Mesenchymal Stem Cells
From Tissue Regeneration to Immunomodulation

What is a Stem Cell?

What is a Mesenchymal Stem Cell (MSC)?

- MSCs are non-hematopoietic self-renewing cells that can differentiate into multiple cell types.
- They are commonly isolated from bone marrow, but can also be found in adipose tissue, placenta, and umbilical cord blood.
- MSCs are characterized by their ability to differentiate into adipose, osteogenic, and chondrogenic lineages.

How are MSCs Successfully Engineered?

- MSCs can be engineered to secrete biomolecules or antigens that are selective for tumor cells.
- Engineered MSCs may be useful as a source of immunomodulatory factors in cancer patients.
- MSCs can be used to deliver therapeutic agents to target tissues.

How are MSCs Characterized?

- MSCs can be characterized by their surface markers and functional properties.
- MSCs are negative for hematopoietic markers and positive for mesenchymal markers.
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How are MSCs Typically Isolated?

- Bone marrow aspirate
- Adherence to plastic
- Characterize according to ISCT standard to ensure you have pure MSCs

What About Passages?

- MSCs can be expanded in culture for up to 10 passages without losing their stem cell properties.
- Beyond 10 passages, MSCs may lose their self-renewal capacity and differentiate into other cell types.

What are the Potential Uses of MSCs in Regenerative Medicine?

- Stem cell therapy for various diseases and injuries
- Tissue regeneration and repair
- Immunomodulation in autoimmune diseases

MSCs as Drug Vehicles in Cancer Immunotheraphy

- MSCs can be engineered to deliver therapeutic agents to tumor sites
- MSCs can be used to modulate the immune response in cancer patients

References

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- www.lonza.com/MSC
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