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Some future perspectives from the current milestone of stem cells

Aparna Srinath

We all may be wondering what makes stem cells so special and why have they become the most researched cells in the world. The reason is that they are a promising cure for many diseases. Stem cells are found in the inner cell mass of the blastocyst which is a structure formed during the early developmental stages of a human zygote and it is the inner cell mass that forms the embryo. The stem cells of the embryo are pluripotent but as they differentiate they lose the potential to give rise to all cell types in the body. The stem cells then differentiate into a germ layer and become multipotent (making cell types within the layer). These stem cells have the potency to give rise to tissues and organs of the growing embryo. Once the baby is born, many prefer to store the stem cells for future therapeutic use (in case if the child suffers from any disease). What makes the stem cells unique from others is their self-renewing capability (ability to replicate themselves) and multipotency. Owing to the advancing technology, there are methods by which stem cells can be produced by altering the genome through genetic engineering and are called induced pluripotent stem cells. This has allowed scientists to study diseases in a lab and have helped them figure out what could have caused the disease. These lab-engineered stem cells have given insights into understanding the mechanisms and the processes that lead to Alzheimer's disease, type 1 diabetes and age-related macular degeneration. The future potential of using stem cells to treat diseases is still being explored.

Keywords: Stem cells, Zygote, Embryo, Pluripotent, Germ layer, Multipotent, Self-renewing, Growth factors, Engineered, Induced pluripotent stem cells, Alzheimer's disease, Age-related macular degeneration, Type 1 diabetes

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