

# Clone rangers: cell scientists tackle balding one hair at a time

Stephen Cauchi / May 1, 2011 The Age



*Humans could be testing a new treatment for hair loss in two years.*

IT MIGHT not be the most important breakthrough in stem cell research, but it could be the technology's crowning glory: cloning hair follicles to overcome baldness.

In what might become the most effective permanent treatment for the condition, several research teams around the world have successfully cloned human hair follicles - though only in limited amounts.

Human trials are yet to be held, but the cloned follicles have been successfully implanted into the soles of the feet of mice, giving hair-loss sufferers hope that a remedy is within reach.



**Peter Mellios 10 years ago before his first hair transplant. Photo: Simon O'Dwyer**

The challenge for scientists at the University of Melbourne and St Vincent's Hospital, and for research teams at Berlin Technical University and British company Intercytex, is to increase the number of follicles that can be cloned from a single hair taken from a patient's scalp. At the moment, one hair produces only one or two clones.

"We've got to find a way of increasing the yield," said Professor Rod Sinclair, head of the research team at St Vincent's. "We've got to find a way of multiplying one hair extracted into 1000 hairs ... what commonly happens in the expansion process is that they lose their ability to induce new hair follicles." He said cloning hair was difficult because each strand, including its follicle, was a complete organ like a kidney or liver.

"Human stem cells are actually pretty weak and that's one of the problems that we've got," he said. To clone hair, scientists have to extract stem cells from the hair follicle, multiply them in a culture dish, and then implant them into the scalp.

"They have to produce hair that is the right thickness, the right length, the right angle as it leaves the scalp, and the right degree of curliness," he said.

Despite the difficulties, scientists had been encouraged by the success of the trials involving mice. Human trials are expected within two years, but Professor Sinclair played down claims in British newspapers that a cure for baldness was five years away.

He said existing hair-loss treatments - hair transplants and medication - worked very well. "What they're not so good at is replacing hair once you've gone bald."

Hair transplant surgery takes balding-resistant hair from the back and sides of the scalp and redistributes it over balding areas, where hair follicles shrink and die. However, the procedure cannot create new hair. Similarly, drugs such as minoxidil and finasteride can halt balding in men, but can't reverse it. The other main option is using a technically advanced hairpiece.

Hair transplantation surgeon Barry White, founder of the Melbourne-based National Hair Institute, said "trying to clone hair is a lot more difficult than trying to clone Dolly the sheep ... but if it does come along, so much the better".

Dr White said that hair transplantation had made huge strides since he started in 1979, with surgeons now able to transplant single hairs instead of clumps of hairs. "It sounds easy, but each hair has to be cut up individually under the microscope and then planted individually," he said.

The other big advance was the amount of hair able to be transplanted in a single surgery session. "You can treat someone who has fairly extensive balding in just one day. When I started we were doing 60 grafts at a time and now it's 6000," he said.

National Hair Institute patient Peter Mellios, 52, said his opinion of hair transplants, when his hair first started thinning, was poor. But after going to a few seminars 10 years ago, he changed his mind.

"I saw that the techniques had improved. I thought, this is amazing. I was used to seeing what Bert Newton had - clumps of hair," he said.

He had his first transplant in 2003 and follow-up procedures in 2005 and 2009.

He said his transplant had stood up "absolutely fine" over the years, although the immediate post-surgery period was uncomfortable. "But it wasn't excruciating and the end result was worth it."