

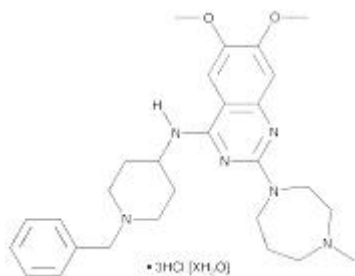
ABM Inc. iPSC Small Molecules

Induced pluripotent stem cell (iPSC) generation, a valuable tool in stem cell research, has traditionally been achieved by the over expression of four of the six iPSC transcription factors. Recent studies, however, have shown that some genetic function of these six iPSC transcription factors required for iPSC generation can be substituted by defined small chemical molecules. Now we know that some small molecules are the key to directly controlling stem cell development and could contribute to the advancement of tissue repair and regeneration.

ABM Inc. developed and distributes small chemical compounds that have been shown to play a role in stem cell and iPSC research. All our molecules are of the highest purity ($\geq 98\%$), structurally verified by NMR and mass spectrometry, and tested for cytotoxicity.

Reprogramming

BIX01294 (Cat No. G608)



2-(hexahydro-4-methyl-1H-1,4-diazepin-1-yl)-6,7-dimethoxy-N-[1-(phenylmethyl)-4-piperidinyloxy]-4-quinazolinamine, trihydrochloride, hydrate

M.W.: 600g/mol

Formula: C₂₈H₃₈N₆O₂

Function: Allows reprogramming via c-Myc, Klf4, and Sox2, in the absence of Oct4 expression. Increases reprogramming efficiency for iPSCs. Histone methyltransferase inhibitor that affects the condensation of chromatin and thereby modulates gene expression.

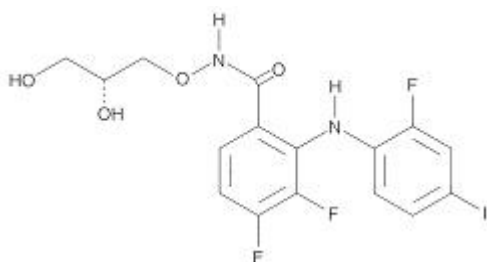
Quality Control: MR and Mass Spectrometry

Purity: $\geq 98\%$

Shelf Life: 2 years

Storage: -20°C

PD0325901 (Cat No. G600)



N-[(2R)-2,3-dihydroxypropoxy]-3,4-difluoro-2-[(2-fluoro-4-iodophenyl)amino]-benzamide

M.W.: 482g/mol (Supplied in 5mg)

Formula: C₁₆H₁₄F₃IN₂O₄

Function: MEK inhibitor that suppresses phosphorylation of ERK in tumors with an IC₅₀ value of 0.33nM. This drug can prevent differentiation and sustain self renewal of stem cells.

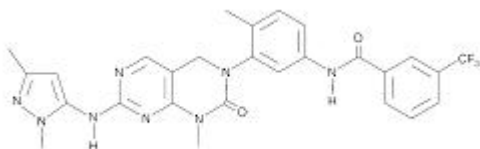
Quality Control: MR and Mass Spectrometry

Purity: ≥98%

Shelf Life: 2 years

Storage: -20°C

Pluripotin/SC-1 (Cat No. G606)



N-(3-(7-(1,3-dimethyl-1H-pyrazol-5-ylamino)-1-methyl-2-oxo-1,2-dihydropyrimido[4,5-d]pyrimidin-3(4H)-yl)-4-methylphenyl)-3-(trifluoromethyl)benzamide

M.W.: 551g/mol

Formula: C₂₇H₂₅F₃N₈O₂

Function: Improves the survival and reprogramming efficiency of hESCs upon trypsinization, in combination with inhibitors of the TGF-beta receptor and the MEK pathway.

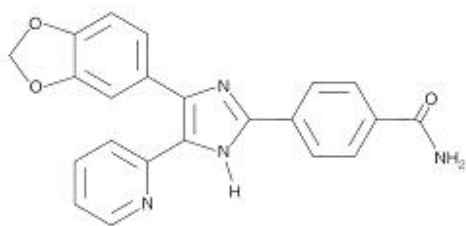
Quality Control: MR and Mass Spectrometry

Purity: ≥98%

Shelf Life: 2 years

Storage: -20°C

SB 431542 (Cat No. G603)



4-(5-Benzol[1,3]dioxol-5-yl-4-pyridin-2-yl-1H-imidazol-2-yl)-benzamide hydrate, 4-[4-(3,4-Methylenedioxyphenyl)-5-(2-pyridyl)-1H-imidazol-2-yl]-benzamide hydrate, 4-[4-(1,3-Benzodioxol-5-yl)-5-(2-pyridinyl)-1H-imidazol-2-yl]-benzamide hydrate

M.W.: 384g/mol (Supplied in 5mg)

Formula: $C_{22}H_{16}N_4O_3$

Function: Inhibits transforming growth factor-beta superfamily type I activin receptor-like kinase (ALK) receptors.

