

## Society for General Microbiology response to the Nurse review of research councils call for evidence

In December 2014 the Government asked Sir Paul Nurse to lead an [independent review](#) of UK research councils. The Society for General Microbiology responded to the Review's [call for evidence](#) in March 2015. The Society highlighted issues concerning the research councils that affect microbiologists, suggested potential improvements, and provided examples of good practice.

### 1. Strategic decision-making

#### Regional balance of research

1. Research Councils cannot and should not positively discriminate for weaker science merely in order to put more money into areas that do not receive as much public money.
2. Microbiology research is conducted in strong centres that are distributed throughout the UK. Keeping responsive mode small grants will undoubtedly benefit regions and is essential to maintaining a good geographic balance of excellent microbiology research.

#### Local and national economic impact of applied research

3. For applied research, it is crucial to consider both the quality and the economic, social and environmental impact.

#### Investigator-led and strategically-focused funding

4. As strategic initiatives are generally developed to meet the economic and societal needs of the UK, they are largely based on consultation with industry and other stakeholders (e.g. healthcare and medicine). Government and Research Councils tend to consult only with selected academics on these issues. However, as the broader community is not consulted, many academics do not understand how/why strategically-focused programmes are decided upon. The mechanisms for making strategic choices should be made more transparent.
5. A recent example of good communication with the academic community is the Call for evidence to inform NERC's investment priorities for the next Comprehensive Spending Review period  
<http://www.nerc.ac.uk/about/whatwedo/engage/engagement/priorities/>.
6. Strategic initiatives are usually time-limited and aim to give a boost to research in a particular area. Once the initiative is over, the expectation is that further research in the area will be funded in competition with all other investigator-led proposals. It is therefore critical that serious thought is given to the optimum balance between the two types of funding.

#### Funding of infrastructure

7. There is always an urgent need to update infrastructure. Replacing 'workhorse' instruments (e.g. confocals, mass spectrometers) can provide a step change in the quality of output they provide and hence make a huge impact on the outcomes of research. This type of need is often overlooked by the funding bodies who do not see it

as being transformative. Instead, Research Councils prefer to fund new technologies, which are also critical for research quality<sup>1</sup>. Furthermore, the requirement for an institution to find 50% of the costs for equipment over £10k can be difficult for some institutions.

## 2. Collaborations and partnerships

### Institutional collaboration

8. Shared access to infrastructure is one way of catalysing collaboration and this strategy is already in place, however as mentioned in paragraph 7, there is a need for research-led institutions to have access to world class equipment to do even fairly basic research.
9. Forcing institutions to work together does not necessarily produce excellent research - the collaboration has to be genuine. Forced or artificial collaborations are less likely to be productive than those motivated purely by the science.

### Integration with other funding bodies

10. The Industrial Biotechnology Catalyst Programme has stimulated academic principal investigators to work with industry for the early stage translational awards and this has really had a positive effect. However, the Industrial Partnerships and Link Grants have not had such an influence on the academic community, perhaps because they are not associated with specific initiatives and success rates are perceived as low.

### Government funding for science

11. The Society for General Microbiology believes that Research Council funding should be directed almost exclusively to the university sector. The university sector has a primary focus on innovative research and the Research Councils are the primary funders of such research. Some Research Councils have their own institutes and these operate at the interface between blue-skies research and its application, and are legitimately funded by the Research Councils.
12. Government Departments have their own funding streams which need to be maintained or increased in the next Spending Review. There needs to be opportunities for Government Departments to collaborate with relevant academic groups funded through the Research Councils (e.g. through LINK and other schemes).

### Interdisciplinary research

13. The support for interdisciplinary science is improving, but there is still an issue with judging interdisciplinary grant proposals. Excellent peer review is essential. For interdisciplinary proposals it is crucial that they are reviewed by both experts in the specific areas covered in the proposal and experts who have the breadth of experience to provide an overall view. There can be problems with very broad proposals, since referees may not be able to comment with authority on all aspects of the proposal and

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<sup>1</sup> For example, in the BBSRC Advanced Life Sciences Research Technology initiative a key aim was 'To pioneer the use of emerging 'advanced research technology'  
<http://www.bbsrc.ac.uk/funding/opportunities/2014/alert14/>

yet feel obliged to do so. For interdisciplinary areas, the role of the Chair of a review panel is critical to ensure proposals receive a fair critique.

