Nuffield Council on Bioethics

Emerging biotechnologies consultation

BBSRC response on behalf of RCUK (with RCUK input).

This response focuses on answering the questions that are most relevant to the remit of Research Councils.

1. **How would you define an 'emerging technology' and an 'emerging biotechnology'? How have these terms been used by others?**
   and
2. **Do you think that there are features that are essential or common to emerging biotechnologies? (If so, please indicate what you think these are.)**

Biotechnologies are very diverse, and as such trying to define them can be counterproductive. There will be some technologies that emerge as biotechnologies many years after their first non-bio applications (e.g. radiation or nanotechnology). There are technologies that are used by biologists, which may not be defined as biotechnologies. A simple definition of biotechnology is a technology that is cell-based or based on the function of cells.

3. **What currently emerging biotechnologies do you consider have the most important implications ethically, socially and legally?**

Advances in neurobiology are likely to lead to biotechnologies with important implications and could include applications that build on our understanding of the brain, its function and activity. Issues may include being able to improve mental performance through stimulation or to use brain scanning technologies in court to monitor witness brain activity.

Similarly, human enhancement technologies and the ability to predict performance from genetic information are areas that have important social implications.

Also, when considering bioethics it is also important to recognise, the wider impacts of technologies on other animals and the environment.

Public dialogue work by BBSRC and EPSRC (with funding from Sciencewise-ERC) has suggested that synthetic biology is likely raise implications as the technology develops from the lab into 'real-world' applications. Public concerns ranged broadly from the effectiveness of current regulation to the responsibility and motivations of those funding and carrying out the research. More details can be found at www.bbsrc.ac.uk/syntheticbiologydialogue

8. **Are there ethical or policy issues that are common to most or many emerging biotechnologies? Are there ethical or policy issues that are specific to emerging biotechnologies? Which of these, if any, are the most important?**

By focusing on emerging biotechnologies the consultation may be assuming that there are common properties to all biotechnologies and that common answers can be found to the issues that they raise. This is unlikely to be true.

Any new emerging technology can have a wide, and unpredictable, range of impacts on for instance, human equality, the environment, ecosystem services, individual freedoms etc. Emerging technologies should be individually evaluated around their implications for people and for the wider world.

Across a number of emerging biotechnologies privacy and autonomy of action remain key concerns (i.e. around assisted conception technologies). As a technology emerges and matures those it affects should expect to have access to information and the ability to steer its development.

10. What evidence is there that ethical, social and policy issues have affected decisions in (i) setting research priorities, (ii) setting priorities for technological development, and (iii) deploying emerging biotechnologies, in either the public or private sector?

Research Councils can point to a number of examples of this through their own work.

BBSRC has a dedicated panel, the Bioscience for Society Strategy Panel (BSS), which is tasked with considering the ethical and other social issues around the research that BBSRC funds. BSS was instrumental in the establishment of the BBSRC/EPSRC Synthetic Biology Dialogue, the impact of that public engagement exercise is set out in the response that BBSRC and EPSRC chief executives made (http://www.bbsrc.ac.uk/web/FILES/Reviews/synthbio_dialogue_response_letter.pdf).

Other examples from across the Councils include:

Nanotechnology for healthcare
Public dialogue was part of the process used to develop a call for research proposals in nanotechnology for healthcare under the cross Council theme, Nanoscience through Engineering to Application (led by EPSRC). The emergent ethical, social and policy issues were used alongside advice from the research and user community in the development of the scope of the call.
Further information is available at http://www.epsrc.ac.uk/ResearchFunding/Programmes/Nano/RC/ConsultNanoHealthcare.htm and http://www.epsrc.ac.uk/ResearchFunding/Programmes/Nano/RC/ReportPublicDialogueNanotechHealthcare.htm

