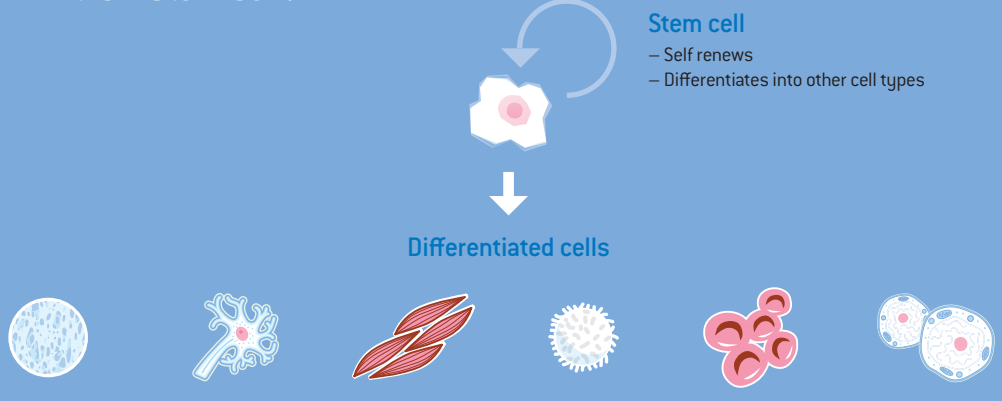


Mesenchymal Stem Cells

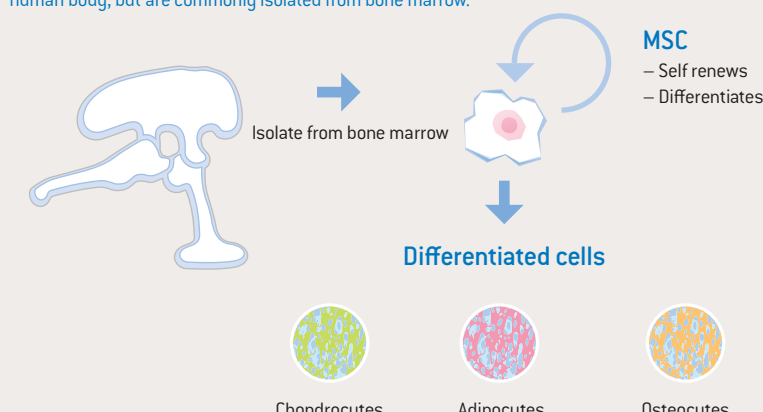
From Tissue Regeneration to Immunomodulation

What is a Stem Cell?

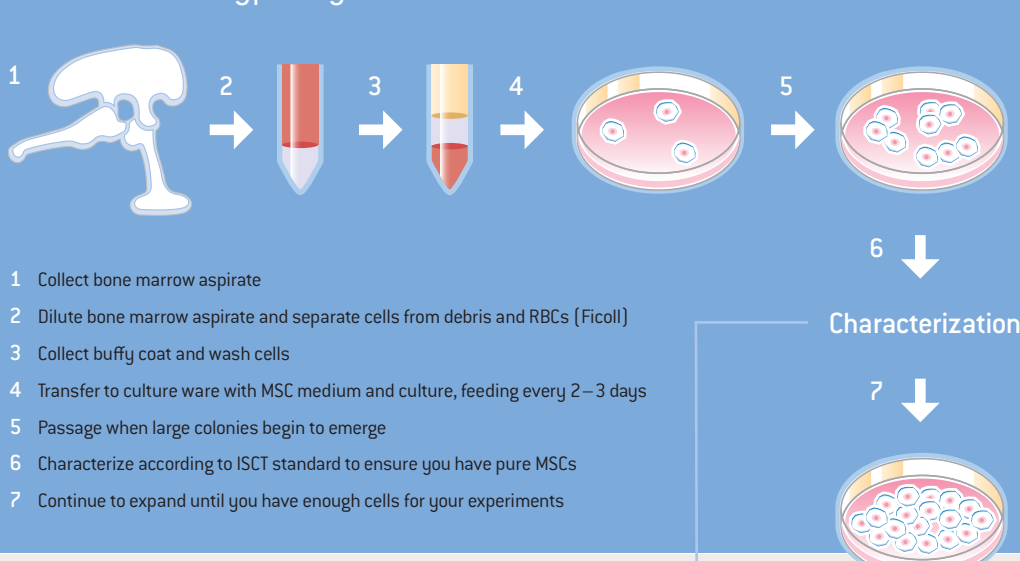


What is a Mesenchymal Stem Cell (MSC)?

