  
*University of Birmingham*

**Professor Anne Stephenson**  
*University of London*

**Professor Tony Trewavas**  
*University of Edinburgh*

**Professor Anne Willis**  
*University of Nottingham*

### **Biomolecular Sciences Committee**

**Professor Rod Hubbard (Chair)**  
*University of York*

**Professor Jim Barber**  
*Imperial College London*

**Professor Paul Barlow**  
*University of Edinburgh*

**Dr Paula Booth**  
*University of Bristol*

**Dr Alexander Breeze**  
*AstraZeneca*

**Dr Dave Brown**  
*Pfizer UK*

**Professor Tom Brown**  
*University of Southampton*

**Dr Julea Butt**  
*University of East Anglia*

**Professor Stephen Caddick**  
*University College London*

**Dr Benjamin Davis**  
*University of Oxford*

**Dr Colin Edge**  
*GlaxoSmithKline*

**Dr Jane Grasby**  
*University of Sheffield*

**Professor Bill Hunter**  
*University of Dundee*

**Dr Justin Molloy**  
*National Institute for Medical Research*

**Professor Nigel Scrutton**  
*University of Manchester*

**Dr David Westhead**  
*University of Leeds*

### **Engineering and Biological Systems Committee**

**Professor Peter Fryer FEng (Chair)**  
*University of Birmingham*

**Professor Robert Beynon**  
*University of Liverpool*

**Professor Andy Baker**  
*University of Glasgow*

**Professor Helen Byrne**  
*University of Nottingham*

**Dr Walter Cook**  
*AstraZeneca*

**Professor Jon Cooper**  
*University of Glasgow*

**Professor Zhanfeng Cui**  
*Oxford University*

**Professor David Fell**  
*Oxford Brookes University*

**Professor Alicia El Haj**  
*Keele University*

**Professor Eileen Ingham**  
*University of Leeds*

**Dr Michael Larkin**  
*Queens University Belfast*

**Professor Graham Leggett**  
*University of Sheffield*

**Dr Gill Stephens**  
*University of Manchester*

**Dr Michael Stumpf**  
*Imperial College London*

**Dr Paul Varley**  
*Cambridge Antibody Technology*

#### **OBSERVERS**

**Dr Martin Anthony**  
*Department of Trade and Industry*

**Dr Stephen Elsby**  
*Engineering and Physical Sciences Research Council*

**Dr Elizabeth Hylton**  
*Engineering and Physical Sciences Research Council*

### **Genes and Developmental Biology Committee**

**Professor Ottoline Leyser (Chair)**  
*University of York*

**Professor Michael Akam FRS**  
*University of Cambridge*

**Professor Mark Blaxter**  
*University of Edinburgh*

**Professor Constanze Bonifer**  
*University of Leeds*

**Professor Martin Buck**  
*Imperial College London*

**Professor Enrico Coen FRS**  
*John Innes Centre*

**Dr Martin Ford**  
*GlaxoSmithKline*

**Dr Peter Hollingsworth**  
*Royal Botanic Garden Edinburgh*

**Professor Elizabeth Jones**  
*University of Warwick*

**Professor Mike Kearsley**  
*University of Birmingham*

**Professor Malcolm Maden**  
*King's College London*

**Professor Marysia Placzek**  
*University of Sheffield*

**Dr Cathy Prescott**  
*Avlar Bioventures Ltd*

**Dr Clive Price**  
*Lancaster University*

**Dr Robert Saunders**  
*Open University*

**Dr Robbie Waugh**  
*Scottish Crop Research Institute*

### **Plant and Microbial Sciences Committee**

**Professor Robert Edwards (Chair)**  
*Durham University*

**Dr Aileen Allsop**  
*AstraZeneca*

**Professor Judy Armitage**  
*University of Oxford*

**Professor Mike Bushell**  
*University of Surrey*

**Professor Allan Downie**  
*John Innes Centre*

**Dr Paul Dupree**  
*University of Cambridge*

**Professor Phillip Gilmartin**  
*University of Leeds*

**Professor Ian Graham**  
*University of York*

**Dr Julie Gray**  
*University of Sheffield*

**Dr Joel Milner**  
*University of Glasgow*

**Professor Nic Talbot**  
*University of Exeter*

**Dr Alyson Tobin**  
*University of St Andrews*

**Dr Lesley Torrance**  
*Scottish Crop Research Institute*

**Dr Huw Williams**  
*Imperial College London*

**Dr Jeroen Wilmer**  
*Biogemma UK Ltd*

**Dr Anil Wipat**  
*University of Newcastle upon Tyne*

# Remuneration report

## i) Council Chair and Council members except Chief Executive

### Policy

Remuneration rates are the same across the Research Councils. The rates are reviewed each year by the Department of Trade and Industry. In considering the new rates, the Department may take into account the increase given to the senior civil service. The Department consults with the Research Councils and the agreed change is implemented in October.

Appointments are non-pensionable and there is no entitlement to compensation for loss of office. No fee is payable in respect of Civil Servants, employees of Research Councils and their institutes and other Non-Departmental Public Bodies and Agencies.

The standard fee paid to Council members was:

	From 1 October 2005 £	Until 30 September 2005 £	
Council Chair	15,100	14,700	per annum
Council Members who also chair Committees	8,370	8,160	per annum
Council Members	6,280	6,120	per annum

	Appointments		Remuneration in £000s	
	From	To	2005-06	2004-05
<u>Chair and Deputy Chair</u>				
Chair - Dr Peter Ringrose	01/05/2003	30/04/2007	See below	
Deputy Chair and CE - Professor Julia Goodfellow CBE	01/01/2002	31/12/2007	See below	
<u>Council Members</u>				
Professor Simon Bright	20/04/2004	31/03/2007	6	6
Mr David Brightman	01/08/2003	31/03/2009	6	6
Professor Howard Dalton FRS	01/04/2002	31/03/2010	No fee payable	
Professor David Delpy FRS	01/04/2004	31/03/2007	6	6
Professor Robert Freedman	01/04/2002	31/03/2008	6	6
Professor Chris Gilligan	01/04/2003	31/03/2009	6	6
Mrs Sarah Haywood	24/10/2005	23/10/2009	No fee payable	
Professor A Jackie Hunter	01/04/2004	31/03/2007	6	6
Professor Douglas Kell	01/04/2000	31/03/2006	6	6
Professor Quintin McKellar	01/04/2005	31/03/2008	6	0
Dr Alistair Penman	01/04/2002	31/03/2008	8	8
Dame Nancy Rothwell FRS	01/04/2005	31/03/2008	6	0
Professor Cheryl Tickle CBE FRS	01/04/2001	31/03/2007	6	6
Dr Malcolm Weir	01/04/2005	31/03/2008	6	0

The total emoluments of the Chairman were honoraria of £14,900 (2004-05: £14,550). The Chairman's appointment is non-pensionable and there is no entitlement to compensation for loss of office. Dr Peter Ringrose was appointed Chairman of the BBSRC for a period of four years from 1 May 2003.

## ii) Committee Chairs and Members

The remuneration of Committee Chairs and Members is set by the Financial Management Group of the Research Councils. The current rates will be reviewed at the end of 2006-07.

	2005-06 £	2004-05 £	
Committee Chairman	215	200	per day
Committee Members	160	150	per day

## iii) Chief Executive

**Remuneration Committee**

The Chief Executive's remuneration is determined by the Permanent Secretary of the Department of Trade and Industry. The Permanent Secretary is advised by a Remuneration Committee chaired by the Director General of Research Councils. The Chair of BBSRC is consulted.

**Policy**

Subject to successful performance, the Chief Executive's salary rises by a cost of living increase and a pre-determined incremental increase up to a salary ceiling. In addition, a non-consolidated, non-pensionable annual bonus may be awarded for performance towards objectives agreed by BBSRC and the Chief Executive.

