

Human/Non-Human Chimeras: Ethical, Legal, and Policy Considerations

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Not only was I hear three hours ago, but I was here a little more than two years ago to testify to your predecessor committee on this issue

I don't think the various positions have changed much

But there have been some interesting political changes that I think raise questions for this NAS committee

I'll talk about five things:

politics, public concerns, ethical concerns, policy responses, and issues for the NAS

but first, an unplanned update on Irv's work

I. Politics

In early 2005, Eric Cohen, editor of the journal, THE NEW ATLANTIS, published an editorial called "The Bioethics Agenda and the Bush Second Term"

He called for less emphasis on hESCs and more emphasis on two things:

Preventing the creation of embryos for research purposes and

Preventing "the degradation of human procreation and the human family, by turning pregnancy into a research technique,

Including "by transgressing the species boundary between human and non-human life,"

or by manufacturing children without the normal familial bonds that connect the generations to one another."

Picking up the legislative recommendations of the 2004 report of the President's Council on Bioethics, *Reproduction and Responsibility*

Shortly thereafter, the Brownback followed – introduced in March 2005, replaced in July 2005 as S. 1373, The Human Chimera Prohibition Act of 2005

No vote, and, as far as I can, no hearings so far

Would make it a felony, with 10 years in prison and a \$1 million fine, to create, or attempt to create, transport or receive in interstate commerce a human chimera

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Odd definition

`(A) a human embryo into which a non-human cell or cells (or the component parts thereof) have been introduced to render its membership in the species *Homo sapiens* uncertain through germ line or other changes;

`(B) a hybrid human/animal embryo produced by fertilizing a human egg with non-human sperm;

`(C) a hybrid human/animal embryo produced by fertilizing a non-human egg with human sperm;

`(D) an embryo produced by introducing a non-human nucleus into a human egg;

`(E) an embryo produced by introducing a human nucleus into a non-human egg;

`(F) an embryo containing haploid sets of chromosomes from both a human and a non-human life form;

`(G) a non-human life form engineered such that human gametes develop within the body of a non-human life form; or

`(H) a non-human life form engineered such that it contains a human brain or a brain derived wholly or predominantly from human neural tissues.

The only product of Irv's proposed experiment to date

And in his State of the Union address this past January, President Bush endorsed the Brownback bill, calling on Congress

to pass legislation to prohibit the most egregious abuses of medical research . . . [which include] creating human-animal hybrids . . .

We think he meant chimeras and the Brownback bill – Brownback has claimed that – although his language may suffer from terminological inexactitude

II. Public Concerns about the Separation of Human from Non-Human

The Brownback bill doesn't deal much with what the NAS (or scientists more generally) have called chimeras

Mix of chimeras, hybrids, mixed species SCNT

Unless "engineered" to make gametes or

"engineered" to have a brain "derived wholly or predominantly from human neural tissues"

All called "chimeras" by the bill

Like Humpty Dumpty, when Congress uses a word, it means whatever Congress says it means

Core concern that finds expression in the Brownback bill is that humans and non-humans be kept completely separate, and not seen as part of the same spectrum

Not biologically sophisticated

- More nonhuman cells in us than human ones
- Few if any “human genes”
- Shared genes
- DNA from retroviruses

But deeply felt

III. Ethical Concerns

Roberts and Baylis
Karpowicz and Cohen
Streiffer
Johns Hopkins group
Stanford group

Have largely focused on “humanness”
Human dignity
Possibility of moral confusion

Some attention to the welfare of the chimeras
Rob Streiffer’s position a combination of the two
A major concern for our group
Interestingly, I think this was the main real concern in *THE ISLAND OF DR. MOREAU*
It was the cruelty of the surgical creation of the animal/people – by “vivisectionist” and without anesthesia – that seems to have been his main complaint
The horribly tortured puma that killed Moreau

IV. Policy Responses

A. Education about connections between human and non-human life

And the weakness of the concept of “species”
Too ambitious to be confident that this will work

B. Education about the importance of chimeras in medical research

Very important that citizens and legislators understand better what research chimeras are and how they are important for research into human health

C. Prudential limits

Not clear to me how convincing the ethical arguments are as *ethical* arguments, but I think they lead us to at least three prudent limits

Be careful about the brain – everyone seems to agree

NAS Guidelines said so

Might want to be a little more specific

July 2005 JHU report in Science

No gametes –

NAS Guidelines said that, too

Might want to be clearer about what you mean by “not allowed to breed”

Human physical features

Already, the mouse with the little human ear - Vacanti, 1997

Was a chimera, though not human/mouse

cow chondrocytes into the human-shaped frame

Conceivably, in the future, monkeys with human hands or faces

V. Directions for the NAS

The Guideline’s treatment of putting hESCs into non-human animals, sending them all to ESCRO committees, is useful, I think

Should be continued, maybe with a little more guidance as noted above

And perhaps sharing of thoughts between ESCROs

Central registry with reasons?

But there are major border issues here that your committee should address because these issues are **not** close to limited to hESCs.

Should this stay within hESC guidelines?

Should it have its own regime?

Should it stay within ESCROs, on the theory they have relevant knowledge?

1. Do the guidelines cover cells differentiated from hESCs?
2. Do they cover other pluripotent cells and their differentiated cells?
3. Do they cover non-pluripotent stem cells
Like Weissman’s brain stem cells
4. Non stem cell actions
Grafting/transplants, as on Dr. Moreau’s island.
5. At some level, beyond biology
human cognitive abilities in a non-biological nonhuman

Limitations of this committee's charge may prevent you from doing all this

But cannot prevent you from talking about it and possibly making
recommendations for other action

NAS needs to consider these seriously

Both to avoid troubling ethical problems and
To avoid bad overreactions from bad politics