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Umbilical Cord Mesenchymal Stromal/Stem Cells and Their Interplay with Th-17 Cell Response Pathway

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Abstract

As a form of immunomodulatory therapeutics, mesenchymal stromal/stem cells (MSCs) from umbilical cord (UC) tissue were assessed for their dynamic interplay with the Th-17 immune response pathway. UC-MSCs were able to modulate lymphocyte response by promoting a Th-17-like profile. Such modulation depended on the cell ratio of the cocultures as well as the presence of an inflammatory setting underlying their plasticity. UC-MSCs significantly increased the expression of IL-17A and ROR γ t but differentially modulated T cell expression of IL-23R. In parallel, the secretion profile of the fifteen factors (IL1 β , IL-4, IL-6, IL-10, IL-17A, IL-17F, IL-22, IL-21, IL-23, IL-25, IL-31, IL-33, INF- γ , sCD40, and TNF- α) involved in the Th-17 immune response pathway was substantially altered during these cocultures. The modulation of these factors demonstrates the capacity of UC-MSCs to sense and actively respond to tissue challenges. Protein network and functional enrichment analysis indicated that several biological processes, molecular functions, and cellular components linked to distinct Th-17 signaling interactions are involved in several trophic, inflammatory, and immune network responses. These immunological changes and interactions with the Th-17 pathway are likely critical to tissue healing and may help to identify molecular targets that will improve therapeutic strategies involving UC-MSCs.

Keywords: Th-17 cells; UC-MSCs; immunomodulation; inflammation; tissue repair.

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Figures

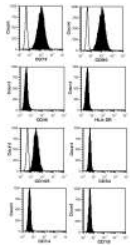


Figure 1 The phenotype of UC-MSCs. UC-MSCs...

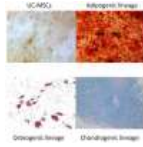


Figure 2 In vitro trilineage potential of...

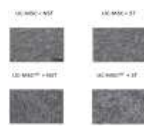


Figure 3 Contrast microscopic representation of UC-

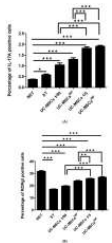


Figure 4 (A) The impact...

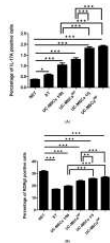


Figure 4 (A) The impact...

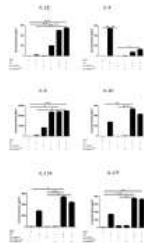


Figure 5 Array profile of IL-1β, IL-4,...

All figures (10)

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