

# Response to the House of Lords Science & Technology Select Committee inquiry into GM insects

September 2015

## KEY POINTS

- Genetic modification techniques, such as gene drives, have been embraced with enthusiasm by many researchers, but also provoked debate about future uses, including ecological engineering.
- Questions about GM research and innovation should be considered in the context of alternative ways of responding to human priorities, and in accordance with broader social values.
- Public engagement around GM insects should learn from the polarised public debate about GM foods. One aspect of this may be to understand what different people mean when they invoke ideas about naturalness in discussions about developments in science and technology.

## BACKGROUND

The Nuffield Council on Bioethics is a UK independent body that examines and reports on ethical issues in science and medicine. We welcome the opportunity to comment on the House of Lords Science and Technology Select Committee inquiry into Genetically Modified (GM) Insects in relation to their use in human disease control as well as livestock and agricultural crop applications.

The Council identified the ethical issues surrounding GM insects in 2014 as a possible topic for future investigation as part of our horizon scanning activities.

The Council has carried out or is carrying out a number of projects that are relevant to discussions about GM insects:

### ***Genome editing***

The Council has recently started a new project on genome editing. The first stage of the project will look at developments such as the CRISPR-Cas9 system and gene drives, which allow precise, targeted changes to be made to DNA molecules in living cells, assess the impact of the technologies in research and the kinds of ethical questions that arise. This will result in a 'platform' report that will be followed by one or more report(s) looking at specific applications.

The Working Group is chaired by Dr Andy Greenfield and met for the first time in September 2015. The early stage of our project means we are not able to comment on specific applications such as GM insects. However, issues that our project will look at include:

- The meanings and significance of 'genome' in societal contexts
- Genome editing in the context of developments in science and society, for example debates about GM, assisted conception
- Issues around ease, efficiency and economy of use of the CRISPR-Cas9 system, and questions around dual use, and bio-hacking
- Drivers and responses to developments in genome editing, including 'science push'/'policy pull', commercial drivers, civic responses, and framings.
- Questions of individual liberty and dignity
- Issues of cross-border and intergenerational justice and questions of global public interest.
- Questions of domestic inequality, for example in terms of access to scientific careers or the distribution of benefits of biomedical research

We intend to publish the first stage of this work in the first half of 2016, when work on the first 'applications' report will commence. We would be happy to advise the Committee on the state of our work as it develops over the coming months. Further information about the project is available online: <http://nuffieldbioethics.org/project/genome-editing/>

### **Naturalness**

The Council is currently undertaking a project exploring how different ideas and understandings of 'naturalness' affect public and policy debates about science and technology, including GM. The project includes a review of media articles, political debates, reports from civil society and scientific organisations, and previous Council reports. The report will be published in late 2015.

A review of academic research exploring public perceptions of naturalness has also been carried out and is available at: <http://nuffieldbioethics.org/project/naturalness/evidence-gathering/>

The findings will be discussed over the autumn with journalists, policy-makers and parliamentarians, Government officials, scientists and representatives from civil society groups, and with members of the public. A report setting out our findings will be published in November 2015.

Further information about the project is available online:

<http://nuffieldbioethics.org/project/naturalness/>

### **GM crops and emerging biotechnologies**

The Council has published three relevant reports on GM and emerging biotechnologies.

- *Genetically modified crops: the ethical and social issues* (published in 1999) – available online: <http://nuffieldbioethics.org/project/gm-crops/>
- *The use of GM crops in developing countries: a follow-up discussion paper* (published in 2003) – available online: <http://nuffieldbioethics.org/project/gm-crops-developing-countries/>

*Nuffield Council on Bioethics – response to House of Lords Science and Technology  
Select Committee inquiry in GM insects*

- *Emerging Biotechnologies: technology, choice and public good* (published in 2012) – available online: <http://nuffieldbioethics.org/project/emerging-biotechnologies/>

## COMMENTS FOR THE COMMITTEE

### Regulation

- 1 GM techniques offer one way among others of responding to human priorities. We conclude that questions about GM research and innovation should be considered in the context of alternative ways of responding to human priorities, and in accordance with broader social values. Rather than considering GM technologies in isolation on a case by case basis, the Council recommends a broader approach where risks and benefits of biotechnologies, such as GM, are assessed on a comparative basis. This should include assessing the risks involved in doing nothing (which in itself is not an ethically neutral act) and investigating alternative options (which may be technological, social or organisational), in order to address the same societal priorities or concerns.
- 2 Some view the issue of GM insects as purely a matter of risk-benefit analysis. Proponents of the technology consider it a useful tool in the fight against insect-borne diseases and for pest control. Possible benefits of GM insects include fewer effects on non-target species than pesticides, the ability to cover areas that may be inaccessible to conventional methods, and the reduction in the amount of insecticides and other potentially harmful chemicals being used. In terms of risks, concerns have been raised regarding the release of GM insects into the environment, including the development of resistant pathogens or insects, the elimination of one species leading to the dominance of another, the transfer of the inserted genes into other species (horizontal gene transfer), and the potential harmful effects of GM insects on human health and the ecosystem.
- 3 In previous written evidence to the House of Commons Science and Technology Committee for its inquiry on GM crops and the application of the precautionary principle in Europe (available at: <http://nuffieldbioethics.org/policy/>), the Council highlighted the inappropriate application of the precautionary principle to emerging biotechnologies. We concluded that regulatory design cannot provide all the answers to securing benefits or averting harms from emerging biotechnologies, such as GM insects. In part, this is because emerging biotechnologies do not fit easily into risk-based regulatory models but require instead an approach guided by caution which, in turn, requires a continuous and reflective engagement with broader societal interests. We are currently awaiting the Government's response to the Committee's report which referred to the Council's recommendations.

### Public debate

- 4 The use of gene drive technology in GM insects means it might be difficult to restrict their spread once they have been released into the environment. This may have important implications for consumers who wish to avoid contact with genetically modified organisms (GMOs), and may revive the ecological concerns of earlier GMO debates, around unintended consequences of environmental release. Gene drive technology therefore opens up a new dimension to public engagement initiatives compared to others that have focused on non-replicating insects.

- 5 There may be opportunities to learn from the polarised public debate about GM foods. Some people may express their concerns about GM technology by describing it as 'unnatural', meaning they think it is wrong or unacceptable. Ideas about naturalness, and what people mean when they say something is 'natural' or 'unnatural' are important to consider when thinking about public debate about GM. Some people use the terms 'nature', 'natural' and 'unnatural' in a value-laden way, i.e. to imply that something is wrong or right, acceptable or unacceptable. Within this, our analysis found that people invoke ideas about naturalness to imply a range of different ideas and meanings. Others are sceptical about the existence of any robust distinction between the natural and unnatural, alongside doubts about any link between naturalness and value.
- 6 Our initial findings suggest that there is a danger of people speaking past each other when they talk about naturalness in the context of developments in science and technology. Greater clarity about what people mean when they invoke ideas about naturalness may help the public, policy makers and scientists have more constructive debates about science, technology and medicine. Our report, to be published in November 2015, will set out a range of different ideas about naturalness and how they affect public debates about science, technology and medicine.