

# Obesity modulates mesenchymal stromal cell (MSC) function in mice

Şerife Ayaz-Güner

Nicola Alessio

Mustafa B. Acar

Domenico Aprile

Servet Özcan

Giovanni Di Bernardo

Gianfranco Peluso

Umberto Galderisi

---

## Video Byte

**Keywords:** Cell Communication and Signaling, obesity, mesenchymal stromal cells, secretome, MSCs, bone marrow, adipocyte, microenvironment, physiology, pathology, extracellular vesicles, cytokines, metabolites, homeostasis, cell therapy, subcutaneous fat, visceral fat, gene ontology, PANTHER, enrichment analysis

**Posted Date:** November 11th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-106056/v1>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

Mesenchymal stromal cells, or MSCs, regulate many functions critical to maintaining organ health. They do so by sending and receiving biochemical signals across short and long distances. How this signaling function is altered by disease, however, remains unclear. In a recent study, researchers examined how obesity in mice affects the signaling functions of MSCs from fat tissue and bone marrow. The proteins secreted by MSCs in mice fed a normal diet play a role in detoxification activity in response to toxic substances and drugs. They are also involved in bone, cartilage and fat development. Further analyses revealed that mouse MSCs participate in two major signaling pathways: platelet degranulation, where signaling molecules wrapped up in granules are deployed to regulate blood clotting and inflammation; and the insulin-like growth factor pathway, which regulates cell proliferation, survival, and metabolism. Comparing proteins secreted by MSCs in normal vs. obese mice revealed key differences. Obesity almost completely negated the release of proteins that promote tissue renewal and homeostasis. This finding could point to the origins of disorder in individuals with obesity and reveals the importance of MSC functions in these individuals.