



25 March 2013

## **Society for General Microbiology Consultation Response**

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### **Refreshing BBSRC's Strategic Plan... Have your say**

#### **Introduction**

The Society for General Microbiology (SGM) is a membership organisation for scientists who work in all areas of microbiology. It is the largest learned microbiological society in Europe with a worldwide membership based in universities, industry, hospitals, research institutes and schools. The SGM publishes key academic journals in microbiology and virology, organises international scientific conferences and provides an international forum for communication among microbiologists and supports their professional development. The Society promotes the understanding of microbiology to a diverse range of stakeholders, including policy-makers, students, teachers, journalists and the wider public, through a comprehensive framework of communication activities and resources. Further information about SGM is provided in Appendix 1.

#### **Responses to consultation questions**

***How can BBSRC best continue to support UK bioscience and derive the widest possible benefit from our investment of public funding?***

The BBSRC strategic plan is still timely, but, despite the plan putting world class Bioscience foremost, there is a feeling among the academic community that investigator-led research outside the strategic priority areas is difficult to get funded. Disruptive ideas outside the priority areas in the Strategic Plan may in fact deliver the next big strategic priorities and it is important that BBSRC continues to fund these, and is perceived to do so.

The three enabling themes (knowledge exchange, innovation and skills; exploiting new ways of working; partnerships) are important in supporting UK bioscience, particularly the development of skilled people and working with other funders and stakeholders.

***What are the main threats to the UK's world-class bioscience research base and how might we address them?***

Apart from the obvious rise of the BRIC research economies, a major threat is the polarisation of the UK training base. While the focus on cohorts of PhD students and partnerships between institutions through the Doctoral Training Partnership (DTP) scheme is welcome, the DTPs must be sufficiently broad and the numbers of students sufficiently high to ensure that researchers are trained in those disciplines that are currently not of high priority, as a protection against future changes.

The rise of the BRIC economies is best addressed through international partnerships; something the BBSRC has traditionally done well, although on a small scale.

***Food security is a broad and multidisciplinary challenge. BBSRC cannot do everything, so where should we place the most emphasis so that our funding can have the greatest benefit to society and the economy?***

This must be original agricultural research, but in partnership with others for co-production of translatable ideas. Defra, Food Standards Agency, Technology Strategy Board (TSB) and industry are all relevant partners. BBSRC can also focus on public engagement, as it should be perceived as independent of industry or Government.

***How can BBSRC best help to ensure that the UK becomes a global leader in industrial biotechnology?***

This requires investment in engineering and chemistry as well as the life sciences. In particular, a focus on synthetic biology, on chemical engineering and in training postdocs and PhD students in these disciplines would be advantageous. This would be particularly effective if the Learned Societies (e.g. SGM), Accrediting Bodies (e.g. IChemE) and large and small companies were involved in partnership.

***What are the barriers that might prevent UK bioscience from achieving its potential in this area, and how can they be overcome?***

The biggest barrier is, as always, communication and knowledge dissemination. The Networks in Industrial Biotechnology and Bioenergy (NIBB) scheme seems like a good idea. In fact the networks idea is cheap and productive in many of the BBSRC strategic areas, as exemplified by the synthetic biology networks that ended recently.

***Basic bioscience that informs and underpins health is a key part of our strategy where we work at the interface with other major funders such as MRC, the Wellcome Trust and third sector funders. Given this complex mix, where can BBSRC's funding have the greatest impact and value for money? Where or how might this priority be strengthened through supporting a 'one biology, one health' approach?***

The obvious relationship between animal disease and human disease is one where BBSRC could usefully work in partnership with others. The "one medicine" agenda is gaining credibility and important issues, such as antimicrobial resistance, require research on organisms causing both animal and human disease.

***How can BBSRC continue to enable the widest possible benefit from the high quality research and skilled people that we fund?***

There is still in the academic community a prevailing view that trained biologists should aspire to an academic position, although research in industry is acceptable. The widest benefit would be through having more trained biologists in other roles, such as policy positions, industry (in a non-research capacity), teaching, etc., etc. The DTPs may encourage this 'diaspora' of doctoral graduates.

The research benefit could be obtained by better working relationships with stakeholders, particularly the TSB in co-production of research and its translation.

