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# Stroma-Providing Activity of Adipose Derived Mesenchymal Stromal Cells in Tissue-Related O2 Microenvironment

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**Abstract :** This work studied the ability of adipose tissue-derived mesenchymal stromal cells (MSCs) to form stroma for expansion of cord blood hematopoietic cells. We showed that 72-hour interaction of MSCs with cord blood mononuclear cells (MNCs) in vitro at atmospheric (20%) and low (5%) O2 conditions increased the expression of ICAM-1, HCAM (at the beginning of interaction) on MSCs. Viability of MSCs and MNCs were maintained at high level. Adhesion of MNCs to MSCs was faster at 20% O2. MSCs promoted the proliferation of adhered MNCs to form the suspension containing great number of hematopoietic colony-forming units, and this effect was more pronounced at 5% O2. Thus, adipose-derived MSCs supplied sufficient stromal support to cord blood MNCs both at 20% and 5% O2, providing their adhesion with further expansion of new generation of different hematopoietic lineages.

**Keywords :** hematopoietic stem and progenitor cells, mesenchymal stromal cells, tissue-related oxygen, adipose tissue
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