Contribution ID: **1** Type: **Poster**

Exploring the Potential of Menstrual Blood-Derived Mesenchymal Stem Cells in Regenerative Medicine

Abstract

For over half a century, stem cells have been used in therapeutic (molecular) medicine. Stem cells can be extracted from various sources, mainly embryonic, fetal, adult, and genetically reprogrammed somatic cells. Recent studies have found that menstrual blood carries Mesenchymal Stem Cells (MSCs), making them potential candidates for cell-based therapies in regenerative medicine and immune-related diseases. Menstrual stem cells (MenSCs) present various advantages, notably their easy accessibility due to collection using hassle-free and non-invasive techniques, and do not pose the threat of graft rejection. they possess all major stem cell properties and showcase greater proliferation and differentiation potential compared with bone marrow MSCS. MenSCs are promising for cartilage regeneration and have shown outstanding results in treating stroke, colitis, limb ischemia, coronary diseases, Duchenne's muscular dystrophy, and streptozotocin-induced type-1 diabetes in animal models. MenSCs also show potential in treating female infertility by improving ovarian and uterine functions. The study of MenSCs enables exploration of their utility in resolving controversies regarding stem cell markets and differentiation potential, improving reprogramming techniques for induced Pluripotent Stem Cell (iPSC) generation, and expanding applications in neurology, cardiology, and gynecology.

Keywords: MenSCs, MSCs, regenerative medicine, non-invasive techniques, iPSC, Stem Cell based therapy

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Track Classification: Biological Sciences