



## Mesenchymal Stem Cells: Immunobiology and Role in Immunomodulation and Tissue Regeneration

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### Message from the Guest Editor

MSCs can be used to repair injured tissue by migrating them into injured sites and engrafting them to function as end-stage cells. The role of homing within MSC-based therapies, however, remains unclear, although increasing evidence suggests that their therapeutic role is actually due to immunomodulation rather than to their capacity for differentiation. It has, in fact, been shown that MSCs exert immunomodulatory and anti-inflammatory effects by regulating multiple immune cell types of both the innate and adaptive immune systems. This means that MSCs can promote neovascularization, increase angiogenesis, enhance cell viability and/or proliferation, inhibit cell death, and modulate immune responses via paracrine and cell–cell contact effects as well as through extracellular vesicles. Interestingly, despite some encouraging results from animal studies, some clinical trials have shown that MSCs have no therapeutic efficacy. Therefore, understanding the biology of MSCs and their role in treatment will be critical to determining their potential in therapeutic applications.

### Keywords

- mesenchymal stem cells
- Immunomodulation
- tissue regeneration
- anti-inflammatory effects





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