

Immunomodulatory Effects of Multipotent Mesenchymal Stromal Cells on T-Cell Populations at Tissue-Related Oxygen Level

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Abstract : Multipotent mesenchymal stromal cells (MSCs) possess immunomodulatory properties. The effect of MSCs on the crucial cellular immunity compartment - T-cells is of a special interest. It is known that MSC tissue niche and expected milieu of their interaction with T- cells are characterized by low oxygen concentration, whereas the in vitro experiments usually are carried out at a much higher ambient oxygen (20%). We firstly evaluated immunomodulatory effects of MSCs on T-cells at tissue-related oxygen (5%) after interaction implied cell-to-cell contacts and paracrine factors only. It turned out that MSCs under reduced oxygen can effectively suppress the activation and proliferation of PHA-stimulated T-cells and can provoke decrease in the production of proinflammatory and increase in anti-inflammatory cytokines. In hypoxia some effects were amplified (inhibition of proliferation, anti-inflammatory cytokine profile shift). This impact was more evident after direct cell-to-cell interaction; lack of intercellular contacts could revoke the potentiating effect of hypoxia.

Keywords : MSCs, T-cells, activation, low oxygen, cell-to-cell interaction, immunosuppression

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