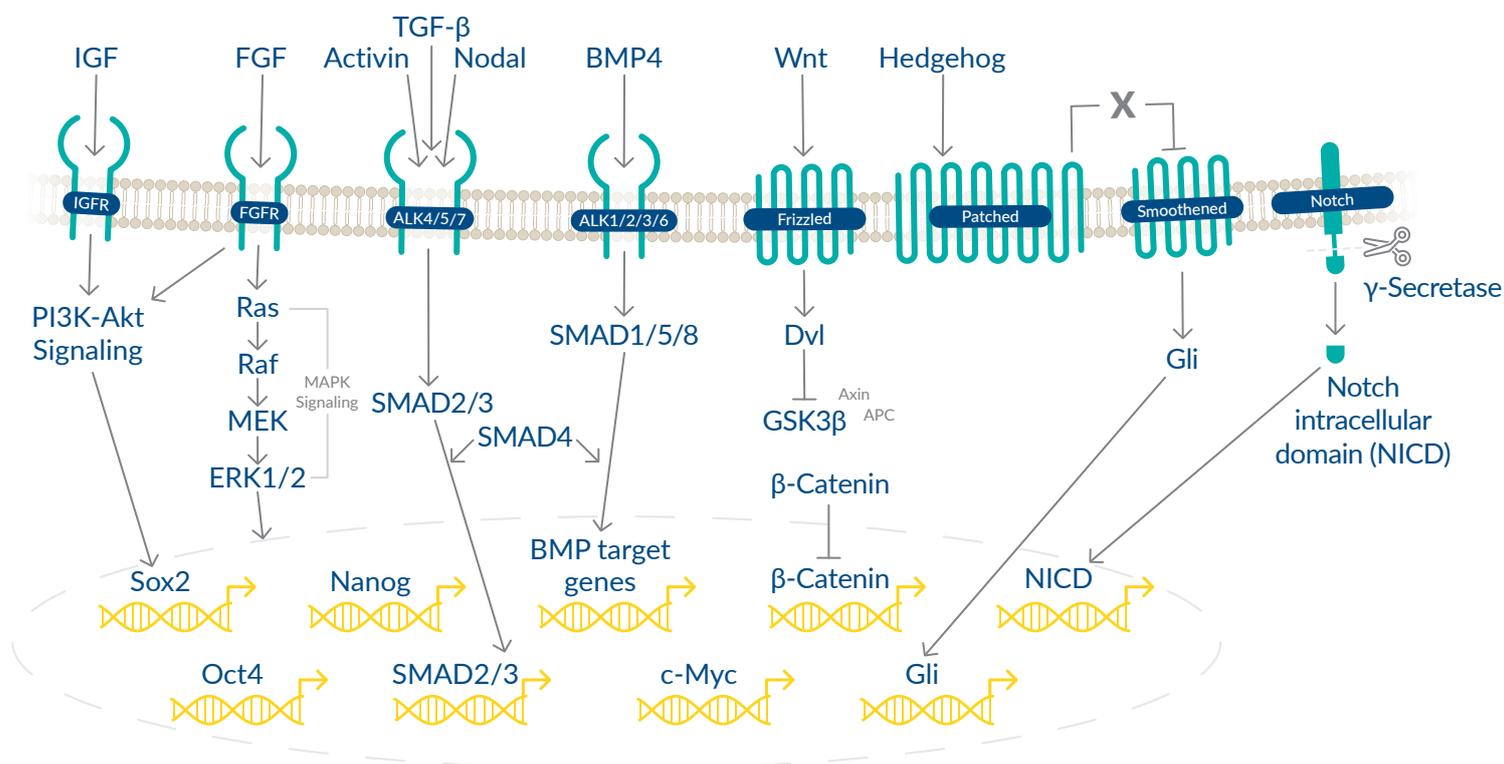


# Stem Cell Research



Cayman offers small molecule modulators of stem cell differentiation, renewal, and proliferation, as well as reprogrammers of differentiated cells back to pluripotent cells. This product line includes activators and inhibitors of the Wnt, TGF- $\beta$ , BMP4, hedgehog, Notch, and growth factor signaling pathways, as well as compounds to control apoptosis occurring during stem cell self-renewal and proliferation.

