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Commentary

# Stem Cell Research

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Stem cells are the raw materials of the body, cells from which all other cells are produced with special functions. Stem cells divide to form more cells called daughter cells under the correct conditions in the body or laboratory. These daughter cells, such as blood cells, brain cells, heart muscle cells or bone cells, either become new stem cells (self-renewal) or become specialised cells (differentiation) with a more unique role. In the body, no other cell has the inherent capacity to produce new types of cells. Those with spinal cord injury, type 1 diabetes, Parkinson's disease, amyotrophic lateral sclerosis, Alzheimer's disease, heart disease, stroke, burns, cancer, and osteoarthritis are people that can benefit from stem cell treatments.

The feasibility of using human stem cells that have been programmed into tissue-specific cells to test new drugs is a new field of research. The cells must be programmed to obtain the properties of the type of cells targeted by the drug in order for the testing of new drugs to be successful. Techniques continue to be studied to programme cells into particular cells. For instance, to test a new drug for a nerve disorder, nerve cells may be produced. Tests will see whether there was some influence of the new drug on the cells and whether the cells were affected.

These stem cells come from three- to five-day-old embryos. An embryo is called a blastocyst at this stage and it has around 150 cells.These are stem cells that are pluripotent (ploo-RIP-uh-tunt), meaning that they can break into more stem cells or become any sort of cell in the body. This versatility enables the regeneration or reconstruction of diseased tissues and organs by embryonic stem cells.

In most adult tissues, such as bone marrow or fat, these stem cells are located in small numbers. Adult stem cells have a more restricted capacity to give rise to different body cells compared to embryonic stem cells. Until recently, researchers believed that only related cell types could be formed by adult stem cells. Researchers assumed, for example, that stem cells. Emerging data, however, indicates that adult stem cells may be able to produce different cell types. Bone marrow stem cells, for instance, may be able to produce bone or heart muscle cells. This study has contributed to clinical trials in the early stages to assess the efficacy and safety of individuals. Adult stem cells, for instance, are currently being studied in individuals with neurological or heart disease. Using genetic reprogramming, scientists have successfully converted normal adult cells into stem cells. Researchers will reprogram the cells to behave similarly to embryonic stem cells by modifying the genes in the adult cells.

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