

# BIOSCIENCES FEDERATION

## **Independent Review of 'A Vision for Science and Society'**

**A response to the Department for Innovation, Universities and Skills**

October 2008

### ***Introduction***

The Biosciences Federation (BSF) is a single authority representing the UK's biological expertise, providing independent opinion to inform public policy and promoting the advancement of the biosciences. The Federation was established in 2002, and is actively working to influence policy and strategy in biology-based research – including funding and the interface with other disciplines - and in school and university teaching. It is also concerned about the translation of research into benefits for society, and about the impact of legislation and regulations on the ability of those working in teaching and research to deliver effectively. The Federation brings together the strengths of 44 member organisations (plus seven associate members), including the Institute of Biology which represents 32 affiliated societies (see Appendix). This represents a cumulative membership of over 65,000 individuals, covering the full spectrum of biosciences from physiology and neuroscience, biochemistry and microbiology, to ecology, taxonomy and environmental science. The Biosciences Federation is a registered charity (no. 1103894).

### ***A response to the consultation questions around the three goals:***

#### ***Section One***

##### **Goal: A New Vision**

*What steps can we take to co-ordinate better or streamline science and society activity to make it more effective?*

A cohesive framework is needed - fragmentation is ineffective. A platform to coordinate, capture and communicate the breadth of activity would be very useful. Information about what is out there is essential to avoid 'reinventing the wheel' and making information on existing initiatives more accessible could help to spread good practice and avoid duplication. Although some data bases exist they need coordination to enable more engagement, dialogue and sharing of good practice. Groups have different needs and should be targeted separately to reflect variation.

*How should we measure progress? What indicators do we need to measure success?*

The definition of success needs to be clear and society should be aware that perceptions of success will vary due to the audience that is being targeted. Politicians should avoid playing on this fact. There should be less reliance on reviews and questionnaires and more use of metrics. Whatever measures are used need to be robust. Progress should not be equated to the level of uptake and awarding of government grants. Government officials should consult directly with scientists and have a suitable scientific background themselves to be able to make informed decisions about progress and success in science.

*How can scientists further improve and professionalise engagement with the public?*

We need to reduce any perception that science is not accessible. The public should be able to easily access relevant information particularly in public places. Professionalization should not discourage those individuals who are excellent at outreach work from participating in the activity because they fear that time spent communicating will negatively impact on metrics relied upon for career advancement.

*How should high quality engagement be recognised and rewarded?*

Time and reward for engagement is often a constraint on publicly and charity-funded researchers. Disincentives need to be identified and reduced and incentives from government and funders increased. The culture of simply acknowledging that engagement has taken place needs to be replaced by a robust system that measures the quality of the engagement and clear definition of what quality means. Those engaged in the delivery need performance indicators. Good academics need to be encouraged and supported to communicate science. The notion that engagement and outreach work is a 'favour' needs to be replaced by the expectation that it takes place, that budgets are ring fenced to support it and all providers deliver at a high standard.

*How can the scientific and policy communities make science more interesting for the public and particularly for those difficult to reach groups?*

What is communicated needs to be interesting, relevant and accessible to all areas of society. Identifying target groups, actively engaging with them as well as tailoring delivery to match needs is crucial. Science needs to be seen in everyday situations and places that people can identify with. Scientific issues need to be sensibly discussed in, for example, popular TV programmes. Impact of knowledge transfer needs to be gauged and delivery treated as more long term and well directed rather than just short term, sound bite launch events.

*What contribution can science centres make to the science and society agenda?*

Science centres make a significant contribution to the agenda. They are important venues for public engagement and informal science education – funding however is a complex issue. There needs to be more support for non profit making concerns. Accessibility and relevance to the public are crucial. More development is needed around special interest groups, returners to education, 'kid's clubs', etc. The appointment of a Chief Scientific Adviser at the Department, Culture, Media and Sport could greatly enhance the contribution that science has in the science and society agenda.

