Evaluation of BBSRC's Animal Sciences Committee Responsive Mode Portfolio

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This document represents the conclusions of a Review Panel of experts in animal sciences. The views expressed are entirely those of the members of the Panel.

BBSRC

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EXECUTIVE SUMMARY

This document sets out the views of a specialist Review Panel convened to provide an independent scientific evaluation of the research supported in responsive mode through BBSRC's Animal Sciences Committee (ASC) since the Committee's inception in 1994. The objectives of the evaluation were to assess the quality of the research supported, to identify major outcomes arising from the research, to consider whether the ASC is currently funding the most appropriate areas of UK bioscience, and to identify ways to build on successes and ways to address identified gaps and issues.

The evaluation covered five subject areas: Research quality and research outputs; Balance and coverage of the portfolio; Interaction with industry; Public engagement; and Ultimate (longerterm) impacts. The findings are based on the results of questionnaire surveys of a sample of current and past grantholders, current and past ASC members, and other relevant funding organisations; and on the final reports that had been submitted for the sample completed grants.

The Panel concluded that the ASC is working very well, and fulfilling its aim to support high quality basic and strategic research on animal function. The quality of the research supported was very high throughout the evaluation period, and an excellent example of the UK's high performance and high profile in bioscience research. The Panel emphasised the importance of retaining the Committee's support across the whole animal kingdom, especially as many European funders are reducing their support for basic animal research.

A high proportion of the research supported was of international quality, with a good level of outputs including publications, novel products and processes, new collaborations and public engagement. The coverage of the portfolio was and is generally appropriate, having evolved to encompass new 'hot topics'.

The Panel made a number of recommendations relating to maintaining and enhancing the quality of the ASC's support for animal science research in the UK. A major recommendation is that BBSRC reconsider its position on the resubmission of grant applications. The Panel considers that BBSRC's policy of discouraging resubmissions is wasteful of good ideas, especially in areas such as animal sciences where there are few or no other sources of funding, and that it significantly increases the burden on the community, in terms of needing to write and referee new applications. The Panel considers that being more open to resubmissions would help to manage this burden, improve the quality of funded applications, encourage more inter-disciplinary research, and reduce the wastage of scientific ideas.

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1. KEY POINTS AND RECOMMENDATIONS

Key points

The Panel drew the following conclusions:

Research quality and research outputs

- The Animal Sciences Committee is working well, and is fulfilling its aim to support basic and structural research on animal function. The quality of the research supported was very high throughout the evaluation period, and an excellent example of the UK's high performance and high profile in bioscience research. It is vital that the Committee's support both for the whole animal kingdom and for basic research is maintained, especially as many European funders are reducing their support for basic animal research.
- The importance of ASC's continued support for animal sciences research is also illustrated by the narrow range of other bodies reported by sampled PIs as having provided follow-on funding for the research.
- A high proportion of the research supported over the last 10 years was of international quality, with a number of particularly striking highlights and, as might be expected, a small proportion of under-performing grants.
- The research outputs were generally good, with the majority of grants resulting in papers in well respected journals; a large number of new contacts and collaborations developed; an impressive range of novel products, processes, tools and technologies; and a higher than expected proportion of PIs reporting that the research had contributed to the reduction, refinement and replacement of animals in experiments.

Balance and coverage of the portfolio

- The coverage of the portfolio was and is generally fine, and appears to have evolved to encompass new 'hot topic' areas. The only apparent gaps in current coverage are mammalian endocrinology; foetal programming and functional magnetic resonance imaging (fMRI).
- The Committee's breadth is both a major strength in terms of the support that it provides across the animal kingdom, and a weakness because some parts of the community (e.g. researchers working on companion animals) perceive that their applications have a lower success rate.
- While having an important role in promoting particular areas of research, Priority Areas should not be over-emphasised to the detriment of support for high quality research that lies outside Priority Areas.
- There is a healthy level of interdisciplinarity amongst ASC-supported research.

Interaction with industry

- ASC-supported research contributes indirectly to industry through the maintenance of a 'bedrock' of knowledge on which future application is based, and the provision of a continued supply of scientists trained in animal science research methods.
- While the level of interaction with industry would never be high amongst a portfolio dominated by basic research, the survey results indicate that there is significant potential in this area, and that opportunities may be being missed.

Public engagement

• Public engagement with animal science research is vital. The level of involvement reported by ASC grantholders is very good, and there were a number of major highlights amongst the sampled grants.

Ultimate impacts

- The sample grants made a range of direct contributions to animal health and welfare and human health, with a number of notable highlights.
- ASC-supported research directly informs government policy in some areas, for example control strategies and contingency planning for certain animal diseases.
- On a longer-term scale, it is clear that ASC-supported research helps to maintain a sound base of scientific knowledge on which more applied research and future application by industry and governments is built.
- Similarly, ASC's support for animal research also contributes to the maintenance of a national skills base in animal sciences that is available to support government policy and strategy and to advise the government on emerging issues and emergencies, and that supplies industry with trained scientists.

Threats to animal science research in the UK

• The research supported through ASC has been of very high quality over the past ten years, and the outlook is generally positive. However, BBSRC's policy of discouraging the resubmission of grant applications, and the increasing cost and difficulty associated with conducting animal research in the UK are potential threats to animal science research in the UK.

Recommendations

The Panel made the following recommendations:

Research quality and research outputs

- Recommendation 1: BBSRC's support for animal sciences research in the UK is vital, and should be continued.
- Recommendation 2: BBSRC's efforts to manage demand are commendable. However, the Council should take further steps to address the burden that the current success rate places on the community.
- Recommendation 3: BBSRC should continue to strive to identify ways in which it can contribute to improving job security, benefits and career prospects for research staff.

Balance and coverage of the portfolio

- Recommendation 4: The ASC's current remit and themes are appropriate and should not be significantly changed. BBSRC should review the way in which the ASC themes are presented on its website to ensure that they read consistently.
- Recommendation 5: BBSRC should investigate the Wellcome Trust's recent experience with its move to sub-Committees to inform the discussion on Committee remits.
- Recommendation 6: BBSRC should consider its current provision of support in mammalian endocrinology, foetal programming and Functional Magnetic Resonance Imaging (fMRI).
- Recommendation 7: Priority Areas have an important role in enabling the Committee to promote particular areas of science, but should not be prioritised to the detriment of support for high quality research outside Priority Areas. BBSRC should provide the community with

a clear statement on the role of Priority Areas in encouraging particular areas of science, and on the way in which they are used in grant appraisal.

• Recommendation 8: BBSRC should continue to encourage interdisciplinary research where it is appropriate, in particular investigating ways to improve the appraisal process and success rate for interdisciplinary research.

