

Tuesday, October 09, 2007

## **Human Therapeutic Cloning at a Standstill**

A lack of human eggs has created a major roadblock in one of the most promising areas of stem-cell research.

By Emily Singer

It's rare for a scientist to take the mike at a prominent conference, face his peers, and plaintively announce that he has made absolutely no progress on an important research project. But that's exactly what [Kevin Eggan](http://www.mcb.harvard.edu/Faculty/Eggan.html) (<http://www.mcb.harvard.edu/Faculty/Eggan.html>), a biologist at the Harvard Stem Cell Institute, did last week at the Stem Cell Summit, in Boston. A year and a half after a highly publicized approval to start human therapeutic-cloning research at Harvard, Eggan and his collaborators have gotten nowhere. Despite extensive outreach, they still lack a crucial resource for their experiments: human eggs. "We've spent \$100,000 on advertising, but we have yet to have a single woman donate eggs," says Eggan.

Human therapeutic cloning shows great promise for medicine because it would produce stem cells genetically matched to whoever donated the adult cell. In the near term, scientists want to use stem cells derived from patients with specific diseases to pinpoint the molecular mishaps underlying these afflictions and to test new treatments. Longer term, cloned stem cells might be used to replace tissue damaged by diabetes, heart disease, and Parkinson's disease.

Unlike other embryonic stem-cell research, these experiments require unfertilized human eggs. However, egg-donation procedure is uncomfortable and potentially painful, and it carries some medical risk. Women must undergo [counseling](http://www.technologyreview.com/Biotech/16990/##) (<http://www.technologyreview.com/Biotech/16990/##>) sessions to understand the risks

involved, hormone treatments to stimulate ovulation, and a medical procedure in which a needle is inserted into the vagina to remove eggs from the ovary. A small percentage of donors develop ovarian hyperstimulation syndrome, which in rare cases can cause kidney damage.

After gaining approval from various regulatory boards at Harvard last year, Eggan and his collaborators began recruiting egg donors with advertisements in local papers and disease-advocacy magazines. "We've had hundreds of calls from women who are interested in donating, but when they find out about the time, effort, and pain involved, they simply can't take the time to go forward," says Eggan.

Eggan blames the dearth of donors on Massachusetts regulations that prohibit researchers from paying women for their eggs. The law is meant to prevent coercion of poor women who might undergo the procedure out of financial need. But women who undergo the same procedure to donate eggs for assisted reproductive technology (ART), in which infertile women use another woman's eggs to get pregnant, are paid anywhere from \$3,000 to \$10,000. "If we feel comfortable compensating women who donate eggs for ART--and infertility is a terrible disease--why aren't we comfortable compensating women for donations that could aid other serious diseases?" Eggan asks.

Similar regulations exist in California, and guidelines from both the [National Academy of Sciences](http://www.nationalacademies.org/) (<http://www.nationalacademies.org/>) and the [International Society for Stem Cell Research](http://www.childrenshospital.org/cfapps/research/data_admin/Site92/mainpageS92P0.html) ([http://www.childrenshospital.org/cfapps/research/data\\_admin/Site92/mainpageS92P0.html](http://www.childrenshospital.org/cfapps/research/data_admin/Site92/mainpageS92P0.html)) permit only limited compensation for egg donors. "Compensating egg donors was a very contentious issue for the International Stem Cell Society," says [George Daley](http://www.childrenshospital.org/cfapps/research/data_admin/Site92/mainpageS92P0.html) ([http://www.childrenshospital.org/cfapps/research/data\\_admin/Site92/mainpageS92P0.html](http://www.childrenshospital.org/cfapps/research/data_admin/Site92/mainpageS92P0.html)), president of the society and a scientist at Children's Hospital Boston, who is also attempting human therapeutic cloning. "We felt that paying the same market rate as ART was not acceptable, but we did agree on a token amount, in part to recognize the time, effort, and suffering."

The United Kingdom has taken a different tack. Last year, the regulatory board that oversees embryonic stem-cell research in the United Kingdom approved an "egg sharing" program, something that some scientists and ethicists want to see adopted in the United States.

Women who plan to undergo in vitro fertilization (IVF) agree to donate to research any excess eggs gathered during the procedure in exchange for subsidized medical costs. "I favor it because it grants access to IVF to the poor, who have traditionally not had access to expensive IVF procedures," says [Laurie Zoloth](http://www.bioethics.northwestern.edu/faculty/zoloth.html) (<http://www.bioethics.northwestern.edu/faculty/zoloth.html>), director of the Center for Bioethics, Science and Society at Northwestern University, in Chicago. She adds that this eliminates one of the major ethical objections to egg donation: that women will put themselves at risk for no personal benefit or will feel coerced to donate eggs because they need money. "In this case, people would be doing it for personal reasons," says Zoloth.

Eggan says that he was looking into trying a similar approach at Harvard but was advised that state laws prohibit it.

In the meantime, scientists are exploring various alternatives, including the use of animal eggs in place of human ones. (See "[Human-Animal Cybrids](http://www.technologyreview.com/Biotech/19485/)".")

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