

## The Evaluation of Neural Stem Cells Neurogenesis Using Flow Cytometry with Comparison to Manual Counting Method

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**Introduction:** Considering the role of neural stem cells in replacement of the lost neurons in neurological diseases, finding factors that can increase neurogenesis is of great importance. To find these factors, it seems that neural stem cells culture is an ideal method. To analyze the effect of different factors in a limited time period and with the least cost, an easier and more efficient method than normal manual counting method is needed. The aim of this study is using flow cytometry as an alternative method to evaluate neural stem cells neurogenesis.

**Methods:** Neural stem cells from E<sub>14</sub> mouse brain have been isolated using Neurosphere Assay method and differentiated in a one- step and a two -step methods. After performing immunohistochemistry for neuronal and astrocytic markers, manual and flow cytometry methods have been compared in determining the percentage of neurons and astrocytes. Then, the percentage of neurons and astrocytes generated in two different differentiation methods has been compared using flow cytometry.

**Results:** Our findings showed that there wasn't any statistical difference between manual and flow cytometry methods in determining the percentage of neurons and astrocytes ( $P > 0.05$ ). Comparing differentiation methods by flow cytometry, showed that the percentage of both neurons and astrocytes were significantly different in these two methods ( $P < 0.001$ ).

**Conclusion:** The results of this study showed that flow cytometry is a simple and reliable method that can replace manual counting method to evaluate neurogenesis of the neural stem cells. This method would be very useful especially when a high content screening of different factors and compounds is needed.