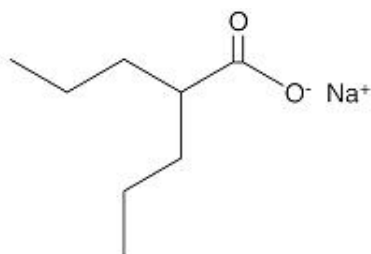
Quality Control: MR and Mass Spectrometry

Purity: $\geq 98\%$

Shelf Life: 2 years

Storage: -20°C

Valproic Acid (Cat No. G601)



2-propyl-pentanoic acid, monosodium salt

M.W.: 167g/mol (Supplied in 10g)

Formula: $C_8H_{16}NaO_2$

Function: Induces Oct4 and Sox2 in somatic cells and enables induction of pluripotent stem cells.

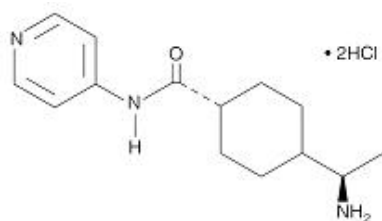
Quality Control: MR and Mass Spectrometry

Purity: $\geq 98\%$

Shelf Life: 2 years

Storage: -20°C

Y-27632 (Cat No. G604)



(R)-(+)-trans-4-(1-Aminoethyl)-N-(4-Pyridyl)cyclohexanecarboxamide

M.W.: 247g/mol (Supplied in 5mg)

Formula: C₁₄H₂₁N₃O

Function: Competitive ROCK (Rho-associated coiled coil forming protein serine/threonine kinase) inhibitor.

Quality Control: MR and Mass Spectrometry

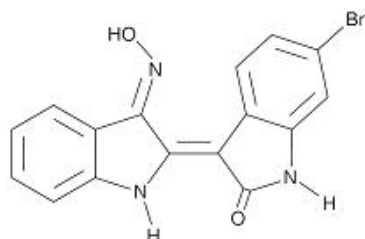
Purity: ≥98%

Shelf Life: 2 years

Storage: -20°C

Renewal

BIO (Cat No. G602)



6-bromo-3-[(3E)-1,3-dihydro-3-(hydroxyimino)-2H-indol-2-ylidene]-1,3-dihydro-(3Z)-2H-indol-2-one

M.W.: 356g/mol (Supplied in 5mg)

Formula: C₁₆H₁₀BrN₃O₂

Function: GSK inhibitor that will result in activating the Wnt pathway. This drug can sustain pluripotency in ESCs, and maintain self-renewal.

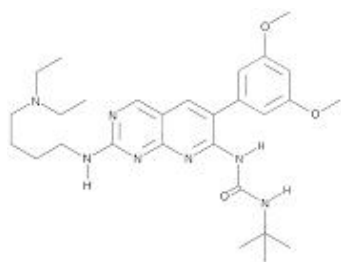
Quality Control: MR and Mass Spectrometry

Purity: ≥98%

Shelf Life: 2 years

Storage: -20°C

PD13032 (Cat No. G605)



N-[2-[[4-(diethylamino)butyl]amino]-6-(3,5-dimethoxyphenyl)pyrido[2,3-d]pyrimidin-7-yl]-N'-(1,1-dimethylethyl)-urea

M.W.: 524g/mol

Formula: C₂₈H₄₁N₇O₃

Function: Decreases propagation and differentiation potential of human multipotent adipose-derived stem cells. Inhibits FGFR1 and VEGFR, leading to suppression of the FGF signalling pathway.

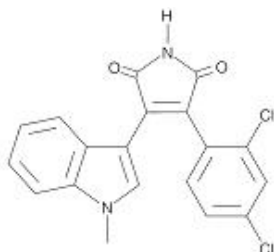
Quality Control: MR and Mass Spectrometry

Purity: ≥98%

Shelf Life: 2 years

Storage: -20°C

SB216763 (Cat No. G607)



3-(2,4-dichlorophenyl)-4-(1-methyl-1H-indol-3-yl)-1H-pyrrole-2,5-dione

M.W.: 371g/mol

Formula: C₁₉H₁₂Cl₂N₂O₂

Function: Aids in proliferation of stem cells. Suppresses the phosphorylation of glycogen synthase by glycogen synthase kinase-3 (GSK-3).

