

# MENSTRUAL BLOOD-DERIVED STEM CELLS: MILESTONES AND FUTURE PROSPECTS FOR REGENERATIVE MEDICINE

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**Background.** Stem cell therapy is the future of medicine as research into incurable diseases and injuries continues to grow. Stem cells are difficult to obtain because of ethical conflicts, sampling difficulties or high costs. However, a line of menstrual blood-derived stem cells (MenSCs) shows great potential in address to these issues. Research on menstrual blood-derived stem cells is growing due to the properties they exhibit, including self-renewal, differentiation, angiogenesis, anti-inflammatory and immunomodulatory properties.

**Aim of study.** Reviewing the latest advances in researching menstrual blood stem cells (MenSC) and their potential for application. Finding convenient and efficient ways to isolate MenSCs and investigate their biological characteristics and proliferative capacities.

**Methods and materials.** This research is based on bibliographic analysis of the sources published in the period 2007-2022, 40 scientific sources were researched. The collection was carried out by means of the "Diva" menstrual cup. The menstrual blood of 3 women was isolated in the Tissue Engineering and Cell Culture Laboratory according to the researched protocols.

**Results.** The internal lining of the uterus - the endometrium - is a tissue with a strong regenerative potential located on the muscle-myometrium layer and is composed of the following layers: functional and basal. The human endometrium regenerates monthly, it has an approximate thickness of 0.5-1mm after menstruation, while at the end of the cycle 10-12mm. MenSCs obtained from women's menstrual blood were first reported in 2007, these stems are multipotent and can differentiate into a variety of cells including adipocytes, osteoblasts, chondrocytes and endothelial cells. In this study, similar to the results of revised sources, during the subculture, MenSCs showed a gradual increase of colonies up to 80% confluence after 3 days of seeding. Counting procedures were performed using a Neubauer chamber. MenSCs have beneficial properties including ease of acquisition, non-invasive collection procedures, large-scale expansion capabilities, rapid amplification abilities, genomic stability, and high proliferation rates without being tumorigenic or immunogenic.

**Conclusion.** The field of stem cells derived from menstruation is still growing, there is huge potential for the use of MenSC due to its multitude of benefits, but studies are needed to learn more about their mechanisms and their impact on people. At the same time, the influence of clinical and epidemiological factors, such as age, use of contraceptives or hormonal status, still requires further investigations to evaluate the collection and processing protocols of menstrual blood and their refinement under the conditions of the tissue engineering and cell culture laboratory.

**Keywords:** stem cells, menstrual blood, regenerative medicine.