

A breakthrough in generating stem cells from adult cells

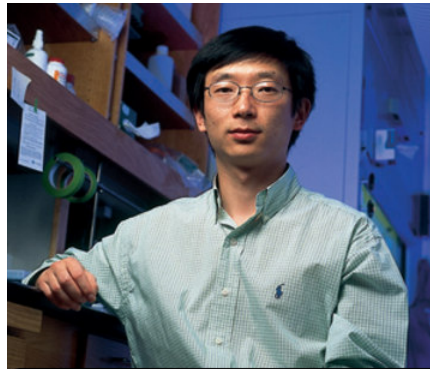
A group of researchers led by Scripps Institute scientist Dr. Sheng Ding have developed a safer way to generate stem cells for therapeutics.

Several years ago, Japanese researchers were able to ‘turn back the clock’ and transform adult skin cells from mice into stem cells by the addition of four genes. Later researchers were able to do the same for human cells. However, while the stem cell lines could be used for research, they were not suitable for use in therapy since the added genes remain in the cell and are associated with the growth of cancerous tumors.

The Scripps Research Institute team was able to chemically reprogram the cells. They used recombinant proteins which are combinations of DNA fragments from various organisms. They experimented to find the exact combinations needed to turn adult skin cells from mice into embryonic stem cells. They were then able to guide their development into neurons, pancreatic and cardiac cells. This new type of stem cell is called a "protein-induced pluripotent stem cell" or "piPS cell."

Various recombinant proteins have been developed to treat a variety of illnesses so the pharmaceutical industry has experience with this type of technique. It would provide an economical way to produce the piPS cells. More work needs to be done but the Scripps researchers have provided an exciting ‘proof of principle’ that it is possible to produce stem cells without genetic manipulation.

"We are very excited about this breakthrough in generating embryonic-like cells from fibroblasts [cells that gives rise to connective tissue] without using any genetic material," said Dr. Ding. "Scientists have been dreaming about this for years."



Dr, Sheng Ding

References

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Scripps Institute press release.

- *Marsha L. Miller, Ph.D., July 23, 2009*