Interaction with industry

• Recommendation 9: BBSRC should continue to think creatively about how to promote interaction and collaboration between academia and industry, including improving networking and communication of opportunities, and identifying ways to encourage industry to invest in grants.

Public engagement

• Recommendation 10: BBSRC should continue its efforts to encourage and assist scientists to engage with the public, in particular by promoting its facilities and increasing its provision of training.

Threats to animal science research in the UK

- Recommendation 11: BBSRC should reconsider its position on the resubmission of grant applications to help to ease the burden on the community, to increase the quality of the applications funded, and to reduce the wastage of scientific ideas.
- Recommendation 12: BBSRC should consider ways in which the concerns of grantholders relating to animal research could be presented to the Home Office and universities.
- Recommendation 13: BBSRC should consider ways in which longer term support for animal research facilities could be provided.

2. BACKGROUND

Introduction

- 1. The Biotechnology and Biological Sciences Research Council is one of eight Research Councils sponsored through the UK government's Office of Science and Technology (OST). Its principle aim is to foster a world-class biological science community in the UK. BBSRC's mission is to fund internationally competitive research, to provide training in the biosciences, to encourage opportunities for knowledge transfer and innovation, and to engage the public and other stakeholders in dialogue on issues of scientific interest.
- 2. BBSRC supports research in a number of ways, including research grants, studentships, fellowships, and Core Strategic Grants to Research Institutes. In financial year 2004/05, 41% of BBSRC's research funding was spent via the organisation's 'responsive mode' scheme, whereby research grants are awarded to unsolicited high quality research proposals from eligible applicants in any area relevant to the Council's mission.
- 3. For organisational purposes, BBSRC's remit is divided into seven key areas, each covered by a Research Committee: Agri-Food; Animal Sciences; Biochemistry and Cell Biology; Biomolecular Sciences; Engineering and Biological Systems; Genes and Developmental Biology; and Plants and Microbial Sciences.
- 4. This document sets out the views of the specialist independent Panel convened to provide an independent scientific evaluation of the Animal Sciences Committee responsive mode portfolio.

Evaluation context

- 5. Evaluation is of growing importance to BBSRC and, with its emphasis on evidencebased decision making, to the UK government. Evaluation plays a central role in:
 - Justifying BBSRC's funding allocation and contributing to the Evidence Base that all Councils are required to submit to OST for Spending Review negotiations;
 - Informing internal funding decisions, providing evidence of progress and achievement, and facilitating the development of a strategic overview for future funding decisions;
 - Enabling BBSRC to account to government, the general public, the scientific community and other stakeholders for the funds it allocates; and
 - Helping BBSRC to improve its policy and practice, through informing policy decisions and the design of new schemes, programmes and processes; and through identifying good practice, lessons learned, and ways to improve processes.
- 6. Formal evaluation of research is currently conducted at a number of levels in BBSRC:

Grant	• Evaluation of final reports from individual grants
Scheme	• Evaluation of the responsive mode scheme, evaluating the portfolio
	of each Research Committee in turn
	• Evaluation of Research Initiatives (time-limited research funding in
	strategically significant areas), 2-3 years after the grants have ended
Institution	• Institute Assessment Exercise, conducted every four years at
	BBSRC-sponsored Research Institutes

7. Following a successful pilot evaluation of the Biomolecular Sciences Committee's responsive mode portfolio, BBSRC decided to evaluate its responsive mode portfolio by Research Committee area on a rolling basis, with two Committees evaluated each year. This report covers animal sciences, the first Committee area to be fully evaluated. Further details on responsive mode funding in BBSRC, the evaluation objectives and methodology, and the Animal Sciences Committee are set out in Annex 2.

3. RESEARCH QUALITY AND RESEARCH OUTPUTS

Overview

- 8. The ASC is achieving its aim 'to support basic and strategic work on animal function at the level of tissues and systems'. This is clear both from the responses of the majority of sampled PIs, and the scientific advances reported in the sample final reports. The ASC plays a unique and vital role in providing broad support for basic animal sciences research, as expressed by a Committee member, "*There is no other Committee that makes the whole animal kingdom its area of interest. This needs to be preserved.*"
- 9. The Committee is also very important in the European context, being one of the few funding bodies maintaining its support for basic science. Indeed, only **7%** of the PIs of sample completed grants said that they had not applied to the ASC for follow-on funding because funding is more accessible from other sources. The strong and well established nature of the UK research

23% of surveyed PIs said that the grant had provided funding for research that other bodies would not fund

community further increases the importance of ASC's support for this type of research.

Recommendation 1: BBSRC's support for animal sciences research in the UK is vital, and should be continued.

10. However, the above statements come with a caveat: the ASC is achieving its aim *within available funds*. It is clear that with current funding levels, much international quality science cannot be funded. BBSRC's success rate for responsive mode compares favourably with other major UK and international funders, and the Council should be congratulated for its success in securing funds for bioscience research from the Treasury. Nevertheless, the Panel is concerned about the considerable burden that current success rates place on the community, entailing a significant waste of time and resources for applicants, referees, and Committee members. BBSRC's current efforts to increase success rates by managing demand are commendable, but the Panel strongly encourages BBSRC to take further action to address the problem.

Recommendation 2: BBSRC's efforts to manage demand are commendable. However, the Council should take further steps to address the burden that the current success rate places on the community.

Quality of the research

- 11. The Panel considered a number of types of research output:
 - Publications
 - Trained people, new skills
 - New collaborations, further funding
 - New products, processes, tools and technologies
 - Intellectual property, spin-out companies
 - Contribution to the welfare, reduction and replacement of animals in research

Longer-term outcomes arising from the research supported through ASC are discussed in Chapter 7.

- 12. The quality of the research supported through ASC was very high throughout the evaluation period, and an excellent example of the UK's high performance and high profile in bioscience research. A high proportion of the research was of international quality, with some particularly striking highlights. This is a particular achievement given that funding for such work was being withdrawn by other funding bodies during the evaluation period, and that some of the research was conducted in target species (and was hence slower, more expensive and more difficult than work in model species).
- 13. This finding is supported by the fact that **72%** of the ASC grants completed since September 1994 were graded A or B^1 (on a scale of A to D), and that **78%** of the sampled PIs felt that their project had been successful.
- 14. The Panel identified a number of grants that had particular impact, and/or that had produced excellent research outputs. Major highlights are described below organised by the three ASC themes. Other notable grants are included at Annex 6.

