

A Brief Note on Stem Cells

Chakri Bose*

Department of Science, University of Delhi, Delhi, India

DESCRIPTION

Stem cells are the body's raw materials. They are the cells that give rise to all other cells with specific functions. Stem cells divide to generate new cells called daughter cells under the appropriate conditions in the body or the laboratory. Stem cells are cells that can differentiate into various types of cells in the body. They function as the body's regeneration system. Because they are unspecialized, they are unable to perform specific activities. They can differentiate into specialized cells such as muscle cells, blood cells, and brain cells.

The two vital sources of stem cells are adult body tissues and embryos. Scientists are also looking at ways to make stem cells from other cells using genetic "reprogramming" techniques. Adult people have between 50,000 and 200,000 blood-forming stem cells in their bone marrow. Adult stem cells, also known as tissue-specific or somatic stem cells, occur throughout the body from the moment an embryo develops. Although the cells are in a non-specific state, they are more specialized than embryonic stem cells. The body repeatedly regenerates its tissues as we go through our systematic lifestyle. Stem cells divide systematically into various parts, such as the gut and bone marrow, to develop new body tissues for maintenance and repair. Stem cells are found in a variety of tissues. Stem cells have been discovered in various organs, including the brain, bone marrow, skin, liver, skeletal muscles, blood, and blood arteries. However, new research reveals that they can also differentiate into distinct cell types.

Types of Stem Cells

- Embryonic stem cells.
- Tissue-specific stem cells.

- Mesenchymal stem cells.
- Induced pluripotent stem cells

Embryonic stem cells: The inner cell mass of the blastocyst, a mostly hollow ball of cells that develops in three to five days after an egg cell is fertilized by a sperm in a human and is used to obtain embryonic stem cells. The size of a human blastocyst is comparable to that of a dot. The cells within the inner cell mass give rise to the more specialized cells that give rise to the complete body, all of our tissues and organs in normal development. When scientists remove the inner cell mass and cultivate these cells under particular laboratory settings, they preserve embryonic stem cell characteristics.

Tissue-specific stem cells: Unlike embryonic stem cells, tissue-specific stem cells (also known as somatic or adult stem cells) are highly specialized. These stem cells may usually generate various cell types for the tissue or organ in which they reside.

Mesenchymal stem cells: MSC stands for mesenchymal stem cells, which are cells obtained from the connective tissue that surrounds other tissues and organs. MSCs were initially found in the bone marrow, where they were shown to be capable of producing bone, cartilage, and fat cells. They've been created from different tissues, like fat and cord blood. Various MSCs are being investigated for a variety of illnesses and are suspected to have stem cell and even immunomodulatory capabilities.

Induced pluripotent stem cells: Induced Pluripotent Stem (iPS) cells are stem cells that have been produced in the lab by converting tissue-specific cells, such as skin cells, into embryonic stem cells. IPS cells are necessary to generate and test novel medications and treatments and also to understand more about normal development and disease start and progression.

Correspondence to: Chakri Bose, Department of Science, University of Delhi, Delhi, India, E-mail: chakri.B@gmail.com

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