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Stem Cell Culture

High Purity | Superior Biological Activity | Excellent Lot-to-Lot Consistency
Complete Species & Specifications | Low Endotoxin Level



About Stem Cell Culture

Stem cells are capable of differentiating into different types of cells in the body and have unique abilities to self-renew and regenerate functional tissues. There are several main types of stem cells, including pluripotent stem cells (PSCs), which consist of embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs), as well as nonembryonic or somatic stem cells (commonly called adult stem cells, ASCs). Stem cells require a combination of growth factors and nutrients to maintain differentiation and development.

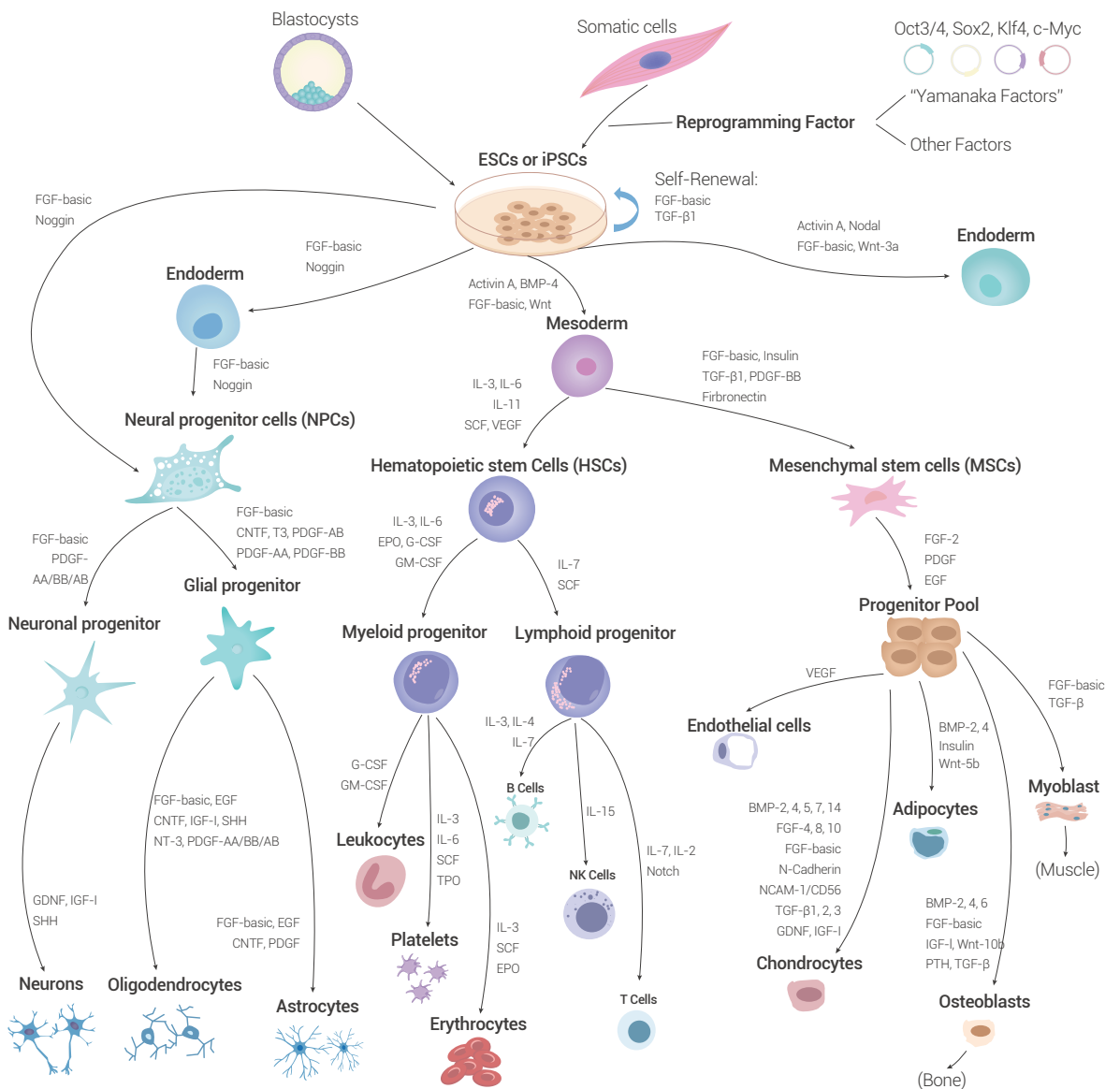


Figure 1. ESCs or iPSCs differentiate into a wide variety of cell types.