Neuroscience and Behaviour

Fish and chips: Identifying and quantifying xenobiotic- induced alterations of gene expression in the brain and gonad. This research identified the key genes that are regulated by low levels of ethinyloestradiol in the brains and gonads of zebra fish. The findings have important implications for the environment, for the plastics/paints industry and potentially on human as well as animal health and welfare. The work engaged both national and international stakeholders, e.g. DEFRA, US Environment Agency, industry, and substantive further funding followed with national and international collaborations. The group also worked hard to bring the work to the public by, for example, media presentations, Royal Society summer exhibition, lectures in Schools and universities.

The physiological role of two *Drosophila* genes, Ance and Acer, in peptide hormone metabolism. The investigators used *Drosophila* as a model to identify potential new roles for angiotensin converting enzyme (ACE) in animals. The data represent a considerable advance, providing firm evidence that ACE (known as Ance in *Drosophila*) contributes to the processes regulating metamorphosis and spermatogenesis. The project led to a large number of publications and to data being lodged in a number of public access data bases. In addition, it triggered collaborative programmes with academic labs in Europe and the USA and with the pharmaceutical industry. The structural studies that this work triggered are expected to provide valuable information for the design of domain-specific inhibitors of human ACE and the recently identified ACE-like gene in cardiac muscle.

Behavioural and neurological investigations of social and object recognition in sheep and their relationship to motivation and affect. Although it has been claimed that complex face perception and recognition is uniquely human, by using a sophisticated mix of the behavioural and neurobiological procedures, this project demonstrated that sheep learn to recognize and remember a large number of individual sheep and human faces, capacities that depend upon same lateralized brain system as in humans. Moreover, the researchers found that sheep can assign emotional and motivational significance to individual faces. This was first class research in comparative cognition, and generated an impressive number of publications, including a Nature paper. The work also attracted considerable media attention.

Targeted cell ablation to study the role of cell-cell interaction in axon guidance. The investigators established a general method for direct gene expression in *Drosophila* using targeted cell ablation to study the role of cell-cell interaction in axon guidance. The work contributed to the development of new methodologies that were then exploited to direct expression of toxins to achieve targeted cellular ablation and study axon growth. The researchers tested the role of specific cell-cell interaction to drive axon guidance, and identified the signalling molecules potentially involved. These findings have important implications for understanding brain development and for human as well as animal welfare. The team published a large number of papers as a result of this work, and established collaborations with groups in Europe and the US.

¹ A is defined as 'very high class work that has produced results of considerable scientific importance in a cost effective way, and met all of almost al of the agreed or related key objectives'.

B is defined as 'work that has added significantly to knowledge in the field and met the majority of its agreed or related key objectives'.

Genomic imprinting and olfactory function. This work was an excellent example of the value of an integrated approach to research questions. The researchers integrated neurobiology, genetics and behaviour techniques in an elegant investigation of the role of genomic imprinting in olfactory-directed behaviour in mammals. The team identified genetic mechanisms influencing postnatal behaviour in response to maternal cues. They provided evidence that F1 mice are more sensitive to and avoid odour maternal cues. The work also produced innovative animal models, and a continuing line of research. These findings are very relevant for animal welfare. The project produced excellent publications, and the group was active in training and in transferring their results to the public.

Physiological and ultrastructural study of the performance of synapses which transmit graded potentials. This was a particularly elegant physiological study combining physiology with ultrastructural studies to investigate the molecular basis of graded potentials transmitted by synapses. The group demonstrated through a variety of staining procedures that these synapses are operated by acetylcholine, thus implying that Ach can exert both inhibitory and excitatory function in the insect nervous system. These results added significantly to understanding of chemical transmission. Excellent scientific publications were produced, and the group leader made a number of presentations to the lay public.

Integrative Animal Physiology

Comparative study of spider silk extrusion systems. This research involved the study of spinning processes and the ultrastructure of silk in several spider species. A number of papers were published both in specialist and general journals, and the work attracted some media attention. The findings were used to optimise the manufacture of synthetic silk analogues, and a spin-out company was established.

Adaptability of an insect herbivore, the diamondback moth, to changes in its nutritional environment. This was an excellent example of the transition from basic research to application. The investigators found (unexpectedly) that the larvae of diamondback moths evolve the ability to eat more carbohydrate without laying it down as body fat. This finding led to a new hypothesis for human obesity and a number of follow on studies.

Computational fluid dynamic modelling of vortex wake generation and evolution in flying birds and bats. Researchers developed a range of computational models to compute and display the vortex wake of a bird in flapping flight and to model the airflow around the body. The work was published in prestigious journals in the field and also caught the public imagination via considerable media attention. A longer term deliverable may be the design of micro-air vehicles with high levels of aerodynamic performance and efficiency.

A study of spinal mechanisms regulating the pathophysiology of inflammatory hyperalgesia in sheep. This research involved comparing spinal cord gene expression levels in sheep following naturally occurring inflammatory disease and experimentally induced inflammation. The work identified a number of mechanisms that could potentially be targeted to provide novel pain treatments and improve animal welfare. The group also found that gene expression patterns in natural versus induced pain were different, questioning the value of some experimental models of pain in this species.

Mechanisms of Immune Function and Disease Pathogenesis

Molecular basis of Th subset bias in intestinal nematode infections. This research showed that induction of the Th2 bias in the immune response to parasites is directly initiated by the action of nematode proteins on dendritic cells, and that this does not require B-cell interactions. The findings were particularly important because they came before much of the information about dendritic cell activation through Toll receptors was known, and at a time when there was huge amounts of interest in how infections were recognised and mechanisms of induction of immunity.

Analysis of the proteome of tachyzoites and bradyzoites of *toxoplasma gondii*. The investigators applied evolving proteomic techniques to develop technologies for the analysis of *t.gondii*. They went on to characterise the proteomes of two life stages of this parasite, and identified individual proteins of parasitic stages based on this analysis. The work resulted in a good range of publications, and was notable for its spin-off training of personnel and public engagement.

Putting the *C. elegans* genome to work: a proteome model for studying the establishment of chronic parasitic nematode infections. This research on the parasite *H. polygyrus* characterised the proteomes and individual proteins that are involved in the parasite's response to its host's environment. The research produced good outputs in terms of publications, achievement of aims, generation of resources for the community, training and public engagement.

15. As might be expected, a small number of grants had been less productive. It was evident from the final reports and survey results that factors such as difficulties in recruiting and retaining staff, and the continued dominance of the 'three-year, one Research Assistant' grant (despite BBSRC's efforts to encourage longer, larger grant applications) had in some cases affected the progress and quality of research.

