

BBSRC ANNUAL DELIVERY REPORT 2007/08

EXECUTIVE SUMMARY

Recent successes: BBSRC continues to be a key funder of the vibrant UK bioscience base. To help deliver economic and social benefit, BBSRC promotes successful interactions between world-class UK research teams, industry and other users, and sustains the biosciences skills base. Notable scientific achievements in BBSRC-funded areas have included advances in the weather-based modelling to predict plant disease; identification of potential molecular targets for treatments of allergy and inflammatory diseases, and understanding how pathogens such as Tuberculosis (TB) can acquire drug resistance, together with the identification a family of proteins that are attractive vaccine candidates with potential to protect against the latent form of TB.

Progress in management: BBSRC has delivered the new cross-Council Transparent Approach to Costing (TRAC) methodology on behalf of Research Councils UK (RCUK). BBSRC also took a leading role in working with four other Research Councils¹ in implementing a harmonised pay system which was agreed as a three-year deal with Unions. BBSRC continues to take an active role in planning and setting up the Shared Services Centre.

Progress to date against targets and milestones: BBSRC met or exceeded almost all of the targets set for 2007/08. Achievements include:

- Invested £10.9M on integrative systems biology; £12M for tools and resources for the biosciences; and £5.2M for Research Equipment Initiative.
- Expanded industry-relevant research, including a new Industry Club in food research and diet and health; doubling current collaborative research awards; and increased support for the Follow-on Fund.
- Prioritisation of crop and plant sciences, including the £7.5M Department for International Development (DfID) co-funded programme on research relevant to developing nations; and of animal health and welfare, with the development of cross-funder guidelines for animal research.
- Introduced flexible 4-year studentships; quota doctoral training grants; and launched (with RCUK) the new UKGrad programme.
- Completed transition of Roslin Institute to University of Edinburgh, and Institute of Grassland and Environmental Research (IGER) to Aberystwyth University.

Future targets/milestones: BBSRC will use its CSR07 funding to build on achievements in a number of key areas. We will:

- maintain a vibrant, internationally competitive multidisciplinary UK bioscience research base, capable of delivering a step-change in its economic impact, in:
 - *energy* - including £20M earmarked to establish a Bioenergy Centre;
 - *environmental change* - involving expected call for proposals in sustainable agriculture for adaptation to environmental change;
 - *ageing* – with support for a joint £3.5M joint initiative with US National Institute on Ageing and the final call of the cross-Council New Dynamics of Ageing initiative;
 - *global security* – with emphasis on animal and plant diseases;
 - nanotechnology – including £1M to strengthen the portfolio of science networks and develop industrial partnerships
- advance the national capability and appropriate facilities (in particular through BBSRC-sponsored institutes) and infrastructure for UK research base in biosciences and related areas, which will include a further £31M towards the redevelopment of the Institute for Animal Health.
- deliver a step-change in the economic impact of UK bioscience and related research, with the

¹ The four Research Councils are Arts and Humanities Research Council (AHRC), Engineering and Physical Sciences Research Council (EPSRC), Economic and Social Research Council (ESRC) and Science and Technology Facilities Council (STFC)

commitment of at least £12M to industrially relevant research.

- deliver wider impact through effective public engagement with UK research base, involving enhanced access to science for young people
- Significantly increase provision of skilled people for the science and bioindustry base, including the move to flexible 4-year Doctoral Training grants to ensure students have time to develop a broad range of skills; and nearly doubling the fellowships budget to £10M.
- seek to ensure that public policy decisions are based on sound scientific evidence
- help to maintain UK as a world leader in biosciences, and securing research, industrial R&D and economic benefits from global scientific activity
- deliver effective and efficient BBSRC support for UK bioscience research base

Gershon efficiency programme: BBSRC has exceeded the cumulative efficiency savings target of £39.2M. This was achieved in large part through higher savings on reprioritisation of programmes including training, and greater co-funding.

Science and Society: BBSRC further embedded the science and society agenda into its decision making process, including consideration of societal issues surrounding synthetic biology research, and contributions to RCUK Science in Society Unit's public engagement in areas including energy and stem cell research.