Hot Cytokines About Stem Cell Research

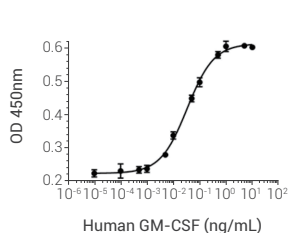
· Superior biological activity, high purity, low endotoxin level · Complete species and specifications · RUO/Animal-Free

	Name/ Cat. No.	HSCs	ESCs	NSCs	iPSCs	MSCs	Function
FGF	FGF-2 HY-P7004	✓	✓	✓	✓	✓	Fibroblast factors promote proliferation and division of a variety of cells, and can also maintain the undifferentiated state and differentiation potential of pluripotent stem cells in stem cell culture.
EGF	EGF HY-P7109	✓	✓	✓	✓	✓	A growth factor for epithelial tissues. Binding to EGF receptors, induces hyperplastic changes.
TGF-β	TGF-β1 HY-P7118	✓	✓			✓	It regulates cell growth, proliferation, differentiation, and immune function. Additionally, it can induce the directional differentiation of various MSCs and regulate immunosuppressive functions.
	TGF-β3 HY-P7120					✓	Transmits signals through the same receptors as TGF-β1 and produces similar biological functions.
	BMP-4 HY-P7007		✓		✓	✓	Plays a vital role in embryogenesis, development and maintenance of tissue homeostasis. Widely applied to induce the differentiation of iPSCs and ESCs for generating hepatocytes.
	Activin A HY-P70311		✓				Regulates the growth and differentiation of a variety of cells and can be used to induce differentiated ESCs to form endoderm.
CSF	SCF HY-P70781	✓					An important hematopoietic factor that mainly acts on early hematopoietic stem cells and primitive hematopoietic progenitor cells, and induces the survival, proliferation and differentiation of these cells.
	Flt3-ligand HY-P7111	✓					Promotes regeneration and differentiation of hematopoietic stem cells and their progenitor cells by working synergistically with other CSFs and interleukins.
	GM-CSF HY-P7016C	✓					A hematopoietic growth factor, mainly involved in the generation of granulocytes and monocytes, and stimulating the proliferation and differentiation process from myeloid stem cells to mature granulocytes.
	G-CSF HY-P70422	✓					Mainly acts on the proliferation, differentiation and activation of hematopoietic cells.
	M-CSF HY-P7050	✓					Induces hematopoietic stem cells to proliferate and differentiate into macrophages and participate in the generation of monocytes.
	LIF HY-P7049		✓		✓		Inhibit the spontaneous differentiation of stem cells and keep them in an undifferentiated state, thus maintaining the pluripotent phenotype of stem cells.
	TPO HY-P70637A	✓					Regulates the proliferation and differentiation of hematopoietic progenitor cells into mature megakaryocytes and promotes platelet production.
Others	VEGF165 HY-P7110A	✓					Plays a role in bone formation, regulates MSCs differentiation, and serves as a survival factor for chondrocytes, hematopoietic stem cells, and tumor cells.
	FGF-8b HY-P70533			✓			Commonly used to induce differentiation of PSCs into neural cell types and brain organoid cultures.
	IL-6 HY-P7044	✓					A multifunctional cytokine that promotes B cell differentiation and synergizes with IL-3 in megakaryocyte development and platelet production.

