1.12 MIF Enhances Human Mesenchymal Stromal Cell Longevity In Vivo In Allergic Airway Inflammation

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Bone marrow derived mesenchymal stromal cells (MSCs) are currently under investigation in clinical trials as immunomodulatory therapeutics for acute respiratory distress syndrome and other inflammatory conditions. Previously we have identified the capacity for pro-inflammatory signals to enhance MSC therapeutic efficacy. In some cases, increased efficacy is associated with enhanced human MSC survival in vivo. The pro-inflammatory cytokine macrophage migration inhibitory factor (MIF) is present at high levels in severe asthma. This study sought to elucidate the influence that MIF licensing has on human MSC survival and function; cyto-protection and immune modulation.

Moreover, the effect of MIF on MSC therapeutic efficacy in vivo was investigated using a clinically relevant acute house dust mite (HDM) (Dermatophagoides pteronyssinus) model of allergic airway inflammation in humanised MIF mice. MIF enhanced human MSC proliferation in vitro and drove MSC migration in transwell assays in a CXCR4 dependent manner. MIF pre-stimulation enhanced MSC promotion of wound healing in airway epithelial cells in a VEGF dependent manner. MSCs protected against allergic airway inflammation in mice expressing higher levels of human MIF. Importantly, higher level expression of human MIF in our transgenic mouse model of allergic airway inflammation significantly enhanced longevity of human MSCs in vivo. ***Conflict of Interest: None to declare***