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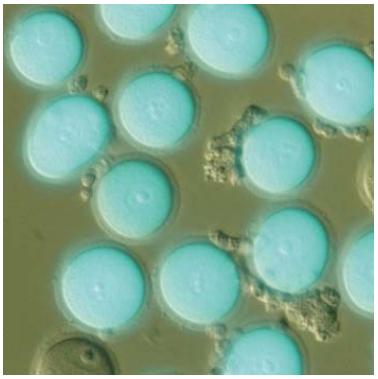
Baby Mice Born from Eggs Made from Stem Cells

By Katherine Harmon | October 4, 2012

Mouse pups from induced pluripotent stem cell-derived eggs; image courtesy of Katsuhiko Hayashi

Stem cells have been coaxed into creating everything from liver cells to beating heart tissue. Recently, these versatile cells were even used to make fertile mouse sperm, suggesting that stem cell technology might eventually be able to play a role in the treatment of human infertility.

Now two types of stem cells have been turned into viable mouse egg cells that were fertilized and eventually yielded healthy baby mice. Details of this achievement were published online October 4 in *Science*.



Mouse oocytes; image courtesy of Katsuhiko Hayashi

Katsuhiko Hayashi, of Kyoto University's School of Medicine, were able to create the eggs with embryonic stem cells as well as with induced pluripotent stem cells (formed from adult cells).

The team started with female embryonic stem cells and then coaxed them genetically to revert to an earlier developmental stage (primordial germ cell-like cells). These cells were blended with gonadal somatic cells, important in the development of sexual differentiation, to create "reconstituted ovaries." The researchers then transplanted these cultured assemblages into female mice (in either the actual ovary or the kidney) for safekeeping and to allow the stem cells to mature into oocytes in a natural environment.

Healthy adult mice from litter produced from induced pluripotent stem cell-based oocytes; image courtesy of Katsuhiko Hayashi

To test the eggs' fertility, the new oocytes were removed from the mice for an *in vitro* fertilization with mouse spermand then re-implanted into the female mice. The experimental females went on to bear normally developing and fertile offspring. The procedure was then **also performed successfully with induced pluripotent stem cells from adult skin cells with similar results.**

"Our system serves as a robust foundation to investigate and further reconstitute female germline development *in vitro*," the researchers noted in their paper," not only in mice, but also in other mammals, including humans."

About the Author: Katherine Harmon is an associate editor for *Scientific American* covering health, medicine and life sciences. Follow on Twitter @katherineharmon.