Commentary

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Stem Cells Vs. Somatic Cells

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Description

Somatic cells

Somatic cells are diploid cells, which has two pairs of chromosomes, one received from each parent. Any cell other than germ cells (sperm and egg), gametocytes (cells that break down to form germ cells), and undifferentiated stem cells are known as somatic cells.

Unlike germ cells, somatic cells are not capable of producing offspring; instead, they form all the internal organs and tissues and contribute significantly to their functionalities.

Stem cells

Stem cells are unspecialized cells with self-renewal capability. They can divide through mitosis limitlessly to replenish different cell types of multicellular organisms throughout their life. After stem cell division, each freshly produced cell can either remain as a stem cell or differentiate to form any other cell type with additional defined functions, such as muscle cell, blood cell, or neural cell.

Under special circumstances, differentiation of stem cells can also be induced to produce tissue-or organ-specific cell varieties with specific functions. There are generally two kinds of stem cells embryonic stem cells, which are concluded from embryos, and somatic or adult stem cells, which are undifferentiated cells abiding in a tissue or organ along with other differentiated cells (somatic cells).

Adult stem cells

Adult stem cells are undifferentiated cells that abide among differentiated cells in a tissue or organ. They have the capability to recreate themselves and differentiate into specialized cell types. The main work of the adult stem cells is to conserve the tissue homeostasis. These adult stem cells are normally maintained in a quiescent state, but they can be activated to proliferate and differentiate into the required variety of cells, upon the loss of cells or injury to the tissue.

Adult stem cells are a diverse stem cell population that can be seen in multiple adult tissues, containing, but not confined to, the blood, bone marrow, brain, skin, fat, lung, intestine, and urethra.

Differences between stem cells and carnal cells

Adult stem cells abide along with bodily cells in multiple tissues and organs, including accessory blood, blood vessels, bone seat, cadaverous muscle, teeth, skin, gut, liver, ovary, testis, brain, and heart.

They are present in a small number and located in a specific area of each tissue called 'stem cell niche'. Unlike bodily cells, stem cells can be in any dividing condition for a long period until they are cranked by certain internal or external signals, analogous as tissue injury or diseased conditions.

Adult stem cells can feel regular discreteness pathways to give rise to technical cells of the tissue wherein they are located. Some exemplars of stem cell discreteness into technical bodily cells are as follows

Hematopoietic stem cells

Discern into all types of blood cells, including red blood cells (RBC), B lymphocytes, T lymphocytes, neutrophils, basophiles, eosinophils, monocytes, natural killer cells, and macrophages.

Mesenchymal stem cells

Also called as bone personification stromal stem cells, discriminate into different cell types, including bone cells, cartilage cells, fat cells, and stromal cells, that regulate blood output.

Neural stem cells

There are present in the brain and can discriminate into three major brain cell types namely neurons (jitters cells), astrocytes, and oligodendrocytes.

Epithelial stem cells

There are present in the epithelial fender of the gastrointestinal tract and can discriminate into different cell types, including absorptive cells, tableware cells, and enteroendocrine cells.

Skin stem cells

These are of two types epidermal stem cells that are seen in the rudimental family of the epidermis and can differentiate into keratinocytes; and follicular stem cells that are plant at the base

of hair follicles and can differentiate into both follicular cells and keratinocytes.

Despite multiple functional differences between stem cells and fleshly cells, the capability of stem cells to differentiate into technical cell types of the body has uncovered a possible way toward cell- predicated rectifiers, where stem cells can be used as a renewable source for replacing damaged fleshly cells to treat multiple mischievous illnesses, including heart illnesses, stroke, spinal cord injury, macular degeneration, diabetes, rheumatoid arthritis, etc.