Publications

- 16. The majority of sampled grants had published a good number of papers as a result of the research supported by the grant (a median of **four** peer-reviewed publications per grant for sampled completed grants²). **6%** of the publications were in journals with an Impact Factor greater than 10, including a number in high profile general journals (e.g. Nature, Science, Proceedings of the National Academy of Sciences). Many were in subject-specific journals that are well respected in their field (e.g. Journal of Experimental Biology, Animal Behaviour, Journal of Neuroscience, Journal of Virology, Journal of Experimental Psychology, Endocrinology). The large number of journals used reflects the broad nature of ASC's remit (from the 171 sample grants, **604** papers had been published in **236** peer-reviewed journals).
- 17. The journals used by the sample PIs were mostly high quality with rigorous peer review. The Panel wishes to stress that the fact that many of the journals have lower Impact Factors than those used by researchers supported through BBSRC's more molecular and cellular Committees is a reflection more of the nature of the area than of the quality of the research. It can be difficult, for example, to interest high profile general journals in some areas of animal research that are not directly relevant to humans (e.g. physiological and pharmacological studies in animals, research in target species).
- 18. The high charges imposed by some important journals (especially American journals), and the fact that 'page rate' charges have not in the past been included in grants may also partly explain why some of the sampled PIs had chosen to publish in lower impact journals. The Panel is reassured to learn that such charges will be eligible for inclusion with the move to Full Economic Costing.
- 19. Comparison of the Impact Factor of journals used by current grantholders and completed grantholders indicates an apparent increase in Impact Factor over recent years. One influencing factor could be the Research Assessment Exercise's focus on publication quality. In addition, the fact that many of the higher Impact Factor journals were review journals, for example the 'Trends' publications, could account for part of the overall increase. Although reviews articles do not carry the same weight in the eyes of RAE panels, the visibility of such articles can help BBSRC-funded scientists to direct attention to their new research in the larger field.

Trained people, new skills

20. This was a difficult area to review as many of the sample final reports had little or no information on the training and skills development resulting from the grant. This was partly due to the final report form not including a section on training in the early years

 $^{^{2}}$ The median is used because the distribution of papers per grant is left-skewed (the majority of grants lead to the publication of 0-6 papers, but a small proportion resulted in larger numbers of papers, with a maximum of 21). The average per grant was 4.8.

covered by the evaluation. However, the lack of information even in more recent final reports, together with the fact that nearly a third of sampled PIs did not indicate in the questionnaire that the grant had strengthened the skill base of their group might indicate that some PIs place a low priority on training and development of transferable skills. The Panel emphasises the importance of training and mentoring for the continued development and availability of skills for animal sciences research.

- 21. The ASC's actions to address identified skills gaps are commended. The recent Combating the Viral Diseases of Livestock Research Initiative, for example, made a major contribution towards maintaining skills in this area. Given the ASC's specific role in supporting the maintenance of animal research skills in the UK, and the fact that these skills are currently in short supply, BBSRC's new Integrative Mammalian Physiology Initiative, and the Academic Fellowships for integrative physiology (co-ordinated by Research Councils UK) are also welcomed.
- 22. BBSRC's New Investigator scheme, aimed at helping researchers at an early stage in their careers to establish their laboratories and to win their first research grants, appears to be working well. Indeed, it should be noted that these grants were slightly more

32% of PIs said that the grant had helped them to establish their laboratory

successful (as measured by final report grades and numbers of publications) over the evaluation period than standard responsive mode grants. The ASC's commitment to supporting new investigators is evident: **21%** of the NI grants starting in 2000 to 2005 were awarded through the ASC (for comparison, ASC awarded **17%** of all responsive mode grants starting the same period).

- 23. The results also highlight a number of issues relating to staffing and career development that are a potential threat to the progression of animal science research and the sustainability of the UK's skills base in animal sciences:
 - Staff turnover is a sign of mobility within the sector, and the transfer of trained researchers to industry is a significant benefit of BBSRC's support for basic research. However, the high level of turnover implied by the fact that **47%** of the RAs employed on sampled grants were in their first postdoctoral position is a concern;
 - The data on first destinations reflects the continuing difficulty that RAs have in finding permanent positions: only 27% of the RAs who had left the lab for academic positions elsewhere had secured a permanent position; and
 - A small proportion of the grants (12%) had a change of RA during the grant. It was evident, both from the final reports and the questionnaire responses, that this had had a detrimental impact on the progress of much of the research in question.
- 24. While not entirely BBSRC's responsibility, the Council should consider ways in which universities and researchers can be encouraged to think more strategically and longer-term about their research pipeline and staffing needs, and to move away from the 'three year one research assistant' grant to applying for the length and quantity of funding most appropriate to research needs.

Recommendation 3: BBSRC should continue to strive to identify ways in which it can contribute to improving job security, benefits and career prospects for research staff.

New collaborations, further funding

- 25. A high proportion of the sampled PIs reported new or improved academic contacts and collaborations as a result of the research supported by the grant (60% of PIs reported new or improved contacts both in the UK and overseas; "The BBSRC grant helped me 40% reported new academic collaborations in the UK, to initiate and co-ordinate a and 33% new collaborations overseas). These new and research network (UK and improved linkages often lead to new research ideas, Europe) which has been awarded over 3 million Euros directions and approaches, and are therefore a major outcome of BBSRC's support for research.
- 26. 47% of the PIs of sampled completed grants reported that they had received further funds to continue or develop the work supported by the grant (30% through ASC, 17%) from other sources). This is considered to be a healthy proportion: some changes of direction would be expected given the basic nature of the research supported (22% of PIs had not applied to ASC because their research priorities had changed); moreover the figure is likely to be an underestimate because some of the sampled PIs had only recently finished their grants, and would not necessarily yet have secured further funding.
- 27. Comparison of the data for follow-on funding from other sources with the results of a recent survey of PIs supported through BBSRC's Biochemistry and Cell Biology Committee highlights striking differences between the two Committees:

	ASC	BCB
Sampled PIs securing follow on funding	17%	44%
from other sources		
Number of other sources reported	9	16
(including BBSRC Committees)		
PIs reporting that funding is easier to	7%	24%
obtain from other funding sources		

Follow-on funding from other funding bodies

The nine 'other sources' of funding reported by the sampled ASC PIs³ were a fairly 28. focussed selection compared with the bodies reported in the BCB survey. These results are indicative of the limited sources of funding, and the difficulty in obtaining funding for animal science research, and hence of the importance of the ASC's continued support for this area.

New products, processes, tools and technologies

29. The proportion of sampled PIs reporting new products, processes, tools or technologies that had or could result from the work supported by their grant is considered to be relatively high for this area of science (27%). Nearly half of these were of the opinion that the output was potentially commercially exploitable. The outputs were very varied, ranging from molecular outputs to cell clones to animal welfare developments, reflecting the breadth of the ASC portfolio.

from the EC." Grantholder

³ Seven PIs had obtained further funding from the Wellcome Trust, four from NERC, three from the European Union, and two from Defra. Two had received follow on grants from another BBSRC Committee (Agrifood).

