**Understanding the Fate of Mesenchymal Stromal Cells Following Intravenous Administration in Mice**

**Lay Summary**

The project presents the post-IV fate and behavior of mesenchymal stromal cells following administration to mice. This study is supposed to give some insight into the involvement of MSCs with lung tissue, paying attention to their influence on the basic lung functioning, healing process, and immune response. The research is vital to better understand the role of MSC in the treatment of lung and kidney diseases, which can potentially advance into application in regenerative medicine.

**Abstract**

"In vivo fate of human umbilical cord-derived mesenchymal stromal cells" (hUC-MSCs) in the lungs of mice is what is studied in this research. The study reports the interaction of MSCs and the lung macrophages to understand the therapeutic potential and immunomodulatory effects of MSCs.

This study aims to give a full insight into the behavior of MSCs post-intravenous administration, majorly their biodistribution within lung tissue in mice. Hematoxylin and Eosin (H&E) staining and lectin targeting for macrophages are being applied for MSC effects on the functionality of the lung and for their immunomodulation.

**Methodology**

Materials and methods: H&E staining, immunofluorescence, microscopy, image analysis, and statistical analysis. H&E staining discerns basic lung structures, while immunofluorescence is undertaken with regards to tracing hUC-MSCs and their interactions in lung tissue.

**Results**

The degree of autofluorescence in the lung verifies the degree of autofluorescence presented in this study. Thus, this study has established the ability to analyze MSC interactions by using H&E staining to identify key anatomical features in the mouse lung.

These data hint at the interaction of hUC-MSCs with lung tissue of mice. No substantial difference was found in the total number of macrophages between treatment groups, indicating that hUC-MSCs did not significantly impact macrophages' total numbers compared to the control group. Moreover, the work justifies the course of further study in regenerative medicine and immunomodulation.

**Appendices**

Comprise figures and data that accompany the research results, for example, the detection of macrophages in lung tissue with kidney injury.

**References**

* Fischer, A., Jacobson, K., Rose, J., & Zeller, R. (2005). Hematoxylin and eosin staining of tissue and cell sections. CSH Protocols.
* Sorokin, S., & Hoyt, R. J. (1992). Macrophage development: I. Rationale for using Griffonia simplicifolia isolectin B4 as a marker for the line. Anatomy Record, 232(4), 520-6.
* Song, N., Scholtemeijer, M., & Shah, K. (2020). Mesenchymal Stem Cell Immunomodulation: Mechanisms and Therapeutic Potential. Trends in Pharmacological Sciences, 41(9), 653-664.
* Nagai-Okatani, C., Nagai, M., Sato, T., & Kuno, A. (2019). An Improved Method for Cell Type-Selective Glycomic Analysis of Tissue Sections Assisted by Fluorescence Laser Microdissection. International Journal of Molecular Sciences, 20(3), 700.
* Zhou, X., & Moore, B. (2017). Lung Section Staining and Microscopy. Bio Protocol, 7(10).