AT ISSUE

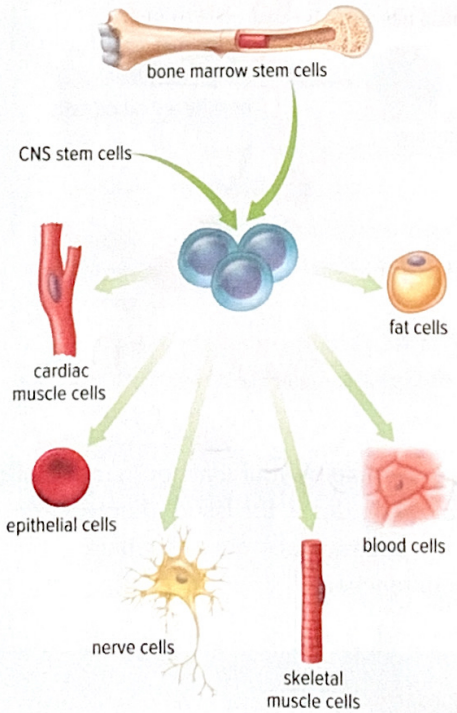
Stem Cells: Paralysis Cured

What's the Issue?

A race car driver is paralyzed in a crash. A teen is paralyzed after diving into shallow water. Until recently, these people would have little hope of regaining the full use of their bodies, but new research on adult stem cells shows promise for reversing paralysis.

What are stem cells? In animals, a cell that can differentiate into many different cell types is called a stem cell. A stem cell divides into two daughter cells through the processes of mitosis and cytokinesis. Each resulting daughter cell can develop into a different type of cell, based on which parts of its DNA are switched on. Stem cells generally occur in clumps that differentiate into different tissue layers, such as epithelial, muscle, and nerve tissues.

There are two types of stem cells. Embryonic stem cells can differentiate into any kind of cell. Adult stem cells exist within specialized tissue. They are only able to differentiate into certain types of cells. For example, tissue stem cells found in bone marrow can differentiate into white blood cells, red blood cells, or platelets.



Stem cells from bone marrow or the central nervous system (CNS) can be manipulated to generate many cell types that can then be transplanted to treat illness or repair damage.

How can stem cells be used? Scientists are trying to find ways to grow adult stem cells in cell cultures and manipulate them to generate specific cell types. For example, stem cells might be used to repair cardiac tissue after a heart attack, to restore vision in diseased or injured eyes, to treat diseases such as diabetes, or to repair spinal cells to reverse paralysis.

Stem Cells and Paralysis In Portugal, Dr. Carlos Lima and his team of researchers found that tissue taken from the nasal cavity is a rich source of adult stem cells. These stem cells become nerve cells when transplanted into the site of a spinal cord injury. The new nerve cells replace the cells that were damaged.

More than 40 people with paralysis due to accidents have undergone the Portuguese procedure. All have regained some sensation in paralyzed body areas. Most have regained some motor control. With intensive physical therapy, about 10 percent of them can now walk with the aid of supportive devices, such as walkers and braces. This is promising news to the many individuals facing illnesses or injuries that have robbed them of the full use of their bodies.

Stem Cells and the Future Scientists are eager to do the research necessary to make adult stem cell treatments a regular part of health care. Paralysis might not have to be permanent—stem cells could provide the cure.

Dig Deeper

Collaborate with your classmates to explore one or more of these questions—or generate your own questions to explore.

1. Create a pamphlet that explains the benefits to society of adult stem cell research. Conduct research in order to include information about the research methods, treatment, examples, cell physiology, and a brief history of adult stem cell research. Be sure to illustrate your pamphlet.
2. Legal, ethical, and social concerns surround human stem cell research. Investigate and summarize Canada's current guidelines on stem cell research.
3. Research the ethical arguments for and against stem cell research. Prepare an argument to present your opinion on this issue.