HOUSE OF LORDS

SELECT COMMITTEE ON SCIENCE AND TECHNOLOGY

Genetically Modified Insects

Call for Evidence

The House of Lords Science and Technology Select Committee, under the Chairmanship of Lord Selborne, is conducting an inquiry into Genetically Modified (GM) Insects. This includes use in both human disease control as well as livestock and agricultural crop applications. The Committee invites interested individuals and organisations to submit evidence to this inquiry.

Genetically modified insects are being developed for a range of different purposes. One important use is in controlling human disease by, for instance, genetically modifying insect disease vectors[1] so that they cannot transmit pathogens[2]. Another important use is in protecting crops, livestock and native species, by modifying their insect pests. Though not currently under development, beneficial insects could also potentially be modified to increase or enhance their function.

Current methods of controlling populations of harmful insects, including disease vectors and crop pests, often involve the use of insecticides, modifying habitats or using biological control agents, including predators and pathogens. Release of insects sterilised by radiation, an approach known as Sterile Insect Technique (SIT), is also used (this technique is not classed as genetic modification). Genetic modification could offer an additional approach which may be effective in controlling insect populations.

Population suppression and population replacement are two approaches that can be used. Population suppression can be achieved by introducing lethal genes, or genes which spread through reproduction, thereby reducing the ability of the insect pest or disease vector to reproduce. With this approach, the pest population declines as these genes spread. Population replacement involves genetic modification that makes the insect no longer able to transmit a harmful pathogen to humans, animals or plants. Here the aim is to replace the wild population with non-transmitting GM insects.

A number of new technologies could find application in the GM insect approaches described above. One such technique is gene drive, a mechanism that increases the transmission of a gene in a population above that which would be expected based on natural inheritance. The regulatory framework for such new technologies is yet to be addressed.

GM insects offer potential for effective control of insect populations and reduction of insecticide use. Particularly in developing countries, there is significant scope for public health benefits from control of diseases such as malaria and dengue. There are, however, safety and

[1] A vector is any agent (person, animal or microorganism) that carries and transmits an infectious pathogen into another living organism.

[2] A pathogen is an organism that causes disease. For example, in dengue infection, the pathogen is a virus whereas in malaria infection, the pathogen is a unicellular parasite.

ethical concerns and a regulatory environment that is fit for purpose will be vital if this technology is to develop appropriately and with greatest economic benefit.

In the European Union, the release of GM insects is regulated under the Directive for the Deliberate Release of Genetically Modified Organisms (GMOs) (2001/18/EC). The Directive requires that all GMOs undergo an extensive risk assessment prior to any release to the environment. The Directive was not drawn up with GM insects in mind, although the European Food Safety Authority (EFSA) has since produced guidance on the risk assessment of GM animals, including insects.[3] The emergence of resistance is not currently considered within these frameworks. The ability of insects to move freely and widely must also be taken into account.

We are interested in the following questions:

1. Which human diseases, across the world, could be addressed through GM insect technology? Are there any human disease risks in Europe, particularly the UK, for which GM insects are under development?

2. What are the possible livestock and agricultural crop applications of GM insects across the world? Of current livestock disease risks and agricultural insect pests that could be addressed through GM Insects, which should be the highest priority for Europe?

3. Are there likely to be opportunities provided by GM insects that cannot be provided by other approaches, such as biological control methods? How could GM insect approaches be complementary to existing Integrated Pest Management (IPM) programmes?

4. How appropriate are current EU and UK GMOs regulatory frameworks in addressing the issues raised by GM Insects? Are there lessons to be learnt from the regulation of GM insects in other countries such as Brazil?

5. Do the World Health Organisation (WHO) guidelines on the release of GM mosquitoes provide the basis of an effective regulatory framework? How should issues regarding the emergence of resistance be considered?

6. Do the European Food Safety Authority (EFSA) guidelines on the environmental risk assessment of GM Insects for commercial use sufficiently address the different risks from population suppression and population replacement approaches? How should the ecological risks and human benefits that might arise from the application of gene drive techniques to population replacement approaches be assessed?

7. How is research into the development of GM insects currently funded? Are there opportunities to attract more private investment into this area?

[3] EFSA (2013) Guidance on the environmental risk assessment of genetically modified animals. EFSA Journal 2013; 11(5):3200. http://www.efsa.europa.eu/en/efsajournal/doc/3200.pdf [accessed July 2015]

8. Given the possible public health benefits of GM insects, should the Government be funding their commercialisation? Would this result in a conflict of interest with regard to regulation of releases? If so, how might this be managed?

9. How could the UK benefit economically from both developing GM Insect technology and its use within the UK?

10. How can the gap between regulatory approaches and public concerns over GMOs be addressed? Is there a role for 'responsible innovation' approaches? What are the critical factors in effective public engagement from lab to final release?

Respondents need not provide responses to all questions. **Equally, if there are any crucial issues not captured under the questions we pose, please highlight what they are and explain their salience.**

The deadline for receiving written submissions is 18 September 2015. Public hearings will be held in the autumn. The Committee aims to report to the House, with recommendations, before the end of the year. The report will receive a response from the Government, and may be debated in the House.

Instructions as to how to respond to this Call for Evidence can be found in Annex I overleaf.

20 July 2015

ANNEX 1: GUIDANCE FOR SUBMISSIONS

Written evidence should be submitted online using the written submission form available at www.parliament.uk/genetically-modified-insects-written-submission-form. This page also provides guidance on submitting evidence. The deadline for written evidence is **18 September 2015**.

If you have difficulty submitting evidence online, please contact the Committee staff by email hlscience@parliament.uk or by telephoning 020 7219 5750.

Short submissions are preferred. A submission longer than eight pages should include a one-page summary. Paragraphs should be numbered. All submissions made through the written submission form will be acknowledged automatically by email.

Evidence which is accepted by the Committee may be published online at any stage; when it is so published it becomes subject to parliamentary copyright and is protected by parliamentary privilege. Submissions which have been previously published will not be accepted as evidence.

Once you have received acknowledgement that the evidence has been accepted you will receive a further email, and at this point you may publicise or publish your evidence yourself. In doing so you must indicate that it was prepared for the Committee, and you should be aware that your publication or re-publication of your evidence may not be protected by parliamentary privilege.

Personal contact details will be removed from evidence before publication, but will be retained by the Committee Office and used for specific purposes relating to the Committee's work, for instance to seek additional information.

Persons who submit written evidence, and others, may be invited to give oral evidence. Oral evidence is usually given in public at Westminster and broadcast online; transcripts are also taken and published online. Persons invited to give oral evidence will be notified separately of the procedure to be followed and the topics likely to be discussed.

Substantive communications to the Committee about the inquiry should be addressed through the clerk of the Committee, whether or not they are intended to constitute formal evidence to the Committee.

This is a public call for evidence. Please bring it to the attention of other groups and individuals who may not have received a copy direct.

You may follow the progress of the inquiry at: www.parliament.uk/genetically-modified-insects.