Professor Julia Goodfellow CBE was appointed Chief Executive on 1 January 2002. Following a two-year extension her fixed-term period appointment will terminate on 31 December 2007. Her total emoluments are below. The cash equivalent transfer value (CETV) of her pension at 1 April 2004 was £47,854. It rose by £42,899 in the year to £90,753 at 31 March 2006, mainly as a result of changes in actuarial assumptions. There were no receipts or benefits in kind.

	Salary	Bonus	Real increase in pension earned	Total earned	Real increase in pension lump sum
2005/06	£111,818	£11,685	£1,476	£124,979	£4,427
2004/05	£102,284	£16,035	£1,270	£119,589	£3,810

(Audited information)

## iv) BBSRC Remuneration Board

The remuneration of BBSRC Directors and Directors of sponsored institutes is reviewed and adjusted annually by the Council Remuneration Board. The Board is chaired by the Chair of Council and other membership comprises the Chief Executive and three Council Members, at least one of whom must have an industry background (page 35).

**Policy**

The Board reviews performance against a series of objectives, categorised between fundamental, value-added or breakthrough, in determining each Director's annual salary level and any bonus. The Board will also take account of public sector pay constraints, relativities, job weight and any special factors and relativities. Increases are normally awarded from 1 July annually.

## v) BBSRC Directors

BBSRC Directors are members of the BBSRC Executive and are:

Professor Nigel Brown, BBSRC Director of Science and Technology Group

Mr Peter Swinburne, BBSRC Director of Human Resources Group

Mr Steve Visscher, BBSRC Executive Director

Dr Doug Yarrow, BBSRC Director of Corporate Science Group

Directors are on indefinite contracts, similar to the majority of BBSRC staff, with notice periods between one and three months. Salaries of Directors are included within the analysis by Band (Note 5). All BBSRC Directors withheld their consent to further disclosure of personal information. No Director is in receipt of benefits in kind.

## vi) Research Directors of Sponsored Institutes

Details of sponsored research institute Directors' emoluments are published in the statutory company and charity accounts prepared by each institute.

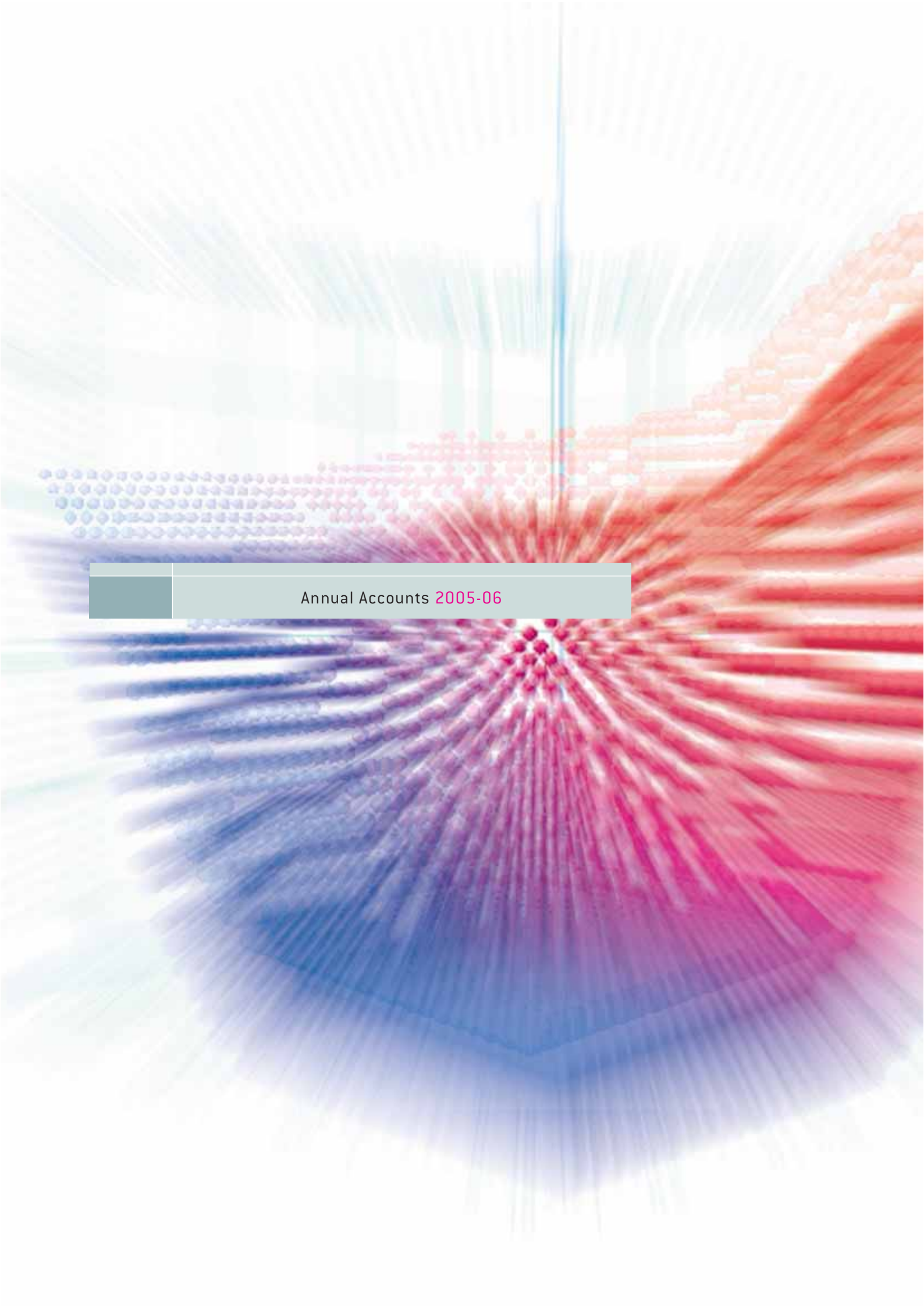
Professor Julia Goodfellow CBE

Date: 3 July 2006

Chief Executive and Accounting Officer

Definitions of terms used in this Remuneration Report are given on page 62.





Annual Accounts 2005-06

## Statement of Responsibilities of Council and Chief Executive as Accounting Officer

Under Section 2(2) of the Science and Technology Act 1965, the Secretary of State for Trade and Industry with the consent of the Treasury has directed BBSRC to prepare for each financial year a statement of accounts in the form and on the basis set out in the Accounts Direction. The accounts are prepared on an accruals basis and must give a true and fair view of the state of affairs of BBSRC and of its income and expenditure, recognised gains and losses and cash flows for the financial year.

In preparing the accounts, the Accounting Officer is required to comply with the requirements of the Government Financial Reporting Manual ([www.financial-reporting.gov.uk](http://www.financial-reporting.gov.uk)) and in particular to:

- observe the Accounts Direction issued by the Secretary of State for Trade and Industry, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;
- make judgements and estimates on a reasonable basis;
- state whether applicable accounting standards as set out in the Government Financial Reporting Manual have been followed, and disclose and explain any material departures in the financial statements; and
- prepare the financial statements on a going concern basis.

The Secretary of State for Trade and Industry has designated the Chief Executive as Accounting Officer of BBSRC. The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which the Accounting Officer is answerable, for keeping proper records and for safeguarding BBSRC's assets, are set out in the NDPB Accounting Officer Memorandum issued by the HM Treasury and published [www.government-accounting.gov.uk](http://www.government-accounting.gov.uk)

## Statement by Chief Executive on Internal Control

### 1. Scope of Responsibility

As Accounting Officer, I have responsibility for maintaining a sound system of internal control that supports the achievement of BBSRC's policies, aims and objectives, whilst safeguarding the public funds and department assets for which I am personally responsible, in accordance with the responsibilities assigned to me in Government Accounting.