Name/ Cat. No.	ESCs	NSCs	iPSCs	MSCs	Function
CNTF HY-P7145			✓	✓	A pluripotent neurotrophic factor that plays a role in neurogenesis and NSCs differentiation, often used to differentiate human hPSCs-derived neural progenitor cells into astrocytes.
Noggin HY-P70558				✓	Endogenous inhibitor of bone morphogenetic protein, regulating cell differentiation, proliferation and apoptosis.
R-spondin-1 HY-P7114	✓			✓	Secreted activator of the canonical Wnt signaling pathway, widely used in adult stem cell-derived organoid culture, intestinal organoid culture, hematopoietic stem cells and other iPSCs culture.
PDGF-BB HY-P7055				✓	Plays an important role in embryonic development, cell proliferation, cell migration and angiogenesis. It is a potent mitogen for cells of mesenchymal origin.
Others HGF HY-P7121				✓	The HGF/Met signaling pathway promotes hepatocyte regeneration from stem and progenitor cells.
Wnt-3a HY-P70453B				✓	Involved in regulating cell development, proliferation, differentiation, adhesion, polarity, cell-cell communication, survival and self-renewal functions.
Laminin 521 HY-P701311		✓		✓	Can be used as a substrate for feeder-free culture of human ESCs and iPSCs in combination with specific maintenance media.
SHH HY-P7407			✓	✓	A member of the Hedgehog family. SHH signaling is important for the derivation of neural cell types from iPSCs.
Vitronectin HY-P70485		✓		✓	It can effectively combine with the extracellular matrix, support cell adhesion by combining with various integrins and other proteoglycans, promote cell adhesion, and maintain the "stemness" of stem cells.

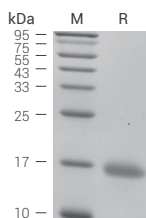
Activity Validation

· GM-CSF Protein, Human



Superior Biological Activity

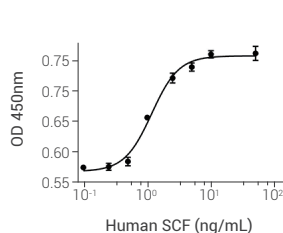
The ED₅₀ is 26.66-33.71 pg/mL measured in a cell proliferation assay using TF-1 human erythroleukemic cells.



High Purity

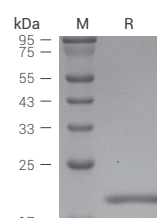
Greater than >95% as determined by reducing SDS-PAGE

· SCF Protein, Human



Superior Biological Activity

The ED₅₀ is 1-5 ng/mL measured in a cell proliferation assay using TF-1 human erythroleukemic cells.



High Purity

Greater than >95% as determined by reducing SDS-PAGE

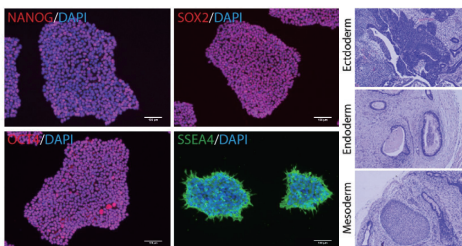
Hot Selling Kits for Stem Cell Research

· 220+ Ready-to-Use Kits · 5,000+ References · 30,000+ IF · Molecular & Proteins & Cells-Related Kits

Product Name	Cat.No.	Application
Stem cell Basement Membrane Matrix	HY-K6006	It is primarily composed of natural basement membrane matrix extracted from mouse tumors, mainly used for stem cells culture.
CEPT Cocktail	HY-K1043	CEPT Cocktail is composed of CET small molecules (Chroman 1, Emricasan, and Trans-ISRIB) and Polyamine Solution, and can effectively enhance cell survival and promote clonal growth of genetically stable hPSCs.
Serum/Protein-Free Cell Freezing Medium	HY-K1012	Serum/Protein-Free Cell Freezing Medium is a complete ready-to-use cryopreservation medium. It is suitable for the cryopreservation of conventional mammalian cells and serum-free cultured cells.
BM-Cyclin	HY-K1059	BM-Cyclin mainly contains Tiamulin fumarate and Minocycline hydrochloride. It can effectively inhibit and remove mycoplasma contamination widespread in cell cultures without affecting cell status, and has a certain clearance effect on common Gram-negative and positive bacteria.
Penicillin-Streptomycin (100 ×), Sterile	HY-K1006	Penicillin-Streptomycin (100×), Sterile is a filtered and sterilized bispecific antibody solution that can be used directly in cell culture.
Antibiotic-Antifungal (100 ×), Sterile	HY-K1058	Antibiotic-Antifungal (100 ×), Sterile contains 10 KU/mL of penicillin, 10 mg/mL of streptomycin, and 25 µg/mL of Amphotericin B. The antibiotics penicillin and streptomycin prevent bacterial contamination, and Amphotericin B prevents fungal contamination.

