



DECISION

Date	1 May 2018
Application Code	APP203395
Application Type	Determination of whether or not any organism is a new organism under section 26 of the Hazardous Substances and New Organisms (HSNO) Act 1996
Applicant	Landcare Research
Date Application Received	29 March 2018
Consideration Date	1 May 2018
Considered by	A decision-making committee of the Environmental Protection Authority (the Committee) ¹ Dr Louise Malone (chair) Dr Ngaire Phillips Dr Sharon Lehany
Purpose of the Application	To determine whether eukaryotic cell lines that have been treated with externally applied double-stranded RNA molecules for the purpose of inducing a transient small interfering RNA (siRNA) response are new organisms for the purposes of the Hazardous Substances and New Organisms Act 1996

1. Decision

1.1 The Environmental Protection Authority (EPA) determined under section 26 of the Hazardous Substances and New Organisms (HSNO) Act 1996 (the Act) and having regard to the relevant information, that eukaryotic organisms (domain Eukaryota) that are not new, prohibited, or unwanted organisms under either the HSNO Act, or the Biosecurity Act 1993, specifically, organisms that:

- *were present in New Zealand immediately before 29 July 1998;*
- *have not been prescribed as risk species;*
- *have not been approved to be held in containment or released with controls;*

¹ The Committee referred to in this decision is the subcommittee that has made the decision on this application under delegated authority in accordance with section 18A of the Act.

- *have not previously been genetically modified;*
- *are not members of species that have been eradicated from New Zealand;*
- *are not named as prohibited organisms in Schedule 2 of the HSNO Act;*
- *are not unwanted organisms as defined in section 2 of the Biosecurity Act 1993;*

and that are treated with externally applied double-stranded RNA molecules to induce a small interfering RNA (siRNA) response do not fulfil the definition of genetically modified organisms detailed in the Act and therefore are not new organisms for the purposes of the HSNO Act.

2. Purpose of the Application

- 2.1 Landcare Research lodged an application to determine whether eukaryotes treated with double-stranded RNA molecules were considered genetically modified organisms for the purposes of the Act.

3. Application and Consideration Process

- 3.1 The application was formally received by the EPA on 29 March 2018.
- 3.2 The information that the EPA took into consideration included:
- the application;
 - comments provided by the Department of Conservation (DOC);
 - the EPA Staff Assessment Report.
- 3.3 The determination was made in accordance with section 26 of the Act. The Committee noted that the HSNO Methodology Order 1998 relating to the identification, assessment and evaluation of risks, costs and benefits is largely not applicable to section 26 determinations. They also noted that applications under section 26 of the Act do not require public notification.
- 3.4 In accordance with section 26(2)(b) of the Act, MPI and DOC were informed of the application and given the opportunity to comment. DOC stated that since the application did not present any biosecurity risks, they did not have any further comments on the application. MPI did not reply.
- 3.5 The EPA considered that, for the purposes of section 26(2)(b), no other relevant information would be held by other government departments or Crown entities.
- 3.6 The EPA provided the Committee with the application, the staff assessment report (including feedback from MPI and DOC), and a draft decision document, for its review and comment on 18 April 2018.
- 3.7 The Committee convened via teleconference to consider the application for statutory determination on 1 May 2018.

4. Eukaryotes treated with double-stranded RNA molecules

Interpretation of statutory criteria and reasons for the decision

- 4.1 For an organism to be determined to be a new organism under section 26 of the Act, the organism must be shown to meet the definition of a new organism as specified in section 2A(1) of the Act.
- 4.2 The Committee evaluated the available information regarding eukaryotes treated with externally applied double-stranded RNA molecules against the section 2A(1)(d) criterion: a “new organism” includes “a genetically modified organism”.
- 4.3 For the purposes of the Act, a “**genetically modified organism** means, unless expressly provided otherwise by regulations, any organism in which any of the genes or other genetic material—
- (a) *have been modified by in vitro techniques; or*
 - (b) *are inherited or otherwise derived, through any number of replications, from any genes or other genetic material which has been modified by in vitro techniques.*”
- 4.4 The Committee recognised that for any entity to be a genetically modified organism, it must first be an organism for the purposes of the Act. They agreed that a eukaryotic cell or organism that has been treated with double-stranded RNA molecules is an organism, according to the natural meaning of the word, and the definition provided in section 2 of the HSNO Act.
- 4.5 The Committee then considered whether any of the genes or genetic material of the treated eukaryotic cell or organism would be modified by the treatment with double-stranded RNA molecules. The Committee interpreted this to mean whether any genes or genetic material of a eukaryotic cell or organism (including *in vitro*-cultured cell lines, germline cells of whole animals or plants, etc.) would be modified by the treatment with externally applied double-stranded RNA molecules.
- 4.6 The Committee reviewed the information provided in the application, and in the EPA Staff Assessment Report. The Committee acknowledged that while siRNA molecules replicate within treated eukaryote species (via RNA-dependent RNA polymerase amplification as part of the normal cellular RNA interference response), they remain solely as RNA molecules in the cell cytoplasm outside the nucleus, and therefore they do not integrate into the DNA of the eukaryote genome, because the molecules are not reverse-transcribed into DNA, and are therefore not inheritable by the organism.
- 4.7 Since the Committee agreed that the genes or genetic material of a eukaryotic cell or organism would not be modified following treatment with double-stranded RNA molecules, it was not necessary to consider whether *in vitro* techniques were involved.
- 4.8 Therefore, the Committee determined that a eukaryotic cell or organism that is not otherwise considered to be a new, prohibited, or unwanted organism under either the HSNO Act, or the Biosecurity Act 1993, and that has been treated with double-stranded RNA molecules is not a genetically modified organism for the purpose of the Act.

- 4.9 The Committee noted that if new evidence does come to light that sequences derived from double-stranded RNA molecules have integrated into the genome of a eukaryotic cell or organism or has otherwise become inheritable in progeny of eukaryotic cells or organisms treated with externally applied dsRNA, then in line with section 26(3) of the Act, any determination issued by the Authority can be revoked or reissued, if appropriate, on receipt of further information by the Authority.

5. Other matters considered

- 5.1 The Committee also noted that this decision is limited to considering the question 'is a eukaryote treated with externally applied double-stranded RNA molecules a genetically modified organism, and therefore a new organism?'
- 5.2 The Committee noted that there is no other legislation or Order-in-Council that is relevant or applicable to this determination.
- 5.3 The Committee acknowledged that the purpose of the Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms. They considered that the current decision is consistent with the purpose of the Act.

6. Conclusion

- 6.1 In accordance with section 26 of the Act, and having regard to the relevant information, the EPA has determined that any eukaryotic cell or organism that does not otherwise meet the definitions of 'new organism' in section 2A of the HSNO Act, and that is neither a prohibited organism as laid out in section 50(1), and named in Schedule 2 of the Act, nor an unwanted organism as defined in section 2 of the Biosecurity Act 1993, and whose cells have been treated with externally applied double-stranded RNA, is not a new organism for the purpose of the Act.



Dr Louise Malone
Chair, Decision Making Committee
Environmental Protection Authority

1 May 2018