The DTI Accounting Officer has designated me as the Accounting Officer of BBSRC, responsible for the effective, safe and efficient operation of the Council in accordance with the Management Statement.

### 2. The Purpose of the System of Internal Control

The system of internal control is designed to manage risk to a reasonable level rather than eliminate all risk of failure to achieve policies, aims and objectives; it can therefore only provide reasonable and not absolute assurance of effectiveness. The system of internal control is based on an ongoing process designed to identify and prioritise the risks to the achievement of BBSRC's policies, aims and objectives, to evaluate the likelihood of those risks being realised and the impact should they be realised, and to manage them efficiently, effectively and economically. The system of internal control has been in place in BBSRC for the year ended 31 March 2006 and up to the date of approval of the annual report and accounts, and accords with Treasury guidance.

### 3. Capacity to Handle Risk

BBSRC gives leadership to the process by a number of means, including:

- 1) setting out a risk management policy and strategy;
- 2) signing up to risk management assurance statements at the most senior levels within BBSRC and its sponsored institutes;
- 3) updating and reviewing the register of key risks at least quarterly.
- 4) Risk management is reinforced at staff level through the development and implementation of Group level risk registers in support of those at corporate level. Additional support has been provided by introducing a formal PRINCE 2 based project management approach with risk management embedded in it. This has been used for major activities, such as the introduction of four grant rounds, which impacted directly on all members of the largest Group in Swindon Office.

The interests of key stakeholders and operational partners are also considered.

### 4. The Risk and Control Framework

Risk management and internal control is considered on a regular basis by the BBSRC Executive and Audit Board during the year. The Audit Board plays an important role in overseeing the internal control arrangements for BBSRC and the sponsored institutes. The Board reviews the external audit management letters arising from BBSRC and from the BBSRC sponsored institutes and approves the internal audit programme plan for the year in the light of the key risks identified as part of the risk management framework. In particular, business critical projects are picked out for special assessment by BBSRC Executive and Audit Board on an ongoing basis. The activities of the Research Councils' Internal Audit Service in respect of the BBSRC and its sponsored institutes are reviewed by the Audit Board and the scope of the internal audit plan for the coming year, which is based on the overall assessment of risk, is agreed. With this overarching view of audit activities, Audit Board plays a pivotal role in evaluating and reviewing the evidence supporting the Chief Executive's assurance statement on internal control. The Council's role in terms of risk management is to oversee the work of the Audit Board through review of Audit Board minutes and periodic oversight of the BBSRC Risk Inventory.

The BBSRC Executive and Audit Board regularly review the strategic and operational risk management registers and framework and receive reports on the business critical projects pertaining through the year.

The status of these at 31 March 2006 is:

1. Silsoe Research Institute (SRI) Restructuring. Complete. The orderly restructuring of SRI following withdrawal of all BBSRC Core Strategic Grant funding by the end of 2005/06.
2. Implementation of Freedom of Information Act. Complete. The successful implementation of BBSRC's response to the Freedom of Information Act.

3. Babraham Bioscience Technologies Ltd, Site Development. Complete. The successful letting of the Bio-Development building at the centre of the Babraham Research Campus, fully let by July 2005.
4. Introduction of four Grant Rounds. Complete. Successful delivery of four grant rounds per year to maintain the BBSRC's credibility with the wider community.
5. IAH Pirbright Redevelopment. Continuing. The project is planned to replace the current, very mixed, facilities with state-of-the-art flexible facilities including areas with the higher level of bio-security. This is allied to the relocation of the Virology Department of the Veterinary Laboratories Agency of Defra.
6. IAH Recovery Plan. Continuing. The restructuring of the Institute for Animal Health including a redundancy programme, development of a new science strategy and management structure and systems.
7. New Edinburgh institute initiation project. Continuing. Setting up a new research institute in Edinburgh bringing together researchers from the Roslin Institute, the current IAH Neuropathogenesis Unit and the Royal (Dick) School of Veterinary Studies of the University of Edinburgh.
8. Institute restructuring programme. Continuing. Managing the successful delivery of redundancy programmes at BBSRC-sponsored institutes.
9. Impact of Defra funding changes on institute sustainability. New since March 2006. Seeking long-term funding agreements with Defra for relevant BBSRC-sponsored institutes in line with RIPSS principles to protect strategic areas of science and secure sustainability.

Research Councils carry out Dipstick Testing, which reviews expenditure on their research grants at universities and other research organisations. The testing broadly looks at overall systems of control and is an important element of the risk management framework. BBSRC is working with the other Research Councils to develop this approach further to take account of the introduction of full economic costing.

#### 5. Review of Effectiveness

As Accounting Officer, I have responsibility for reviewing the effectiveness of the system of internal control. My review of the effectiveness of the system of internal control is informed by the work of the internal auditors, and the executive managers within BBSRC who have responsibility for the development and maintenance of the internal control framework, and comments made by the external auditors in their management letter and other reports. I have been advised on the implications of the result of my review of the effectiveness of the system of internal control by the Council and the Audit Board and a plan to address weaknesses and ensure continuous improvement of the system is in place.

The principal elements of support for the Accounting Officer's assurance statement are the work of the Audit Board and the BBSRC Executive including the review of Business Critical projects, the annual report from the Head of Internal Audit, the risk management frameworks developed by BBSRC and its sponsored institutes and responses to external management letters which identify where control gaps exist.

The BBSRC sponsored institutes have their own Risk Management Assurance Framework as part of the accounting requirements within the charity sector and to underpin BBSRC's approach.

In general, controls are in place which can provide a reasonable degree of assurance that operational, financial and reputational risks are managed appropriately. This is not based on a culture of risk aversion but one where risks are considered as part of the decision making process.

Professor Julia Goodfellow CBE  
Chief Executive and Accounting Officer

Date: 3 July 2006



## Certificate and Report of the Comptroller and Auditor General to the Houses of Parliament

I certify that I have audited the financial statements of the Biotechnology and Biological Sciences Research Council for the year ended 31 March 2006 under the Science and Technology Act 1965. These comprise the Income and Expenditure Account, the Balance Sheet, the Cashflow Statement and Statement of Total Recognised Gains and Losses and the related notes. These financial statements have been prepared under the accounting policies set out within them.

### Respective responsibilities of the Council, Chief Executive and Auditor

The Council and Chief Executive are responsible for preparing the Annual Report, the Remuneration Report and the financial statements in accordance with the Science and Technology Act 1965 and Secretary of State for Trade and Industry directions made thereunder and for ensuring the regularity of financial transactions. These responsibilities are set out in the Statement of Responsibilities of Council and Chief Executive as Accounting Officer.

My responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements, and with International Standards on Auditing (UK and Ireland).

I report to you my opinion as to whether the financial statements give a true and fair view and whether the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State for Trade and Industry directions made thereunder. I also report whether in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them. I also report to you if, in my opinion, the Annual Report is not consistent with the financial statements, if the Biotechnology and Biological Sciences Research Council has not kept proper accounting records, if I have not received all the information and explanations I require for my audit, or if information specified by relevant authorities regarding remuneration and other transactions is not disclosed.

I review whether the statement on pages 43 and 44 reflects the Biotechnology and Biological Sciences Research Council's compliance with HM Treasury's guidance on the Statement on Internal Control, and I report if it does not. I am not required to consider whether the Accounting Officer's statements on internal control cover all risks and controls, or form an opinion on the effectiveness of the Biotechnology and Biological Sciences Research Council's corporate governance procedures or its risk and control procedures.