Customer Validation

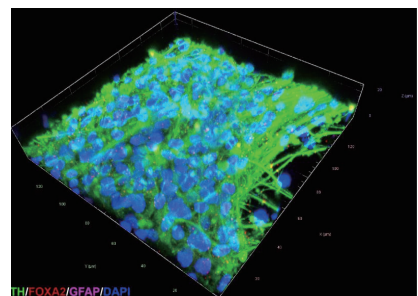
Generation of a human induced pluripotent stem cell line



Source: **Stem Cell Res.** 2022 Apr;60:102676.

iPSC was generated from PBMCs and reprogrammed. PBMCs were isolated and cultured for 10 days in Serum-free media (SFM), supplemented with 10 ng/mL IL-3 (HY-P7040), IL-6 (HY-P7044A), SCF (HY-P70781) and Flt3 (HY-P70178). This iPSC line expressed pluripotency that was confirmed by immunofluorescence staining [16].

iPSC-derived high-purity mesDA neurons



Source: Customer submission reviews

iPSCs are derived into highly pure mesDA neurons under culture conditions containing SHH (HY-P7407) and other related factors.

Small Molecules for Stem Cell Research

Product Name	Cat.No.	Description
LDN 193189	HY-12071	A selective BMP I inhibitor that inhibits transcriptional activity of the BMP type I receptors ALK2 and ALK3.
CHIR 99021	HY-10182	A selective GSK-3 α / β inhibitor and Wnt/ β -catenin signaling pathway activator that enhances mouse and human embryonic stem cells self-renewal, reprograms human cells into iPSC.
SB 431542	HY-10431	TGF- β 1, ALK4 and ALK7 inhibitor that improves the efficiency of iPSC generation from human myoblasts; Induced human pluripotent stem to differentiate into islet cells and functional nerve cells.
XAV 939	HY-15147	Tankyrase inhibitor that inhibits Wnt signaling; Promoted differentiation of ESCs into cardiomyocytes; An enhancer of osteoblastic differentiation of hMSCs.
Y-27632	HY-10071	Selective ROCK inhibitor, combined with CHIR99021, RepSox, Forskolin, SP 600125, Go 6983, and VPA and reprogramme fibroblasts into mature neurons.
A-83-01	HY-10432	TGF- β type I receptor (ALK 5, ALK 4, and ALK 7) inhibitor . Inhibits spontaneous differentiation and improves the efficiency of clonal expansion, helping to maintain the rat-induced pluripotent stem cells (riPSC) in a pluripotent state.
RepSox	HY-13012	TGF- β type I receptor/ALK 5 inhibitor, triggers an endogenous switch in partially reprogrammed cells via Nanog expression, resulting in fibroblasts reprogram.



MedChemExpress also provides GMP-grade small molecules, which can be used as ancillary reagents in cell therapy production to ensure the safety of cell therapy.

References

- [1] Stem Cell Res Ther. 2019;10(1):68.
- [2] Prog Mol Biol Transl Sci. 2018;160:1-22.
- [3] Development. 2013;140(12):2457-61.
- [4] Stem Cells and the Future of Regenerative Medicine. CHAPTER THREE, Embryonic Stem Cells; 2002.
- [5] Haematologica. 2021 Apr 1;106(4):947-957.
- [6] Stem Cell Res. 2022 Apr;60:102676.

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