INTRODUCTION

This Report outlines BBSRC's progress against its objectives as defined in the BBSRC Delivery Plan 2005/08 (published in May 2005), and the Department for Innovation, Universities and Skills (DIUS) Performance Management System. The structure and content are in accordance with the reporting requirements for all Research Councils as specified by DIUS. Further detail is available in the BBSRC Annual Report and Accounts 2007/08

http://www.bbsrc.ac.uk/publications/accounts/bbsrc_annual_07_08.html

RECENT SUCCESSES

A healthy UK science base

BBSRC funds high quality basic and strategic research that adds significantly to the knowledge base that underpins the agri-food, pharmaceutical, healthcare and other bioindustry sectors. The time taken for a scientific discovery in the life sciences to become exploitable in commercial terms is often protracted. Examples of high quality science that may ultimately lead to practical applications as well as being exciting scientific discoveries include:

- A team of biologists and mathematicians led by Rothamsted Research has used a weather-based model developed to predict the start and severity of epidemics of phoma stem canker, a disease of oilseed rape and other brassicas that causes losses of \$900M worldwide². They found that warmer winters significantly advanced the date of stem canker appearance in spring and increased the severity of canker before harvest. They also predicted that epidemics will spread north from England to Scotland, where cankers do not currently occur on oilseed rape.
http://www.bbsrc.ac.uk/media/releases/2007/070815_plant_disease.html
- Researchers from St Bartholomew's (Barts) Hospital and The London School of Medicine and Dentistry have found an important target that holds significant promise for millions of people

² Range and severity of a plant disease increased by global warming Neal Evans, Andreas Baierl, Mikhail Semenov, Peter Gladders and Bruce Fitt Published online in the Royal Society journal Interface (10.1098/rsif.2007.1136)

suffering from allergies, asthma, rheumatoid arthritis and a range of other inflammatory diseases³. Normal allergy treatments reduce symptoms by damping down the immune response. The BBSRC-funded team has shown in mice that by targeting a key component of the body's own response to allergy-causing agents it is possible to interfere in the allergic reaction before symptoms occur, but without shutting down the immune system.

http://www.bbsrc.ac.uk/media/releases/2008/080215_asthma_allergy_drugs.html

- A group from Imperial College has made significant progress in maturing beating heart cells (cardiomyocytes) derived from embryonic stem cells and in developing the physical scaffolding that would be needed to hold the patch in place in the heart in any future clinical application. Using matured stem cells reduces problems of arrhythmia, and matching scaffolding material to human heart muscle may prevent deterioration of heart function before the newly introduced cells take over.
http://www.bbsrc.ac.uk/media/releases/2007/071213_cardiomyocytes.html
- Biochemists, chemists and structural biologists from Leicester University and Imperial College have shown how an enzyme in Mycobacterium tuberculosis converts the drug isoniazid to the active form which kills the bacterium, and how simple mutation of the enzyme can prevent this killing and protect the bacterium⁴. This explains the occurrence of some drug-resistant forms of TB and provides a target for more effective treatments.
http://www.bbsrc.ac.uk/media/releases/2008/080313_tb_invincibility.html
- Researchers at Aberystwyth University, working with international collaborators, have used BBSRC funding to identify a family of proteins called resuscitation-promoting factors (Rpf). These proteins can resuscitate dormant actinobacteria including Mycobacterium tuberculosis, which is the causative agent of TB. The Rpf proteins have a range of uses, including new types of vaccine. Rpf proteins are attractive vaccine candidates as they may have the unique potential to protect against the latent form of TB. A licence to develop the Aberystwyth work into a vaccine has now been agreed with a major foundation, which aims to develop TB vaccines and make them available in the developing world.
http://www.bbsrc.ac.uk/media/releases/2008/081008_tb_vaccine.html
- A major initiative in Systems Approaches to Biological Research provided almost £26M of new funding. Six new projects, involving 13 universities and institutes across the UK, were funded to study a variety of important questions, including how plants cope with drought, temperature changes and disease, how the fungus that causes thrush alters its virulence depending on the defensive response of its human host, and how animal cell signalling tells a cell how to respond to stimulus, a function that (if it goes wrong) can lead to cancer, inflammation and autoimmune diseases.
http://www.bbsrc.ac.uk/media/releases/2007/071127_systems_biology.html
- With the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs), BBSRC has funded an £1.2M programme in 'Tissue engineering solutions for replacing animal experiments'.
http://www.bbsrc.ac.uk/funding/opportunities/2006/tissue_engineering_animals.html