MSCs are stem cells that can differentiate into cartilage, fat, and bone cells. They can be found in many different parts of the human body, but are commonly isolated from bone marrow.

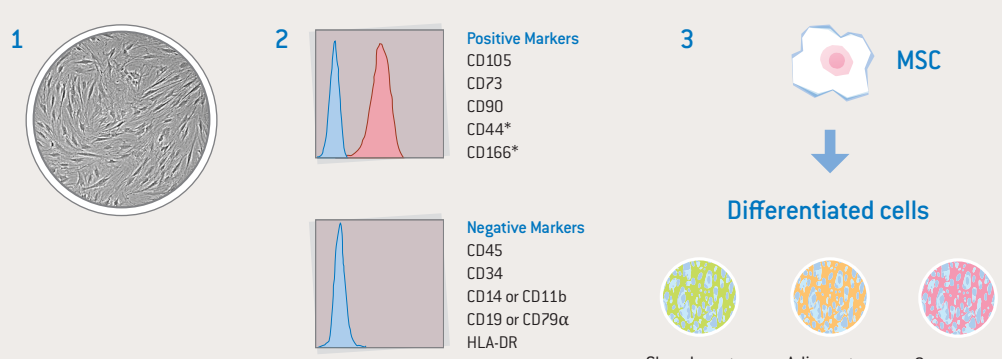


How are MSCs Typically Isolated?



How are MSCs Characterized?

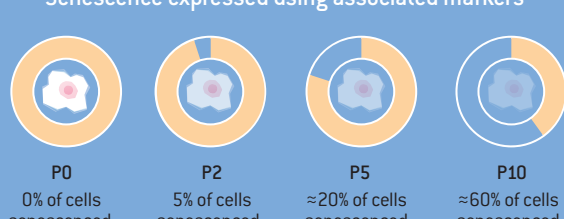
- 1 Adherence to plastic – The cells must adhere to plastic in standard culture conditions
- 2 Specific surface antigen expression – Positive and Negative Markers
- 3 Multipotent differentiation potential – The cells must differentiate into osteoblasts, adipocytes, and chondrocytes *in-vitro*



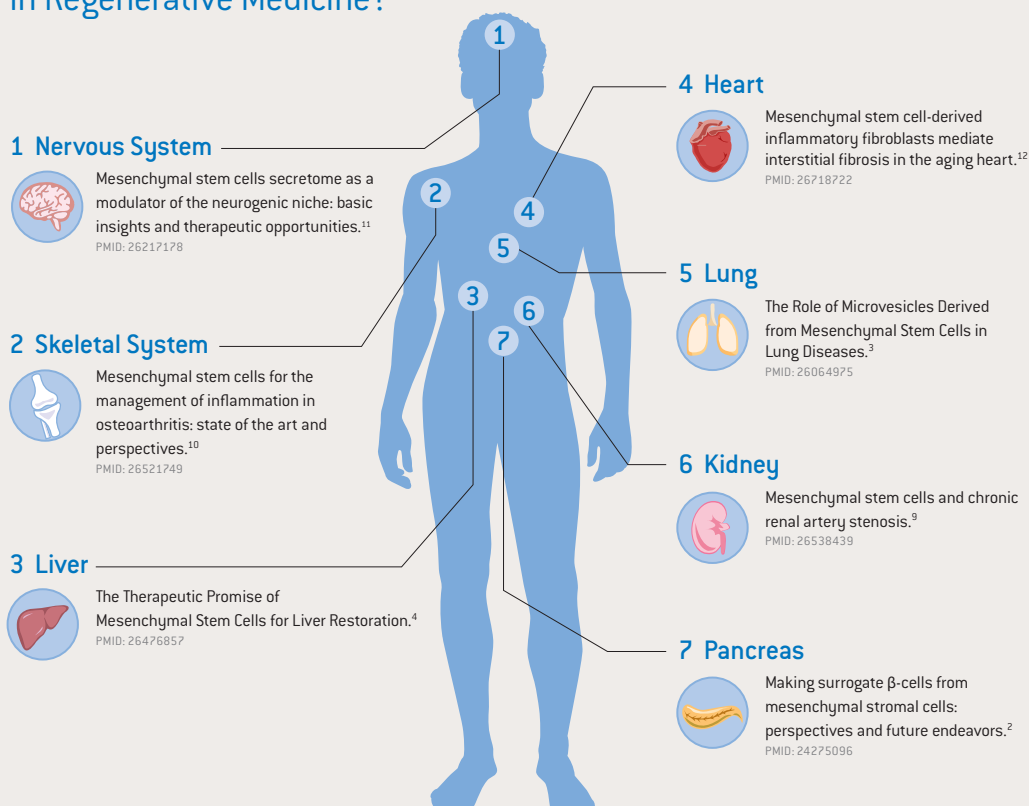
What About Passages?