I read the other information contained in the Annual Report and consider whether it is consistent with the audited financial statements. This other information comprises only the Chairman's statement, Chief Executive's report, the unaudited part of the Remuneration Report, and the rest of the Management Commentary. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements. My responsibilities do not extend to any other information.

### Basis of audit opinions

I conducted my audit in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board. My audit includes examination, on a test basis, of evidence relevant to the amounts, disclosures and regularity of financial transactions included in the financial statements and the part of the Remuneration Report to be audited. It also includes an assessment of the significant estimates and judgments made by the Council and Chief Executive in the preparation of the financial statements, and of whether the accounting policies are most appropriate to the Biotechnology and Biological Sciences Research Council's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations which I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements and the part of the Remuneration Report to be audited are free from material misstatement, whether caused by fraud or error and that in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements and the part of the Remuneration Report to be audited.

### Opinions

In my opinion:

- the financial statements give a true and fair view, in accordance with the Science and Technology Act 1965 and directions made thereunder by the Secretary of State for Trade and Industry, of the state of the Biotechnology and Biological Sciences Research Council's affairs as at 31 March 2006 and of its surplus for the year then ended;
- the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Science and Technology Act 1965 and Secretary of State for Trade and Industry directions made thereunder; and
- in all material respects the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them.

I have no observations to make on these financial statements.

John Bourn  
Comptroller and Auditor General  
6 July 2006

National Audit Office  
157-197 Buckingham Palace Road  
Victoria  
London SW1W 9SP

## Income & Expenditure Account for the year ended 31 March 2006

	NOTE	2005-06		2004-05
		£'000	£'000	£'000
<b>INCOME</b>				
Revenue Grant-in-aid	2	<b>320,569</b>		275,460
Government grant transfer	10	<b>3,117</b>		3,417
Other Income	3	<b>13,092</b>		10,853
			<b>336,778</b>	289,730
<b>EXPENDITURE</b>				
Research and Capital Grants	4	<b>264,861</b>		234,093
Training Awards and Fellowships	4	<b>39,129</b>		33,666
Staff costs	5	<b>8,586</b>		6,975
Other operating costs	6a	<b>6,965</b>		6,235
Research Institute staff restructuring	7	<b>3,325</b>		15,458
Depreciation and impairment	9	<b>7,463</b>		5,827
			<b>(330,329)</b>	(302,254)
<b>OPERATING SURPLUS/(DEFICIT) FOR THE YEAR</b>			<b>6,449</b>	(12,524)
Notional Interest	6c		<b>(7,268)</b>	(7,184)
Net Gain on disposals and demolition of fixed assets	8		<b>2,660</b>	1,184
<b>SURPLUS/(DEFICIT) FOR THE YEAR</b>			<b>1,841</b>	(18,524)
Reversal of Notional Interest	6c		<b>7,268</b>	7,184
Surplus/(Deficit) after reversal of Notional Interest			<b>9,109</b>	(11,340)
Surplus brought forward			<b>2,102</b>	8,634
Transfers from revaluation reserve	10		<b>4,399</b>	4,808
<b>GENERAL RESERVE CARRIED FORWARD</b>			<b>15,610</b>	2,102

All activities are regarded as continuing.

The Notes on pages 49 to 61 form part of these Accounts.

## Balance Sheet as at 31 March 2006

	NOTE	31 March 2006		31 March 2005
		£'000	£'000	£'000
<b>FIXED ASSETS</b>				
Intangible	9	220		701
Tangible	11	195,786		200,872
Investments	12	1,000		1,000
			<b>197,006</b>	<b>202,573</b>
<b>CURRENT ASSETS</b>				
Debtors:				
- due within one year	13(i)	21,578		17,772
- due after one year	13(ii)	10,585		13,084
		<b>32,163</b>		30,856
Cash at bank and in hand	17(iii)	6,005		3,104
		<b>38,168</b>		<b>33,960</b>
<b>CURRENT LIABILITIES</b>				
Creditors falling due within one year	14a	(13,219)		(15,050)
<b>NET CURRENT ASSETS</b>			<b>24,949</b>	18,910
<b>TOTAL ASSETS LESS CURRENT LIABILITIES</b>			<b>221,955</b>	221,483
<b>LONG TERM LIABILITIES</b>				
Creditors falling due after one year	14b		-	(130)
Provisions for liabilities and charges	15		(9,339)	(16,678)
<b>NET ASSETS</b>			<b>212,616</b>	<b>204,675</b>
<b>Financed by:</b>				
<b>RESERVES</b>				
Government Grant Reserve	10		38,636	40,517
Revaluation reserve	10		158,370	162,056
General reserve			15,610	2,102
<b>TOTAL GOVERNMENT FUNDS</b>			<b>212,616</b>	<b>204,675</b>

Professor Julia Goodfellow CBE  
Chief Executive and Accounting Officer

Date: 3 July 2006

The Notes on pages 49 to 61 form part of these Accounts.

## Cash Flow Statement for the year ended 31 March 2006

	NOTE	2005-06		2004-05
		£'000	£'000	£'000
NET CASH INFLOW/(OUTFLOW) FROM OPERATING ACTIVITIES	17(i)		<b>1,215</b>	<u>(2,567)</u>
<b>CAPITAL EXPENDITURE</b>				
Payments to acquire tangible fixed assets	17(v)	<b>(863)</b>		(534)
Purchase of investments	17(v)	<b>(500)</b>		(750)
Receipts from sale of fixed assets	17(vi)	<b>1,813</b>		3,582
NET CASH INFLOW FROM CAPITAL EXPENDITURE AND RECEIPTS			<b>450</b>	<u>2,298</u>
NET CASH INFLOW/(OUTFLOW) BEFORE FINANCING			<b>1,665</b>	<u>(269)</u>
<b>FINANCING</b>				
Capital Grant-in-aid received	2	<b>1,236</b>		1,122
NET CASH INFLOW FROM FINANCING			<b>1,236</b>	<u>1,122</u>
INCREASE IN CASH	17(ii)		<b>2,901</b>	<u>853</u>

## Statement of Total Recognised Gains and Losses for year ended 31 March 2006

		2005-06	2004-05
		£'000	£'000
SURPLUS/(DEFICIT) FOR THE YEAR		<b>1,841</b>	(18,524)
Reversal of Notional Interest		<b>7,268</b>	7,184
Capital Grant-in-aid received	2	<b>1,236</b>	1,122
Release to income of Government Grant reserve	10	<b>(3,117)</b>	(3,417)
Valuation additions	10	<b>1,300</b>	4,022
Professional revaluation	10	<b>(587)</b>	8,415
TOTAL RECOGNISED GAINS AND LOSSES FOR THE YEAR		<b>7,941</b>	<u>(1,198)</u>

Following its redesignation as the movement in Government Grant Reserve (see Note 10), the 2004-05 decrease of £2,295 in Deferred Capital Grant-in-aid reduces the Total Recognised Gain for that year.



## Notes to the Accounts

### 1. ACCOUNTING POLICIES

#### a) Basis of Accounting

- i) These accounts have been prepared in accordance with the Accounts Direction issued by the Secretary of State for Trade and Industry, pursuant to Section 2 (2) of the Science and Technology Act 1965 and follow the 2005/06 Government Financial Reporting Manual (FReM) [www.financial-reporting.gov.uk](http://www.financial-reporting.gov.uk). The accounting policies contained in the FReM follow UK generally accepted accounting practice for companies (UK GAAP) to the extent that it is meaningful and appropriate to the public sector. BBSRC's accounting policies have been applied consistently in dealing with items considered material in relation to the accounts.

#### b) Accounting Convention

- i) These accounts have been prepared under the historical cost convention modified to account for the revaluation of fixed assets.