BBSRC exceeded its 2006/07 target for investment in collaborative research. For further detail of achievements in support of industrial collaboration, knowledge transfer and commercialisation, see **Progress to date** (below).

³ The research is published on 15 February in *The Journal of Immunology*. 'Isoform Specific Functions of Phosphoinositide 3-kinases: p110delta but not p110gamma promotes optimal allergic responses in vivo', Khaled Ali et al, pp. 2538-2544, Issue 4, Volume 180

⁴ The Tuberculosis Prodrug Isoniazid Bound to Activating Peroxidases. Clive Metcalfe, Isabel K. Macdonald, Emma J. Murphy, Katherine A. Brown, Emma Lloyd Raven, and Peter C. E. Moody
J. Biol. Chem., Vol. 283, Issue 10, 6193-6200, March, 2008

PROGRESS IN MANAGEMENT

BBSRC continues to manage its administration very tightly and has again operated at a level below the overall Research Council target for proportion of science budget funds spent on administration.

BBSRC has delivered the new cross-Council Transparent Approach to Costing (TRAC) methodology on behalf of Research Councils UK (RCUK) to enable Higher Education Institutes (HEIs) to estimate the full economic cost (FEC) of research and to ensure that this is properly considered in funding decisions.

BBSRC also took a leading role in implementing a harmonised pay system, which was agreed as a three-year deal with Trades Unions. BBSRC continues to take an active role in planning and setting up the Shared Services Centre (SSC) which will undertake transactional activities for all the Research Councils. All relevant activities and staff have been identified for transfer to SSC, and staff began to transfer in 2007/08.

PROGRESS TO DATE AGAINST 2007/08 TARGETS AND MILESTONES

BBSRC successfully met or exceeded almost all the targets and milestones for 2007/08, as shown in the [2007/08 Scorecard](#) (see pages 7-8 for the few not met). Particular highlights include the following.

Healthy Disciplines

BBSRC has increased responsive mode funding to £167M, in line with demand. This has allowed BBSRC to maintain success rates above 20%. Recognising the diversity of research approaches, mechanisms are now in place to encourage scientists to tackle big biological questions which require funding through longer or larger grants.

The allocation of £5M to the Selective Chemical Intervention in Biological Systems (SCIBS) initiative helped to increase research activities at the interface of the biosciences with the physical sciences, mathematics and engineering.

BBSRC continued its ongoing evaluation of its research funding: the programme of formal evaluations covered the Agri-Food responsive mode research portfolio and initiatives in the Biology of Spongiform Encephalopathies, Science of Ageing, and Experimental Research into Ageing.

Strategic planning activities

2007/08 saw BBSRC make the final commitment of funding for its SR04 Strategic Priorities.

BBSRC committed £36M to build capacity and promote cooperative and multidisciplinary working in Systems Biology, both nationally and internationally, supporting 70 staff under the Systems Approaches to Biological Research (SABR) initiative; and extending international interactions, including the ANR-BBSRC SysBio (collaboration with France) and SysMo (collaboration with Germany, Netherlands, France, Spain and Norway) programmes.

BBSRC's funding for underpinning technologies, tools and resources for modern bioscience saw £6M for the Technology Development Research Initiative, and £6M to Bioinformatics and Biological Resources Fund investment to complete our total commitment of £23.2M over 2006-09. In addition, a further £5M was committed to the ongoing Research Equipment Initiative (REI).

BBSRC coordinated funding into sustainable crop and plant science research, including £2.5M towards the £7.5M joint programme with DfID in crop and plant science relevant to developing countries.

