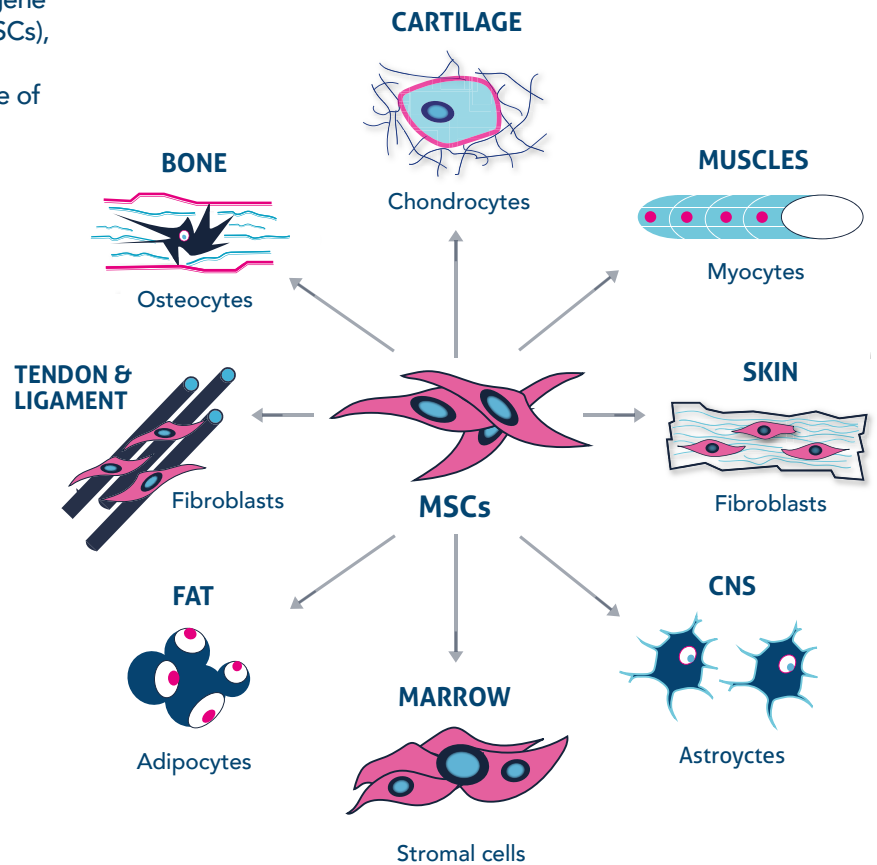


Mesenchymal Stem Cell

Mesenchymal Stem Cells (MSCs) are considered to be the most promising tools for cell and cell-based gene therapy. Similar to Hematopoietic Stem Cells (HSCs), MSCs are also found in bone marrow and are commonly known as “multi-lineage cells” because of their wide range of potential applications.

Uses
Regenerate structure and connective tissues
Repair bones and cartilage
Stimulate angiogenesis
Reduce inflammation and scarring
Where are they found?
Adipose tissue
Amnion
Synovial fluids
Muscles
Dermis
Deciduous teeth
Umbilical cord tissue




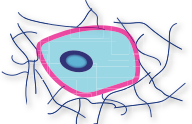


Mesenchymal Stem Cell Markers

Positive Markers		Negative Markers
CD13	CD106	CD11b
CD29	CD117	CD14
CD36	CD45RO	CD19
CD44	CD54	CD31
CD73	CD106	CD34
CD90	STRO-1	CD45
CD105	CD71	CD79a
CD146		HLA-DRA

*Conjugated and unconjugated versions of antibodies available at ptglab.com

Mesenchymal Stem Cell

Depending on the environment MSCs grow in, they can give rise to a variety of lineage-specific cell types. The four principal cell types they differentiate into are myocytes, chondrocytes, osteocytes, and adipocytes. The table below contains a summary of the key growth factors needed for the differentiation process, and the antibodies used to detect markers of these cell types.

Cell Type	Growth Factor used for Differentiation*	Antibody Markers**
 <p>Myocytes</p>	FGF basic (HZ-1285)	Alpha actinin
	FGF-4 (HZ-1218)	Calponin
	FGF-8b (HZ-1103)	Myosin Light Chain 2/MLC-2V
	TGF-beta (HZ-1011)	SMA
	PDGF-bb (HZ-1308)	SMMHC
 <p>Chondrocytes</p>	IL-6 (HZ-1019)	Troponin I
	FGF basic (HZ-1285)	Annexin VI
	FGF-4 (HZ-1218)	CD44
	FGF-8b (HZ-1103)	CD151
	TGF-beta 1 (HZ-1011)	FOXC1
	TGF-beta 2 (HZ-1092)	FOXC2
	TGF-beta 3 (HZ-1090)	ITM2A
	BMP-2 (HZ-1128)	SOX5
	BMP-4 (HZ-1045)	SOX6
BMP-7 (HZ-1229)	SOX9	
 <p>Osteocytes</p>	FGF basic (HZ-1285)	Biglycan
	TGF-beta (HZ-1011)	Fibronectin
	BMP-2 (HZ-1128)	MEPE
	BMP-4 (HZ-1045)	Podoplanin
		Sclerostin
 <p>Adipocytes</p>		SPARC
		Adiponectin
	FGF basic (HZ-1285)	CD36
	TGF-beta (HZ-1011)	CLTCL1
	BMP-2 (HZ-1128)	DLK1
	BMP-4 (HZ-1045)	DLK2
BMP-7 (HZ-1229)	HOXC8	
	PPAR γ	

* Growth-factors found at ptglab.com using the catalogue numbers provided. **Conjugated and unconjugated versions available at ptglab.com

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