Quality Control: MR and Mass Spectrometry

Purity: ≥98%

Shelf Life: 2 years

Storage: -20°C

ABM Inc. iPSC Growth Factors

Growth factors and cytokines are important signaling molecules that participate in regulating embryonic development, tissue repair, and cellular communication. There are a number of growth factors identified to be crucial for stem cell survival, self-renewal, differentiation, and de-differentiation. Stem cell culture relies heavily on specific growth factor combinations that modulate signaling pathways to sustain stem cell self-renewal states and/or to induce lineage specific differentiations.

ABM Inc. offers high-quality growth factors and cytokines for targeted differentiation of iPSCs. These proteins are extensively tested to ensure high biological activity, high purity, freeze-thaw stability, and structural homogeneity. Our growth factors and cytokines allow you to perform reproducible results in all your stem cell projects without any interference from other protein contaminants.

General Growth Factors

Brain Derived Neurotrophic Factor, BDNF (Cat No. G412)

Organism: Human

Source: Recombinant produced from *E. coli*.

Packaging: 2 and 10µg, Lyophilized

Purity: > 96.0% as determined by RP-HPLC and SDS-PAGE

Function: Promotes the survival of neuronal populations that are all located either in the central nervous system (CNS) or directly connected to it. Major regulator of synaptic transmission and plasticity at adult synapses in many regions of the CNS. The versatility of BDNF is emphasized by its contribution to a range of adaptive neuronal responses including long-term potentiation (LTP), long-term depression (LTD), certain forms of short-term synaptic plasticity, as well as homeostatic regulation of intrinsic neuronal excitability.

Fibroblast Growth Factor-basic, FGFb (Cat No. G408/G409)

Organism: Human/Mouse

Source: Recombinant produced from *E. coli*.

Packaging: 10 and 50µg, Lyophilized

Purity: > 96.0% as determined by RP-HPLC and SDS-PAGE

Function: FGF family members possess broad mitogenic and cell survival activities, and are involved in a variety of biological processes, including embryonic development, cell growth, morphogenesis, tissue repair, tumor growth and invasion. This protein functions as a modifier of endothelial cell migration and proliferation, as well as an angiogenic factor. It acts as a mitogen for a variety of mesoderm- and neuroectoderm-derived cells *in vitro*, thus is thought to be involved in organogenesis. Three alternatively spliced variants encoding different isoforms have been described. The heparin-binding growth factors are angiogenic agents *in vivo* and are potent mitogens for a variety of cell types *in vitro*. There are differences in the tissue distribution and concentration of these 2 growth factors.



Activin A, aka Erythroid Differentiation Protein, EDP (Cat No. G402)

Organism: Human

Source: Recombinant produced from *E. coli*.

Packaging: 2 and 10µg, Lyophilized

Purity: > 95.0% as determined by RP-HPLC and SDS-PAGE

Function: Inhibins are dimeric peptide hormones produced by female ovarian granulosa cells and male Sertoli cells as well as a variety of other tissues. Inhibins have two isoforms, A and B, with the same alpha subunit but different beta subunits. Inhibin A is a dimer of alpha and beta A subunits, inhibin B is a dimer of alpha and beta B subunits. Inhibins are thought to inhibit the production of follicle-stimulating hormone (FSH) by the pituitary gland. In addition, Inhibins are also thought to play a role in the control of gametogenesis, and embryonic and fetal development.

Epidermal Growth Factor, EGF (Cat No. G410/G411)

Organism: Human/Mouse

Source: Recombinant produced from *E. coli*.

Packaging: 100 and 500µg, Lyophilized

Purity: > 98.0% as determined by RP-HPLC and SDS-PAGE

Function: Epidermal growth factor has a profound effect on the differentiation of specific cells *in vivo* and is a potent mitogenic factor for a variety of cultured cells of both ectodermal and mesodermal origin. The EGF precursor is believed to exist as a membrane-bound molecule which is proteolytically cleaved to generate the 53-amino acid peptide hormone that stimulates cells to divide. EGF stimulates the growth of various epidermal and epithelial tissues *in vivo* and *in vitro* and of some fibroblasts in cell culture.

Cardiac Growth Factors

Bone Morphogenetic Protein-2, BMP2 (Cat No. G405)

Organism: Human

Source: Recombinant produced from *E. coli*.