Tools to study transcription factor activation and antibodies against various stem cell markers and intracellular signaling components are also available.



Signaling pathways regulating pluripotency and differentiation of stem cells

## Small Molecule Inhibitors and Activators

### Growth Factor Signaling/MAPK Pathway

Item No.	Product Name	Summary
17254	Compound 56	EGFR inhibitor ( $IC_{50}$ = 6 pM); induces differentiation of rat mesenchymal stem cells
31561	Ganglioside $G_{O1b}$ (bovine) (ammonium salt)	Promotes differentiation of murine embryonic stem cells (mESCs) to neuronal precursor and glial cells <i>via</i> activation of the ERK1/2 pathway
10010268	Lavendustin A	EGFR inhibitor ( $IC_{50}$ = 11 nM); induces differentiation of rat mesenchymal stem cells
10006726	PD 98059	Prevents the activation of MEK by Raf or MEK kinase ( $IC_{50}$ = 2-7 $\mu$ M)
13032	PD 173074	Selective inhibitor of FGFR tyrosine kinase activity, blocking autophosphorylation of FGFR1 ( $IC_{50}$ = 21.5 nM)
13034	PD 0325901	Potent MEK inhibitor that suppresses phosphorylation of ERK
10009557	SC-1	Inhibits RasGAP and ERK1 ( $K_s$ = 98 and 212 nM, respectively), promoting self-renewal and blocking differentiation
13182	SU 5402	An inhibitor of VEGFR2, FGFR1, and PDGFR $\beta$ ( $IC_{50}$ s = 0.02, 0.03, and 0.51 $\mu$ M, respectively)

## Activin/Nodal/TGF- $\beta$ Pathway

Item No.	Product Name	Summary
9001799	A 83-01	Inhibits ALK4, ALK5, and ALK7 ( $IC_{50}$ s = 45, 12, and 7.5 nM, respectively)
14794	ALK5 Inhibitor II	Selectively inhibits ALK5; induces stem cell pluripotency by replacing the reprogramming transcription factor Sox2 <i>via</i> inhibition of the TGF- $\beta$ signaling pathway and induction of Nanog transcription (also known as RepSox)
13816	IDE1	Induces differentiation by activating the TGF- $\beta$ signaling pathway ( $EC_{50}$ = 125.5 nM <i>in vitro</i> )
13817	IDE2	Induces differentiation by activating the TGF- $\beta$ signaling pathway ( $EC_{50}$ = 223 nM <i>in vitro</i> )
13031	SB-431542 (hydrate)	Selectively inhibits ALK5 ( $IC_{50}$ = 94 nM), suppressing stem cell renewal and promoting differentiation
11793	SB-505124	Inhibits ALK4, ALK5, and ALK7, blocking activation of SMAD2/3
15945	SMAD3 Inhibitor, SIS3	Inhibits TGF- $\beta$ /activin signaling by inhibiting SMAD3 phosphorylation ( $IC_{50}$ = 3 $\mu$ M)

## BMP4 Pathway

Item No.	Product Name	Summary
16679	DMH1	Inhibits the kinase activity of ALK2 ( $IC_{50}$ = 13-108 nM)
11967	Dorsomorphin	Inhibits the BMP type I receptors ALK2, ALK3, and ALK6
16678	K02288	Inhibits ALK1 and ALK2 ( $IC_{50}$ s = 1.8 and 1.1 nM, respectively) and prevents BMP4-induced SMAD1/5/8 pathway activation
11802	LDN-193189	Inhibits ALK1, ALK2, ALK3, and ALK6 ( $IC_{50}$ s = 0.8, 0.8, 5.3, and 16.7 nM, respectively)
29904	SJ000291942	Activates BMP4 and increases expression of BMP target genes

