

# Scientists discover way to mass produce stem cells

Tom Whipple Science Editor

From baldness to blindness, paralysis to multiple sclerosis, the range of problems to which stem cells have been promised as a solution is breathtaking.

What is rarely mentioned, however, is that for any treatment to become a routine procedure requires overcoming a major practical difficulty: making enough cells — and at the right price.

Now though a team of scientists say they have found a possible way to mass-produce stem cells, which they hope may make them a feasible treatment.

Stem cells have the extraordinary ability to develop into all the different

cell types found in the body. As such they are especially promising in organ repair and regenerative medicine, where they can be extracted and cultured into the specialist cells required before being reimplanted.

Many proposed treatments require using a patient's own cells — meaning that they have to be removed and multiplied before being transplanted back in. For a single heart patient it has been estimated that for a treatment to have a useful effect would require a billion cells to be cultivated, something that would stretch today's techniques even if done for a handful of cases.

"The amount of cells you need is

enormous," said Sara Pijuan Galitó, of the research team from the University of Nottingham and Uppsala University in Sweden. "The methods are there, but it would take weeks, for sure. And it is extremely expensive."

In a paper in the online journal Nature Communications, she and her colleagues outlined a potential solution. Their method involves growing stem cells on a plastic medium, but one which — unlike in alternative techniques — does not need to be pre-coated.

"Human stem cells are very sensitive and difficult to culture," Dr Pijuan Galitó said. "At first they were grown on mouse cells because they needed help

in order to survive. Over the last few years there have been huge efforts to refine this, to make the process animal-free. Still, up until now they required a substrate to grow on."

This substrate was used to help the stem cells to bond to the medium on which they were growing. However, by adding a special protein derived from human blood to the cells, the scientists showed that they were able to get them to grow into colonies directly on plastic — speeding up the process.

"At the minute in large-scale production the conditions are harder, and more difficult to control," Dr Pijuan Galitó said. "We hope to increase sur-

vival and also simplify the method." Many other research teams around the world are working on ways of improving stem-cell production.

Another approach has been to find and cultivate stem cells that will be immune-compatible with much of the population, in the same way that type O blood is a "universal" blood type.

Dr Pijuan Galitó is confident that the method she helped to develop, now patented by GE Healthcare, has a good chance of scaling up. "We've reduced the time required and removed the step of pretreating the plastic," she said. "When you want to automatise, the simpler the method the better."

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