

Product List Stemgent 2015

Tissue Dissociation

ESC/iPSC Cells, Media & Reprogramming Tools

3D Cell Culture Technology & Cell Culture Models

Recombinant Proteins, Cytokines, Biomatrix Proteins & Elisa

Cell Based Assays & Protein Labeling for Microscopy, FACS and HTS

Cell Culture Tools



PELOBiotech *Competence^h Cells*

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Your
ONE-STOP-
CELL CULTURE
SHOP

Pelobitech offers you a broad range of products for ES/iPS Cells from all members of the Reprcell Family [ReproCell – Stemgent – Reinnervate – BioServe].

Stemgent, Inc. is developing innovative technology and application solutions for the advancement of stem cell research. Stemgent products are designed by leading stem cell researchers worldwide.



Reprogramming Solutions from Stemgent

Through Dr. Shinya Yamanaka’s pioneering work on the reprogramming of somatic cells to a pluripotent-like state the iPS cell has become an invaluable tool for strategies in regenerative medicine, disease modeling, drug discovery, and basic research in cell development.

For a whole range of reprogramming methods, Stemgent provides the quality, knowledge, and expertise you depend on.

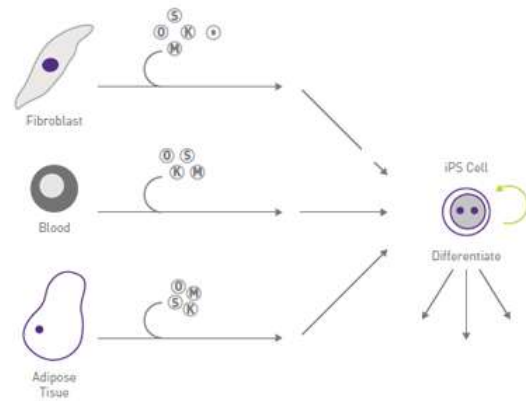


Fig. 1: ©Stemgent

Faster, virus-free reprogramming

- mRNA Reprogramming
- microRNA-Enhanced mRNA reprogramming – even faster

mRNA Reprogramming - Generate colonies in as early as 16 days

The optimized Stemgent mRNA Reprogramming System enables non-viral, non-integrating, clinically-relevant reprogramming of human cells in less than 20 days with an expansion of new lines in culture in as little as 3 weeks. This is a big step forward, compared to lentivirus, Sendai virus, and other methods that can take over 20 weeks to confirm viral remnants no longer remain. Six major steps are required for mRNA reprogramming along with morphology changes of human iPS cells (as shown in timeline below).

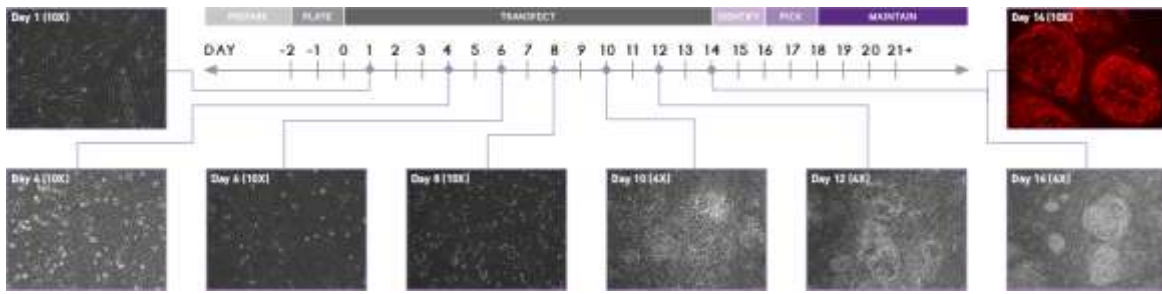


Fig. 2:Phase-contrast images taken on Day 1-12. Phase-contrast image and fluorescent staining of TRA-1-60 taken on Day 14 (© Stemgent, Inc.).

