

Mesenchymal stem cells of human placenta and umbilical cord suppress T-cell proliferation at G₀ phase of cell cycle

Abstract

Mesenchymal stem cells (MSC) generated from human umbilical cord (UC-MSC) and placenta (PLC-MSC) were assessed and compared for their immunomodulatory function on T cells proliferation by analysis of the cell cycle. Mitogen stimulated or resting T cells were co-cultured in the presence or absence of MSC. T-cell proliferation was assessed by tritiated thymidine ((³H-TdR) assay and the mechanism of inhibition was examined by cell cycle and apoptosis assay. Both UC-MSC and PLC-MSC profoundly inhibited the proliferation of T-cell, mainly via cell-to-cell contact. MSC-mediated anti-proliferation does not lead to apoptosis, but prevented T cells from entering S phase and they therefore accumulated in the G₀ /G₁ phases. The anti-proliferative activity of MSC was related to this cell cycle arrest of T-cell. UC-MSC produced a greater inhibition than PLC-MSC in all measured parameters.

Keyword: Mesenchymal stem cell; Cell cycle arrest; Umbilical cord; Placenta; T cells