## Wnt/ $\beta$ -Catenin Pathway

Item No.	Product Name	Summary
16733	1-Azakenpaullone	Inhibits GSK3 $\beta$ ( $IC_{50}$ = 18 nM)
13123	BIO	Reversibly inhibits GSK3 $\alpha$ and GSK3 $\beta$ ( $IC_{50}$ = 5 nM for both)
13122	CHIR99021	Selectively inhibits GSK3 $\alpha$ and GSK3 $\beta$ ( $IC_{50}$ s = 10 and 6.7 nM, respectively)
20573	CP21R7	Selectively inhibits GSK3 $\beta$
13951	IWP-2	Inactivates PORCN and inhibits Wnt production, impairing Wnt pathway activity <i>in vitro</i> ( $IC_{50}$ = 27 nM)
13954	IWP-4	Inactivates PORCN and inhibits Wnt production, impairing Wnt pathway activity <i>in vitro</i> ( $IC_{50}$ = 25 nM)
13659	IWR-1-endo	Inhibits Wnt/ $\beta$ -catenin pathway in cells ( $IC_{50}$ = 180 nM) by stabilizing the destruction complex
14315	KY 02111	Promotes the differentiation of human pluripotent stem cells by inhibiting Wnt signaling
10011251	TWS119	Inhibits GSK3 $\beta$ ( $IC_{50}$ = 30 nM)
19903	Wnt Agonist I	Cell-permeable activator of Wnt signaling that does not inhibit GSK3 $\beta$
16644	Wnt-C59	Inhibits PORCN, preventing Wnt activation
13596	XAV939	Inhibits TNKS1 and TNKS2 ( $IC_{50}$ s = 11 and 4 nM, respectively), increasing protein levels of the axin-GSK3 $\beta$ complex

## Stem Cell Small Molecule Screening Library (96-Well)

Item No. 9001827

- Contains >140 small molecules in two 96-well plates
- Includes compounds that induce differentiation, maintain self-renewal and proliferation, or improve the reprogramming efficiency of various stem cell populations



## Hedgehog Pathway

Item No.	Product Name	Summary
11321	Cyclopamine	Inhibits signaling through the hedgehog pathway at the level of Smo
13841	GANT 61	A Gli antagonist that inhibits Gli1 activation of gene expression ( $IC_{50} = 5 \mu\text{M}$ )
14933	SANT 1	Inhibits hedgehog signaling by directly antagonizing Smo ( $IC_{50} = 20 \text{ nM}$ )
14193	GANT 58	A Gli antagonist that inhibits Gli1-mediated transcription ( $EC_{50} = 5 \mu\text{M}$ )
20103	20(S)-hydroxy Cholesterol	An allosteric agonist of Smo that activates the hedgehog signaling pathway ( $EC_{50} = \sim 3 \mu\text{M}$ )
10009634	Purmorphamine	A Smo agonist that promotes differentiation
11914	SAG	A Smo agonist ( $EC_{50} = 3 \text{ nM}$ ) that inhibits hedgehog signaling at high concentrations ( $>1 \mu\text{M}$ )

## Notch Pathway

Item No.	Product Name	Summary
27919	Crenigacestat	An orally bioavailable Notch inhibitor
15579	Compound E	Inhibits $\gamma$ -secretase, blocking the cleavage of the Notch carboxy-terminal fragment ( $IC_{50} = \sim 0.3 \text{ nM}$ )
13197	DAPT	Inhibits $\gamma$ -secretase, thereby indirectly inhibiting Notch
14627	DBZ	An inhibitor of $\gamma$ -secretase that blocks cleavage of Notch into its active signaling effector
21272	FLI-06	A first-of-its-kind Notch signaling inhibitor that disrupts the intracellular trafficking and processing of the Notch signaling pathway

## Controlling Stem Cell Apoptosis

Item No.	Product Name	Summary
18168	A-419259 (hydrochloride)	A Src family kinase inhibitor that prevents differentiation while maintaining pluripotency in embryonic stem cells
16372	Dihydrolipoic Acid	Triggers apoptosis of mouse embryonic stem cells and human cancer cells, suppressing proliferation
16257	ICG-001	A disruptor of Wnt/ $\beta$ -catenin signaling that selectively induces apoptosis in transformed cells and has been studied in the context of regulating cancer stem cells
16161	PluriSn 1	Selectively induces ER stress and induces apoptosis in human pluripotent stem cells while sparing progenitor and differentiated cells
15378	Siomycin A	Inhibits FoxM1, preventing proliferation and inducing apoptosis in certain types of stem cells as well as cancer cells
10005583	Y-27632 (hydrochloride)	A ROCK inhibitor that blocks apoptosis of dissociated cultured human embryonic stem cells, increasing cloning efficiency by 25% and sustaining survival up to 30 passages

