**Breast milk stem cells may be incorporated into baby**

Breast milk is known for being full of goodies – but could that include stem cells from mum that go on to transform into parts of the baby's body? Preliminary evidence has shown this happens in mice, suggesting it also does in people.

Stem cells have the unusual ability to regenerate themselves and develop into a variety of tissues. Several sources of stem cells are being developed for therapeutic use, including embryos, umbilical-cord blood and adult tissues.

It was discovered seven years ago that [human breast milk also contains a kind of stem cell](http://www.ncbi.nlm.nih.gov/pubmed/17440749). The question was whether these cells do anything useful for the baby or if they simply leak unavoidably into breast milk.

The latest findings, presented at the National Breastfeeding and Lactation Symposium in London last week, suggest that in mice at least, breast milk stem cells cross into the offspring's blood from their stomach and play a functional role later in life.

[Foteini Hassiotou](http://www.uwa.edu.au/people/foteini.hassiotou) at the University of Western Australia and her colleagues showed this by first creating genetically modified mice whose cells contain [a gene called tdTomato](http://catalog.takara-bio.co.jp/PDFS/200812_15.pdf), which makes them glow red under fluorescent light.

The female mice were mated but then after giving birth were given unmodified baby mice to suckle. So any red cells that ended up in the pups must have come via the milk.

Sure enough, when the offspring reached adulthood, red cells were found in their blood and many of their tissues, including the brain, thymus, pancreas, liver, spleen and kidneys. Using other techniques, Hassiotou's team also found that the stem cells had developed into mature cells. The ones in the brain, for instance, had the characteristic shape of neurons; the ones in the liver were making the liver protein albumin, and the ones in the pancreas were making insulin. "They seem to integrate and become functional cells," she says.

Is it simply that these stem cells play a role in normal growth and development, or might they also be, say, helping to make the offspring tolerant to its mother's cells and proteins, to reduce chances of an allergic reaction to her breast milk? "There must be some evolutionary advantage," says Hassiotou.

The finding that breast milk stem cells are capable of making different tissues makes it more likely they could be used for therapeutic applications, says Hassiotou. [Chris Mason](http://www.ucl.ac.uk/biochemeng/people/academic/mason-c) of University College London adds: "If these intriguing cells are functional, they could be a novel option for producing future cell therapies."

Breast milk stem cells seem to have less capacity for unlimited cell division than embryonic stem cells. "But that's actually a good thing," says Hassiotou.[They do not form tumours when injected into mice](http://www.newscientist.com/article/mg21729084.800-are-breast-milk-stem-cells-the-real-deal-for-medicine.html), for example, so they may be less likely to trigger cancer if used to treat people.

Hassiotou points out that this kind of work cannot be done in humans, but she is planning to repeat it in macaques.