*How can the media better support society's need for balanced information that accurately portrays the nature of science and improves scientific literacy?*

The media often do a very good job and the Science Media Centre in particular is valuable and its work could be further enhanced with public funding. But the media can also give a rather black and white picture presenting headlines rather than debates. Media need to be more responsible in the way scientific information is published; it can often be sensationalized and simply serve to polarize public reaction. There is a need to support the media to identify truly credible scientists and science. There is scope for more localized transmission of science stories and science programming and for scientists to work more closely with their local networks. Presenters who are good role models, who the public can identify with and who know the subject, are an asset.

*How can the lack of quantity and breadth of science television on terrestrial and other channels be addressed?*

Science can often get lost in programmes as politics take over. More presenters that actually work in the relevant field would help to promote particular areas of science. More funding and more prime time programmes are crucial but the broadcasters themselves need to see the benefits of science programmes and receive good quality scientific advice. Creativity in the science communication sector needs to be enhanced and facilitated further so that it becomes more attractive to TV programme makers and broadcasters.

*How can new technologies help empower all people, especially minorities and those currently excluded, to contribute ideas and opinions to scientists and decision-makers?*

Not all will engage with new technologies – more accessibility to technology in public places would help. It would be beneficial to have one named web portal to respected scientific sites for the public to identify with and go to in the first instance. Approved sites could be quality controlled through kite marking.

*How can policy makers better engage with society about the development of science?*

Experience has shown that in some cases science ministers do not necessarily require a qualification in science per se when they have a genuine enthusiasm and interest in the field. However, this may not always be the case and relevant qualifications, understanding and connections to science generally would be desirable. It is unproductive to vaunt failure or inability to engage with the science curriculum. Internships for policy makers can provide valuable experience within the science sector and vice versa. Policy makers need to be proactive in meeting and consulting with scientists and the public regularly.

*How can we capture emerging issues effectively and feed into the communication and engagement process?*

The science and business sectors need public representatives to regularly communicate society's needs. Many institutions produce excellent and informative material on science and on science and society matters. Although public access to information is available it is not always easy, especially for non – specialists. More use of the Science Media Centre would be valuable.

## **Section Two**

### **Goal: A society that feels confident in the use of science**

*How can we embed and communicate the principles of responsible scientific practice and ethics?*

Many scientific institutes, societies and institutions have codes of ethics and there is growing adoption of the Rigour, Respect and Responsibility code. Good communication of these codes more broadly within science and the public would help to communicate that ethics is core scientific principle. Mechanisms to aid public understanding of the difference between reliable evidence-based science and unreliable evidence would be helpful.

*What more can the science community and the media do to foster a shared understanding of the nature of science?*

The Science Media Centre generally does a good job and needs to be promoted more amongst scientists. Learned societies and umbrella organisations could take a more active role briefing science and news journalists and in making their own stories more attractive to the reporting media. It is more difficult for smaller organisations to publicise their work and they need effective avenues to help with this.

*What more can the education community do to develop scientific literacy in young people?*

More hands-on science and good teaching of practical skills by enthusiastic, specialist teachers are needed. The current health and safety legislation is often seen as restrictive. Improved funding for lab facilities and technicians would be beneficial. Creativity in science needs to be encouraged along with more cross curricular links to help enthuse pupils, make science relevant and encourage innovation. Sharing of resources and improved outreach work by universities would help many educational establishments further develop their work.

*How can we develop the scientific literacy of the science, policy and public communities?*

Better financial support is needed for returners to education (particularly those with no formal qualifications) to access routes into science education.

*How can we use technology better to empower more people to contribute ideas, opinions and data to science?*

Improvement is needed in generic skills to better facilitate access to information. One approved science web portal could help with information access.

*What can we do to reach those not able to use technology?*

Use of all the obvious channels should continue and ensure inclusivity, accessibility and affordability.

