

Expert calls for animal-human embryo research to proceed

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In a World View opinion column published in *Nature*, a Case Western Reserve University School of Medicine researcher calls for animal-human embryo research to proceed – but only with strong animal protections in place. So-called "chimera" research raises the hope of producing human organs in genetically modified large animals, such as pigs and sheep, offering a potential solution to the persistent shortage of human organs for transplantation.

Insoo Hyun, PhD, associate professor of bioethics, urges such research to proceed only after "knowing the right and wrong ways to treat sentient beings according to complexities of their attributes."

Hyun's recommendations appear in the journal's September 15th issue and come a week after the National Institutes of Health closed a month-long public comment period on proposed new regulations, widely expected to be adopted, that would lift a moratorium that currently forbids federal funding for chimera embryo research.

For decades, research has taken place on animal-human chimeras (after a Greek mythological figure with the head of a lion, the body of a goat, and the tail of a serpent), without much controversy in the United States, such as in the case of mice transplanted with human cancer cells. However, concerns have arisen about research using human pluripotent [stem cells](#), the focus of the current NIH moratorium. These cells are made from skin or blood cells which are genetically modified to act like [embryonic stem cells](#) that can form any adult cell types including [human](#)

[organs.](#)

Hyun's recommendations come in response to concerns that the transfer of human stem cells into animal hosts would result in an animal with a human organ with at least partially human moral status, especially if the central nervous system is involved. He writes, however, that "The moral status of humans is not automatically assured by our genetic composition or the physical arrangement of our cells. Rather, it is sustained by a complex of mental traits ..." which cannot develop in such chimeras.

He notes that chimera studies that involve sentient animals are already tightly regulated via the US Animal Welfare Act and other national and international research policies. He adds, however, that since "the transfer of human stem cells could produce unpredicted effects on the resulting chimeras' equilibria and capacities for suffering, it is crucial that qualified veterinary staff and researchers monitor experiments" and if necessary, apply swift, humane care.

Under the NIH's pending proposals, an internal steering committee would provide guidance on chimera research proposals, an approach consistent with new professional guidelines for [stem cell research](#) offered by the International Society for Stem Cell Research, which themselves are based on an advisory report which Hyun helped draft.

In addition to protecting animals, Hyun notes that "[g]rounding the ethics and regulation of human-animal chimera research in anything other than animal welfare would invite serious practical and philosophical difficulties." He points out that for example, one argument used against transferring human stem cells into animal embryos is that this research is not overseen by animal research committees when it is limited to test-tube experiments. But, he says, the "challenge for these critics ... is to explain why animal embryos containing human cells deserve serious consideration of their moral status – enough to potentially rule out their

use – when standard human embryos can be used in other projects."

The World View column in which Hyun's piece appears is described by *Nature* as a "must-read weekly rapid response opinion column, which offers senior figures and commentators a platform to discuss events that affect the world's scientific community."

More information: Insoo Hyun. Illusory fears must not stifle chimaera research, *Nature* (2016). [DOI: 10.1038/537281a](https://doi.org/10.1038/537281a)

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