

HUMAN FERTILISATION AND EMBRYOLOGY AUTHORITY

Committee:	Scientific and Clinical Advances Group
Meeting Date:	14 February 2006
Agenda Item:	
Paper Number:	
Paper Title:	Creation and Use of Hybrid Embryos in Research
Author:	Chris O'Toole
For Information or Decision?	Scoping paper for future decision
Resource Implications:	None
Implementation	If permitted: Research Licence Committee
Communication	Chair's letter
Organisational risk	Medium - Possibly adverse publicity.
Recommendation to the Committee:	The Committee is asked whether it agrees with the proposed approach and whether it requires any additional work to be undertaken in order for the Committee to advise the Authority on the creation and use of hybrid embryos in research.
Evaluation	

Creation and Use of Hybrid Embryos in Research

Introduction

1. Scientists in the UK have publicly stated that they may wish to create hybrid embryos by fusing human cells with rabbit eggs. These embryos would then be used to produce stem cells that carry genetic defects with the aim of studying them in order to understand the mechanisms that cause serious genetic diseases. Since this announcement the HFEA has received two further queries asking whether a licence from the HFEA is required in order to carry out research using hybrid embryos.

2. The HF&E Act 1990 does not allow the mixing of human and animal gametes except under extremely limited circumstances for testing the viability of human sperm. However, mixing other human cells e.g. a nucleus from an adult somatic cell with an animal egg is not specifically prohibited under the HF&E Act 1990.

3. Following reports that scientists in China¹ had successfully derived embryonic stem (ES) cells with human characteristics from embryos created by the transfer of nuclei taken from human adult skin cells into enucleated rabbit oocytes, the Authority's Scientific and Clinical Advances Group was asked whether these hybrid embryos could be classed as human embryos.
4. The Group noted that in the Quintavalle judgement, the House of Lords adopted a broad purposive approach to the interpretation of an 'embryo' in that it agreed that the creation of human embryos *in vitro*, by any method, should be regulated.
5. The Authority's Scientific and Clinical Advances Group determined, at its meeting in September 2004, that embryos created by inserting human somatic nuclei into enucleated animal oocytes would certainly approximate human embryos. Therefore, for this reason, the creation of these embryos would require a licence from the HFEA.
6. In the review of the HF&E Act consultation, the Department of health asked for views on "whether the law should permit the creation of human-animal hybrid or chimera embryos for research purposes only (subject to the limit of 14 days culture *in vitro*, after which the embryos would have to be destroyed)". This suggests the Department of Health view that these creations are not permitted currently.
7. In our response to the consultation the Authority stated that: "*The creation of human-animal hybrids is permitted until the two cell stage under the current Act and the HFEA considers that research within the constraints outlined by the Government should be permitted. As long as it can be ensured that such entities would never be implanted into a woman or allowed to develop beyond the 14 day stage, and as long as the research would fall under current research purposes, it could be argued that the ethical justification for the creation of such entities is consistent with research as it is currently allowed. Nevertheless, we recommend that the Government has proper consideration to the diversity of views on this issue. The HFEA would recommend that hybrids and chimeras are defined in the new Act.*" This response suggests that the creation of hybrid embryos would be licensable and are ethically acceptable. However, it also suggests that these hybrid embryos would have to be destroyed after the two-cell stage which would prevent these embryos being used to derive embryonic stem cells, as to do so requires embryos to be cultured until it reaches the blastocyst stage (usually at day 5 after fertilisation).
8. In light of this possible conflict and the fact that the HFEA is likely to receive applications asking for licences to derive embryonic stem cells from human-

¹ Chen, *et al.*, Cell Research 2003; 13(4):251-264

animal hybrid embryos, the Executive thought it would be appropriate for the Authority to take a more in-depth look at the legal, ethical and scientific justifications for creating human-animal hybrid embryos. Therefore, the Authority's Scientific and Clinical Advances Group and its Ethics and Law Committee will be asked to advise the Authority on the creation and use of human-animal hybrid embryos in research.

Scientific and Clinical Advances Group

9. SCAG will be asked, at its meeting on 26 April 2006, to look at evidence and give a view on the scientific aspects of creating human-animal hybrids including:
 - Are the embryos created by inserting human nuclei into enucleated animal oocytes human?
 - Would studying these embryos provide useful information thus abrogating the need to use human eggs to create embryos for research?
 - Would the embryonic stem cell derived from human-animal hybrid embryos be human ES cells?
 - Would studying ES cells derived from human-animal hybrid embryos provide useful information thus abrogating the need to derive ES cells from *in vitro* fertilised embryos?

Ethics and Law

10. The Ethics and Law Committee, at its meeting on 17 May 2006, will be asked to examine and provide a view on the legal and ethical aspects of creating human-animal hybrids including:
 - Is the creation of human-animal embryos prohibited by the HF&E Act 1990?
 - If not, would the creation of these embryos be licensable under the HF&E Act 1990?
 - Would it be ethical acceptable to create and use human-animal hybrid embryos in research?
 - What would be the moral status of these human-animal hybrid embryos be?
 - Would it be ethically acceptable to use animal oocytes in order to increase the number of human eggs for use in treatment services?

Conclusion

11. The Committee is asked whether it agrees with the proposed approach and whether it requires any additional work to be undertaken in order for the Committee to advise the Authority on the creation and use of hybrid embryos in research.