*How can we ensure policy makers understand the benefits of engagement with society on science in bringing a wider dimension to policy making?*

Amongst other things, policy makers should have sound scientific backgrounds and actively engage with the public on a regular basis.

*How can good practice in public dialogue be embedded across government?*  
The Sciencewise-Expert Resource Centre should help with public dialogue. Government officials need to follow a strict code of practice and ensure greater visibility and improved public profiles.

*What additional mechanisms should be put in place to enable scientists to better interact with policy makers?*

Mechanisms to train scientists in the basics of policy development should be developed - internships for scientists in parliamentary departments, such as those run by the Institute of Biology, would be an important element of professional development.

*How is good practice by scientists engaging with policy makers celebrated and rewarded?*

There is a clear interest for scientists to engage with policy makers however it is not always evident how engagement is recognised and often it is at a high level, for example through prestigious awards and fellowships. There are some other schemes in place which do reward at a lower level such as the Bioscience Federation communications award. However such opportunities need to be more widely available, funded and facilitated. The Beacons of Public Engagement seems to be valuable but impact needs to be measured and analysed.

*What additional mechanisms should be put in place to enable policy makers to better interact with scientists?*

Better access and information about current government consultations – for example making it easier to get onto emailing lists would be helpful. A one stop shop for science consultations could also be valuable to increase awareness of all consultations and help improve the number of responses from relevant bodies. Internships for policy makers should be expanded and funded appropriately. Government should be more proactive in direct contact with learned societies for advice and opinions.

### ***Section Three***

#### **Goal: A society that supports a representative well-qualified scientific workforce**

*What further support do teachers need to help young people understand how science works, how government works and how the media works?*

Teachers need improved access to Continuous Professional Development in order to keep abreast of changes and emerging technologies. It is unclear how successful National Science Learning Centres are in attracting and providing good CPD, however, funding through Project Enthuse is valuable and should continue. The shortage of specialist science teachers is an ongoing issue and teachers are often expected to teach outside their specialism – there is no real substitute for studying the subject full time at university level. Barriers need to be removed which prevent or restrict teachers attending courses which is often due to lack of funding or difficulty providing good supply cover by schools. The importance of discipline specific professional development should not be underestimated by school leadership teams. Pupils should be encouraged to realise the potential that science qualifications can have in shaping their future employment prospects in different areas. Improved careers information and training for careers advisors would be valuable.

*What more do schools need to enhance the science curriculum to make it more exciting and relevant?*

Improved time allocations and funding for practical work and fieldwork are needed. Focus on examinations and perceived health and safety risks often compromises such work. Better training for technicians could enhance practical work. Better links between universities and schools could improve access by schools to resources including research scientists and laboratory facilities. Trainee teachers should be better prepared to plan and manage practical work. The pace of change within education can be overwhelming for teachers and can make it difficult to embed initiatives sufficiently. Initiatives need to be properly evaluated for impact.

*What can the science and business communities do to tell young people about the career opportunities that a science education opens up in all work areas?*

Well trained and up to date careers advisors are needed – students need to understand the different arms of science and the qualification requirements for entry as well as the opportunities in the business world. Views need to be balanced to enable students to understand just how many jobs there are in the different areas to avoid over subscription. Industry should engage better with science bodies and institutions and there should be an increased willingness by employers to take on work experience students. Business could, for example, more readily sponsor initiatives such as the Institute of Biology's recent publication 'Where You Can Go with Biology'.

*How can we measure future demand for science skills in the UK?*

The speed and scope of change makes it difficult to measure future demand for science skills. We need to produce technically competent and theoretically grounded people who can adapt to a changing society. Industry could take more responsibility for appropriate training to match their personnel needs rather relying too specifically on the universities.

*Is there a different way to teach science subjects which could help overcome the issue of under-representation of some groups?*

Science teaching needs to be flexible, up to date and relevant to students in a changing society. Access via a variety of routes is crucial. Mature students or those who missed the opportunity at school are finding it increasingly difficult to participate in courses due to funding restrictions. Museums and libraries, for example, provide important access for many but are often financially challenged. Improved funding to teach non examination science courses would also help to make a more scientifically literate society.

