1.06 MSC secretome prevents apoptosis in a model of allergen-induced airway epithelial damage; a role for MIF stimulation of the protective factor VEGF

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Background: Mesenchymal stromal cells (MSCs) are bone marrow-derived cells that are renowned for their cytoprotective abilities. The impact of the macrophage migration inhibitory factor (MIF) CATT polymorphism on MSC licensing is undocumented. In asthma, inhalation of house dust mite (HDM) damages the airway epithelium. Vascular endothelial growth factor (VEGF) plays a pivotal role in the repair and maintenance of airway epithelial integrity.

Methods: Human bone-marrow derived MSCs were licensed with $CATT_7$ MIF monocyte supernatants to examine the therapeutic effects of MIF-MSC conditioned media (CM).

Results: MIF-MSCs secreted elevated VEGF, which significantly enhanced bronchial epithelial wound healing. MIF-MSC CM provided epithelial protection from HDM-induced apoptosis *in vitro*. These cytoprotective effects were MIF-dependent, as protection was blocked with the addition of the MIF inhibitor SCD-19. Furthermore, the cytoprotective efficacy of $CATT_7$-MIF licensed MSC CM was also demonstrated when administered intranasally after HDM challenge *in vivo*.

Conclusion: This study demonstrates the therapeutic efficacy of human MIF-licensed MSC CM, where increased levels of MSC-derived VEGF facilitated epithelial protection and repair *in vitro* and *in vivo*.

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