

Abstract

Mesenchymal stem cells (MSCs) have the potential to be a valuable therapeutic tool due to their capacity for differentiation and immunomodulation. However, in order to ensure their efficacy in clinical applications, it is necessary to gain a comprehensive understanding of the factors influencing their properties. This bachelor thesis investigates the influence of environmental factors, including physical activity, temperature and light exposure, on MSCs functionality. Additionally it describes the underlying mechanisms involved in the action of these factors. Finally, it evaluates the theoretical implications of exploiting environmental cues to enhance MSCs properties. An understanding of how environmental conditions shape MSCs behavior is essential for optimising their therapeutic potential and advancing regenerative medicine strategies.

Key words: mesenchymal stem cells, environmental factors, physical activity, temperature, light