30. Inspection of the information given by PIs indicates that few of the reported outputs appear to be of potential use to industry, perhaps reflecting the low level of reported collaboration with industry. While not a major concern, given the basic nature of much of the research supported and the fact that research in target species is often difficult to exploit commercially, the level of industrial relevance of the outputs does appear to be somewhat low. Interaction with industry is discussed further in Chapter 5.

Intellectual property, spin-out companies

- 31. 5% of the sampled PIs reported having secured intellectual property (all in the form of patents) as a result of the work supported by the grant, with a further 4% likely to apply in the near future. As a comparison, 11% of surveyed PIs supported through BBSRC's Biochemistry and Cell Biology Committee (BCB) reported having secured or being likely to apply for intellectual property.
- 32. Three spin out companies were reported as having been established from the research supported by the sampled grants, two of which were currently trading. The establishment of a spin-out company was one of the notable features of the spider silk project highlighted in Chapter 3, for example. Another company was in the process of being set up. This was the same proportion as reported by PIs in the recent BCB evaluation. These figures also appear to be somewhat lower than might be expected (discussed further in Chapter 5).

Contribution to the reduction, refinement and replacement of the use of animals in experiments

- 33. BBSRC's drive to promote research on the reduction, refinement and replacement of animal use in experiments (the '3Rs') is generally commended. The Panel welcomes the fact that a relatively high proportion of sampled PIs (**21%**) stated that their research had contributed to this goal. The descriptions given by PIs were varied, relating to disease, physiology and animal welfare in a number of different species.
- 34. However, the Panel wishes to voice concern relating to two of the '3Rs': reduction and replacement. Commitment to the full principles of the 3Rs effectively implies that animal research as conducted at present is a 'necessary evil'. Many animal scientists do not accept this position and believe that 'animal experiment' has acquired a perjorative connotation that it rarely deserves. The Panel accepts that the reduction and replacement of animals in research should be pursued wherever possible, particularly if any avoidable suffering is involved. However, BBSRC should also acknowledge that in certain, specific areas, research on certain target species is an entirely legitimate focus of scientific study in its own right. Indeed, recent technological advances have resulted in the increased use of animals in research, for example those involving transgenic and 'knockout' techniques. Furthermore, as identified by SEERAD (Annex 7, page 85), continuing support for animal research is vital for the maintenance of a skills base in the UK to cope with unforeseen circumstances, as demonstrated during the outbreak of Foot and Mouth Disease. The pharmaceutical industry is also concerned about the gradual loss of scientists experienced in whole animal science.

4. BALANCE AND COVERAGE OF THE PORTFOLIO

Overview

- 35. Review of the final reports of sample grants, current support for 'hot topic' areas, and responses from other funding organisations indicates that both the ASC's remit and its current support for animal science research has been, and still is generally appropriate. This is supported by the fact that **92%** of the sampled PIs reported that they had not significantly changed the direction of their research to fit into ASC's remit.
- 36. The Committee's three themes describe its remit well, but the way that the themes are described on the BBSRC website should be reviewed to improve overall consistency.

Recommendation 4: The ASC's current remit and themes are appropriate and should not be significantly changed. BBSRC should review the way in which the ASC themes are presented on its website to ensure that they read consistently.

37. The Panel discussed whether the ASC's remit is too broad and whether as a consequence the Committee should be split into two. To inform thinking on the issue, the Panel recommends that BBSRC investigate the Wellcome Trust's recent experience with the introduction of sub-Committees.

Recommendation 5: BBSRC should investigate the Wellcome Trust's recent experience with its move to sub-Committees to inform the discussion on Committee remits.

Coverage of the portfolio

38. The ASC's portfolio is very broad, with the sample grants encompassing a wide range of research in target and model species, vertebrates and invertebrates, and from molecular and cellular studies to animal behaviour and physiology. The allocation of funding across the Committee's three themes (as shown in Annex 2) is reflected in the areas of expertise indicated by sampled PIs:

Areas of expertise indicated by sampled PIs

(many respondents ticked multiple categories)



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- 39. The following points are pertinent to the above figure.
 - The apparent increase in PIs working on physiology is unexpectedly high but, given the broad definition of the category, probably reflects the growth in the use of physiological methods in the neuroscience area rather than an increase in animal physiology research per se. The increasing use of non-interventional approaches in neuroscience (e.g.imaging, neurophysiological analysis of cells in brain slices or culture preparations) is welcomed;
 - The lower than expected proportion of PIs working on animal disease is likely to be because some of the work falls within the remit of other BBSRC Committees (e.g. the AgriFood Committee) or the MRC, and because many researchers in this area would have applied to the recent 'Combating the Viral Diseases of Livestock' Research Initiative (which was not included in this evaluation); and
 - The decline in the numbers of immunologists supported through ASC may be a result of the government's drive for more clinical research, much of which does not fall within ASC's remit.
- 40. Not surprisingly, the research field has changed significantly over the last ten years. Review of the sample final reports of completed grants identified a number of important areas as apparently insufficiently represented, including basic endocrinology, electrophysiology and transgenic animal research. However, inspection of the range of grants currently supported across all BBSRC Committees in the identified areas shows that these gaps have mostly been filled, as the field has caught up with scientific advances.
- 41. Two specific areas stand out where current support appears to be insufficient and where it may be appropriate to review current provisions for support:
 - Mammalian endocrinology and foetal programming, both current 'hot topics' in endocrinology research; and
 - Functional Magnetic Resonance Imaging (fMRI).

The lack of support for fMRI is not a major concern, as this area is also covered by MRC and other funders. The lack of grants with ASC may be partly because applicants are put off by the Committee's name.

Recommendation 6: BBSRC should consider its current provision of support in mammalian endocrinology, foetal programming and Functional Magnetic Resonance Imaging (fMRI).

42. In addition, veterinary researchers often find it difficult to secure funding for companion animal research, and many do not realise that applications in these areas are accepted by the ASC. BBSRC's current efforts to visit veterinary departments to discuss such issues are therefore welcomed.

Priority Areas

43. As identified by surveyed ASC Committee members, Priority Areas have an important role in enabling the Committee to promote particular areas of science. However, given that the ASC is one of the few bodies supporting basic animal science research, Priority Areas should not be over-emphasised to the detriment of support

"I believe it is very important for the ASC to continue to fund basic research that is of high quality, even if it lies outside the Priority Areas." Grantholder

for high quality research outside Priority Areas (this concern was also voiced by the few PIs who commented on Priority Areas).

