

## Sperm and Eggs Created in Dish Produce Mouse Pups

by Dennis Normile on 4 October 2012, 2:10 PM | [16 Comments](#)

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Want baby mice? Grab a petri dish. After producing normal mouse pups last year [using sperm derived from stem cells](#), a Kyoto University team of researchers has now accomplished the same feat using eggs created the same way. The study may eventually lead to new ways of helping infertile couples conceive.

"This is a significant achievement that I believe will have a sustained and long-lasting impact on the field of reproductive cell biology and genetics," says Amander Clark, a stem cell biologist at University of California, Los Angeles.

The stem cells in both cases are embryonic stem (ES) cells and induced pluripotent stem (iPS) cells. The former are taken from embryos and the latter are adult tissue cells that are reprogrammed to act like stem cells. In theory, both can produce all of the body's cell types, yet most researchers have been unable to turn them into germ cells, precursors of sperm and eggs.

[ENLARGE IMAGE](#)

**Who's your mommy?** These adult mice grew from oocytes, or immature eggs, derived in vitro from induced pluripotent stem cells.

Credit: Mitinori Saitou and Katsuhiko Hayashi

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The Kyoto group, led by stem cell biologist Mitinori Saitou, found a process that works. As with the sperm, the group started with ES and iPS cells and cultured them in a cocktail of proteins to produce primordial germ cell-like cells. To get oocytes, or precursor egg cells, they then mixed the primordial cells with fetal ovarian cells, forming reconstituted ovaries that they then grafted onto natural ovaries in living mice. Four weeks and 4 days later, the primordial germ cell-like cells had developed into oocytes. The team removed the ovaries, harvested the oocytes, fertilized them in vitro, and implanted the resulting embryos into surrogate mothers. About 3 weeks later, [normal mouse pups were born](#), the researchers report online today in *Science*.

"It is remarkable that one can produce oocytes capable of sustaining complete development starting with embryonic stem cells," says Davor Solter, a developmental biologist at Singapore's Institute of Medical Biology. Clark adds that the immediate impact of the work will be on understanding the molecular mechanisms involved in forming germ cells. Saitou says that with a bit more progress in understanding the complex interactions at work, they may be able to coax the cells through the entire oocyte development process in a lab dish. If successful, "we may be able to skip the grafting," he says. *ScienceNOW*. ISSN 1947-8062

Further in the future, the technique could lead to a new tool for treating infertility. "This study has provided the critical proof of principle that oocytes can be generated from induced pluripotent stem cells," Clark says. If applied to humans, it could lead to the ability to create oocytes from iPS cells taken from infertile women. But Saitou cautions that moving on to human research will require resolving thorny ethical issues and technical difficulties. Solter says that at the extreme, the new approach could lead to the production of human embryos from cell lines and tissue

samples. Still, he notes, "defining the status of such 'parentless' human embryos and the biological, ethical, and legal issues they will raise defies the imagination."

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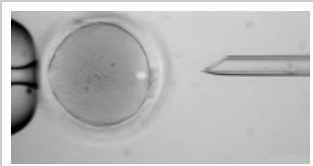
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**Yootha** • a month ago

This is an incredible advance! Waiting for the usual backlash from the God-Squad...

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**Trenchant** → **Yootha** • a month ago

Why turn science into a religious attack? Are you so paranoid and obsessive that this is how your mind works?

8 ^ | 4 v • [Reply](#) • [Share](#)



**srslydude** → **Trenchant** • a month ago

"Why turn science into a religious attack?"

That appears to be what he is afraid of. While most European protestants and Catholics view evolution, the big bang, and science as a whole as being able to coexist with scripture and not be at odds with it, that is not the case for most conservative or fundamentalist Christians in the U.S. It's pretty apparent that Yootha is simply cringing at such a possible backlash, not making one of his own you idiot.

7 ^ | 3 v • [Reply](#) • [Share](#)



**AndromedaPrice** • a month ago

Amazing! I wonder if they are also going to try and use this on endangered animals that they have a tough time mating. This would be a great way to bring back species!

2 ^ | v • [Reply](#) • [Share](#)



**jumbybird** • a month ago

Do we really need more ways to conceive? The world is overpopulated as it is... and this just creates more people who can't naturally conceive.

8 ^ | 7 v • [Reply](#) • [Share](#)



**Bob** → **jumbybird** • a month ago

and what on Earth, jumbybird, makes you think the world is overpopulated?

1 ^ | 3 v • [Reply](#) • [Share](#)



**Rob** → **Bob** • a month ago

Who knows... I'm sure he isn't considering things like massive water table

depletion, top soil erosion, increased habitat destruction for living space and cropland use, or any of the other indicators that human activities are removing resources at rates far in excess of their ability to be replenished. It really isn't like this is a problem people have been discussing for decades. My question is have you simply been ignoring these warnings or do you think that these problems will be magically fixed with no effort on humanity's part? Either way you're retarded.

3 ^ | v • Reply • Share ›



Lithp → jumbybird • a month ago

What on Earth makes you think that people born of this process would be infertile?

0 ^ | v • Reply • Share ›



Dr Colossus → Lithp • a month ago

there could either be genetic incompatibilities between the couple, thus could not conceive with each other but could with someone else, or there could be genetic causes of infertility in either person. in the later case, one can imagine their children having the same problems.

0 ^ | v • Reply • Share ›



Woohoo • a month ago

So, that means that same-sex partners could in the near future have their own kids that a mix of their genomes just as hetero couples.

4 ^ | 4 v • Reply • Share ›



Bob → Woohoo • a month ago

or... forget having partners at all! just take some of my cells and induce some to be sperm and others to be eggs!!!

3 ^ | v • Reply • Share ›



Tom Davidson → Woohoo • a month ago

$X+X$ =female,  $X+Y$ =male,  $Y+Y=?$

0 ^ | 1 v • Reply • Share ›



Jbar → Tom Davidson • a month ago

$YY$ =dead

0 ^ | v • Reply • Share ›



Joelin → Tom Davidson • a month ago

If that work, will be a "legend"!

0 ^ | v • Reply • Share ›



He L • a month ago

A great advance for conservation. I miss dodo and elephant bird, hope we can find some living tissue of them.

1 ^ | v • Reply • Share ›



Joelin • a month ago

I do not want to see the movie "I am a legend" happening in the real life. The point is which is the best and "safest" reprogramming method for making human pluripotent stem cells, not the easiest or most powerful one. In particular, I am very very worry about the most powerful reprogramming method that can do everything like the god if there is. Hope that this will never happen!

0 ^ | v • Reply • Share ›

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