microRNA-Enhanced mRNA reprogramming - Generate colonies in as early as 12 days, faster reprogramming kinetics & higher efficiency

microRNAs play an important role in the maintenance and retention of pluripotency for both ES cells and iPS cells, as ongoing research has demonstrated ^{1,2}. These endogenous, small, non-coding RNAs target and down-regulate mRNAs by blocking gene expression via translational repression or degradation of functionally transcribed mRNAs. In 2012, two groups succeeded in functionally reprogramming human fibroblasts to a pluripotent state in the absence of exogenous reprogramming factor expression, but with the help of specific microRNA combinations ^{3, 4, 5}.

microRNAs induce self-renewal and proliferative networks, inhibit TLR-induced inflammatory cytokine expression, and promote a mesenchymal to epithelial (MET) transition, which is particularly advantageous when working with difficult to reprogram patient samples ^{6, 7}.

Stemgent developed a new microRNA-enhanced mRNA Reprogramming method, which combines the use of the Stemgent mRNA Reprogramming Kit, the Stemgent microRNA Booster Kit, and the Stemfect™ RNA Transfection Kit, to generate high-quality human iPS cell lines. These modifications to the traditional feeder-based mRNA reprogramming protocol results in faster reprogramming kinetics (see timeline Fig. 3), simpler experimental set up simpler, allows for reprogramming more than twice the number of wells (9 wells in 6-well format) and shows higher efficiency. This method is recommended for achieving the best results from your reprogramming experiment when compared to other available reprogramming methods.

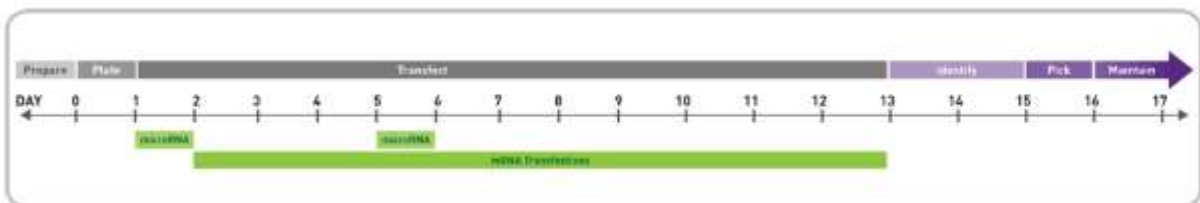


Fig. 3: microRNA enhanced mRNA Reprogramming Timeline. 2 microRNA transfections and 11 mRNA transfections in total are required for this system. By Day 13, emerging iPS cell colonies are often able to be identified by morphology and life staining. But depending on the target cell type, cell colonies may be ready to be picked and replated earlier or later than shown in the timeline (© Stemgent, Inc.).

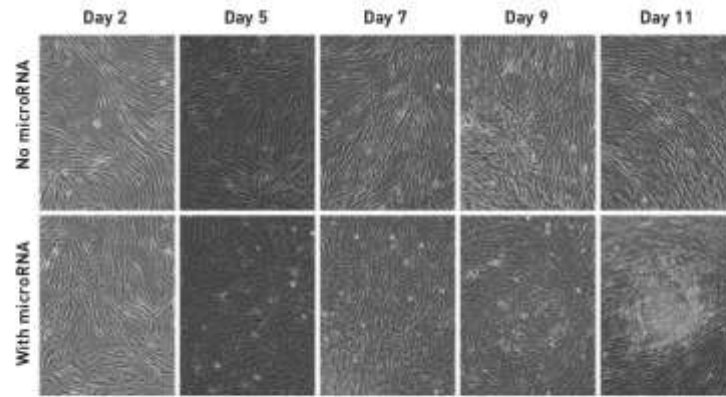


Fig. 4: Morphological progression comparison of diseased patient fibroblasts during reprogramming with and without microRNA: The above panel demonstrates representative morphological progression of adult diseased patient fibroblasts with and without the Stemgent-Asterand microRNA booster cocktail (© Stemgent, Inc.).

