

# Immunomodulatory Effects of Human Adipose Tissue-derived Mesenchymal Stem Cells on T Cell Subsets in Patients with Rheumatoid Arthritis.

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## Abstract

Adipose-derived mesenchymal stem cells (Ad-MSCs) have been reported to suppress the effector T cell responses and have beneficial effects on various immune disorders, like rheumatoid arthritis (RA). This study was designed to investigate the effects of co-cultured Ad-MSCs on peripheral blood mononuclear cells (PBMCs) of RA patients and healthy individuals, through assessing transcription factors of T cell subsets. PBMCs from RA patients and healthy donors were co-cultured with Ad-MSCs with or without Phytohaemagglutinin (PHA). The quantitative real-time polymerase chain reaction (qRT-PCR) was used to measure the expression of T-box 21 (T-bet), GATA-binding protein-3 (GATA3), retinoid-related orphan receptor  $\gamma$ t (ROR- $\gamma$ t) and forkhead box P3 (Foxp3). Based on the results, Ad-MSCs greatly upregulated Th2 and Treg cell transcription factors, i.e., GATA3 and Foxp3 ( $p < 0.05$ ), and downregulated Th1 and Th17 transcription factors, i.e., T-bet and ROR $\gamma$ t ( $p < 0.05$ ). These results demonstrate that Ad-MSCs can result in an immunosuppressive environment through inhibition of pro-inflammatory T cells and induction of T cells with a regulatory phenotype. Therefore, they might have important clinical implications for inflammatory and autoimmune diseases such as RA.

## KEYWORDS:

Adipose tissue-derived mesenchymal stem cell; Foxp3; GATA3; ROR- $\gamma$ ; Regulatory T cells; Rheumatoid arthritis; T helper 1; T helper 17; T helper 2; T-bet