Stem Cell Dialogue
BBSRC and MRC, with funding from Sciencewise, commissioned a consortium to conduct a public and stakeholder dialogue on stem cell research in the UK to identify peoples' views around stem cell research. This involved stakeholder interviews and deliberative workshops across the UK.
Full project report available. Further information is available at http://www.mrc.ac.uk/Sciencesociety/Publicinvolvement/Consultations/Stemcelldialogue/index.htm and http://www.bbsrc.ac.uk/society/dialogue/activities/stem_cell_dialogue.html

Living with Environmental Change (LWEC) Citizens Advisory Forum

Supported by Sciencewise, a series of workshops were held with a panel of members of the public to discuss flooding, adaptation and behavioural change. The key findings were fed back to the LWEC programme to inform their decision making (e.g. as part of a consultation on a strategic research framework (flooding), providing input on future research priorities (adaptation) and inputting into a potential research call (behaviour change)).
Further information is available at http://www.sciencewise-erc.org.uk/cms/citizens-advisory-forum-for-living-with-environmental-change-lwec/

12. Who should bear responsibility for decision making at each stage of the development of an emerging biotechnology? Is there a clear chain of accountability if a risk of adverse effects is realised?

Research Councils recognise that as funders of research they have a responsibility to consider the issues that the downstream applications of the research they fund may raise.

Research Councils have mechanisms in place for assessing the social and ethical issues raised by research proposals, for example BBSRC (Bioscience for Society Strategy Panel) is currently reviewing these systems. BBSRC is working to raise the awareness of its grant holders to the potential issues that their research may raise.

It is important to strike an appropriate balance between regulation and the freedom for researchers to explore new avenues of research.

There is no clear chain of accountability if a risk of adverse effect is realised. However, it is currently very difficult to understand how accountability could be introduced given the multitude of actors and responsibilities involved as a technology emerges.

Researchers and funders should continue to work to build trust and public confidence in research and its conduct through developing a culture of openness and transparency around their work (throughout the lifecycle of research) and in particular the risks it poses to society, the environment and elsewhere.

RCUK is committed to enabling public aspirations and concerns to contribute to Councils' decision making ‘upstream’.

15. What role should public opinion play in the development of policy around emerging biotechnologies?

The Research Councils recognise that public engagement can elucidate not just public opinion but also people’s values, aspirations and concerns. These insights can help emerging technologies, and the policies and regulations around them, to develop in a way that is sensitive to public views and so help command public trust and confidence.

However, The Nuffield Council should recognise that, while public engagement can play a significant and important part in the development of robust policy, it is important to acknowledge the limitations and uncertainties of public engagement. For instance, there are still methodological debates about who to involve and when.

16. What public engagement activities are, or are not, particularly valuable with respect to emerging biotechnologies? How should we evaluate public engagement activities?

The BIS Science for All group has recently developed a ‘public engagement triangle’ tool that attempts to aid practitioners in designing public engagement activities. In line with the

Research Councils, the tool encourages one to think first about the motivations for doing public engagement. This will vary between technologies and even within various aspects of a single technology (i.e. its regulation, application or commercialisation).

Evaluation of the public engagement activity is key. Considering evaluation at the start of any exercise can help to ensure robust and realistic objectives are in place and formative evaluation throughout the process can help to reshape the processes for best efficiency. Evaluation must be independent.

Further guidance on evaluation of public engagement activities is available in the RCUK Evaluation: Practical Guidelines publication, available at http://www.rcuk.ac.uk/documents/publications/evaluationguide.pdf

17. **Is there something unique about emerging biotechnologies, relative to other complex areas of government policy making, that requires special kinds of public engagement outside the normal democratic channels?**

The emergent and 'bio' aspects of emerging biotechnologies may separate them from other policy making areas. The emergent aspect suggests that engaging with the public early in a technology's development may require a degree of information provision to enable informed debate. Public perceptions of 'bio' can draw on the concepts of naturalness and nature which are often portrayed as being in conflict with biotechnological development. While these distinctive aspects do not necessarily require special kinds of public engagement they do suggest that those undertaking public engagement should be sensitive to them.