- 44. The decline in the proportion of grants outside Priority Areas in recent years (only **12%** of the grants funded in 2004 were not in a Priority Area) indicates that the ASC Priority Areas need to be revised. The Committee's decision to do so in the near future is therefore welcomed.
- 45. On a more general note, the rationale for Priority Areas, and the way in which they are used by Committees in grant appraisal, are sometimes not clear to the community. Furthermore, for the appraisal process to work properly, it is vital that Committee members themselves are clear on the rationale for, and relative significance of different Priority Areas. The Panel therefore recommends that BBSRC address these concerns through the provision of more detailed information to the community on the rationale and significance of Priority Areas.

Recommendation 7: Priority Areas have an important role in enabling the Committee to promote particular areas of science, but should not be prioritised to the detriment of support for high quality research outside Priority Areas. BBSRC should provide the community with a clear statement on the role of Priority Areas in encouraging particular areas of science, and on the way in which they are used in grant appraisal.

Interdisciplinary research

- 46. The final reports reviewed showed a healthy level of interdisciplinarity, for example research integrating transgenics and brain imaging, and using physiological techniques to investigate infection. This is also reflected by the fact that **16%** of sampled PIs reported having established or strengthened cross-disciplinary contacts as a result of the research supported by the grant.
- 47. However, BBSRC's current data shows a very low level of interdisciplinarity in the ASC portfolio: five grants are classified as interdisciplinary, which is only 2% of BBSRC's current interdisciplinary grants. In light of the final report and survey data, this is considered to be a significant under-estimate, reflecting the way in which interdisciplinary grants were defined⁴ rather than the actual level of interdisciplinarity in the portfolio.
- 48. The Panel's concern in this area is that despite BBSRC's support for interdisciplinary research, a perception remains in the community that it is more difficult to secure funding for interdisciplinary research, as captured by this PI:

"Research is becoming increasingly interdisciplinary, and the BBSRC at least gives lip service to this trend. However, when push comes to shove, reviewers and the panel seem to be scared of it, preferring instead to fund conventional proposals. Reviewers and panel members must be found who can understand and are sympathetic to the interdisciplinary approach".

BBSRC is therefore encouraged to take action to improve the appraisal process for interdisciplinary applications.

⁴ 'Interdisciplinary' grants were defined as either grants between a life sciences department and a non-life sciences department, or grants based in a non-life sciences department.

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Recommendation 8: BBSRC should continue to encourage interdisciplinary research where it is appropriate, in particular investigating ways to improve the appraisal process and success rate for interdisciplinary research.

Overlap with other funders

49. ASC's remit overlaps with that of a number of other UK research funders, including Government departments, other Research Councils and charities. The funders and ASC Committee members surveyed were all of the opinion that overlap between the remits of funding bodies does not matter because remits are clearly defined and mechanisms are in place to handle applications in overlap areas. In fact, many commented that overlap is a good thing because it ensures that there are no gaps in coverage.

5. INTERACTION WITH INDUSTRY

- 50. The level of interaction with industry in the sampled grants appears to be fairly low. This is partly to be expected, given the nature of ASC's remit and its support for basic research. Furthermore, it is important to note that knowledge transfer and interaction with industry occur at a number of other levels (for example specialist networks, direct funding of research by industry), which were not included in this study on research grants. Perhaps the most important contributions that ASC-supported research makes to industry, as identified by Committee members and SEERAD, are longer-term, and more difficult to measure and attribute:
 - The basic research supported by ASC forms the 'bedrock' of knowledge from which industry can conduct more applied research, followed by applications; and
 - Grants for animal sciences research provide industry with a continued supply of scientists trained in animal research methods, as illustrated by the fact that **10%** of RAs employed on the sampled grants went into the private sector. The new Integrative Mammalian Physiology initiative is an excellent example of BBSRC acting to address a skills gap identified by industry.

The contribution that ASC-supported research has made in these areas is discussed in Chapter 7.

- 51. The level of initial investment by industry in the sample grants was low: 6% of sampled PIs of both completed and current grants reported having had co-funding or in-kind support from industry at the start of the grant. This is also reflected by the fact that only 3% of the publications reported by sampled PIs had a co-author based in industry.
- 52. However, the level of interaction, and the potential for collaboration, appears to be much higher once the research has been conducted:
 - **46%** of the PIs who reported new products, processes, tools and technologies arising from the grant (**12%** of all sampled PIs) considered the outputs of their grant to be potentially commercially exploitable (paragraph 29);
 - **19%** of sampled PIs reported new or improved contacts with UK industry as a result of the research supported by the grant, and **14%** with overseas industry; and
 - 8% of sampled PIs reported new collaborations with UK industry, 4% with overseas industry.
- 53. These figures are encouraging, and suggest that the research supported through ASC is of direct interest to industry, even if the companies do not invest in it at the outset. The discrepancy in the level of interaction before and after grants may, however, indicate that opportunities are being missed, and that more work is needed to bring academia and industry together into fruitful collaboration.
- 54. The success of the CASE studentship scheme (whereby PhD students are supported to work in industry) and specific initiatives such as the Genesis Faraday Partnership indicates that there is significant potential for more interaction between academic and industrial research. Much of the ASC's remit is potentially of interest to the pharmaceutical industry, including the research on model organisms, physiology, brain scanning and integrative studies. More effort needs to be made by industry, academia and BBSRC to bring industry and academia together at the outset of research.

- 55. BBSRC has an important role to play here, and should continue to think creatively about ways in which interaction and collaboration between academic and industrial researchers, who often have a poor awareness of each others' research, could be promoted. The Council should build on existing initiatives to promote networking and communication of opportunities (Knowledge Transfer Networks such as the Genesis Faraday Partnership, and the Bioprocessing Research Industry Club joint funded by BBSRC, EPSRC and industry are excellent examples). It would also be beneficial if BBSRC regularly shared information on newly approved grants with industry.
- 56. Given the low level of investment in grants, BBSRC should in particular consider ways in which industry could be encouraged to invest in research at the outset, for example by increasing publicity about BBSRC's knowledge transfer schemes amongst both industry and academia (the Industrial Partnership Award is not widely known in some communities for example).

Recommendation 9: BBSRC should continue to think creatively about how to promote interaction and collaboration between academia and industry, including improving networking and communication of opportunities, and identifying ways to encourage industry to invest in grants.

