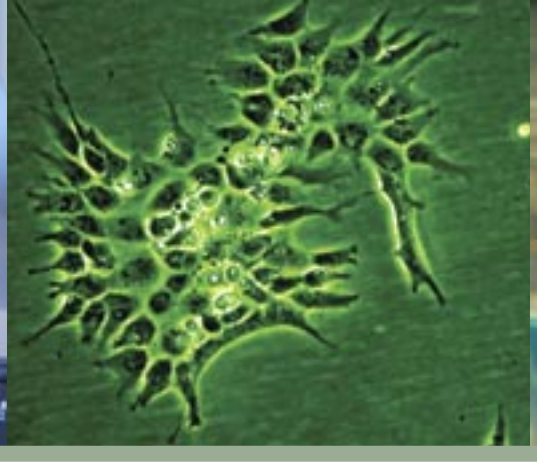
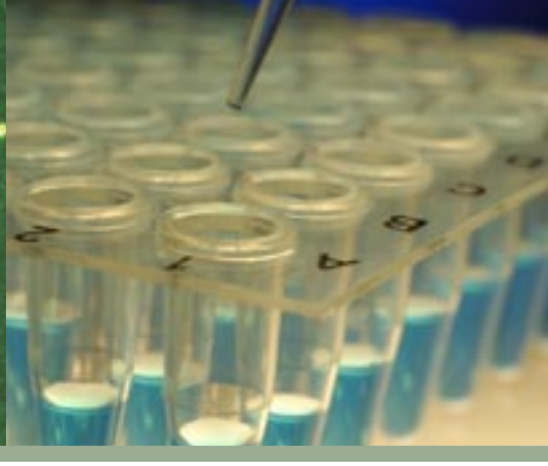
KirkleesBIO
Kirklees Biosciences Ltd

CELL CULTURE

STEM CELL REAGENTS

FEBRUARY 2012

www.kirkleesbio.com

The following is a selection of reagents, sera and kits specifically designed for use in Stem Cell research. Kirklees Bio is a privately owned biotechnology company supplying quality cell culture and biological products to the cell culture and biopharma industries for use in such disciplines as cell biology, genomics, proteomics, virology, immunology, drug discovery and toxicology.

Our focus on traditional values of quality product, competitive pricing and absolute customer care is reflected in our range of products for stem cell research.

Kirklees Bio provides a range of standardized reagents and tools for all areas of stem cell research through our association with Euroclone in Italy and from our own production. The importance of quality control and raw material selection is critical to optimal performance of the products, ensuring that batch-to-batch variability is minimised.

Kirklees Bio and its production partner achieved ISO 9001 certification in 2010 to consolidate our commitment to providing consistent quality products and services.

Kirklees Bio is committed to working with you to develop new products that will help you perform your experiments effectively and economically. If there is a product you require we would be happy to work with you to customize media or cell separation products to meet your specific needs.

We have an extensive range of products to help optimally maintain and develop both Mouse and Human stem cells.

KirkleesBIO
Kirklees Biosciences Ltd

Importance of Stem cells in Science

Stem cells, having unique regenerative abilities, open new avenues for the treatment of many diseases including heart disease, diabetes, vascular disease and cancer. It is hoped that continued research with stem cells will allow for the development of cell based therapies and drug delivery mechanisms and a completely new understanding in the field of regenerative and reparative medicine.

Stem cell research allows for the in depth study of the essential properties of cells and an understanding of what makes them different from differentiated, specialized cell types. Stem cells are currently being widely used for drug molecule screening and to aid in the development of model in vitro systems enabling the study of 'normal' growth of cells.

Stem cell research enables the scientific community to advance knowledge about how an organism develops from a single cell and how healthy cells replace damaged cells in adult organisms.

Embryonic Stem Cells (ES Cells)

These are cultures of cells derived from the epiblast tissue of the inner cell mass (ICM) of a blastocyst. ES cells are pluripotent, they can develop into each of more than 200 cell types occurring in the adult body when given sufficient and specific stimulation for a specific cell type. Nearly all of the research to date has been carried out using mouse embryonic stem cells (mES) or human embryonic stem cells (hES). Both types have essential stem cell characteristics yet they require very different environments in order to maintain an undifferentiated state as without optimal culture conditions or genetic manipulation, embryonic stem cells will rapidly differentiate.

Adult Stem Cells

These are any cell which is found in a developed organism and have two properties; the ability to divide and create another cell like itself and also to divide and create a differentiated cell. Pluripotent adult stem cells are rare and usually occur in small numbers but may be found in a number of tissues including umbilical cord blood. Most adult stem cells are multipotent (lineage restricted) and are generally referred to by their tissue of origin such as mesenchymal stem cell, haematopoietic stem cell, neuronal stem cell etc. Much of adult stem cell research has focused on clarifying the capacity of these cells to divide or self-renew indefinitely and their potential for differentiation.

