

Contribution of Hepatic Stellate Cells in Liver Regeneration.  
Establishment of Optimized Isolation Techniques for Mouse Hepatic  
Stellate Cells Based on Magnetic Cell Sorting and Comparison with  
Standard Techniques Based on Flow Cytometry

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This work is divided into two parts: a literature review about the contribution of hepatic stellate cells in liver regeneration and a series of four experiments in order to establish the optimal isolation method for mouse hepatic stellate cells. The first part focuses on the contribution of hepatic stellate cells in liver regeneration, their different phenotypes and their role in hepatic fibrosis. As hepatic stellate cells interact with numerous liver cells leading to liver regeneration, these processes are developed. Hepatic stellate cells release various cytokines and other molecules that participate in liver regeneration and the effect of these secretions on liver regeneration is explained in detail. Finally, I will also describe intracellular pathways occurring in hepatic stellate cells that participate in liver regeneration. The second part reports on a series of four experiments that were conducted with my participation at the Surgical Research Unit of the University of Fribourg. These experiments aimed to evaluate the optimal method for the isolation of mouse hepatic stellate cells comparing the magnetic cell sorting with the standard techniques based on flow cytometry. Our results showed that flow cytometry did not seem a highly reliable method for the isolation of mouse HSC. Isolation by magnetic cell sorting resulted in a significant higher viability and purity of mouse HSC and should be favored.

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