

STEM CELLS :1

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DEFINITION

- A cell that has the ability to continuously divide and differentiate (develop) into various other kind(s) of cells/tissues.
- the body is made up of about 200 different kinds of specialised cells such as muscle cells, nerve cells, fat cells and skin cells.
- all cells in the body come from stem cells.
- a stem cell is a cell that is not yet specialised.
- the process of specialisation is called differentiation.
- once the differentiation pathway of a stem cell has been decided, it can no longer become another type of cell on its own.

STEM CELL CHARACTERISTICS

- 'Blank cells' (unspecialized)
- Capable of dividing and renewing themselves for long periods of time (proliferation and renewal)
- Have the potential to give rise to specialized cell types (differentiation)

Unique properties of all stem cells

1] Stem cells are **unspecialized**

One of the fundamental properties of stem cells is that it does not have any tissue specific structures that allow it to perform specialized function.

2] **Proliferation**

They are capable of dividing and renewing themselves for indefinite periods

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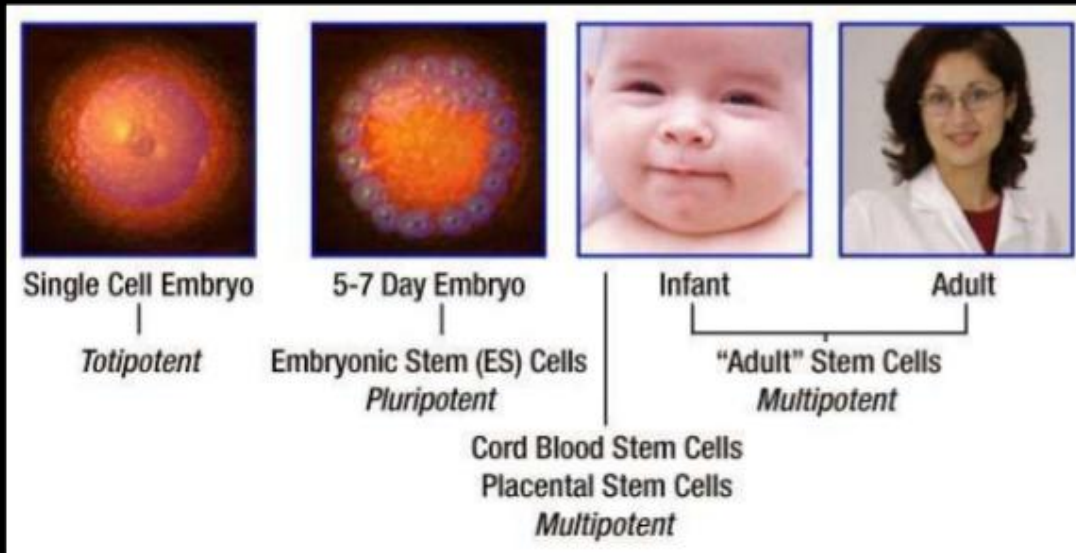
3] **Differentiation**

They can give rise to specialized tissue. Under certain **physiological** and **experimental conditions** unspecialized cell can give rise to specialized cells such as including heart muscle cells, blood cells or nerve cells required to repair damaged or depleted adult cell population or tissue.

4] **Plasticity**

Stem cell from one tissue may be able to give rise to cell types of completely different tissue, a phenomenon known as plasticity. e.g. Blood cells becoming neuron, liver cells producing insulin and haematopoietic stem cells, developing into heart muscle.

Stem cell timeline



Dr. Monika Nema

