

News in Brief

Biology's dream

On the frontiers of biology, scientists have the quality to “see the unthinkable and think the unseeable”. A big dream of many biologists looks closer to fulfillment.

The human body has roughly 200 cell types. The dream is to produce pluripotent human cells which can develop into the tissue desired. This could be used to treat myriad illnesses like Parkinson's and diabetes. Human embryonic cells have this propensity and they are got from the left over embryos during *in vitro* fertilization. The problem is that they are genetically non-identical from the patient to be treated. The logical answer is to produce cloned human embryonic tissue.

The first animal cloned was Dolly the sheep in 1996. This was followed by a succession of clones but none in humans or monkeys. By 2003 there was general pessimism whether nuclear transfer would ever be able to produce embryonic stem cells in non-human primates.

In 2004 Woo Suk Hwang from Seoul created a major furor when he announced that he had created human cloned embryonic stem cells. Subsequently, the results were shown to be faked and the skeptics of human cloning rejoiced.

Now in November 2007, Mitalipov from Oregon Health and Science University in Beaverton have announced that they have created an embryonic stem

cell line from cloned monkey embryo's. This achievement is as good as “breaking the sound barrier”. The success is largely due to a special imaging machine called Oosight which enables the scientist to see the structures which hold the DNA in the egg, enabling easy extraction—the first step in nuclear transfer.

In a brilliant piece of lateral thinking, scientists from Kyoto University in Japan have tried to solve the problem a little differently. Yamanaka from Kyoto discovered that introducing 4 new transcription factors into mouse skin cells reprogrammed them into an embryo like state.

Much to their surprise they found that the transcription factors have the same effect in human cells. So they produced 10 pluripotent cell lines from a culture of 50,000 facial skin cells. Yamanaka's induced pluripotent stem cells (iPS) have passed all the basic tests for embryonic stem cells.

To confirm whether they are truly pluripotent, they need to show whether a whole individual can be created from them. A test which cannot be done in humans but will have to be done in mice.

But the iPS technique seems so promising that even Ian Wilmut one of Dolly's creators is considering giving up his original technique to use Yamanaka's reprogramming method. (Nature, 20 November 2007)

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