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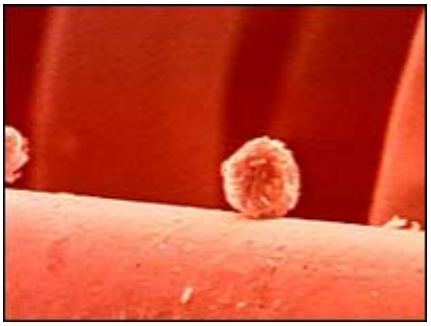
Hope for new source of stem cells

US scientists have found a way to turn adult cells back into immature cells with the potential to become many different types of tissue.



Stem cells can be taken from embryos

The breakthrough by Scripps Research Institute in California could provide a non-controversial way to grow tissue for medical treatments.

The use of immature "stem" cells holds great promise as a treatment for paralysis or diseases like Parkinson's.

But some oppose use of the most potent cells because they come from embryos.

The key to the new development is a small molecule called reversine.

> **"This will allow you to derive stem-like cells from your own mature cells, avoiding the technical and ethical issues associated with embryonic stem cells."**
>
> Dr Sheng Ding

The researchers found that it caused cells which are normally programmed to form muscles to turn back into immature cells whose final state is not sealed.

Thus they could become many different types of tissue such as bone or cartilage.

Researcher Dr Sheng Ding said: "This [type of approach] has the potential to make stem cell research more practical.

"This will allow you to derive stem-like cells from your own mature cells, avoiding the technical and ethical issues associated with embryonic stem cells."

Replace lost cells

Stem cells have huge potential because in theory they can provide doctors with the ability to produce cells that have been permanently lost by a patient.

For instance, they could potentially be used to generate new brain cells to replace those lost in patients with Parkinson's

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disease, or pancreatic islet cells to replace those destroyed by the immune system of people with diabetes.

Scientists believe it would be best to use stem cells taken from a patient's own body. This would avoid possible complications caused by the immune system attacking what it perceives as foreign invaders.

However, in general it has proven very difficult to isolate and propagate stem cells from adults.

Embryonic stem cells offer an alternative. However, their use is fiercely opposed by the "pro-life" movement, and scientists face problems controlling their subsequent development.

Lessons from nature

The latest approach represents a potentially more practical alternative.

In humans, the only organ that can regenerate itself - possibly by reversing the developmental state of its cells - is the liver.

But examples of the developmental reversal of cells have been seen in nature.

For instance, some amphibians the have the ability to regenerate severed body parts by turnings cells at the site of the wound back into an immature state.

The Scripps team says much more work is needed to understand how reversine works, and to refine the process. They have warned that tissue regeneration using this method is still years away at best.

The research will be published in the Journal of the American Chemical Society.

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