*How can the science community and employers show society that they welcome and embrace diversity, including women, ethnic minorities and older people?*

Providing good role models for all groups is vital – accessibility to courses and jobs needs to be improved and the perceived elitism of scientists and science related courses addressed. Recognising and rewarding good practice by employers is also necessary to ensure that all employees have a supportive working environment that does not discriminate directly or indirectly against underrepresented groups, and does not disadvantage those with caring responsibilities. Postgraduate scientists are especially vulnerable to poor employment practices in the university sector – they are neither students nor permanent staff. The recent concordat on management of research staff should improve this issue if actively adopted by employers, and will benefit scientists from all groups.

*What can policy groups and business do to address issues of under-representation and retention?*

General career support for those new recruits is essential. More accessible information about science and science opportunities is needed in everyday settings and non-specialist publications. There are some 'at risk areas' that need specifically targeting, for example, in vivo science and taxonomy.

***Overall we consider this to be a broad and comprehensive consultation with an appropriate timeframe which allows for considered contributions to be generated.***

## **Appendix**

### **Member Societies of the Biosciences Federation**

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Association for the Study of Animal Behaviour	Heads of University Biological Sciences
Association of the British Pharmaceutical Industry	Heads of University Centres for Biomedical Science
AstraZeneca	Institute of Animal Technology
Biochemical Society	Institute of Biology
Bioscience Network	Institute of Horticulture
British Andrology Society	Laboratory Animal Science Association
British Association for Psychopharmacology	Linnean Society
British Biophysical Society	Nutrition Society
British Ecological Society	Physiological Society
British Lichen Society	Royal Microscopical Society
British Mycological Society	Royal Society of Chemistry
British Neuroscience Association	Society for Applied Microbiology
British Pharmacological Society	Society for Endocrinology
British Phycological Society	Society for Experimental Biology
British Society of Animal Science	Society for General Microbiology
British Society for Developmental Biology	Society for Reproduction and Fertility
British Society for Immunology	Universities Bioscience Managers Association
British Society for Matrix Biology	UK Environmental Mutagen Society
British Society for Medical Mycology	Zoological Society of London
British Society for Neuroendocrinology	
British Society for Plant Pathology	
British Society for Proteome Research	
British Toxicology Society	
Experimental Psychology Society	
Genetics Society	

**Associate Member Societies**

BioIndustry Association  
Royal Society  
Wellcome Trust  
Medical Research Council  
Biotechnology & Biological Sciences Research Council  
Association of Medical Research Charities  
Merck, Sharp & Dohme

**Additional Societies represented by the Institute of Biology**

Anatomical Society of Great Britain & Ireland  
Association of Applied Biologists  
Association of Clinical Embryologists  
Association of Clinical Microbiologists  
Association for the Study of Animal Behaviour  
Association of Veterinary Teachers and Research Workers  
Biometric Society  
British Association for Cancer Research  
British Association for Lung Research  
British Crop Production Council  
British Ecological Society  
British Lichen Society  
British Microcirculation Society  
British Society for Ecological Medicine  
British Society for Neuroendocrinology  
British Society of Plant Pathology  
British Society for Proteome Research  
British Society for Research on Ageing  
British Society of soil Science  
Fisheries Society of the British Isles  
Freshwater Biological Association  
Galton Institute  
Laboratory Animal Science Association  
Marine Biological Association  
Nutrition Society  
Royal Entomological Society  
Scottish Association for Marine Science  
Society for Applied Microbiology  
Society for General Microbiology  
Society for the Study of Human Biology  
Society of Academic & Research Surgery  
Society of Cosmetic Scientists  
Society of Pharmaceutical Medicine

**Additional Societies represented by the Linnean Society**

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Botanical Society of the British Isles

Systematics Association