To seize opportunities presented by advances in genomics and to take forward research in animal health and welfare, BBSRC allocated £10.15M via the 'Combating Endemic Diseases of Farmed Animals for Sustainability' initiative, including additional funding from the Scottish Government (£1.0M) and Department for Environment, Food and Rural Affairs (Defra) (£0.4M). BBSRC also supported 3 awards, together with a 4th with the National Centre for the 3Rs (NC3Rs), within the funding initiative on 'Tissue engineering solutions for replacing animal experiments'.

Continued BBSRC commitment to Ageing research included £2M support via the joint cross-Council programme New Dynamics of Ageing, and £1.5M contribution (with the Medical Research Council (MRC), Engineering and Physical Sciences Research Council (EPSRC) and Economic and Social Research Council (ESRC)) for 3 research centres on lifelong health and wellbeing.

The secretariat for the National Stem Cell Network was established, and its associated website launched, to improve the coordination of stem cell research and the dissemination of research results, in addition to providing a focal point for communication with overseas researchers, the media and the general public.

Training and Career Development

BBSRC's integrated support to equip researchers with the skills and expertise needed to deliver the Council's strategic priorities, and to sustain the competitiveness of UK bioindustries, saw the delivery of a broad range of activities:

- new PhD studentships as flexible 4-year packages;
- BBSRC Quota Doctoral Training Grants (2009 start), promoting quality, broad-based training;
- Targeted Priority Studentships in ageing and bioprocessing;
- call for proposals for BBSRC fellowships competition, including second round of the Institute Fellowships schemes;
- Industrial CASE Partnership studentships (quotas to major UK industrial partners), together with Industrial CASE studentships, aimed particularly at SMEs; and
- new flexible Masters Training Grants in priority training areas.

The new UKGrad programme was launched, with RCUK, providing skills training for postdocs and postgraduates. This aims to broaden the remit for the existing activities to give greater prominence to the career development needs of research staff and help maintain a highly skilled, self-reliant workforce within the globally competitive knowledge-based economy.

Sustainable institute base

2007/08 has seen a major set of activities by BBSRC towards a sustainable institute base to undertake longer-term strategic and multidisciplinary research, and provide a diverse range of economic impact activities.

The extensive programme of coordinated changes included the transition of the Roslin institute (including the Neuropathogenesis Unit) to Edinburgh University, and the establishment of the Institute of Biological, Environmental and Rural Sciences (IBERS) by the transition of IGER to Aberystwyth University. Following the review of governance of the Institute of Food Research (IFR), we expect that 'New IFR' will be embedded in University of East Anglia (UEA) from April 09.

Following the 2007 Foot and Mouth disease outbreak in Surrey, BBSRC together with Defra considered the wider implications of the Spratt and Anderson reports on the redevelopment of the IAH Pirbright site and the implications for the governance of IAH and the requirements for development of research and facilities currently located at Compton. This led to the independent review of funding, governance and risk management at IAH by Professor Sir John Beringer. BBSRC also commissioned a review chaired by Professor Martin Jeggo (Geelong, Australia), working with existing bodies overseeing the plans for the Pirbright redevelopment, to ensure that all safety critical

issues are addressed within the project. A third review Chaired by Professor Willie Donachie (Moredun Research Institute) reviewed the safety of all laboratory activities at IAH.

Council approved introduction of Institute Strategic Programme Grants in December 2007 to address clearly-stated scientific goals while focusing more clearly on the special role of institutes, and facilitate closer alignment of the funding and scientific review procedures between institute science and the rest of the BBSRC science base.

International collaboration

International collaboration in science and training continues to be a high priority for BBSRC. In April 2007 the Council published its *International Strategy*. This sets out how BBSRC is working to ensure that the UK remains a world leader in the biosciences, and that academic research, industrial R&D and the UK economy benefit from the increasing scientific activity across the globe.

