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Experts discourage ban on genetic engineering

By Kelly Scurry|April 4, 2013

As genetic technology develops, the ability to change the genes of a fetus has moved from the realm of science fiction to a possible reality in the future.

Large-scale genetic modifications are currently banned in the United States by the Food and Drug Administration, however other countries are experimenting with the practice, said Hank Greely, the Deane F. and Kate Edelman Johnson professor of law at Stanford University. As other countries experiment with genetic engineering, the ability to change the composition of an unborn child's DNA has raised a plethora of ethical dilemmas, with some groups calling for the practice to be prohibited all together. Although Duke researchers see issues with genetic engineering, most do not believe it should be banned altogether.

"Banning is not a productive way forward," said Nita Farahany, professor of law, philosophy and genome sciences and policy. "Whether or not [genetic modification] should be allowed is a different discussion."

In theory, genetic engineering of human zygotes could be used to alter the genes of a fetus that have been affected by a genetic disease. Ethical dilemmas have arisen, however, out of the fear that parents may attempt to change a fetus' genes for aesthetic reasons or to endow the child with athletic prowess or intelligence.

"Such genetic modifications can become problematic if people start modifying fetuses for small issues that can be considered gratuitous use," said Misha Angrist, assistant professor of the practice at the Institute for Genome Sciences and Policy.

Farahany, a member of the Presidential Commission for the Study of Bioethical Issues, argued against a motion banning the genetic modification of fetuses at the Intelligence Squared U.S. debates on prohibiting genetically engineered babies February. Despite her motion against the ban, Farahany said she does not unequivocally support the procedure.

She noted that some forms of genetic engineering have proven to be safer than others. For example, changes in mitochondrial DNA, the genetic material that is passed from the mother to the fetus, have proven to be effective. Nonetheless, the impact on modifications in the nucleus of DNA is still unknown.

"A better way to regulate [fetal genetic modification] is to determine what procedures are appropriate and inappropriate, not ban it all together," Farahany said.

Angrist said the fears associated with genetic engineering are not realistic concerns, but noted the difficulty in making precise predictions of its outcome. Another dilemma, he added, concerns the impact that modified genes would have on future generations.

“There are definitely concerns about germ-line genetic modifications since we would be making changes that could transfer to that fetus’ descendants,” he said. “We’d be mucking about in things we really don’t understand.”

Large-scale genetic modifications, however, will remain in the realm of science fiction for the foreseeable future in the United States since cytoplasmic transfers—which refers to the change in the arrangement of the mitochondrial and nuclear DNA—are currently banned by the FDA, Greely said. Because the FDA considers cytoplasmic transfers a drug, pharmaceutical companies would either need to challenge the FDA in court or gain the agency’s approval to test the safety and effectiveness of the drug.

“This is not a drug that will make a lot of money, and the research could be quite expensive and last for a number of years,” Greely said. “So one wouldn’t expect the private sector to decide to test [the transfers].”

On the other hand, it is unlikely to expect such research to come from the government as current politics prevents funding research of reproductive matters, he said.

Greely considers many of the arguments made by those opposed to genetic modification as “crazy and stupid” because there are many instances in which scientists have a moral obligation to prevent the spread of genetic diseases.

“Approximately 400 babies are born every year [with a mitochondrial disease],” Greely said. “If a mother wants to avoid passing a disease to her fetus, then we have to try.”