

Embryonic-like cells repair damaged mouse hearts

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By Julie Steenhuisen

CHICAGO (Reuters) - Ordinary cells reprogrammed to act like embryonic stem cells can help repair damaged heart tissue in mice, researchers reported on Monday in a study that shows a potential practical use for the experimental cells.

When injected into mice whose hearts had been damaged by a heart attack, the new cells helped improve both the structure and function of the heart. Eventually the hope would be to patch up seriously ill heart patients using their own cells.

"It was obvious to the observer which animals had been treated and which ones hadn't," said Dr Timothy Nelson of the Mayo Clinic in Rochester, Minnesota, whose study appears in the journal *Circulation*.

The team used a promising new type of embryonic-like stem cell called an induced pluripotent stem cell, or iPS cell, made from ordinary cells. Many teams are using this new technology to look for ways to repair the body, a fast-growing field of research known as regenerative medicine. Nelson and colleagues tested the technology as a way to regenerate heart muscle damaged by a heart attack.

"We're taking advantage of a diseased tissue environment that is sending out a distress signal that is asking the tissue to repair itself," Nelson said. "When we put these iPS cells in, they are able to respond."

Like embryonic stem cells, induced pluripotent stem cells have the ability to form any kind of cell in the body. Because they come from adult tissue, their use is less controversial than embryonic stem cells, which come from days-old embryos.

There are several ways to make iPS cells, but Nelson's team used a method in which a virus is used to transplant genes that turn back the clock on the cells.

For Nelson, the point was not making the cells, but seeing whether they could make any difference in damaged heart tissue.

'WOW FACTOR'

Instead of coaxing the iPS cells into a specific type of heart tissue, they used the iPS cells in their most embryonic-like state.

Nelson said two weeks after they had transplanted the cells, they started making different types of heart tissue, including heart muscle, blood vessels and the cells that line blood vessels.

"They were able to respond to this damaged environment and spontaneously give rise to the appropriate tissues and create new tissues within that diseased heart," he said. "That is a key wow factor of this paper."

Nelson said heart cells continued to grow for four weeks, and the mice that got the iPS cells got better.