#### c) Tangible and Intangible Fixed Assets

- i) Capital expenditure includes the purchase of equipment valued at £3,000 or more, milk quotas, land and buildings.
- ii) Tangible and intangible fixed assets are included at cost or valuation in existing use. The Council owns land and buildings, which are leased to a number of grant-aided institutes, all of whom are constituted as companies limited by guarantee and as registered charities who prepare separate audited accounts. Additions to these assets may be funded wholly or in part from sources other than BBSRC. Any funding contribution made by BBSRC, in the form of capital grants, is included within Research Grants in the Income and Expenditure Account.

Where institutes carry out developments that result in a material change in the value of the Council's owned assets, this is disclosed as a fixed asset valuation addition within these accounts based on a professional valuation at the Balance Sheet date.

- iii) The basis of valuation is depreciated replacement cost in the case of specialised scientific buildings or open market value for non-specialised buildings. Valuations are adjusted annually to the Balance Sheet date by using appropriate published indices and statistics. A full revaluation of land and buildings is carried out at least every five years except for buildings under construction or sites being prepared for sale.

Some buildings with similar remaining lives have been grouped for valuation and depreciation purposes.

- iv) Increased depreciation charges arising from the revaluation are matched by annual transfers from the revaluation reserve to the general reserve. On disposal of a revalued asset, that element of the revaluation reserve that becomes realised as a result is also transferred to the general reserve.
- v) In the opinion of BBSRC, there is no material difference between the historic cost of equipment, fixtures and fittings and their current cost. Accordingly these assets have not been revalued and this position is kept under review.
- vi) Provision is made for depreciation on all tangible fixed assets at rates calculated to write off the cost or the valuation of each asset (or group of assets) to its estimated residual value evenly over its expected useful life. An expected useful life is assessed at each location by the valuer. Buildings are not depreciated in the year of acquisition whilst a full year's depreciation is charged in the year of disposal. Expected useful lives are as follows:

Freehold Land	-	not depreciated
Depreciated replacement cost buildings	-	up to 60 years
Agricultural buildings	-	up to 60 years
Dwellings	-	up to 60 years
Office and Computing Equipment	-	3 to 5 years
System Software	-	5 years
Motor Vehicles	-	up to 4 years
Assets Under Construction	-	not depreciated until brought into use

Milk Quota are rights gained by using land for milk production in the past. They are tradable on established markets and have a listed market price – [www.mdcdatum.org.uk/farmdata/quotaprices](http://www.mdcdatum.org.uk/farmdata/quotaprices). They are not amortised but revalued each year using the published year end price per litre.

#### c) Investments

Investments are stated at cost less provision for any impairment in value.

#### d) Ownership of Equipment Purchased with BBSRC Research Grants

Equipment purchased by an institution with research grant funds supplied by the Council belong to the institution and are not therefore tangible fixed assets of the Council. Through the Conditions of Grant applied to funded institutions, the Council reserves the right to determine how such equipment shall be disposed of and how any disposal proceeds are to be utilised.

#### e) Grant-in-aid

Grant-in-aid for revenue purposes is credited to income in the year in which it is received. Grant-in-aid applied for the purchase of fixed assets is credited to the Government Grant reserve. This is released to income over the estimated useful lives of the related assets.

#### f) Research Grants

Research grants are charged to the Income and Expenditure account in the period to which it relates.

#### g) Foreign Currencies

Assets and Liabilities denominated in foreign currencies are translated at the rates of exchange ruling at the balance sheet date. Transactions in foreign currencies are recorded at the rate ruling at the time of the transaction. All exchange differences are taken to the Income and Expenditure account.

#### h) Value Added Tax

As the Council is partially exempt for VAT purposes, all expenditure and fixed asset additions are shown inclusive of VAT where applicable. Residual input tax reclaimable by the application of the partial exemption formula is taken to the Income and Expenditure account as miscellaneous sundry income. Income is shown net of VAT.

#### i) Retirement Costs

Contributions to pension schemes (currently 21.3 per cent) are recorded as expenditure. Payments by the Council of early retirement lump sums are recoverable from the Research Councils' Pension Schemes when recipients reach normal retirement age. Recoverable amounts are recognised as debtors in these accounts and set off against annual staff restructuring costs.

#### j) Notional Interest

A charge, reflecting the cost of capital utilised by the Council is included in operating costs. The charge is calculated at the real rate set by HM Treasury (currently 3.5 per cent) on the average of opening and closing assets less liabilities, except for balances with HM Paymaster General.

#### k) Provisions

When BBSRC has taken a decision to fund a programme of redundancies, then the associated costs are provided for. The provision for the on-going Annual Compensation Payments is transferred from the Major Institute Restructuring and any remaining balance released once the redundancies are complete.

**2. GRANT-IN-AID**

	<b>2005-06</b>	2004-05
	<b>£'000</b>	£'000
Amount provided by the Office of Science and Technology under Request for Resources (RfR) 2 Subhead 0	<b>321,805</b>	276,582
Less Capital Grant-in-aid received transferred to Government Grant Reserve (See Note 10)	<b>(1,236)</b>	(1,122)
<b>Revenue Grant-in-aid</b>	<b><u>320,569</u></b>	<u>275,460</u>

**3. OTHER INCOME**

	<b>2005-06</b>	2004-05
	<b>£'000</b>	£'000
Grant-in-aid RfR 2 Subhead W	<b>102</b>	125
Pirbright Redevelopment Funding	<b>4,562</b>	-
Other Research Councils and Government Departments	<b>5,949</b>	5,305
Joint Infrastructure Fund	<b>-</b>	969
Other Operating Income	<b>654</b>	553
	<b><u>11,267</u></b>	<u>6,952</u>
<b>Recoveries of Costs</b>		
- IT Services to Institutes	<b>1,659</b>	3,669
- Other recoveries	<b>166</b>	232
	<b><u>1,825</u></b>	<u>3,901</u>
<b>TOTAL</b>	<b><u>13,092</u></b>	<u>10,853</u>

**4. RESEARCH & CAPITAL GRANTS AND TRAINING AWARDS**

	<b>2005-06</b>	2004-05
	<b>£'000</b>	£'000
Responsive Research Grants	<b>115,384</b>	109,691
Core Strategic Grants	<b>66,574</b>	58,434
Research Initiatives	<b>45,246</b>	34,938
Equipment and Facilities	<b>12,962</b>	15,301
Capital and Buildings	<b>24,695</b>	15,729
	<b><u>264,861</u></b>	<u>234,093</u>
Training Awards and Fellowships	<b>39,129</b>	33,666
	<b><u>303,990</u></b>	<u>267,759</u>
Beneficiaries:		
Universities	<b>182,502</b>	168,112
Research Institutes	<b>104,622</b>	89,481
Other Research Councils and other organisations	<b>16,866</b>	10,166
	<b><u>303,990</u></b>	<u>267,759</u>

## 5. STAFF COSTS

## FOR BBSRC OFFICE, BIOSCIENCE IT SERVICES (BITS) AND HOSTED RESEARCH COUNCILS' JOINT SERVICES

	<b>2005-06</b>	2004-05
	<b>£'000</b>	£'000
Salaries and wages	<b>7,848</b>	7,119
Social Security costs	<b>624</b>	553
Pension costs	<b>1,578</b>	678
Other fees and honoraria	<b>331</b>	211
	<b>10,381</b>	8,561
Less Joint Services staff	<b>(2,006)</b>	(1,670)
Administrative and BITS staff on payroll	<b>8,375</b>	6,891
Temporary Administration and BITS agency staff	<b>211</b>	84
<b>TOTAL</b>	<b>8,586</b>	6,975

In accordance with Treasury guidance, from 1 April 2005 the Employer's Pension Contribution rate was increased from 10.1% to 21.3%.