The ability to expand MSCs in culture allows for enough cells to be generated for experiments and clinical purposes. However, as passage increases, differentiation potential decreases, and the cells eventually senesce.^{5,6}

Senescence expressed using associated markers

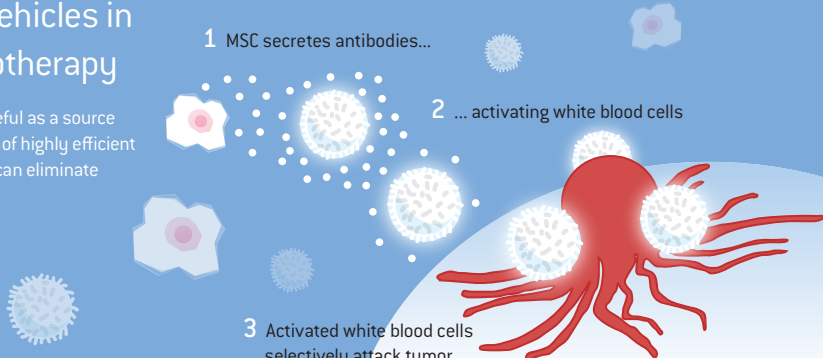


What are the Potential Uses of MSCs in Regenerative Medicine?



MSCs as Drug Vehicles in Cancer Immunotherapy

Engineered MSCs may be useful as a source for sustained concentrations of highly efficient and specific antibodies that can eliminate cancer growth.¹



Lonza Mesenchymal Stem Cells and Media

	Product	Size	Cat. No.
Cells	hMSC – Human Mesenchymal Stem Cells	≥750,000 cells/vial	PT-2501
Media	MSCGM™ Mesenchymal Stem Cell Growth Medium BulletKit™	Kit	PT-3001
	TheraPEAK™ MSCGM™ Serum-free Mesenchymal Stem Cell Growth Medium BulletKit™	Kit	BEBP18-936
Differentiation	hMSC – Human Mesenchymal Stem Cell Osteogenic Differentiation Medium BulletKit™	Kit	PT-3002
	hMSC – Human Mesenchymal Stem Cell Chondrogenic Differentiation Medium BulletKit™	Kit	PT-3003
	hMSC – Human Mesenchymal Stem Cell Adipogenic Differentiation Medium BulletKit™	Kit	PT-3004

References

- 1 Aliperta et al. *Blood Cancer Journal* [2015] 18;5:e348
- 2 Bionde RR, et al. *Int J Biochem Cell Biol.* [2014] Jan;46:90–102
- 3 Chen J, et al. *Biomed Res Int* [2015];2015:985814
- 4 Christ B, et al. *Trends Mol Med.* [2015] Nov;21(11):673–686
- 5 D'Souza et al. *BMC Medicine* [2015] 13:186
- 6 Estrada et al. *Cell Death and Disease* [2013] 4, e691
- 7 Horwitz et al. *Cytotherapy* [2006] 8(4):315–317
- 8 Murray and Peault *BMC Biology* [2015] 13:99
- 9 Oliveira-Sales EB, et al. *Am J Physiol Renal Physiol.* [2016] Jan 1;310(1):F6–9
- 10 Pers YM, et al. *Osteoarthritis Cartilage.* [2015] Nov;23(11):2027–2035
- 11 Salgado AJ, et al. *Front Cell Neurosci.* [2015] Jul 13;9:249
- 12 Trial J, et al. *J Mol of Cell Cardiol.* [2015] Dec 22;91:28–34
- 13 Wagner et al. *PLoS ONE* [2008] 3(5):e2213

* Lonza screens MSCs for ISCT published markers plus CD44 and CD166