In the course of the reporting period, BBSRC ran the following activities to promote international partnerships:

- US Partnering Awards scheme was launched in September 2007 (6 awards);
- 20 Partnering Awards funded with USA, Japan, China and India plus 8 workshops.
- International collaboration on scientific priorities resulted in 10 collaborative projects funded by both BBSRC and the Agence Nationale de la Recherche (ANR) in France to deliver a coordinated programme of research in systems biology.
- informal confirmation of US participation in a joint initiative on ageing research during the CSR2007 period was received following a visit to the National Institute of Aging in September 2007.

BBSRC Executive Director visited the US National Science Foundation (NSF) and National Institute of Health (NIH) in April 07, and NSF in November 07. BBSRC undertook a Bioenergy mission to Brazil in March 08, accompanied by the Government Chief Scientific Advisor. BBSRC International Relations Unit represented RCUK at the FCO Global Conference and led on RCUK input to FCO business planning

BBSRC continued to input into UK negotiations with the EU on the third call of the Seventh Framework Programme, together with DIUS, Defra and Food Standards Agency (FSA). BBSRC was involved in ongoing trilateral discussions with France and Netherlands on EU issues. Also, as managing sponsor of UK the Research Office (UKRO) in Brussels, BBSRC continues to ensure UKRO meet the needs of subscribed sponsors.

Economic Impact (Industrial collaboration, knowledge transfer and commercialisation)

The BBSRC has effectively engaged in the translation of research to address industrial need across a broad range of activities in advance of the expansion of activities from 2008.

Examples of where BBSRC is enhancing the economic impact of its funding through supporting research and training relevant to industrial needs include:

- Meeting Council's target to double current investment in collaborative research.
- Developing and implementing a Technology Strategy through increased investment in research in areas of relevance to industry. This has included awarding grants totalling £3.6M through the Bioprocessing Research Industry Club and launching a new Research Technology Club (RTC) with 13 companies to fund high quality research in Diet and Health of relevance to the food industry. In addition we developed plans and secured company involvement to establish a new RTC relating to biorefineries.
- Committing £1.8M to co-fund with Technology Strategy Board (TSB) and EPSRC collaborative research projects in areas of Smart and Nanostructured Materials for Health and Cell Therapy.

- Initiating recruitment of three new members of staff to enhance Council's capacity to engage with UK companies and develop the interface with the TSB.
- Maintaining a high commitment to collaborative training and career development with industry through awarding 120 new industrial CASE studentships and increasing investment in support for continuing professional development through modular training.

In addition, BBSRC continues to increase support for the identification and commercialisation of research outputs through for example:

- Investing £1.45M in new awards through the Follow-on Fund (FoF).
- Awarding 10 new Enterprise Fellowships.

BBSRC has continued to develop an understanding of the economic and social impact of BBSRC supported research and training. This has included:

- Working with RCUK to deliver an Economic Impact Study and User Survey.
- Undertaking an analysis of the impact and interactions of leading bioscience departments.

BBSRC has introduced activity to capture impact more effectively:

- Working with BBSRC-sponsored institutes to report on the economic and social impact of their activities;
- Review of the Follow-on Fund;
- Portfolio reviews to capture 'exploitation' outcome;
- Agreement with DIUS on a 10-point Economic Impact (EI) baseline;
- University innovation returns.

Science in Society

A working group established by BBSRC's Science for Society Strategy Panel commissioned an independent review of societal issues raised by Synthetic Biology. The Group is advising on BBSRC's response to the findings of the review; and BBSRC is taking a lead role in working with other Councils on approaches to public engagement.

In partnership with EPSRC, we part-funded and contributed to part of the Sciencewise Nanodialogues project led by the think-tank Demos, which explored upstream public engagement about emerging technologies.

The BBSRC and MRC programme on public dialogue on stem cells, funded by Sciencewise, has been taken forward through a series of public workshops delivered by BMRB Social Research.

BBSRC has continued to contribute to several major RCUK activities including: management of the Public Attitudes to Science Survey, published in partnership with DIUS in March 2008; the Beacons for Public Engagement programme, and a wide variety of schools-science links such as Researchers in Residence and Nuffield Bursaries.