1. Takahashi, K., Tanabe, K., Ohnuki, M., Narita, M., Ichisaka, T., Tomoda, K., Yamanaka S. (2007) Induction of pluripotent stem cells from adult human fibroblasts by defined factors. *Cell*, 131 (5): 861 - 872.
2. Yu, J., Vodyanik, M.A., Smuga-Otto, K., Antosiewicz-Bourget, J., Frane, J.L., Tian, S., Nie, J., Jonsdottir, G.A., Ruotti, V., Stewart, R., Slukvin, I.I., Thomson, J.A. (2007) Induced pluripotent stem cell lines derived from human somatic cells. *Science*, 318 (5858): 1917 – 1920.
3. Mallanna, S. and Rizzino, A. (2010) Emerging roles of microRNAs in the control of embryonic stem cells and the generation of induced pluripotent stem cells. *Dev Biol*. 344: 16-25.
4. Anokye-Danso, F., Trivedi, C. M., Juhr, D., Gupta, M., Cui, Z., Tian, Y., Zhang, Y., Yang, W., Gruber, P. J., Epstein, J. A., and Morrissey, E. E. (2011) Highly Efficient miRNA-Mediated Reprogramming of Mouse and Human Somatic Cells to Pluripotency. *Cell Stem Cell*. 8 (4): 376 – 388.
5. Miyoshi, N., Ishii, H., Nagano, H., Haraguchi, N., Dewi, D. L., Kano, Y., Nishikawa, S., Tanemura, M., Mimori, K., Tanaka, F., Saito, T., Nishimura, J., Takemasa, I., Mizushima, T., Ikeda, M., Yamamoto, H., Sekimoto, M., Doki, Y., and Mori, M. (2011) Reprogramming of Mouse and Human Cells to Pluripotency Using Mature MicroRNAs. *Cell Stem Cell* 8: 633 – 638.
6. Liao, B., Bao, X., Liu, L., Feng, S., Zovoilis, Z., Liu, W., Xue, Y., Cai, J., Guo, X., Qin, B., Zhang, R., Wu, J., Lai, L., Teng, M., Niu, L., Zhang, B., Esteban, M. A., Pei, D. (2011) MicroRNA Cluster 302–367 Enhances Somatic Cell Reprogramming by Accelerating a Mesenchymal-to-Epithelial Transition. *The Journal of Biological Chemistry*, 286, 17359 – 17364.
7. Kuo, C-H., Ying, S-Y. (2013) MicroRNA-Mediated Somatic Cell Reprogramming. *Journal of Cellular Biochemistry*, 114:275 – 281.

Products for Reprogramming

- [Reprogramming Systems \(13\)](#)
- [Transfection \(2\)](#)
- [Antibodies \(19\)](#)
- [Cell Lines \(4\)](#)
- [Media \(3\)](#)
- [Cytokines / Proteins \(1\)](#)
- [Small Molecules \(5\)](#)

Catalog #	Brand	Product	Size
Reprogramming Tools			
Reprogramming Systems			
05-0018	Stemgent®	c-Myc mRNA, Human	20 µg
05-0020	Stemgent®	eGFP mRNA	20 µg
05-0015	Stemgent®	Klf4 mRNA, Human	20 µg
05-0022	Stemgent®	L-Myc mRNA, Human	20 µg
05-0017	Stemgent®	Lin28 mRNA, Human	20 µg
00-0073	Stemgent®	microRNA Booster Kit	kit
00-0067	Stemgent®	mRNA Reprogramming Factors Set: hOKSML	1 Set
00-0071	Stemgent®	mRNA Reprogramming Kit	1 kit
00-0071mi	Stemgent®	microRNA-Enhanced mRNA Reprogramming Kit	1 kit
05-0021	Stemgent®	Nanog mRNA, Human	20 µg
05-0019	Stemgent®	nGFP mRNA	20 µg
05-0014	Stemgent®	Oct4 mRNA, Human	20 µg
05-0016	Stemgent®	Sox2 mRNA, Human	20 µg
00-0068	Stemgent®	VSVg Retrovirus Reprogramming Set: Human OKSM	1 set
Transfection			
05-0020	Stemgent®	eGFP mRNA	20 µg
00-0069	Stemfect™	RNA Transfection Kit	1 Kit
Antibodies			
00-0009	Stemgent®	Alkaline Phosphatase Staining Kit	50 assays