6. PUBLIC ENGAGEMENT

- 57. PIs are required to conduct public engagement activities as a condition of their grant. Recent analysis by BBSRC's External Relations Unit indicates that around three quarters of recent ASC PIs were involved in public engagement activities, just under the BBSRC average. The activities most frequently reported by sampled PIs were newspaper articles, popular scientific articles & contributions to books; schools activities; and radio. The survey results indicate no particular trend in the level of public engagement by PIs during the evaluation period. Given the sensitive nature of some of the areas of ASC's remit, these results are very positive.
- 58. There were some notable achievements amongst the highlighted sample grants (described in Chapter 3 and Annex 6):
 - The research on face recognition in sheep (Behavioural and neurological investigations of social and object recognition in sheep and their relationship to motivation and affect) generated significant publicity involving newspapers, science magazines, radio and television news programmes, BBC childrens programmes and BBC documentaries;
 - The group investigating endocrine disruption in zebra fish (Fish and chips: Identifying and quantifying xenobiotic- induced alterations of gene expression in the brain and gonad) presented their work to a wide range of audiences nationally and internationally, including government, industry, schools and the general public;
 - The work on bird flight (Computational fluid dynamic modelling of vortex wake generation and evolution in flying birds) caught the public imagination and generated significant media interest; and
 - A National Geographic film was made about the work on reproductive behaviour in meerkats (The evolution and control of reproductive skew in eusocial animals), and the researchers assisted both film companies and professional photographers to obtain footage of the animals.
- 59. Public engagement with animal science research is vital, both to the survival of this area of research in the UK, and to the maintenance of the skills base. While noting concerns about the extra burden that these activities entail, and that some scientists are not comfortable with engaging with the public, no-one is better placed to explain the science (and challenge its opponents) than the scientists themselves.
- 60. Research funders and learned societies have a major role in assisting scientists to engage with the public. Learned societies and other organisations can, for example, be of considerable assistance in preparing subject-specific presentations and other materials for scientists to use. The science communications materials produced by the Wellcome Trust's Dana Centre are a notable example.
- 61. BBSRC is commended for the assistance that it provides to researchers, and also encouraged to do more to promote its facilities and materials, for example further publicising the fact that its External Relations Unit can assist scientists with designing and running public engagement activities, and increasing the availability of training for the researchers that it funds.

Recommendation 10: BBSRC should continue its efforts to encourage and assist scientists to engage with the public, in particular by promoting its facilities and increasing its provision of training

62. The Panel does not encourage BBSRC to include plans for public engagement as a criterion in the appraisal of applications. Despite the importance of this issue, scientific quality must remain the key criterion on which applications are assessed.

7. ULTIMATE IMPACTS

Introduction

- 63. Ultimate impacts are those that relate to BBSRC's overall objectives as an organisation, and would generally be expected to arise in the longer-term. The logic chart used to guide the evaluation identifies the following 'ultimate' impacts (relating to the objectives expressed in BBSRC's 10-year vision) that should arise from BBSRC's support for animal sciences through responsive mode funding (Annex 3):
 - Research findings are used for the 'public good', e.g. medical research, biotechnology, government policy;
 - Income to research community and 'UK plc', e.g. from new technologies, intellectual property;
 - The UK maintains its international standing in animal science research;
 - BBSRC maintains its role as a key funder of animal sciences research in the UK; and
 - Public confidence in UK animal sciences research is maintained.
- 64. These impacts are clearly difficult to measure, and even more difficult to attribute. However, it is particularly important that they are evaluated because they relate to the organisation's overall objectives: they help to answer the question 'how effectively is BBSRC doing its job?'
- 65. Income to the research community and UK plc, and the UK's international standing in animal science research are discussed in Chapters 5 and 3 respectively. The main other ultimate impacts arising from ASC-supported research can be divided into three areas: impacts arising directly from research findings; impacts arising as a result of the maintenance of a sound knowledge base; and impacts arising as a result of the maintenance of a national skills base.

Impacts arising directly from research findings

- 66. Many PIs identified direct contributions that the research supported by the grant had made (or could potentially make) to animal health and welfare (**35%** of sampled PIs) and human health (**26%**). Amongst the highlighted grants identified in Chapter 3 and Annex 6, for example:
 - The grant on diamondback moths (Adaptability of an insect herbivore, the diamondback moth, to changes in its nutritional environment) lead, unexpectedly, to a new hypothesis for obesity, which had potentially major implications for human health and government policy. This grant is a clear example of the potential of basic research, and of the importance of supporting research that, at the time, has no obvious potential application;
 - The group investigating inflammation in sheep (A study of spinal mechanisms regulating the pathophysiology of inflammatory hyperalgesia in sheep) generated novel targets for the future management of inflammatory pain, with important implications for animal welfare. The group also found that gene expression patterns in natural versus induced pain were different, questioning the value of some experimental models of pain in this species; and
 - The group working on scrapie (The immunobiology of prions during peripheral scrapie pathogenesis) was one of the first to show the presence of the prion PrP^{Sc} in animals without clinical disease at levels comparable to animals with disease, and how inflammation from secondary infections may precipitate clinical disease. This

had implications for the presence of the Bovine Spongiform Encephalopathy (BSE) agent in sub-clinically infected cattle, and hence for public health.

67. Defra commented that ASC-supported research on host pathogen interactions in farm animals, the development of vaccine technology, and farm animal welfare are all highly relevant to government priorities. SEERAD added that BBSRC-supported research (both responsive mode grants and Core Strategic Grants to Research Institutes) on the basic biology of exotic diseases such as blue tongue, foot and mouth and avian influenza feeds directly into government control strategies and contingency planning for these diseases. SEERAD also commented that recently commissioned work on the epidemiology of endemic diseases in dairy herds could inform the development and implementation of improved farm management based control strategies that will support the implementation of the government's Animal Health and Welfare Strategy.

Impacts arising as a result of the maintenance of a sound knowledge base

68. This longer-term and less direct impact of BBSRC's support for basic animal sciences research was also identified by Committee members, Defra and SEERAD, and neatly encapsulated by SEERAD (Annex 7, page 85):

"ASC funds the basic research at the start of the UK's R&D 'supply chain' which informs (and enables) the more applied research and development supported by SEERAD, other Government departments and industry, and which (often many years later) contributes to the public good, for example improved animal health and welfare, exploitable intellectual property and Government policy. The length of the supply chain, and the breadth of information used in policy development means that it is difficult to identify specific examples."

While it is difficult to measure the level of impact directly, the importance of this longerterm impact of ASC's support for basic animal research should not be underestimated.

