



## **Immunomodulatory effects of umbilical cord-derived mesenchymal stem cells**

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### **Objective**

To evaluate the immunomodulatory effects of mesenchymal stem cells on proliferation of PB lymphocytes by two different techniques; namely, 5-bromo-2-deoxyuridine ELISA and a carboxy fluorescein diacetate succinimidyl ester flow cytometric technique.

### **Methods**

Mesenchymal stem cells (MSC) were isolated from UCB, propagated until passage four and then characterized for cell surface markers by flow cytometry and ability to differentiate towards osteocytes and adipocytes. Immunosuppressive effects on PB lymphocytes were examined by co-culturing mitomycin C-treated UCB MSCs with mitogen- stimulated lymphocytes for 72 hours. Thereafter, proliferation of lymphocytes was detected by CFSE flow cytometry and colorimetric ELISA.

### **Results**

The titers of cytokines in cell culture supernatant were also assayed to clarify possible mechanisms of immunomodulation. UCB MSCs suppressed mitogen- stimulated lymphocyte proliferation, which occurs via both cell-cell contact and cytokine secretion. Titers of transforming growth factor beta and interleukin 10 increased, whereas that of IFN-g decreased in the supernatants of co-cultures.

### **Conclusion**

We can conclude that UCB MSCs suppress the proliferation of mitogen-stimulated lymphocytes. However further in vivo studies are required to fully evaluate the immunomodulatory effects of UCB MSCs.