14. The Society for General Microbiology believes that Research Councils need to improve arrangements to ensure optimal funding for research that crosses disciplinary boundaries. The divide between BBSRC and EPSRC can be problematic for science and engineering at the interface. For example, EPSRC funds Chemical Engineering whereas BBSRC is responsible for funding Biochemical Engineering. These areas are so closely related that there is little sense in separating them. There are also issues with the chemistry/biology interface, with scientists drawing down funds for similar research from both EPSRC and BBSRC. Similarly, synthetic biology is supported by both EPSRC and BBSRC, and this can also lead to duplication of effort, or worse, confusion by funding panels and reluctance to fund. There have been gaps between NERC and BBSRC research funding, such as for wildlife disease and the farmed environment.
15. This issue could be improved by offering more cross-Council initiatives. For example, zoonotic infections straddle the MRC/BBSRC/NERC boundaries. A 'holistic' approach to the study of these infections would really only be achievable and sustainable through cross-Council funding. In the absence of this we risk continuing to artificially differentiate between human and animal health research.
16. A cross-Council initiative with excellent outcomes was the Rural Economy and Land Use Initiative, which funded work between natural scientists and social scientists and was funded by BBSRC, ESRC and NERC, with a microbiological focus on animal disease.
17. Another great cross-Council initiative is the Antimicrobial Resistance (AMR) Funders Forum. This initiative, which is also working with other major funders of AMR Research such as the Wellcome Trust, is supporting interdisciplinary AMR research. Seven Learned Societies<sup>2</sup> are working together through the Learned Societies Partnership on AMR to represent the view of the scientific community across a broad range of disciplines. The Partnership is working closely with the AMR Funders Forum and is facilitating networking across the disciplines for AMR researchers.
18. While interdisciplinary funding mechanisms need improvement, it is important to emphasise the value that separate Research Councils bring to the research funding landscape. Individual Councils ensure that there is 'ownership' of priority areas and strategy, but also that diversity is maintained in UK research output, which is important for ensuring innovation and resilience to future challenges. Microbiology covers diverse topics, including health, environment, food security and industrial biotechnology, so there is concern that excessive merging of funding structures could have a negative impact, through homogenising research output and leading to underinvestment in important microbiology research areas and skills.

### 3. Balance of funding portfolio

19. Please see Paragraphs 13 to 14

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<sup>2</sup> The Learned Societies Partnership on AMR is made up of seven Learned Societies: Society for General Microbiology, Society of Biology, Royal Society of Chemistry, Biochemical Society, Society for Applied Microbiology, British Pharmacological Society and the British Society for Antimicrobial Chemotherapy.

20. The balance of funding is determined at the time of Spending Reviews. The process needs to take account of where there are genuinely new areas of science being developed (e.g. Synthetic Biology, Graphene Technology) and potential impact of the science. However, it must be clear where reductions in funding are to be made to accommodate the new areas.
21. There is a problem with overlap/gaps between BBSRC and NERC for microbiology. It is not always clear what kind of science should go to which Research Council. For example, where should a grant that tries to understand disease of wildlife that has no impact on agriculture be sent?

#### 4. Effective ways of working

22. It would be useful for the research community to know what systems are in place to evaluate and identify how the Research Councils operate most effectively within the wider science and innovation system.
23. Mechanisms should be reinstated that allow effective working between university groups, funded by the Research Councils, and Government Departments, funded through departmental resources, where these have been discontinued or eroded.
24. The Research Councils have a major influence on research strategy in the UK, since academics are encouraged to work in priority funding areas to improve the opportunities for financial support. It is sometimes unclear how strategy is developed; greater transparency would be beneficial, particularly following consultation with the community.
25. Peer review is not a perfect system as it relies on a small number of reviewers per application and it is difficult to ensure consistency across sub-disciplines; the lack of engagement in this process across the community is also worrying. Peer Review constitutes only part of the Research Council decision process for grant funding, however, this has given rise to concerns about inconsistencies between the numerical scores from peer review and the subsequent funding decisions made by Research Council boards<sup>3</sup>. There is a need to develop wider appreciation of the overall Research Council grant funding decision process, especially among early career researchers.

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<sup>3</sup> <http://www.nature.com/news/biochemist-questions-peer-review-at-uk-funding-agency-1.16479>