Catalog #	Brand	Product	Size
00-0055	Stemgent®	Alkaline Phosphatase Staining Kit II	50 assays
09-0021	Stemgent®	Klf4 Antibody (Purified), Mouse anti-Mouse/Human	100 µl
09-0020	Stemgent®	Nanog Antibody (Affinity Purified), Rabbit anti-Mouse/Human	100 µl
09-0023	Stemgent®	Oct4 Antibody (Affinity Purified), Rabbit anti-Mouse/Human	100 µl
09-0024	Stemgent®	Sox2 Antibody (Affinity Purified), Rabbit anti-Mouse/Human	100 µl
09-0067	StainAlive™	SSEA-1 Antibody (DyLight™ 488), Mouse anti-Mouse/Human	100 µl
09-0095	StainAlive™	SSEA-1 Antibody (DyLight™ 550), Mouse anti-Mouse/Human	100 µl
09-0001	Stemgent®	SSEA-1 Antibody (PE), Mouse anti-Mouse/Human	1 ml
09-0005	Stemgent®	SSEA-1 Antibody (Purified), Mouse anti-Mouse/Human	100 µl
09-0044	Stemgent®	SSEA-3 Antibody (PE), Rat anti-Human	1 ml
09-0014	Stemgent®	SSEA-3 Antibody (Purified), Rat anti-Mouse/Human	100 µl
09-0003	Stemgent®	SSEA-4 Antibody (PE), Mouse anti-Human	1 ml
09-0006	Stemgent®	SSEA-4 Antibody (Purified), Mouse anti-Human	100 µl

Catalog #	Brand	Product	Size
09-0068	StainAlive™	TRA-1-60 Antibody (DyLight™ 488), Mouse anti-Human	100 µl
09-0009	Stemgent®	TRA-1-60 Antibody (PE), Mouse anti-Human	1 ml
09-0010	Stemgent®	TRA-1-60 Antibody (Purified), Mouse anti-Human	100 µl
09-0069	StainAlive™	TRA-1-81 Antibody (DyLight™ 488), Mouse anti-Human	100 µl
09-0011	Stemgent®	TRA-1-81 Antibody (Purified), Mouse anti-Human	100 µl
Cell Lines			
08-0006	Stemgent®	Mouse Primary iPS Cells-T1b	2 x 10 ⁵ cells/vial
08-0007	Stemgent®	Mouse Primary iPS Cells-WP5	2 x 10 ⁵ cells/vial
GSC-3002G	Stemgent®	Stemgent® NuFF-RQ™ IRR	4-5 x 10 ⁶ cells/vial
GSC-3006G	Stemgent®	Stemgent® NuFF-RQ™ IRR	4-5 x 10 ⁶ cells/vial
Media			
01-0014-500	Stemgent®	hES Cell Cloning & Recovery Supplement	5 x 100 µl
00-0070	Pluriton™	Reprogramming Medium	500 ml
01-0005	NutriStem™	XF/FF Culture Medium	500 ml
01-0005-100			100 ml
Cytokines / Proteins			
03-0002	Stemfactor™	FGF-basic, Human Recombinant	50 µg
Small Molecules			
04-0016	Stemolecule™	Doxycycline hyclate	10 mg
04-0017	Stemolecule™	Thiazovivin	1 mg
04-0007	Stemolecule™	Valproic Acid	5 g
04-0012	Stemolecule™	Y27632	2 mg
04-0012-10			10 mg
04-0012-02	Stemolecule™	Y27632 in Solution	2 mg (10 mM)

Self-renewal Solutions from Stemgent

The key feature of ES and iPS cells, that distinguishes them from all other cells, is the ability to proliferate indefinitely while maintaining the capacity to differentiate into many cell types. Therefore ES and iPS cells present an enormous potential as biological tools in strategies for regenerative medicine, drug discovery, disease models, as well as for research in developmental biology. However, physical and chemical stimuli from the environment influence these cells' behavior by triggering signaling pathways that directs them into remaining a pluripotent state or differentiating into a mature cell type. This sensitivity of pluripotent stem cells towards environmental changes has proven to be a major challenge.

