Insights in Stem Cells

Open access Commentary

Short Note on Stem Cells Technologies

Jessie Brown*

Department of Cancer Epidemiology, Mayo Clinic, USA

DESCRIPTION

Stem cell technology is a fast evolving field that brings together the efforts of cell biologists, geneticists, and clinicians to offer hope for effective treatment of a wide range of malignant and non-malignant diseases. Stem cells are totipotent progenitor cells that can self-renew and differentiate into multiple lineages. 1 Stem cells survive and divide well in culture, making them ideal targets for in vitro manipulation. Although early research focused on hematopoietic stem cells, stem cells have been discovered in other tissues as well. Solid tissue stem cell research has not made the same strides as hematopoietic regenerative medicine. This is due to the difficulty of replicating the necessary and accurate three-dimensional arrangements, as well as the tight cell-cell and cell-extracellular matrix interactions found in solid organs. Tissue stem cells, on the other hand, are ideal for cell therapy due to their ability to integrate into tissue cytoarchitecture underneath the control of the host microenvironment and developmental cues. In this overview, we will discuss the current state of research as well as the clinical status of treatments based on hematopoietic and tissue stem cells. Hematopoietic stem cells are a somatic cell population with highly specific homing properties that can self-renew and differentiate into a wide range of cell lineages. 2 Like stromal cell precursors in bone marrow, human hematopoietic progenitor cells express the CD34 antigen, a membrane - spanning cell surface glycoprotein recognized by the My10 monoclonal antibody. 3 Pluripotent stem cells, on the other hand, make up a tiny proportion of the total CD34+ population, which is itself quite heterogeneous in terms of phenotype and function. The functional biology of hematopoietic stem cells is the best way to approach them. In lethally cytoablated hosts, they were shown to restore multilineage, long-term haematopoietic cell differentiation, and maturation. Bone marrow, peripheral blood, umbilical cord blood,6 and foetal liver can be used to obtain haematopoietic cells. Peripheral blood stem cells have become common in both autologous and allogeneic transplantation because they can be collected on an outpatient procedure and promote a consistent acceleration in haematopoietic reconstitution after engraftment. 8 In pediatric patients, umbilical cord blood stem cells from both related and unrelated HLA-matched donors have been used progressively. Fast engraftment is required in recipients with severe T cell immunodeficiency disorders, as well as a low risk of graft versus host disease and a low viral transmission rate. 9 Umbilical cord blood stem cells have been used in clinical trials for both autologous and allogeneic haematopoietic stem cell transplants because they can be expanded in vitro or stored in a freezer for storage in cell banks. The bone marrow is a mesenchyme-derived tissue with a complex haematopoietic cellular component supported by a microenvironment of stromal cells embedded in a complex extracellular matrix. This extracellular matrix plays an important role in cell-to-cell interaction, as well as a more complex role in cytokine binding and presentation to haematopoietic progenitor cells. The interaction between the cytokine milieu and the extracellular matrix serves as a “road map” for stem cell growth and development and differentiation.

ACKNOWLEGEMENT

None.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

Received:	26-January-2022	**Manuscript No:**	IPISC-22-12972
Editor assigned:	28-January-2022	**PreQC No:**	IPISC-22-12972(PQ)
Reviewed:	11-February-2022	**QC No:**	IPISC-22-12972
Revised:	16-February-2022	**Manuscript No:**	IPISC-22-12972 (R)
Published:	25-February-2022	**DOI:**	10.35841/ipisc-8.1.10

Corresponding author Jessie Brown, Department of Cancer Epidemiology, Mayo Clinic, USA; E-mail: Jessie_b@mayo.edu

Citation Brown J (2022) Short Note on Stem Cells Technologies. Insights Stem Cells. 8:10.