Missed or delayed targets

BBSRC met in full 121 milestones out of a total of 131. This is a 92.4% success rate.

Missed targets:

- The increase responsive mode funding to £167M commitment was in line with demand and maintained the success rate (original target modified from £187.2M),.
- Initial slow take up for longer, larger grants by the community resulted in 5 awards (target 10-15). Demand now increasing.

The following 2 targets were attained, but at a reduced level:

- BRIC Steering Group funded successfully 7 projects at £3.6M (£4.0M was earmarked).
- 8 new awards made through the new Industry Interchange Programme (10 new awards were anticipated but slow take-up from the community meant that only 8 could be awarded. Demand is now increasing).

Delayed targets:

- The completion of the evaluation of Engineering and Biological Systems responsive mode research portfolio (June 08 from March 08).
- Completion of the review of provision of land-based research facilities (with other UK funders) (May 08 from December 07)
- Adoption of JeS system for submission of fellowship proposals will now be introduced for 2008 reports.
- The decision to move to direct BBSRC control of Rothamsted Research was deferred pending clarification of DIUS concerns and consideration of the Anderson Report (from December 07).
- Revised target spend of £2.3M (target £5.8M), following project delays in IAH Pirbright redevelopment.
- Further iteration of the Bioenergy statement delayed its announcement past March 08.

FUTURE TARGETS/MILESTONES ON OBJECTIVE 1 AND OBJECTIVE 2

Full details of targets and milestones for the 2008/09 period can be found in the [2008/09 Scorecard](#). Further description of priorities and activities can also be found in the [Delivery Plan 2009-11](#). Examples of future targets and milestones include:

Research priority areas

BBSRC is working closely with other Research Councils and funders to maintain a competitive multidisciplinary research base in the following areas:

- *Energy*: BBSRC has earmarked £20M for a bioenergy research initiative to establish a Bioenergy Centre and programme grants. This includes support for the second call of the Bioenergy Initiative (announced in March 08).
- *Environmental Change*: Following an independent review to identify and refine priorities, BBSRC is expecting to launch a call for proposals in sustainable agriculture for adaptation to environmental change, in addition to targeted funding on basic research (in responsive mode) to mitigate and adapt to environmental change.
- *Ageing*: Working through RCUK, BBSRC will commit additional funds for ageing research including new centres for Lifelong Health and Wellbeing. This will include developing a joint c£3.5M initiative with US National Institute on Aging, and also providing BBSRC support for the final call of the cross-Council New Dynamics of Ageing initiative.
- *Global Security*: BBSRC will fund research directly relevant to security, with emphasis on animal and plant diseases, including a joint call with DfID in animal health for international development.
- *Nanotechnology*: BBSRC will commit £5M for bio-nanotechnology research, including £1M to strengthen the portfolio of science networks and develop industrial partnerships.

BBSRC will spend an additional £5M on Tools and Resources as part of our continuing commitment to overcome bottlenecks in bioimaging, computational analysis, bio-based tools and bioanalytical techniques for academic and industrial use.

We will implement revisions to the responsive mode committee structure to better review and fund systems approaches to biology and other multi-disciplinary research, as well as funding summer

schools in systems biology in order to better embed systems approaches in responsive mode, initiatives and institute funding.

Responsive mode funding will increase to £173M, with increasing commitments to longer, larger grants. In tandem we will improve evaluation to encompass economic impacts of research and, with RCUK, review methodologies for economic impact assessment to identify best approaches.

BBSRC will increase FEC expenditure by £30M in 2008-09 for funding of grants and fellowships.

Science in Society

BBSRC remains committed to realising the impact of research through effective public engagement with the UK research base, and playing our part in the delivery of the RCUK Science in Society strategy, including enhanced access to science for young people. Our activities include contributing with other Councils to public dialogue on energy research and developing public engagement activities to celebrate Darwin's bicentenary. Our Bioscience for Society Strategy Panel will be identifying societal issues related to synthetic biology, and BBSRC will also work with EPSRC, Royal Society and others to foster constructive public debate on this emerging topic.

