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Short Communication

Clinical Significance of Adult Stem Cell

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DESCRIPTION

Adult stem cells are undistinguishable cells that multiply by cell separation to replace dying cells and regenerate injured tissues. They are found throughout the body after development. Unlike embryonic stem cells, which can only be found in embryos, somatic stem cells can be found in juvenile, adult, and human animals. Adult stem cells have two main characteristics that attract scientists' attention. The first is their ability to divide or self-renew indefinitely, and the second is their ability to generate all of the cell types of the organ from which they come, potentially regenerating the entire organ from just a few cells [1]. Human adult stem cells, unlike embryonic stem cells, are derived from adult tissue samples rather than human embryos designated for scientific research, so their use in research and therapy is not thought to be controversial. Adult stem cells have two main functions: to replace cells that are at risk of dying due to disease or injury and to keep the cell in a state of homeostasis. There are three main methods for determining whether or not an adult stem cell can become a specialised cell. Adult stem cells can be tracked and labelled *in vivo*, isolated and then transplanted back into the organism, and isolated and manipulated with growth hormones *in vivo*. Humans and model organisms like mice and rats have been the main subjects of research [2].

Self-renewal refers to a cell's ability to go through multiple cycles of cell division while remaining undifferentiated. Stem cells can divide multiple times, resulting in the formation of two stem cells, one more differentiated than the other, or two differentiated cells. Multipotency, also known as multidifferentiative potential, refers to a cell's ability to produce progeny of several different cell types (for example, glial cells and neurons), as opposed to unipotency, which refers to cells that can only produce one cell type [3]. However, some scientists believe that multipotency isn't required and that unipotent self-renewing stem cells can exist. *In vitro*, these properties can be demonstrated with relative ease using methods such as clonogenic assays, which characterise the progeny of a single cell [4]. However, because it is well known that *in vitro* cell culture conditions can alter cell behaviour, proving that a specific subpopulation of cells has stem cell properties *in vivo* is difficult, and there is considerable debate about whether some proposed stem cell therapies actually work [5].

CONCLUSION

Adult stem cell treatments have been used to treat leukaemia and related bone/blood cancers with bone marrow transplants for many years. Adult stem cell research and treatments are not as contentious as embryonic stem cell research and therapy because adult stem cell production does not necessitate the destruction of an embryo. Intravenous delivery of blood progenitors known as Hematopoietic Stem Cells (HSCs) was the focus of early regenerative applications of adult stem cells. CD34+ hematopoietic stem cells have been used in the treatment of a variety of ailments, including spinal cord injury, liver cirrhosis, and peripheral vascular disease. Men of reproductive age have more CD34+ hematopoietic stem cells than women of reproductive age, according to research. Mesenchymal Stem Cells (MSCs) were the focus of other early commercial applications (MSCs). Because intravenously injected cells are sequestered in the lungs, direct injection or placement of cells into a site in need of repair may be the preferred method of treatment for both cell lines.

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