

Stem Cell Research

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Stem cells have the ability to develop into many different cell types in the body during early life and growth. They can divide for imprecise periods in culture and also have the ability to give rise to specialized cells. They serve as an internal repair system by continuously dividing to replenish other cells as long as the mammal lives. When each stem cell divides it has the ability to remain a stem cell or another type of cell with its own distinct function for a certain tissue.

Stem cells have their own unique properties that differ from other cell types in the body. All stem cells have three main properties. They are capable of dividing and renewing themselves for long periods; they are unspecialized; and they can give rise to specialized cell types.

There are two kinds of stem cells (either from animals or humans) that scientist primarily work on. These stem cells are embryonic stem cells and somatic or adult cells. Embryonic stem cells are derived from a five day old embryo. They are capable of dividing without differentiating for a long period of time. Adult cells also referred to as somatic cells are any body cell other than gametes (egg or sperm).

There are differences and similarities between both embryonic and adult cells. One major difference is their different abilities in the number and type of differentiated cell types they can become. Embryonic stem cells can be grown easily in a culture and adult stem cells are rare in mature tissues, so dividing these cells from an adult tissue is not as easy.

In both types of stem cells, scientists believe that they are both capable of being rejected by the body tissues after transplantation. Both human embryonic and adult stem cells each have advantages and disadvantages regarding potential use for cell-based regenerative therapies.

Embryonic stem cells can become all cell types of the body because they are pluripotent. Cells that are pluripotent have the ability to give rise to all of the various cell types of the body. Even after prolonged culture, these cells have the potential to form copies of all three embryonic germ layers from the progeny of a single cell.

There are many ways in which human stem cells can be used within research or clinics. They use human stem cells to identify how undifferentiated stem cells become the differentiated cells that form the tissues and organs. Another goal of these cells is to test drugs. Possibly the most important potential function of human stem cells is the generation of cells and tissues that could be used for cell-based therapies. Cell based therapies is treatment in which stem cells are induced to acquire the characteristics of a specialized cell into the specific cell type required to repair damaged or destroyed cells or tissues.

Within the research topic, scientists are still studying ways to cure different types of diseases. One way they want to cure diseases is by mending broken hearts. Such diseases of the heart include Cardiovascular disease (CVD), which includes hypertension, coronary heart disease, stroke, and congestive heart failure.

Works Cited

NIH Stem Cell Information Home Page. In *Stem Cell Information*. Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services, 2009 [cited Wednesday, September 30, 2009] <<http://stemcells.nih.gov/index>>