A number of factors that should be considered for sustained culturing of ES and iPS stem cells include:

1. [Defined cell culture medium](#) for reproducibility
2. Defined media components at optimal concentrations; [cytokines](#) (growth factors) and [small molecules](#)
3. Optimal cell density
4. [Methods for passaging](#) cells that do not force differentiation
5. Defined basement membrane [substrates](#) that facilitate cell attachment

ES and iPS cell cultures should be routinely monitored for pluripotency, because of their extreme sensitivity,.

Some of the key assays include:

1. Normal colony morphology and rate of proliferation
2. Expression of key pluripotency genes and absence of lineage-specific genes (for iPS cells)
3. Expression of key [pluripotency surface markers](#)
4. Ability to [differentiate](#) into cells from all three primary germline layer tissues in vivo and in vitro
5. Normal genetic karyotype

New technologies for stem cell research are being developed with increasing speed. Our teams at Stemgent work diligently with our [Scientific Advisory Board](#) and other leading stem cell scientists to validate and deliver cutting-edge reagents that enable you to more readily [culture](#) and [characterize](#) ES and iPS cells.

Products for Self-Renewal

- [Antibodies \(19\)](#)
- [Media \(3\)](#)
- [Cytokines / Proteins \(4\)](#)

- [Small Molecules \(12\)](#)

Catalog #	Brand	Product	Size
Self-Renewal			
Antibodies			
00-0009	stemgent®	Alkaline Phosphatase Staining Kit	50 assays
00-0055	Stemgent®	Alkaline Phosphatase Staining Kit II	50 assays
09-0021	Stemgent®	Klf4 Antibody (Purified), Mouse anti-Mouse/Human	100 µl
09-0020	Stemgent®	Nanog Antibody (Affinity Purified), Rabbit anti-Mouse/Human	100 µl
09-0023	Stemgent®	Oct4 Antibody (Affinity Purified), Rabbit anti-Mouse/Human	100 µl
09-0024	Stemgent®	Sox2 Antibody (Affinity Purified), Rabbit anti-Mouse/Human	100 µl
09-0067	StainAlive™	SSEA-1 Antibody (DyLight™ 488), Mouse anti-Mouse/Human	100 µl
09-0095	StainAlive™	SSEA-1 Antibody (DyLight™ 550), Mouse anti-Mouse/Human	100 µl
09-0001	Stemgent®	SSEA-1 Antibody (PE), Mouse anti-Mouse/Human	1 ml
09-0005	Stemgent®	SSEA-1 Antibody (Purified), Mouse anti-Mouse/Human	100 µl
09-0044	Stemgent®	SSEA-3 Antibody (PE), Rat anti-Human	1 ml

Catalog #	Brand	Product	Size
09-0014	Stemgent®	SSEA-3 Antibody (Purified), Rat anti-Mouse/Human	100 µl
09-0003	Stemgent®	SSEA-4 Antibody (PE), Mouse anti-Human	1 ml
09-0006	Stemgent®	SSEA-4 Antibody (Purified), Mouse anti-Human	100 µl
09-0068	StainAlive™	TRA-1-60 Antibody (DyLight™ 488), Mouse anti-Human	100 µl
09-0009	Stemgent®	TRA-1-60 Antibody (PE), Mouse anti-Human	1 ml
09-0010	Stemgent®	TRA-1-60 Antibody (Purified), Mouse anti-Human	100 µl
09-0069	StainAlive™	TRA-1-81 Antibody (DyLight™ 488), Mouse anti-Human	100 µl
09-0011	Stemgent®	TRA-1-81 Antibody (Purified), Mouse anti-Human	100 µl
Media			
01-0013-50	CryoStem™	Freezing Medium	50 ml
01-0014-500	Stemgent®	hES Cell Cloning & Recovery Supplement	5 x 100 µl
01-0005	NutriStem™	XF/FF Culture Medium	500 ml
01-0005-100			100 ml
Cytokines / Proteins			
03-0001	Stemfactor™	Activin A, Human Recombinant	5 µg
03-0007	Stemfactor™	BMP-4, Human Recombinant	10 µg
03-0002	Stemfactor™	FGF-basic, Human Recombinant	50 µg
03-0004	Stemfactor™	TGF-β1, Human Recombinant	5 µg
Small Molecules			
04-0003	Stemolecule™	BIO	2 mg
04-0004	Stemolecule™	CHIR99021	2 mg