## AVERAGE STAFF NUMBERS AND FULL TIME EQUIVALENTS (FTE)

	<b>2005-06</b>	2004-05
	FTE	FTE
Administrative	<b>178.4</b>	170.6
BITS	<b>41.8</b>	41.5
Administrative and BITS staff on payroll	<b>220.2</b>	212.1
Joint Services	<b>60.0</b>	59.3
Staff on payroll	<b>280.2</b>	271.4
Temporary agency staff	<b>4.4</b>	2.1
	<b>284.6</b>	273.5

Further information on staff numbers and pensions are contained in the management commentary and remuneration report. Details of the pension scheme are on page 33.

In accordance with the Government Reporting Manual, the table above is of FTE staff numbers instead of headcounts as in previous years.

## THE FOLLOWING NUMBER OF EMPLOYEES EXCLUDING THE CHIEF EXECUTIVE RECEIVED REMUNERATION FALLING WITHIN THE FOLLOWING RANGES:

	2005-06	2004-05
	No.	No.
£120,000 to £129,999	1	-
£110,000 to £119,999	1	-
£100,000 to £109,999	-	1
£90,000 to £99,999	1	-
£80,000 to £89,999	2	1
£70,000 to £79,999	3	1
£60,000 to £69,999	5	1

Remuneration includes Employers' Pension Scheme Contributions of 21.3% (2004-05: 10.1%)



**6a. OTHER OPERATING COSTS**

	<b>2005-06</b>	2004-05
	<b>£'000</b>	£'000
Maintenance, repairs and cleaning	<b>460</b>	592
Rent, rates and insurance	<b>278</b>	236
External audit	<b>44</b>	43
Internal audit	<b>216</b>	188
Office supplies	<b>547</b>	704
Computing expenses	<b>620</b>	367
Travel, subsistence and hospitality	<b>857</b>	874
Professional fees and management consultancy	<b>1,064</b>	487
Central Purchasing by BITS	<b>1,915</b>	1,984
Other	<b>964</b>	760
	<b>6,965</b>	6,235

**6b. CALCULATION OF NET COSTS**

Staff costs (See Note 5)	<b>8,586</b>	6,975
Recovery of costs (See Note 3)	<b>(1,825)</b>	(3,901)
Net administration and programme costs	<b>13,726</b>	9,309

Expenditure on publications and publicity (2004-05: £51,000) have been included in 6a. Other.

Staff costs include a £750,000 increase in Employer's Pension contribution on 2005-06.

The reduction in recovery of costs is as a result of Bioscience IT Services (BITS) being partially funded directly by BBSRC, rather than recovering all of their cost from the BBSRC sponsored institutes as occurred in the comparative year.

**6c. NOTIONAL INTEREST**

	<b>7,268</b>	7,184
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This notional cost is included in the accounts to reflect a cost for the use of capital in the business in the year, as the Council has no specific interest bearing debt. In accordance with Treasury guidance, the calculation is based on a 3.5% (2004-05: 3.5%) rate of return on average net assets employed at cost or valuation. The net assets were £207.7M (2004-05: £204.0M) excluding the average cash balance with the Paymaster General of £1.0M (2004-05: £1.3M).

The reported notional cost is subsequently reversed in the Income & Expenditure Account in accordance with Treasury NDPB Guidance. Notional Interest as Cost of Capital is, however, reported in the Council's Departmental Expenditure Limit (DEL) under Resource Accounting and Budgeting where it forms part of Council's Resource control envelope account to Treasury.

## 7. RESEARCH INSTITUTE STAFF RESTRUCTURING

	2005-06	2004-05
	£'000	£'000
Annual Compensation Payments (ACP)	<u>2,340</u>	<u>1,772</u>
Redundancy payments	<b>11,571</b>	1,633
Early Retirement Lump Sums (ERLS)	<b>2,991</b>	1,098
Other costs	<b>547</b>	284
	<b>17,449</b>	<b>4,787</b>
Recoverable ACP and redundancy payments	<b>(3,808)</b>	(1,207)
Recoverable ERLS	<b>(2,977)</b>	(1,098)
Provided for (See Note 15)	<b>(10,194)</b>	(1,839)
	<b>470</b>	643
Increase provision for ACP and restructuring cost (See Note 15)	<b>4,094</b>	14,815
Release from existing restructuring provisions (See Note 15)	<b>(1,239)</b>	-
<b>Net Cost</b>	<b><u>3,325</u></b>	<b><u>15,458</u></b>

The total number of redundancies during 2005-06 was 274 (2004-05: 108).

This Note now shows ACP and redundancy payments gross of costs provided for by existing provisions.

## 8. NET GAIN ON DISPOSALS OR DEMOLITION OF FIXED ASSETS

	2005-06	2004-05
	£'000	£'000
Receipts on disposals of fixed assets	<u>2,713</u>	<u>3,582</u>
Less: Net Book Value of assets sold/demolished	<b>(53)</b>	(2,398)
<b>Net Gain</b>	<b><u>2,660</u></b>	<b><u>1,184</u></b>

## 9. FIXED ASSETS

	INTANGIBLE Milk Quota £'000	TANGIBLE (See Note 11) £'000	INVESTMENTS (See Note 12) £'000	Total £'000
At 1 April 2005				
At cost or valuation	852	310,465	1,000	312,317
Depreciation and impairment	(151)	(109,593)	-	(109,744)
Net Book Value	701	200,872	1,000	202,573
Additions including valuation additions*	-	2,036	500	2,536
Depreciation and impairment	(228)	(6,735)	(500)	(7,463)
Disposals	-	(53)	-	(53)
Professional revaluation	(253)	(334)	-	(587)
<b>At 31 March 2006</b>				
Net Book Value	220	195,786	1,000	197,006
Comprising:				
At cost or valuation	599	292,004	1,000	293,603
Depreciation and impairment	(379)	(96,218)	-	(96,597)
	220	195,786	1,000	197,006

## 10. FINANCING OF FIXED ASSETS

	GOVERNMENT GRANT RESERVE £'000	REVALUATION RESERVE £'000	Total £'000
At 1 April 2005	40,517	162,056	202,573
Capital expenditure and valuation additions*	1,236	1,300	2,536
Releases and Transfers to Income and Expenditure Account / General Reserve:			
- To match depreciation	(3,080)	(4,383)	(7,463)
- To match net book value of disposals	(37)	(16)	(53)
	(3,117)	(4,399)	(7,516)
Professional revaluation	-	(587)	(587)
<b>At 31 March 2006</b>	38,636	158,370	197,006

In accordance with the Government Financial Reporting Manual, financing classed as Deferred Capital Grant-in-aid in 2004-05 has been redesignated as the Government Grant Reserve.

\* See Accounting Policies (c) (ii)

## 11. TANGIBLE FIXED ASSETS

	Land and Completed Buildings £'000	Buildings Under Construction £'000	Plant & Equipment £'000	Total £'000
<b>Cost or Valuation</b>				
At 1 April 2005	306,478	100	3,887	310,465
Additions	-	-	736	736
Valuation additions*	-	1,300	-	1,300
Reclassification	100	(100)	-	-
Disposals	(195)	-	(394)	(589)
Professional revaluation	(19,908)	-	-	(19,908)
<b>At 31 March 2006</b>	<b>286,475</b>	<b>1,300</b>	<b>4,229</b>	<b>292,004</b>
<b>Depreciation</b>				
At 1 April 2005	107,096	-	2,497	109,593
Provided during the year	6,174	-	561	6,735
Disposals	(157)	-	(379)	(536)
Professional revaluation	(19,574)	-	-	(19,574)
<b>At 31 March 2006</b>	<b>93,539</b>	<b>-</b>	<b>2,679</b>	<b>96,218</b>
<b>Net Book Value</b>				
<b>At 31 March 2006</b>	<b>192,936</b>	<b>1,300</b>	<b>1,550</b>	<b>195,786</b>
At 1 April 2005	199,382	100	1,390	200,872

The land and buildings were professionally valued as at 31 March 2006 by external valuers, Powis Hughes Chartered Surveyors, in accordance with SAVP and RICS guidance notes except for two sites that are being prepared for sale.