Sustaining the National Capacity

Ongoing support by BBSRC for the sustainability of the national capability and appropriate facilities and infrastructure for the UK research base will include a further £31M spend in 2008/09 as part of the redevelopment of world-class facilities at IAH Pirbright, as well as £11.1M towards the total £57M commitment in the new Roslin research centre at University of Edinburgh.

Revised governance arrangements for BBSRC-sponsored institutes will be in place or agreed at the end of 2008/09. BBSRC will also work with Defra and DIUS to agree future governance of IAH following the Anderson and Beringer reports, implement revised interim governance for IAH, and develop options for research and facilities currently located at IAH Compton.

Single core grants to institutes to be replaced by five-year institute strategic programme grants and institute integration awards, with the first awards being made in April 2008.

BBSRC will embed IFR as a BBSRC institute within the University of East Anglia to form a major new centre for diet, food and health research

Knowledge Transfer and Exploitation

As part of the step-change in the economic impact of UK bioscience and related research BBSRC will be committing at least £12M to industrially relevant research, with at least £8M to be complementary or collaborative with TSB, including at least £7M through Research Technology Clubs in Bioprocessing (BRIC) and Diet & Health (DRINC). We will also engage with companies and TSB to discuss potential new clubs including: Biorefining, Ageing, Crop Improvement, Bio-instrumentation.

BBSRC will be working with TSB in sectors new to the Board, including agri-food. BBSRC will support a new Innovation and Knowledge Centre in the biosciences, with TSB and EPSRC.

Other increased activities include: participants in Biotechnology YES 2008 raised to 300; at least £1.9M support for the Follow-on Fund; and 7 new Industry Interchange Awards

As part of our activities to effect culture change in universities around the concept of excellence with impact, BBSRC will develop plans for new incentives for researchers, pilot strategic partnerships with leading universities, and hold a high profile event focusing on economic impact

Training

All new studentships will be funded as flexible 4-year doctoral training grants to cover research excellence and transferable skills. We will increase investment in studentships to a total of c£45M, in order to ensure BBSRC continues to attract the highest calibre candidates to pursue research careers. BBSRC will increase support to £6.5M for its fellowships portfolio of early career, career development and senior fellowships. There will also be ongoing promotion to the BBSRC community of industry/academe exchange through Royal Society Industry Fellowships competition.

International

Following the publication of BBSRC's *International Strategy* in April 2007, BBSRC will input to RCUK International Strategy implementation plan (June 2008), and input to GSIF activities. We will publish calls for proposals for workshops and international partnering awards to attract the highest calibre fellows and students. We will establish closer coordination with DfID, Research Councils and others through the UK Collaborative on Development Sciences, and we will develop a call for proposals with DfID in animal health research.

SCIENCE AND SOCIETY

Interactions with the RCUK Science in Society Unit

BBSRC continues to support and fund the activities of the RCUK Unit such as activities for public engagement on energy research. BBSRC participation with the Unit's activities included contributions to RCUK Education review, discussions with Nuffield and CREST, links with PE Beacons and input on Public Attitudes to Science Survey.

THE GERSHON EFFICIENCY PROGRAMME

This year BBSRC delivered efficiency savings worth £48.6M against a target of £22.7M. Accumulated savings were derived from: reprioritisation of programmes including training (£24.8M); reduction of administration costs (£2.1M); increased efficiency of Institutes including better use of capital infrastructures (£8.0M); increased co-funding (£13.7M)

Efficiency Savings in 2008-09

Total efficiency savings in 2008-09 of £28.3M are expected to be derived from reprioritisation of programmes (£6.3M); reduction of administration costs (£0.5M); improved assets use (£14.5M); and increased co-funding (£7.0M).

SUMMARY FINANCIAL TABLE

2007-08 £M	Outturn*	Allocation	Difference
Near Cash	313.9	322.1	8.2
Non Cash	21.0	18.1	-3.0
Capital Grants	69.8	67.0	-2.8
Capital	3.7	0.8	-2.9
Total DEL	408.9	408.0	-0.5

* subject to final audit adjustment (if any)
DEL = Departmental Expenditure Limit