

Stem cells from anyone?

by Bend_Weekly_News_Sources

Ordinary cells of the body can be reprogrammed to become markedly similar to stem cells, the so-called pluripotent cells that can grow into many different organs and cure a range of diseases, scientists say. The findings are striking because stem cells are normally obtainable only from embryos, a process that ordinarily kills the embryos and is thus fraught with ethical controversy. Researchers have begun figuring out ways to create stem cells without killing embryos in the past few years. A new approach reported this week both builds and improves on some of these strategies, and could also sidestep concerns about tissue rejection that accompany other stem cell treatments, researchers said. This is because the new procedure raises the possibility of a patient being treated with stem cells from his or her own body, providing an exact genetic match. Konrad Hochedlinger of the Massachusetts General Hospital in Boston and colleagues worked with a previously developed technique in which four genes were added to common cells called fibroblasts in mice. Fibroblasts are plentiful in the skin. In previous studies, the procedure had resulted in re-setting the genetic structure to make them similar to stem cells, but with some undesirable differences. Hochedlinger's team combined this approach with a new procedure that allowed them to choose only the genetically altered cells that met certain specific criteria. This led them to find cells that they called indistinguishable, based on several tests, from embryonic stem cells. Experts cautioned that it will still be a long time before such techniques can be perfected and used in humans, but that the results are promising. The researchers went on to show that the newly generated cells could differentiate into a wide range of cell types, including blood cells and egg cells. Hochedlinger's findings appear in the August 7 issue of a new research journal, Cell Stem Cell, an offshoot publication of the journal Cell. Two related studies appear in the July 7 issue of the journal Nature. One of these found that stem-like cells similar to those of Hochedlinger's team could give rise to fertilized embryos, although these later died. A second paper, by a team including Shinya Yamanaka of Kyoto University, Japan, who pioneered the technique of using the four genes to reprogram cells, attempted to inject similar cells into early developing mouse embryos. The mice reached adulthood and the reprogrammed cells contributed to and functioned in various organs, they found. A setback was that 20 percent of these mice developed cancer, which was blamed on one of the four genes used in the reprogramming process, called c-myc. "There may be ways to overcome this problem," Yamanaka and colleagues wrote. The authors of the other Nature paper, Rudolf Jaenisch of the Whitehead Institute for Biomedical Research in Cambridge, Mass. and colleagues, wrote that the findings indicate that ordinary cells potentially can be reprogrammed to become similar, if not identical, to embryonic stem cells. Courtesy World Science

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