Impacts arising as a result of the maintenance of a national skills base

- 69. ASC's continuing support for basic animal science research also helps to ensure that the UK retains its national skills base in animal sciences. As identified in Chapter 5, ASC's support for basic animal research is vital to the continued supply of trained scientists for industry. The outbreak of foot and mouth disease demonstrated the government's continued need for national expertise and research capacity to cope with unforeseen circumstances. SEERAD, for example, commented that it attaches great value to the fact that experts are available when needed, both to synthesise and interpret the results of research, and to provide advice. SEERAD also added that BBSRC's support to the Institute for Animal Health and Roslin Institute (both through ASC and the Core Strategic Grants) is particularly important because the Institutes represent a national core of expertise in animal health and animal science available for consultation and advice.
- 70. The final area benefiting from the maintenance of the skills base is public engagement with science. As noted in Chapter 6, the availability of experienced researchers to participate in public debate is important, both for informing government policy and for the continuation of academic research and industrial activity in the UK in these areas.

8. THREATS TO ANIMAL SCIENCE RESEARCH IN THE UK

- 71. The research supported by ASC has been of very high quality over the past ten years, and given that the Committee is one of the few remaining funders of basic animal research in Europe, the outlook is generally positive. The Panel is, however, concerned about two issues: BBSRC's policy on the resubmission of grant applications; and the increasing cost and difficulty associated with conducting animal research in the UK, and the implications that this has for the sustainability of the UK's animal research and animal research skills base.
- 72. BBSRC's policy of discouraging resubmissions is wasteful of good ideas, especially in areas such as animal sciences where there are few or no other sources of funding. Experience shows that it is generally more valuable to refine the techniques and procedures to be used to tackle the original concept of a grant than to start afresh with a new idea. This is particularly the case for research with a long lead or development time, for example research using transgenic animal lines (which few groups are in a position to develop), and for interdisciplinary research. Current interdisciplinary opportunities include interactions between behavioural scientists and neurophysiology, and new kinds of imaging science. Feedback from referees and the ASC could thus help to shape a new generation of cutting-edge research. Furthermore, this policy also significantly increases the burden on the community, in terms of needing to write and referee new applications.
- 73. Resubmission of applications (often several times) is normal practice for some funders (e.g. US National Institutes of Health). Although this lengthens the procedure for securing funds, it can result in well thought-out applications for research that is more likely to be valuable.
- 74. The Panel considers that being more open to resubmissions would not necessarily increase the number of applications, as PIs would often 'recycle' (improved) applications rather than send in new ones (not least because there is only a certain rate at which original ideas can be developed). As the resubmissions would be sent to the same referees, this would also reduce the reviewing burden on the community.
- 75. The Panel therefore recommends that BBSRC reconsider its position on the resubmission of grant applications, as a way of managing the burden on the community, increasing the quality of the applications funded, and reducing the wastage of scientific ideas. One option would be to pilot this change in policy in the ASC, and to monitor the impact that this had both on the numbers of applications received, and on their quality.

Recommendation 11: BBSRC should reconsider its position on the resubmission of grant applications to help to ease the burden on the community, to increase the quality of the applications funded, and to reduce the wastage of scientific ideas.

76. The Panel also fears that the UK's stringent rules on the use of animals in research will have a growing impact on animal research in the UK, significantly increasing costs and time inputs, reducing the number of animal houses (leading to the increased use of facilities located away from the research institution, adding to the burden on researchers, and leading to more 'down time' if facilities are closed for any reason), deterring young scientists from entering animal research, and hampering scientists' efforts to collaborate actively with international partners.

77. While suitable procedures and safeguards need to be in place, the Panel is of the opinion that many of the Home Office's conditions and decisions are more stringent than necessary. Furthermore, the system of local licensing varies considerably between universities, and some universities have themselves created costly bureaucratic hurdles for animal research. While much of this is beyond the control of the Research Councils, BBSRC is encouraged to consider ways to present the concerns of the animal researchers that it funds to the Home Office and to universities.

Recommendation 12: BBSRC should consider ways in which the concerns of grantholders relating to animal research could be presented to the Home Office and universities.

78. Animal research has always been expensive, and is becoming more so. The Panel welcomes the fact that BBSRC considers that the move to Full Economic Costing should not lead to a reduced success rate for animal research proposals. However, the Panel is concerned about the availability of resources for animal facilities in situations where there is a gap between grants. The importance of long-term support for animal research facilities, and the need for continued funding to maintain important animal colonies and transgenic lines between grants is therefore emphasised. BBSRC should therefore urgently consider how longer term support for the research resource provided by animal research facilities could be provided.

Recommendation 13: BBSRC should consider ways in which longer term support for animal research facilities could be provided.

79. The Panel also wishes to record its disappointment that SEERAD no longer provides funding for joint projects with SEERAD Institutes. Many of these projects, for example the collaborations between the Moredun Research Institute and various universities, have been very successful and beneficial for both sides.

9. GENERIC ISSUES

- 80. A number of general issues relating to BBSRC's programmes and grant administration processes arose in the surveys and during the Panel meetings. These findings will be presented to BBSRC's Strategy Board in combination with the results of other current responsive mode portfolio evaluations. The main points are summarised here.
- 81. PIs and Committee members were asked for their thoughts on BBSRC's grant application/administration process. Most of the comments given suggested that the process is at least satisfactory, with a number describing it as excellent. Some of the responsents added that BBSRC staff are helpful and efficient. A number of PIs noted that is very valuable to be able to respond to referees comments before the Committee meeting. Fewer respondents made less positive comments, the only common one being that the process is too slow.
- 82. When asked about Committee meetings, all of the Committee members surveyed commented that the Committee works very well as a team, and that there is robust discussion of difficult cases. The majority added that the meetings are efficient and well organised. The most common issue identified by Committee members was the difficulty of assessing large numbers of

"I was immensely impressed by how the ASC worked. It was professional, fair and utterly scrupulous." Committee member

applications at each meeting. Members commented that they hoped that numbers of applications per meeting would fall with the move to four grant rounds per year, and that otherwise it was difficult to identify ways to address this issue.

- 83. The Panel discussed the following issues and made detailed recommendations to BBSRC (which are reported separately):
 - The wastage of resources, and burden on the community arising from the current availability of funding and the fact that BBSRC does not encourage resubmissions;
 - Acknowledging that much of it is beyond BBSRC's control, the continuing threat to UK science posed by the low salaries and insecure career prospects for researchers in the UK;
 - The fact that longer and larger responsive mode grant applications are still rare, despite BBSRC encouraging PIs to submit such applications;
 - The need to promote the importance of training at the postdoctoral level;
 - The fact that early-mid-career researchers coming to the end of their New Investigator grants often need further support; and
 - Acknowledging that much of this information is contained in the grant letter, the grant guide and on the website, the continued lack of awareness in parts of the community of aspects of BBSRC's policy and decision-making processes, for example the role of Priority Areas in grant appraisal by Committees, and how final report grades are used.