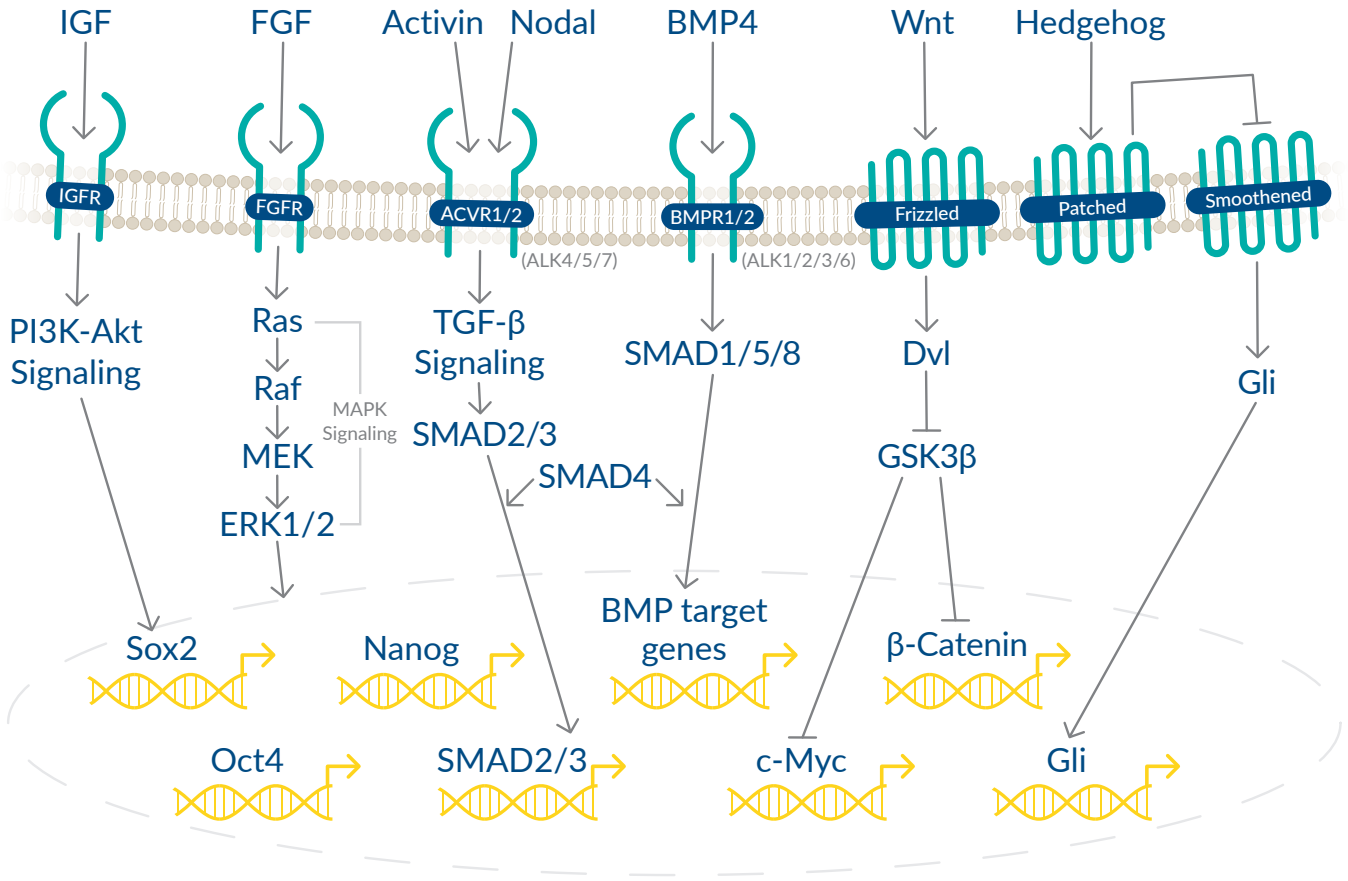
Stem Cell Research

Cayman offers small molecule inducers of stem cell differentiation, stimulators of stem cell renewal and proliferation, and reprogrammers of differentiated cells back to pluripotent cells. This product line includes activators and inhibitors of the Wnt, TGF-β, BMP4, hedgehog, 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 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
15589	Ganglioside G_{Q1b} Mixture (sodium salt)	Promotes differentiation of murine embryonic stem cells (mESCs) to neuronal precursor and glial cells *via* 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 µM)
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_ds = 98 and 212 nM, respectively), promoting self-renewal and blocking differentiation
13182	SU 5402	An inhibitor of VEGFR2, FGFR1, and PDGFRβ (IC_{50}s = 0.02, 0.03, and 0.51 µM, respectively)

