

Human nasal mucosa contains tissue-resident immunologically responsive mesenchymal stromal cells

Jakob Mark, MD, Department of Otorhinolaryngology, Head and Neck Surgery, University Hospital Bonn, Sigmund-Freud-Street 25, 53105 Bonn, Germany.
Tel: 0049-1772460102, Email: markjakob@gmx.de

Jakob Mark, MD^{1,2}, Hemed Hatim, PhD², Janeschik Sandra, MD², Bootz Friedrich, MD¹, Lang Stephan, MD² and Brandau Sven, PhD²

¹Bonn, Germany

²Essen, Germany

Introduction: Multipotent mesenchymal stromal cells (MSC) are present in bone marrow and other tissues such as adipose tissue, muscle, pancreas, liver, tendon, etc. Recent evidence suggests that MSC interact with different immune cell subsets and thus may be important regulators of local tissue immunity. Until now, most immunological studies refer to bone marrow-derived MSC (bm-MSC).

Methods/Results: Here, we report for the first time on the isolation and characterization of multipotent nasal mucosa-derived mesenchymal stromal cells (nm-MSC). Nm-MSC show a plastic adherent and fibroblast-like morphology and are able to form colonies which can be expanded for at least 14 passages. Following an initial proliferation period, nm-MSC express the typical bm-MSC marker antigens CD29, CD44, CD73, CD90 and CD105. Nm-MSC were able to differentiate along the adipogenic, chondrogenic and osteogenic pathway. Tissue-specific differentiation was confirmed by histochemical and immunofluorescence staining as well as by reverse transcriptase PCR (RT-PCR) for defined marker genes. Nm-MSC are immunologically active and responsive, produce a set of inflammatory cytokines and express a number of chemokines receptors.

Conclusion: Our study to best of our knowledge is the first description of human tissue-resident MSC from nasal mucosa. These cells may be an alternative adult stromal cell resource for regenerative tissue repair and auto-transplantation in the clinical approaches and may represent important regulators of local mucosal immunity.