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## Immune- modulatory effects of mesenchymal stromal cells in autoimmune joint diseases: May cytokines play a role?

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Bone marrow- derived mesenchymal stromal cells (MSCs) represent a population of non-hematopoietic cells, which can differentiate into various cell types. The cells possess poor immunogenicity and active immunosuppressive capacity profile. Moreover, it was discovered that the immunosuppressive potential of MSCs is not natural, but requires the induction by inflammatory mediators: the cytokines. Interferon- gamma (INF-  $\gamma$ ), and contemporary other pro- inflammatory cytokines like tumor- necrosis factor – alpha (TNF-  $\alpha$ ), interleukin- 1 (IL- 1) change functional state of MSCs. Upon inflammation, fluctuations of the INF-  $\gamma$  levels correlate with the loss of alloreactive inducing activity of MSCs. Type of toll-like receptor ligand influences cytokine- profile of MSCs. TLR4- primed MSCs exhibit a pro- inflammatory profile with increased levels of interleukins (IL- 6, and IL- 8), whilst TLR3- primed MSCs develop characteristics of immunosuppressive cells with increased levels of interleukin- 10 (IL- 10).

The rationale for using MSCs in autoimmune joint diseases is their local immunosuppressive and anti-inflammatory activity. *In vitro*, MSC- differentiated chondrocytes from RA patients inhibited collagen type II- stimulated T- cell proliferation and activation by increasing secretion of IL-10 and restoring the secretion of interleukin- 4 (IL-4). *In vivo*, a single injection of MSCs prevented the occurrence of severe damage to bone and cartilage in collagen- induced arthritis model. These data suggest that cytokines may influence the immune-suppressive properties of MSCs in autoimmune joint diseases.

### Biography

PharmDr. Martina Skurlova has completed her Ph.D studies at the age of 31 at Third Faculty of Medicine, Charles University in Prague. Now she works as a scientist in the field of rheumatology at the University at the Department of Normal, Pathological, and Clinical Physiology. She participates actively in the pre- and postgraduate education programmes. She has published 10 papers in reputed journals.