	2005-06 £'000	2004-05 £'000
<b>Analysis of Land and Buildings</b>		
Land and Completed Buildings:		
Research and Administration Buildings at Institutes	164,412	159,402
Dwellings at Institutes	24,642	36,600
Institute Occupied Land and Buildings	189,054	196,002
Swindon Office	3,882	3,380
	<b>192,936</b>	199,382
Buildings Under Construction	1,300	100
Total Land and Buildings	<b>194,236</b>	199,482
Comprising:		
Freehold	194,201	199,393
Long Leasehold	35	89
	<b>194,236</b>	199,482

\* See Accounting Policies (c) (ii)



## 12. INVESTMENTS

	At 1 April 2005 £'000	Movements in year £'000	At 31 March 2006 £'000
<b>Cost or Valuation</b>			
<b>PBL</b>			
110 Ordinary Shares at 10p each, representing one third of the issued share capital of Plant Bioscience Ltd at a total subscription price of £2,000,000 payable in four instalments of:			
- At Completion of Agreement to Purchase £250,000	250	-	250
- On 1st June 2004 £750,000	750	-	750
- On 1st June 2005 £500,000	-	500	500
- On 1st June 2006 £500,000	-	-	-
Impairment	-	(500)	(500)
Plant Bioscience Ltd is incorporated in England and Wales. The shares were 75% part paid at 31 March 2006.			
<b>RBL</b>			
49 Ordinary Shares at 100p each representing 49 per cent of the issued share capital of Roslin BioCentre Ltd fully paid. Roslin BioCentre Ltd is incorporated in Scotland.			
<b>Rainbow Seed Fund</b>			
Partner's capital fund investment of £92			
	-	-	-
	1,000	0	1,000

## 13. DEBTORS

	2005-06		2004-05
	£'000	£'000	£'000
i) Due within one year:			
Trade debtors		903	2,519
Other debtors		4,626	4,625
Repayment of Early Retirement Lump Sums*		1,584	1,057
		<b>7,113</b>	8,201
Prepayments and accrued income:			
- Research grants	2,848		2,579
- Training awards	4,621		4,265
- Other	6,996		2,727
		<b>14,465</b>	9,571
		<b>21,578</b>	17,772
ii) Due after one year:			
Repayment of Early Retirement Lump Sums*	5,061		3,766
Other	5,524		9,318
		<b>10,585</b>	13,084
		<b>32,163</b>	30,856

\*Cash received from Research Councils' Pensions Schemes (RCPS) in 2005-06 in repayment of Early Retirement Lump Sums (ERLS) was £1,155,000 (2004-05: £1,146,000).

## 14a. CREDITORS: Amounts falling due within one year

	2005-06		2004-05
	£'000	£'000	£'000
Trade creditors	98		2
Deferred income	2		109
Purchase of tangible fixed assets	165		162
Other creditors	357		543
		622	816
Accruals:			
- Research grants	11,115		13,560
- Other	1,482		674
		12,597	14,234
		13,219	15,050

## 14b. CREDITORS: Amounts falling due after one year

	2005-06	2004-05
	£'000	£'000
Purchase of tangible fixed assets	-	130

## 15. PROVISIONS FOR LIABILITIES AND CHARGES

## Provisions for:

	Annual Compensation Payments	Major Institute Restructuring (See Note 22)	Total
	£'000	£'000	£'000
At 1 April 2005	2,702	13,976	16,678
Amount provided in year	243	3,851	4,094
Amount released in year	-	(1,239)	(1,239)
Transfers between provisions	696	(696)	-
Amount expended in year	(839)	(9,355)	(10,194)
<b>Total Provisions At 31 March 2006</b>	<b>2,802</b>	<b>6,537</b>	<b>9,339</b>

Annual Compensation Payments (ACPs) are payments to early retirees in advance of their pension entitlements under the Research Councils' Pension Schemes. The major institute restructuring relates to redundancies due to the implementation of revised scientific strategies and the redeployment of Core Strategic Grant funding.

## 16. RECONCILIATION OF MOVEMENTS IN GOVERNMENT FUNDS

	Government Grant Reserve	Revaluation Reserve	General Reserve	Total
At 1 April 2005	40,517	162,056	2,102	204,675
Surplus for the year	-	-	1,841	1,841
Reversal of Notional Interest	-	-	7,268	7,268
Capital expenditure and valuation additions	1,236	1,300	-	2,536
Releases and Transfers to Income and Expenditure Account / General Reserve:				
- To match depreciation	(3,080)	(4,383)	4,383	(3,080)
- To match net book value of disposals	(37)	(16)	16	(37)
Professional revaluation	-	(587)	-	(587)
<b>At 31 March 2006</b>	<b>38,636</b>	<b>158,370</b>	<b>15,610</b>	<b>212,616</b>

## 17. NOTES TO THE CASHFLOW STATEMENT

**i) Reconciliation of operating surplus/(deficit) to net cash inflow/(outflow) from operating activities**

	2005-06	2004-05
	£'000	£'000
<b>Operating surplus/(deficit)</b>	<b>6,449</b>	(12,524)
Reversal of depreciation and impairment charge	7,463	5,827
Reversal of release of Government Grant Reserve	(3,117)	(3,417)
(Decrease)/increase in provision for liabilities and charges	(7,339)	12,976
Increase in debtors, excluding those for fixed assets	(407)	(5,020)
Decrease in creditors, excluding those for fixed assets	(1,834)	(409)
<b>Net cash inflow/(outflow) from operating activities</b>	<b>1,215</b>	(2,567)

**ii) Reconciliation of movement in cash to movement in net funds**

	2005-06	2004-05
	£'000	£'000
Cash as at 1 April	3,104	2,251
Increase from operating activities	2,901	853
<b>Cash as at 31 March</b>	<b>6,005</b>	3,104

**iii) Breakdown of Balances**

	2005-06	2004-05
	£'000	£'000
HM Paymaster General	558	1,399
Barclays Bank plc	5,670	1,705
Less Held for third parties	(223)	-
	<b>6,005</b>	3,104

**iv) Third Party Assets: Cash held on behalf of Institutes to cover unforeseen losses**

	2005-06
	£'000
At 1 April	-
Gross Inflow	223
<b>At 31 March</b>	<b>223</b>

**v) Movement in creditors and payments for fixed assets**

	2005-06	2004-05
	£'000	£'000
Grant-in-aid financed capital expenditure (See Note 10)	1,236	1,122
Add decrease in fixed asset creditors	127	162
Payments to acquire fixed assets	1,363	1,284
Payments to acquire tangible fixed assets	863	534
Purchases of investments	500	750
	<b>1,363</b>	1,284

**vi) Movement in debtors and receipts for fixed assets**

	2005-06	2004-05
	£'000	£'000
Fixed asset debtors	900	-
Other debtors	31,263	30,856
Total debtors (see Note 13)	<b>32,163</b>	30,856
Receipts on disposals of fixed assets (see Note 8)	2,713	3,582
Increase in fixed asset debtors	(900)	-
Cash received from sale of fixed assets	1,813	3,582

**18. FORWARD COMMITMENTS ON APPROVED RESEARCH GRANTS**

	<b>2005-06</b>	2004-05
	<b>£M</b>	£M
2005-06	-	164.6
2006-07	<b>183.9</b>	104.9
2007-08	<b>115.4</b>	57.4
2008-09	<b>65.9</b>	11.6
2009-10	<b>17.1</b>	3.4
After 2009-10	<b>5.4</b>	-
	<b><u>387.7</u></b>	<b><u>341.9</u></b>

**19. CAPITAL COMMITMENTS**

The majority of capital expenditure funded by BBSRC is on contracts let by sponsored institutes. The following capital commitments have been authorised as at 31 March:

	<b>2005-06</b>	2004-05
	<b>£'000</b>	£'000
Authorised for contracts to be let	<b>4,300</b>	1,951
Funding approved in principle:		
- BBSRC contribution to the Pirbright redevelopment	<b>10,486</b>	-
- Other	<b>22,812</b>	8,127
	<b><u>37,598</u></b>	<b><u>10,088</u></b>

**20. CONTINGENT LIABILITIES**

In 2003, BBSRC provided a Bank Guarantee to Bank of Scotland to cover a 15-year, £11.5M, loan facility to Babraham Bioscience Technologies Limited for the development of the Babraham BioPark. BBSRC's liability for this facility was capped at a maximum of £17.3M. The difference in values accommodated costs arising from a potential default including interest and legal charges. The loan facility was at a fixed rate of interest of 5.4%.