Catalog #	Brand	Product	Size
04-0004-10			10 mg
04-0004-02	Stemolecule™	CHIR99021 in Solution	2 mg (10 mM)
04-0049	Stemolecule™	GSK429286A	2 mg
04-0006	Stemolecule™	PD0325901	2 mg
04-0006-10			10 mg
04-0006-02	Stemolecule™	PD0325901 in Solution	2 mg (10 mM)
04-0008	Stemolecule™	PD173074	2 mg
04-0030	Stemolecule™	ROCK II Inhibitor	2 mg
04-0011	Stemolecule™	SC1 (Pluripotin)	1 mg
04-0017	Stemolecule™	Thiazovivin	1 mg
04-0012	Stemolecule™	Y27632	2 mg
04-0012-10			10 mg
04-0012-02	Stemolecule™	Y27632 in Solution	2 mg (10 mM)

Differentiation Solutions from Stemgent

The stem cell community has endeavored to find culture conditions and key signaling factors to guide stem cell differentiation towards clinically relevant cell fates, since the derivation of human embryonic stem cells in 1981. In vitro differentiation cell culture strategies were designed from signaling cues gained from in vivo development.

Novel small molecules were discovered thanks to recent advances in high-throughput robotics and chemical synthesis. These molecules can be used alone or with more traditional cell culture reagents such as cytokines and extracellular matrix (ECM) substrates. We recommend to test the best ECM conditions first ([MicroMatrix Arrays](#)) as the microenvironment has a huge influence on stem cell differentiation. Stemgent offers consistent robust reagents for stem cell differentiation towards:

1. Ectoderm: with [cytokines](#) (e.g. SHH, Noggin), [small molecules](#) (e.g. SHH Signaling Pathway Modulator Set); and [matrices](#) (Laminin).
2. Endoderm: with [cytokines](#) (e.g. Activin A) and [small molecules](#) (e.g. IDE-1, IDE-2).
3. Mesoderm: with [cytokines](#) (e.g. BMP-4, Wnt-3a) and [small molecules](#) (e.g. Wnt Signaling Pathway Set)

Inspired by the success of reprogramming mature cells to iPS cells, Marius Wernig² and Douglas Melton³ have led the way to identifying key transcription factors that directly differentiate skin cells to neurons (Ascl1, Brn2, and Myt1l) and pancreatic exocrine cells into insulin-producing beta-cells (Ngn3, Pdx1, and Mafa). Stemgent newly offers viral vectors for the directed differentiation of one mature cell type to another mature cell type, which reduces the experimental time between patient tissue collection and derivation of cell type of interest in regenerative medicine.

Our teams at Stemgent work diligently with our [Scientific Advisory Board](#) and other leading stem cell scientists to validate and deliver cutting-edge reagents that enable you to more readily generate, differentiate, culture, and characterize ES/iPS cells for use in strategies in regenerative medicine, disease modeling, drug discovery, and developmental biology.

References

1. Thomson J.A., Itskovitz-Eldor J., Shapiro S.S., Waknitz M.A., Swiergiel J.J., Marshall V.S., Jones J.M. (1998) Embryonic Stem Cell Lines Derived from Human Blastocysts. *Science*, 282:1145–1147.
2. Vierbuchen T., Ostermeier A., Pang Z.P., Kokubu Y., Südhof T.C., Wernig M. (2010) Direct conversion of fibroblasts to functional neurons by defined factors. *Nature*, 463(7284):1035–41.
3. Zhou Q., Brown J., Kanarek A., Rajagopal J., Melton D.A. (2008) In vivo reprogramming of adult pancreatic exocrine cells to beta-cells. *Nature*, 455(7213):627–32.

