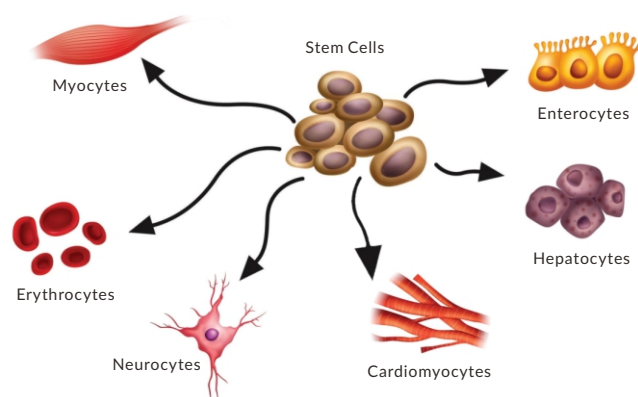


Cell Induction and Differentiation

I Technology Overview

With the advancement of research on stem cells and regenerative medicine (the use of stem cells as a treatment for various diseases), humans have also made significant progress in the technical field of inducing stem cell differentiation. Stem cell induction and differentiation is an important area in stem cell research. At present, stem cells can be targeted to induce osteoblasts, chondrocytes, adipocytes, neurocytes, cardiomyocytes, vascular endothelial cells, etc. And these differentiated cells will be used in many ways.

For example, the cardiomyocytes induced from stem cells could be used in a tissue scaffold and produce a fully functional heart for people who need a heart replacement.



II Product Introduction

There are many ways to achieve cell differentiation, including exogenous molecules inducement, transgene inducement, and inducement by co-culture of stem cells with other cells. Among them, stem cell induction by adding exogenous small molecule compounds is the most researched and fruitful method.

In addition to directed differentiation, small molecule compounds also play an important role in maintaining cell stemness. Stem cells have the potential of self-differentiation both in vivo and in vitro, and are easily differentiated into other cells. Keeping stem cells from differentiation during in vitro proliferation is an issue of importance. In the study of maintaining the pluripotency of ESCs, some researchers found that with the presence of exogenous small molecules, stem cells can retain the potential of differentiation. Undoubtedly, more and more small molecule compounds are used as tools to maintain or regulate stem cells. These small molecules can precisely control embryo formation and determine cellular life cycle and differentiation. Choosing the right small molecule compounds for cell reprogramming, self-renewal and differentiation is the key to the success of the entire project.

1) Reprogramming:

Traditionally, induced pluripotent stem cells (iPSC) are obtained by exogenous expression of specific multifunctional genes induced by viral or non-viral vectors. This method has a relatively low induction efficiency and a high risk in clinical applications. Alternatively, small molecule compounds greatly improved stem induction efficiency and even made iPSC more predictable, resulting in a safer clinical application.

Reprogramming

ID	CAS	Products
T6337	446859-33-2	ALK5 Inhibitor (RepSox)
T2155	1226056-71-8	Thiazovivin (Tzv)
T2939	66575-29-9	Forskolin

ID	CAS	Products
T6292	102052-95-9	3-Deazaneplanocin A (DZNep)
T2038	48208-26-0	RG108
T6189	391210-10-9	Pd0325901

ID	CAS	Products
T2040	300586-90-7	OAC-1
T1959	1392399-03-9	BIX01294 3HCl
T2247	142273-20-9	Kenpaullone

2) Stemness Maintenance:

Stem cells are easily differentiated into other cells. How to maintain their stemness is an important issue. Due to the limitation of the cell culture system that maintains stem cells, the experimental results lack stability. However small molecule compounds are easy to manipulate. CHIR99021, PD0325901, and SB203580 have been used to maintain the self-renewal of embryonic stem cells (ESC) and induced pluripotent stem cells (iPSC), extending our understanding to the pluripotency of mouse and human stem cells.

Stemness Maintenance

ID	CAS	Products	ID	CAS	Products	ID	CAS	Products
T2642	219580-11-7	PD173074	T2623	167869-21-8	PD98059	T2310	252917-06-9	CHIR99021 (GSK-3 Inhibitor XVI)
T2633	864082-47-3	GSK429286A	T1726	301836-41-9	SB431542	T1917	667463-62-9	BIO (GSK-3 Inhibitor IX)
T1725	129830-38-2	Y-27632 Dihydrochloride	T3031	909910-43-6	A83-01	T3077	280744-09-4	SB216763

3) Cell Differentiation:

The development of Biochemistry has introduced a variety of biologically active small molecules for stem cell research. Small molecules are increasingly being used in stem cell research with their advantages. Simply adding or removing some cytokines or small molecules during the cell culture process can guide the proliferation or differentiation of stem cells.

Neural Differentiation

ID	CAS	Products
T6202	208255-80-5	DAPT (GSI-IX)
T6063	209984-57-6	LY411575
T1810	483367-10-8	Purmorphamine

Neural Differentiation

ID	CAS	Products
T1935	1062368-24-4	LDN193189
T4968	1262770-73-9	KHS101
T1878	284028-89-3	XAV939

Myocardial Differentiation

ID	CAS	Products
T1339	320-67-2	5-Azacytidine
T1764	152121-47-6	SB203580
T2169	3690-10-6	Zebularine

Hepatic Differentiation

ID	CAS	Products
T1393	156-54-7	Sodium Butyrate
T2102	2719-05-3	FH1
T2292	957485-64-2	FPH2 (BRD-9424)

Pancreatic Differentiation

ID	CAS	Products
T2008	154447-36-6	LY294002
T2825	4449-51-8	Cyclopamine
T0934	98-92-0	Nicotinamide

Osteogenic Differentiation

ID	CAS	Products
T1076	50-02-2	Dexamethasone
T1477	2627-69-2	AICAR (Acadesine)
T1748	4727-31-5	Kartogenin

More Services

In addition to the above small molecule inhibitors that maintain cell stemness or induce cell differentiation, TargetMol® will provide you with a series of small molecule compound libraries for cell differentiation to meet your needs of research.

ID	Products	Features
L4000	Bioactive Compound Library	Clear targets with comprehensive information. Especially suitable for drug repurposing, induction of cell differentiation by small molecules, or confirmation of protein targets in mechanism research.
D7800	Bioactive Compound Library plus	A supplementary for L4150 Bioactive Compound Library Supplement. All compounds have clear targets and have gone through activity verification. They are more novel than Approved Drug Libraries and are effective tools to facilitate the discovery of new drugs.
L4150	Bioactive Compound Library Supplement	Selected from the Bioactive Compound Library Plus. Without reducing the targets, 1-15 compounds with the highest score for each target were selected. The compounds were evaluated based on activity value, pharmacological properties, structural diversity, etc. The compounds have structures that are more novel than the ones of known drugs. They have more activity information than drug-like compounds and have a higher screening hit rate. It is a powerful tool for new drug discovery and target identification.
L1000	Approved Drug Library	Molecules gone through clinical experiments tests, with biological activities and safety verified. Approved Drug Library can shorten the new drug discovery cycle, save costs of research and development, and greatly improve the success rate of drug development.
L4200	FDA-Approved Drug Library	Compounds approved by the FDA and each has an FDA approval number. With highly biological activity, clear target information, better safety and bioavailability, the FDA-Approved Drug Library is an effective tool for drug repurposing and new drug target screening.
L6000	Natural Product Library for HTS	With known bioactivity, novel structure, and diversity structure, the Natural Compound Library is very cost-effective and will save your experiment cost.

Targetmol Chemicals Inc.

— Drug Screening Expert (Inhibitors, Natural Products, Compound Libraries)

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