## Study Transcription Factor Activation in Cells

*Sensitive, non-radioactive assays for detecting transcription factors*

### STAT3 Transcription Factor Assay Kit

Item No. 601950

- Detect specific STAT3 DNA binding activity in nuclear extracts
- DNA-coated 96-well plate with high binding capacity
- Highly specific monoclonal antibody provides excellent signal to background ratio

### Oct4 Transcription Factor Assay Kit

Item No. 601080

- Detect Oct4 from whole cell lysates
- Capture the transcription factor using a specific dsDNA sequence bound to the 96-well plate
- Detect the dsDNA-bound transcription factor with specific antibodies

View additional STAT3 Assay Kits at [www.caymanchem.com](http://www.caymanchem.com)

# Antibodies for Stem Cell Research

## Cell Surface Markers

Item No.	Product Name	Species Reactivity	Application(s)	Summary
32201	CD31 Rabbit Monoclonal Antibody	(+) Human	IHC, WB	Surface marker of human and mouse embryonic stem cells
38094	CD31 Rabbit Monoclonal Antibody (Clone 007)	(+) Human	ICC, IF	
10004835	CD34 Monoclonal Antibody (Clone ICO-115)	(+) Human	FC, ICC	Surface marker of hematopoietic stem cells, satellite, and endothelial progenitor cells
32245	CD34 (C-Term) Rabbit Monoclonal Antibody	(+) Human, mouse, and rat	IHC, WB	
10004597	CD45 Monoclonal Antibody (Clone BRA-55)	(+) Human	FC, ICC, IHC, WB	Surface marker of white blood cell progenitors
32236	CD45 (C-Term) Rabbit Monoclonal Antibody (Clone RM291)	(+) Human	IHC, WB	

## Intermediate Filaments

Item No.	Product Name	Species Reactivity	Application(s)	Summary
29286	Nestin Monoclonal Antibody (Clone 4D11)	(+) Human, mouse, and rat	ICC, IHC, WB	Markers of ectoderm, neural, and pancreatic progenitor cells
20197	Vimentin Monoclonal Antibody (Clone 12E4)	(+) Human	ELISA, IP, WB	
25341	Vimentin Polyclonal Antibody	(+) Human	ELISA, WB	

## Intracellular Signaling

Item No.	Product Name	Species Reactivity	Application(s)
32226	$\beta$ -Catenin Rabbit Monoclonal Antibody	(+) Human	IHC, WB
100029	$\beta$ -Catenin Polyclonal Antibody	(+) Human, bovine, mouse, porcine, and rat	IHC, WB
10822	SMAD1/5/8/9 Polyclonal Antibody	(+) Human, mouse, and rat	WB
10823	SMAD2 Polyclonal Antibody	(+) Human, chicken, mouse, and rat	IHC, WB
10832	SMAD3 Polyclonal Antibody	(+) Human, bovine, canine, mouse, porcine, primate, and rat	IF, IHC, WB
10838	SMAD4 Polyclonal Antibody	(+) Human, new world monkey, mouse, and rat	WB
32227	SMAD4 (C-Term) Rabbit Monoclonal Antibody	(+) Human	IHC, WB
35319	Sox2 (C-Term) Rabbit Monoclonal Antibody	(+) Human	IHC, WB
35812	STAT3 $\alpha/\beta$ (N-Term) Rabbit Monoclonal Antibody	(+) Human	IHC, WB
32212	STAT3 $\alpha/\beta$ (Phospho-Tyr <sup>705</sup> ) Rabbit Monoclonal Antibody	(+) Human	IHC, WB

To view a complete list of our Stem Cell Research products, visit us online at [www.caymanchem.com](http://www.caymanchem.com)