Products for Differentiation

- [Antibodies \(1\)](#)
- [Media \(3\)](#)
- [Cytokines / Proteins \(6\)](#)
- [Small Molecules \(29\)](#)
- [Differentiation \(7\)](#)

Catalog #	Brand	Product	Size
Differentiation			
Antibodies			
09-0075	Stemgent®	Pax6 Antibody (Purified), Rabbit anti-Mouse/Human	100 µl
Media			
01-0014-500	Stemgent®	hES Cell Cloning & Recovery Supplement	5 x 100 µl
00-0072	Stemgent®	MesoFate™ Differentiation Medium	500 ml + supplement
01-0005	NutriStem™	XF/FF Culture Medium	500 ml
01-0005-100			100 ml
Cytokines / Proteins			
03-0001	Stemfactor™	Activin A, Human Recombinant	5 µg
03-0007	Stemfactor™	BMP-4, Human Recombinant	10 µg

Catalog #	Brand	Product	Size
03-0002	Stemfactor™	FGF-basic, Human Recombinant	50 µg
03-0006	Stemfactor™	Noggin, Human Recombinant	10 µg
03-0008	Stemfactor™	Sonic Hedgehog, Human Recombinant	25 µg
03-0004	Stemfactor™	TGF-β1, Human Recombinant	5 µg
Small Molecules			
04-0052	Stemolecule™	A769662	10 mg
04-0014	Stemolecule™	A83-01	2 mg
04-0014-10			10 mg
04-0015	Stemolecule™	ALK5 Inhibitor	1 mg
04-0021	Stemolecule™	All-Trans Retinoic Acid	100 mg
04-0051	Stemolecule™	BI-D1870	10 mg
04-0003	Stemolecule™	BIO	2 mg
04-0004	Stemolecule™	CHIR99021	2 mg
04-0004-10			10 mg
04-0004-02	Stemolecule™	CHIR99021 in Solution	2 mg (10 mM)
04-0022	Stemolecule™	Cyclopamine	2 mg
04-0041	Stemolecule™	DAPT	5 mg
04-0024	Stemolecule™	Dorsomorphin	2 mg
04-0025	Stemolecule™	Forskolin	10 mg
04-0026	Stemolecule™	IDE-1	2 mg
04-0027	Stemolecule™	IDE-2	2 mg
04-0037	Stemolecule™	IPA-3	5 mg
04-0028	Stemolecule™	KAAD-Cyclopamine	100 µg
04-0050	Stemolecule™	Ku-0063794	2 mg
04-0074	Stemolecule™	LDN-193189	2 mg
04-0074-10			10 mg
04-0074-02	Stemolecule™	LDN-193189 in Solution	2 mg (10 mM)
04-0008	Stemolecule™	PD173074	2 mg
04-0009	Stemolecule™	Purmorphamine	5 mg
04-0010	Stemolecule™	SB431542	5 mg
04-0010-10			10 mg
04-0010-05	Stemolecule™	SB431542 in Solution	5 mg (10 mM)
04-0032	Stemolecule™	SHH Antagonist	2 mg
04-0031	Stemolecule™	SMO Antagonist	2 mg
04-0034	Stemolecule™	Wnt Inhibitor IWP-2	2 mg

Catalog #	Brand	Product	Size
04-0035	Stemolecule™	Wnt Inhibitor IWP-3	2 mg
04-0036	Stemolecule™	Wnt Inhibitor IWP-4	2 mg
04-0046	Stemolecule™	XAV939	2 mg
mRNA's for Differentiation			
05-0033	Stemgent®	Gata4 mRNA, Human	20 µg
05-0034	Stemgent®	Mef2c mRNA, Human	20 µg
00-0072	Stemgent®	MesoFate™ Differentiation Medium	500 ml + supplement
05-0031	Stemgent®	Myf5 mRNA, Human	20 µg
05-0029	Stemgent®	MyoD mRNA, Human	20 µg
05-0032	Stemgent®	Myog mRNA, Human	20 µg
05-0035	Stemgent®	Tbx5 mRNA, Human	20 µg