***What are the key challenges in ensuring that we are able to exploit fully new ways of working in a field such as bioscience, that is adopting and developing new technical capabilities at an ever increasing rate?***

The major challenge, as always, is predicting which technical capability is going to be essential to future progress. For technical developments which require capital investment, the idea of a national facility, which can be used by the research community, provides an economic way of expertly supporting technologies.

We also need underpinning capability in high volume data analysis, which seems by far the most common bottleneck. Bioinformatics is a rate-limiting step to standardisation and harmonisation for global analysis platforms.

***What are likely to be the 'next generation' of technological breakthroughs that will revolutionise bioscience?***

Next generation sequencing is likely to have a much greater impact than it has currently in all areas of biology. The next technology breakthroughs will be in:

- DNA assembly methods, which will greatly accelerate the production of synthetic organisms and the use of DNA constructs *in vitro*.
- Imaging will continue to develop: mass spectrometers that image molecules in native cells/organisms; and the use of single cell imaging to monitor biochemical reactions in real-time. Currently these technologies are available to only a few but they will spread.

A technological breakthrough is urgently needed to recreate and understand microbial communities, which are responsible for many natural processes in agriculture and could provide novel approaches in industrial biotechnology. This may require greater engagement with the complexity sciences.

***What should be BBSRC's role in developing e-science for the solution of biological problems?***

BBSRC should act as a conduit to the communities of the other Research Councils, who are bigger users of e-science, and support (inter)national facilities for this (Archer, SysMO-DB, EBI, Elixir, etc.). Individual investigators will need funding in this area.

***How can BBSRC make even better use of partnerships in delivering its vision for UK bioscience?***

Work more closely with partners including learned societies such as SGM. Learned societies know their discipline well. Through their members, they have a unique ability to provide insights, and access to key contacts and advice both nationally and internationally. They are an underexploited resource in the UK research ecosystem.

***Are there any UK or international partnerships that BBSRC should prioritise, or that require particular attention?***

In the UK, the relationships with other research funders, particularly TSB and Government Departments. Internationally, the relationship with Europe (through Joint Programming Initiatives, ERA-Nets, etc.).

***Is there anything else that BBSRC should consider in refreshing its Strategic Plan?***

There needs to be a clear strategy on capital funding. Following the reduction in the last Comprehensive Spending Review, the current *ad hoc* capital funding appears neither strategic nor sustainable.

***Society for General Microbiology – President & Chair of the Policy Committee:***

- Professor Nigel Brown, Emeritus Professor, University of Edinburgh<sup>1</sup>

***Society for General Microbiology – Policy Committee:***

- Professor David Blackburn, University of Birmingham
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<sup>1</sup> Professor Brown declares an interest as a former BBSRC employee and a current Trustee Director of the Genome Analysis Centre and External Advisor to IBERS, Aberystwyth University.

## **Appendix 1**

### **Vision**

A world in which the science of microbiology provides maximum benefit to society.

### **Mission**

To promote high-quality microbiological science, both nationally and internationally, to a diverse range of stakeholders.

### **Rationale**

The potential socio-economic benefits arising from microbiology are substantial. They include:

- A healthier future (for humans, animals and plants) and a better quality of life, within the context of a sustainable natural environment.
- The development of biotechnology products (such as food, drinks, biopesticides, biofuels and medicines), which generate wealth and employment, and so support growth and innovation.
- The advancement of scientific knowledge, as a benefit in its own right, and to allow us to plan for the future and contribute to international solutions for global challenges, such as climate change, the burden of disease and food security.

### **Strategic priorities**

To achieve its Vision and Mission, the Society will work towards the strategic priorities below.

- Publishing: to contribute to the science of microbiology through high-quality publications.
- Scientific conferences: to hold international scientific conferences to disseminate research knowledge and provide a forum for communication between microbiologists and to grow and support communities among them.
- Raising awareness: to inspire and educate people about microbiology, and allow them to make informed decisions which recognize the importance of microbiology and its advances.
- Influencing policy: to ensure that appropriate scientific information and expert opinion are made available to policy- and decision-makers and that the improvement of resources and infrastructure for microbiology is supported.
- Professional development: to promote microbiology as a career from school level onwards and support career and professional development of microbiologists.

The Society is a Charity registered in England and Wales (No. 264017) and in Scotland (No. SC039250) and a Company Limited by Guarantee, registered in England and Wales (No. 1039582).

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