The loan facility was fully repaid after 31 March 2006.

**21. RELATED PARTY TRANSACTIONS**

The BBSRC is a Non-Departmental Public Body sponsored by the Office of Science and Innovation (OSI) within the Department of Trade and Industry (DTI).

For the purposes of Financial Reporting Standard 8, OSI/DTI are regarded as related parties. During the year, BBSRC has had various material transactions with OSI/DTI and entities for which OSI/DTI is regarded as the parent department, viz.: Arts and Humanities Research Council, Economic and Social Research Council, Engineering and Physical Sciences Research Council, Medical Research Council, Natural Environment Research Council, Particle Physics and Astronomy Research Council, Council for the Central Laboratory of the Research Councils.

Debtors include balances with other central government bodies within the boundary set for the whole of government accounts of £2.2M (2004-05: £2.0M). The £2.2M includes £0.9M owed by the Medical Research Council being the balance due on a sale of land for £2.7M.

During the year, the following material payments with Council members' organisations took place in respect of research grants funded by BBSRC:

	<b>Awards</b>	<b>£</b>
Professor Howard Dalton FRS	1	69,769
Professor Chris Gilligan	1	102,726
Professor Douglas Kell	6	696,023
Professor Cheryl Tickle CBE FRS	1	58,010

The following Council members held positions on the Governing Bodies of sponsored research institutes:

Professor Chris Gilligan	Silsoe Research Institute
Professor Quintin McKellar	Institute for Animal Health
Professor Cheryll Tickle CBE FRS	Roslin Institute

Registers of interest for Council, Boards and Committees can be found at [www.bbsrc.ac.uk/about/gov/](http://www.bbsrc.ac.uk/about/gov/)

	Grants		Debtors (including loans)		Major Provision In Year	
	(See Note 4)		(See Note 13)		(See Note 15)	
	05-06 £M	04-05 £M	05-06 £M	04-05 £M	05-06 £M	04-05 £M
Babraham Institute*	15.4	12.7	0.3	0.3	-	-
Institute for Animal Health*	20.2	17.4	4.1	4.8	0.2	2.5
Institute of Food Research*	11.9	10.3	0.2	0.4	1.3	-
Institute of Grassland and Environmental Research*	7.2	6.2	0.1	0.8	-	-
John Innes Centre	21.8	17.9	1.8	1.2	0.8	1.5
Roslin Institute*	7.1	5.7	0.8	0.7	-	-
Rothamsted Institute	18.0	15.1	3.8	4.6	1.5	-
Silsoe Research Institute*	3.0	4.2	-	0.1	-	10.8
<b>Total</b>	<b>104.6</b>	<b>89.5</b>	<b>11.1</b>	<b>12.9</b>	<b>3.8</b>	<b>14.8</b>

\*Institutes occupying BBSRC owned estate at peppercorn rents.

## 22. DERIVATIVES AND OTHER FINANCIAL INSTRUMENTS

FRS 13, Derivatives and Other Financial Instruments, requires disclosure of the role which financial instruments have had during the period in creating or changing the risks an entity faces in undertaking its activities. Because of the non-trading nature of its activities and the way in which government bodies are financed, BBSRC is not exposed to the degree of financial risk faced by business entities. Moreover, financial instruments play no role in creating or changing risk as would be typical of the listed companies to which FRS 13 mainly applies. BBSRC has very limited powers to borrow or invest surplus funds and financial assets and liabilities are generated by day-to-day operational activities and are not held to change the risks facing the Council in undertaking its activities.

### Liquidity risk

BBSRC's net revenue resource requirements are financed by resources voted annually by Parliament, and administered as Grant-in-aid through the Office of Science and Innovation, just as its capital expenditure largely is. BBSRC is not therefore exposed to significant liquidity risks.

### Interest-rate risk

BBSRC's only exposure to interest rate risk is described in Note 20.

### Foreign currency risk

BBSRC's exposure to foreign currency risk is insignificant. Foreign currency income is nil and foreign currency expenditure at less than 0.1 per cent of total expenditure is also negligible.

## 23. POST BALANCE SHEET EVENTS

Nil.



## Accounts direction given by the Secretary of State for Trade and Industry

The Secretary of State for Trade and Industry with the approval of the Treasury, in pursuance of Section 2(2) of the Science and Technology Act 1965, hereby gives the following Direction:

The annual accounts shall give a true and fair view of the income and expenditure cash flows for the financial year, and the state of affairs as at the year-end. Subject to this requirement the Biotechnology and Biological Sciences Research Council shall prepare accounts for the financial year ended 31 March 2002 and subsequent financial years in accordance with:

- a. Executive Non-Departmental Public Bodies Annual Reports and Accounts Guidance published by HM Treasury and as amended from time to time
- b. other guidance which the Treasury may issue from time to time in respect of accounts where the requirement is to give a true and fair view of the financial statements;
- c. any other specific disclosures which may be required by the Secretary of State;

Except where agreed otherwise with HM Treasury, in which case the exception shall be described in the notes to the accounts.

Signed for and on behalf of the Secretary of State for Trade and Industry

S Speed

Dated 27 November 2001

### Definition of terms used in the Remuneration Report

#### Salary and allowances, including bonus

Salary and allowances, including bonus, covers both pensionable and non-pensionable amounts and includes: gross salaries; performance pay or bonuses; over-time; allowances and any ex-gratia payments. It does not include amounts which are a reimbursement of expenses directly incurred in the performance of an individual's duties.

#### Benefits in kind

The monetary value of benefits in kind covers any benefits provided by the employer and treated by HM Revenue and Customs as a taxable emolument.

#### The Cash Equivalent Transfer Value (CETV)

A Cash Equivalent Transfer Value (CETV) is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the member's accrued benefits and any contingent spouse's pension payable from the scheme. A CETV is a payment made by a pension scheme or arrangement when the member leaves a scheme and chooses to transfer the benefits accrued in their former scheme. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their total membership of the pension scheme, not just their service in a senior capacity to which disclosure applies. The CETV figures, and from 2003-04 the other pension details, include the value of any pension benefit in another scheme or arrangement which the individual has transferred to the Research Councils' pension arrangements and for which the CS Vote has received a transfer payment commensurate with the additional pension liabilities being assumed. They also include any additional pension benefit accrued to the member as a result of their purchasing additional years of pension service in the scheme at their own cost.

#### The real increase in the value of the CETV

This reflects the increase in CETV effectively funded by the employer. It takes account of the increase in accrued pension due to inflation, contributions paid by the employee (including the value of any benefits transferred from another pension scheme or arrangement) and uses common market valuation factors for the start and end of the period.