Activin/Nodal/TGF-β Pathway

Item No.	Product Name	Summary
9001799	A 83-01	Inhibits ALK4/5/7 (IC_{50}s = 45, 12, and 7.5 nM, respectively) to block the phosphorylation of SMAD2/3
14794	ALK5 Inhibitor II	Induces stem cell pluripotency by replacing the reprogramming transcription factor Sox2 *via* inhibition of the TGF-β signaling pathway and induction of Nanog transcription
13816	IDE1	Induces differentiation by activating the TGF-β signaling pathway (EC_{50} = 125.5 nM *in vitro*)
13817	IDE2	Induces differentiation by activating the TGF-β signaling pathway (EC_{50} = 223 nM *in vitro*)
13031	SB-431542 (hydrate)	Selectively inhibits ALK5 (IC_{50} = 94 nM), suppressing stem cell renewal and promoting differentiation
16281	SB-525334	Inhibits ALK5 (IC_{50} = 14.36 nM), blocking TGF-β1-induced SMAD2/3 activation
15945	SMAD3 Inhibitor, SIS3	Inhibits TGF-β/activin signaling by inhibiting SMAD3 phosphorylation (IC_{50} = 3 µM)

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	Prevents BMP4-induced SMAD1/5/8 pathway activation *in vitro* (IC_{50} = 100 nM) without affecting TGF-β signalingt
11802	LDN-193189	Inhibits SMAD1/5/8 phosphorylation by BMP type I receptors
17698	LDN-212854	Inhibits ALK2 (IC_{50} = 1.3 nM)
18006	LDN-214117	Inhibits ALK1 and ALK2 (IC_{50} = 24 nM for both)
29904	SJ000291942	Activates BMP4 and increases expression of BMP target genes

Wnt/β-Catenin Pathway

Item No.	Product Name	Summary
16733	1-Azakenpaullone	Inhibits GSK3β (IC_{50} = 18 nM)
16728	AZD 2858	Inhibits GSK3β (K_i = 4.9 nM)
13123	BIO	Reversibly inhibits GSK3α and GSK3β (IC_{50} = 5 nM for both)
13122	CHIR99021	Selectively inhibits GSK3α and GSK3β (IC_{50}s = 10 and 6.7 nM, respectively)
20573	CP21R7	Selectively inhibits GSK3β
16153	IQ-1	Alters signaling through Wnt/β-catenin to maintain pluripotency
13951	IWP-2	Impairs Wnt pathway activity *in vitro* (IC_{50} = 27 nM)
13953	IWP-3	Impairs Wnt pathway activity *in vitro* (IC_{50} = 40 nM)
13954	IWP-4	Impairs Wnt pathway activity *in vitro* (IC_{50} = 25 nM)
22729	IWP-12	Inhibits cell-autonomous Wnt signaling (IC_{50} = 15 nM)
13659	IWR-1-endo	Inhibits Wnt/β-catenin pathway in cells (IC_{50} = 180 nM) by stabilizing the destruction 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

Wnt/β-Catenin Pathway *Continued*

Item No.	Product Name	Summary
14315	KY 02111	Promotes the differentiation of human pluripotent stem cells by inhibiting Wnt signaling
16726	Sotrastaurin	Inhibits GSK3α and GSK3β (IC_{50}s = 229 and 172 nM, respectively)
15398	Stauprimide	Inhibits the nuclear localization of NME2, which results in the suppression of c-Myc, a key regulator of pluripotency
10011251	TWS119	Inhibits GSK3β (IC_{50} = 30 nM)
19903	Wnt Agonist I	Cell-permeable activator of Wnt signaling that does not inhibit GSK3β
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-GSK3β complex

Hedgehog Pathway

Item No.	Product Name	Summary
11321	Cyclopamine	Inhibits signaling through the hedgehog pathway at the level of Smo
13841	GANT 61	Gli antagonist that inhibits Gli1 activation of gene expression (IC_{50} = 5 µM)
16164	GSA 10	A Smo agonist that promotes differentiation
9001369	*Nat*-20(S)-yne	A Smo agonist with a terminal alkyne group, which can be used in click chemistry reactions
9002936	PF-04449913	Inhibits hedgehog signaling by binding Smo and blocking signal transduction (IC_{50} = 5 nM)
10009634	Purmorphamine	A Smo agonist that promotes differentiation
11914	SAG	A Smo agonist (EC_{50} = 3 nM) that inhibits hedgehog signaling at high concentrations (>1 µM)

Study Transcription Factor Activation in Cells

Sensitive, non-radioactive assays for detecting transcription factors

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

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-Activating Compounds

Item No.	Product Name
14102	OAC1
14103	OAC2
14104	OAC3
19935	O4I1
19135	O4I2

STAT3 TR-FRET Kits

For rapid, semi-quantitative measurement of STAT3 and/or STAT3 (Phospho-Tyr^{705}) protein levels in cells

Item No.	Product Name
500200	STAT3 (Phospho-Tyr^{705}) TR-FRET Kit
500201	STAT3 (Total) and STAT3 (Phospho-Tyr^{705}) TR-FRET Kit
500202	STAT3 (Total) TR-FRET Kit

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/β-catenin signaling that selectively induces apoptosis in transformed cells and has been studied in the context of regulating cancer stem 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

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
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	(+) Human	IHC, WB	

Intermediate Filaments

Item No.	Product Name	Species Reactivity	Application(s)	Summary
29286	Nestin Monoclonal Antibody	(+) 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	β-Catenin Rabbit Monoclonal Antibody	(+) Human	IHC, WB
100029	β-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
32212	STAT3α/β (Phospho-Tyr^{705}) Rabbit Monoclonal Antibody	(+) Human	IHC, WB

To view a complete list of our Stem Cell Research products, visit us online at **www.caymanchem.com**