Packaging: 2 and 10µg, Lyophilized

Purity: > 95.0% as determined by RP-HPLC and SDS-PAGE

Function: BMP2 belongs to the transforming growth factor-beta (TGFβ) superfamily. Bone morphogenic protein induces bone formation. BMP2 is a candidate gene for the autosomal dominant disease of fibrodysplasia (myositis) ossificans progressiva.

Bone Morphogenetic Protein-4, BMP4 (Cat No. G406)

Organism: Human

Source: Recombinant produced from *E. coli*.

Packaging: 2 and 10µg, Lyophilized

Purity: > 95.0% as determined by RP-HPLC and SDS-PAGE

Function: The protein encoded by this gene is a member of the bone morphogenetic protein family which is part of the transforming growth factor-beta superfamily. The superfamily includes large families of growth and differentiation factors. Bone morphogenetic proteins were originally identified by an ability of demineralized bone extract to induce endochondral osteogenesis in vivo in an extraskeletal site. This particular family member plays an important role in the onset of endochondral bone formation in humans, and a reduction in expression has been associated with a variety of bone diseases, including the heritable disorder Fibrodysplasia Ossificans Progressiva. Alternative splicing in the 5' untranslated region of this gene has been described and three variants are described, all encoding an identical protein.

Neural Growth Factors

Noggin, NOG (Cat No. G400/G401)

Organism: Human/Mouse

Source: Recombinant produced from *E. coli*.

Packaging: 5 and 20µg, Lyophilized

Purity: > 95.0% as determined by RP-HPLC and SDS-PAGE

Function: The secreted polypeptide noggin, encoded by the NOG gene, binds and inactivates members of the transforming growth factor-beta (TGF-beta) superfamily signaling proteins, such as bone morphogenetic protein-4 (BMP4). By diffusing through extracellular matrices more efficiently than members of the TGF-beta superfamily, noggin may have a principal role in creating morphogenic gradients. Noggin appears to have pleiotropic effect, both early in development as well as in later stages. It was originally isolated from *Xenopus* based on its ability to restore normal dorsal-ventral body axis in embryos that had been artificially ventralized by UV treatment. The results of the mouse knockout of noggin suggest that it is involved in numerous developmental processes, such as neural tube fusion and joint formation. Recently, several dominant human NOG mutations in unrelated families with proximal symphalangism (SYM1) and multiple synostoses syndrome (SYNS1) were identified; both SYM1 and SYNS1 have multiple joint fusion as their principal feature, and map to the same region (17q22) as NOG. All NOG mutations altered evolutionarily conserved amino acid residues. The amino acid sequence of human noggin is highly homologous to that of *Xenopus*, rat and mouse.

Sonic Hedgehog, SHH (Cat No. G403/G404)

Organism: Human/Mouse

Source: Recombinant produced from *E. coli*.

Packaging: 5 and 25µg, Lyophilized

Purity: > 97.0% as determined by RP-HPLC and SDS-PAGE

Function: Sonic Hedgehog is part of a small group of secreted proteins that are vital for development in both vertebrates and invertebrates. 3 mammalian hedgehog genes (sonic, desert, Indian) share about 60% homology. The Human Sonic Hedgehog is 99% homologous to the mouse gene. Sonic Hedgehog is a protein that is vital in guiding the early embryo. It has been associated as the major inductive signal in patterning of the ventral neural tube, the anterior-posterior limb axis, and the ventral somites. Sonic Hedgehog binds to the patched receptor, which functions in association with smoothened, to activate the transcription of target genes. In the absence of sonic Hedgehog, patched receptor represses the constitutive signaling activity of smoothened. Sonic Hedgehog also regulates another factor, the gli oncogene. Sonic Hedgehog intercellular signal is essential for a various patterning events during development: signal produced by the notochord that induces ventral cell fate in the neural tube and somites, and the polarizing signal for patterning of the anterior-posterior axis of the developing limb bud. Sonic Hedgehog exhibits both floor plate- and motor neuron-inducing activity. Mutations in a long-range Sonic Hedgehog enhancer located in an intron of the limb region 1 gene result in preaxial polydactyly.

Mesenchymal Growth Factors

Transforming Growth Factor- β , TGF β (Cat No. G407)

Organism: Human

Source: Recombinant produced from 293 cells.

Packaging: 1 and 5 μ g, Lyophilized

Purity: > 98.0% as determined by RP-HPLC and SDS-PAGE

Function: TGF β mediate many cell-cell interactions that occur during embryonic development. Three TGF β have been identified in mammals. TGF- β 1, TGF- β 2 and TGF- β 3 are each synthesized as precursor proteins that are very similar in that each is cleaved to yield a 112 amino acid polypeptide that remains associated with the latent portion of the molecule.