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July 15, 2005

Ethicists Offer Advice for Testing Human Brain Cells in Primates

By NICHOLAS WADE

If stem cells ever show promise in treating diseases of the human brain, any potential therapy would need to be tested in animals. But putting human brain stem cells into monkeys or apes could raise awkward ethical dilemmas, like the possibility of generating a humanlike mind in a chimpanzee's body.

No such experiments are planned right now. But in a paper today in the journal Science, a group of scientists and ethicists is advising researchers to exercise care with such experiments, particularly if they should lead to a large fraction of a chimpanzee's brain's being composed of human neurons.

The group, led by Ruth R. Faden, a biomedical ethicist at Johns Hopkins University, acknowledged the view that monkeys and apes should not be experimented on at all, but nevertheless considered what kinds of research should be permitted if the experiments were required by regulatory authorities.

Clinical trials often depend on previous tests with rats or mice that have some equivalent of the human disease. But for some diseases that affect the human brain, the rodent models may not serve so well. If stem cell therapies for Alzheimer's or Parkinson's disease were to be developed, the Food and Drug Administration might require tests in monkeys or apes before permitting clinical trials.

Neural stem cells, the source cells that build the brain, might be introduced into an adult human's brain to replace cells that are lost in Parkinson's disease. Trying such a therapy first in animals would show how well the cells integrated themselves in the brain. Dr. Faden's group considers it unlikely that the adult brain of a monkey or ape would be significantly altered by human cells.

But the earlier that human cells are introduced in an animal and the closer the species is to humans, the higher the risk of some significant shift toward humanlike cognition. If human neural stem cells were inserted into the embryo of a chimpanzee, they might construct a significant part of the brain. "We couldn't rule out the possibility that certain experiments could potentially alter the cognitive or emotional status of the animal in ways that would be problematic from an ethical point of view," Dr. Faden said.

Her group lists six factors to be considered in assessing the risk of inserting human neural stem cells into monkeys and apes. The recommendations fill a blank in the stem cell guidelines published in April by the National Academy of Sciences. The academy flagged the area for concern and ruled out putting human embryonic stem cells into the embryos of monkeys or apes for the time being. But it left to local review boards the task of ruling on other types of experiments. The advice of Dr. Faden's group provides more specific guidance.

Dr. Faden is director of the Phoebe R. Berman Bioethics Institute at Johns Hopkins. She undertook the study at the request of John Gearhart, a stem cell expert who is also at Johns Hopkins.