# Stem cell breakthrough gets closer to the clinic

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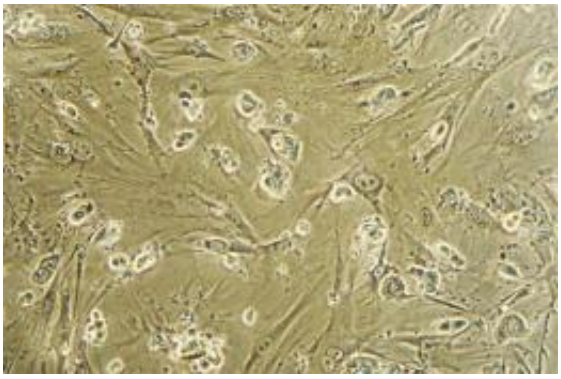

Embryonic stem cells are pictured through a microscope viewfinder in a laboratory. The quest for versatile, grow-in-a-dish transplant tissue took a step towards clinical use Thursday when researchers announced they have found a safe way to transform skin cells into stem cells.

The technology for versatile, grow-in-a-dish transplant tissue took a step toward clinical use Thursday when researchers announced they have found a safe way to turn skin cells into stem cells.

Researchers say the method is so promising they hope to apply for approval to begin clinic trials by the middle of next year.

"This is the first safe method of generating patient specific stem cells," said study author Robert Lanza, the chief scientific officer at Stem Cell & Regenerative Medicine International.

"This technology will soon allow us to expand the range of possible stem cell therapies for the entire human body," Lanza told AFP.

"This allows us to generate the raw material to solve the problem of rejection (by the immune system) so this is really going to accelerate the field of regenerative medicine."

The research builds on an award-winning breakthrough in 2007 by Shinya Yamanaka of Kyoto University.

Yamanaka and his team introduced four genes into skin cells, reprogramming them so that they became indistinguishable from embryonic stem cells.

That achievement conjured the distant vision of an almost limitless source of transplant material that would be free of controversy, as it would entail no cells derived from embryos.

But the downside of the technique for creating these so-called induced pluripotent stem cells (iPS) is that the genes are delivered by a "Trojan horse" virus.

Reprogramming cells using a virus modifies their DNA in such a way that they cannot be given to patients without boosting the risk of cancer and genetic mutation.

Other researchers have succeeded in delivering the genes with a method called DNA transfection or using a chemical wash, but these techniques also posed health risks.

Lanza and the team led by Kwang Soo Kim of Harvard University succeeded in delivering the genes by fusing them with a cell penetrating peptide which does not pose the risk of genetic mutation.

While this method took twice as long to generate pluripotent stem cells, Lanza said he believes his team can increase the efficiency of the transmission by purifying the protein.

The study was published in the online edition of *Cell Stem Cell.*

Stem cells have excited huge interest over the past decade.

Promoters say this material could reverse cancer, diabetes, Alzheimer's and other diseases and also allow researchers to grow patient-specific organ and tissue transplants which will not require harmful anti-rejection drugs.

But the dynamic has been sapped by opposition from religious conservatives, who argue that research on embryos -- the prime source of stem cells so far -- destroys human life.

Generating stem cells from skin cells bypasses the controversy and also dramatically increases the availability of patient-specific stem cells.

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