Differentiation

The in vitro differentiation of Embryonic Stem Cells and Adult Stem Cells may be controlled using growth media and cell specific growth factors and hormones. Stem cell therapy has the potential to radically change the treatment of human disease. A number of Adult Stem Cell therapies already exist, particularly in the field of bone transplant therapy. Future treatments will rely on new stem cell technology to treat a variety of disease including cancer, Parkinson's disease, spinal cord and muscle damage and a number of other conditions.

Human Differentiation Kits

Mesenchymal Stem Cell (MSC) Kit

Mesenchymal Stem Cells have become a very important part of research into human therapeutics. These cells are self renewing and capable of differentiation into distinct cell types.

The Mesenchymal Stem Cell Kit has been developed to support the proliferation of human mesenchymal stem cells (hMSCs). hMSCs cultured in this medium retain the trilineage mesoderm differentiation potential (adipocytes, chondrocytes and osteoblasts).

The Mesenchymal Stem Cell kit contains a basal medium plus a supplement containing selected serum components and growth factors.

Product Code	Product Description	Size
ECM0888S	Mesenchymal Stem Cell (MSC) Kit - Trial size containing basal medium ECM0887D (100ml) and supplement ECM0618B (10ml)	1 kit
ECM0888K	Mesenchymal Stem Cell (MSC) Kit - containing basal medium ECM0887L(500ml) and supplement ECM0618B (50ml)	1 kit

Adipogenic Differentiation Kit

Adipocytes require specific culturing conditions and the Adipogenic Differentiation Kit has been developed to fully achieve the ideal culture conditions for these cells. Adipogenic differentiation may be achieved following the expansion of hMSCs using either the Mesenchymal Stem Cell Kit (ECM0888) or Mesenchymal Stem Cell serum-free medium (ECM0889). This kit contains a basal medium and a supplement containing specific selected components.

Product Code	Product Description	Size
ECM0891S	Adipogenic Differentiation Kit - Trial size containing basal medium ECM0887D (100ml) and supplement ECM0622B (10ml)	1 kit
ECM0891K	Adipogenic Differentiation Kit - containing basal medium ECM0887L (500ml) and supplement ECM0622N (50ml)	1 kit

Chondrogenic Differentiation Kit

This Chondrogenic Differentiation Kit has been developed to support the differentiation of a variety of hMSCs into matrix-producing chondrocytes.Chondrogenic differentiation may be achieved following the expansion of hMSCs using either the Mesenchymal Stem Cell Kit (ECM0888) or Mesenchymal Stem Cell serum-free medium (ECM0889). This kit contains a basal medium and a supplement containing specific selected components.

Product Code	Product Description	Size
ECM0890S	Chondrogenic Differentiation Kit - Trial size containing basal medium ECM0887D (20ml) and supplement ECM0621A (1ml)	1 kit
ECM0890K	Chondrogenic Differentiation Kit - Containing basal medium ECM0887D (100ml) and supplement ECM0621F (5ml)	1 kit

Osteogenic Differentiation Kit

Undifferentiated hMSCs are, under ideal culturing conditions, able to differentiate into osteoblasts producing mineralised matrix. The differentiation into osteogenic progenitors is achieved once cell multilayering has been observed. The Osteogenic Differentiation Kit has been developed to support the differentiation of hMSCs into osteogenic progenitors. The kit contains a basal medium and a supplment containing specific selected components.

Product Code	Product Description	Size
ECM0892S	Osteogenic Differentiation Kit - Trial size containing ECM0887D (100ml) and supplement ECM0624B (10ml)	1 kit
ECM0892K	Osteogenic Differentiation Kit - Containing ECM0887L (500ml) and supplement ECM0624N (50ml)	1 kit

Stem Cell Specific Media

Seralab offers a large range of media optimised for stem cell use by the addition of growth factors and hormones

hES Defined Medium for Human ES cell

A defined and animal component free media for the maintenance and expansion of human embryonic stem cells without differentiation

Product Code	Product Description	Size
MED-300-F	hES Defined medium for human ES cells	500ml
MED-300-H	hES Defined medium for human ES cells	100ml

Stem Cell Specific Media (continued)

mES Optimised Medium for Murine ES cells

mES when supplemented with mLIF provides optimal ES cell expansion for a variety of applications such as the generation of chimeric animals or tissue differentiation pathway studies. Maintenance of ES cells *in vitro* is achieved by co-culture on irradiated mouse fibroblast or on gelatinised dishes with the addition of LIF (Leukaemia Inhibitory Factor), a differentiation inhibitory factor.

Product Code	Product Description	Size
ECM0881L	mES Optimised medium for murine ES cells	500ml
ECM0881D	mES Optimised medium for murine ES cells	100ml

mLIF Mouse Leukaemia Inhibitory Factor Medium

mLIF is a pleiotropic cytokine of the interleukin-6 family, named for its ability to inhibit proliferation of a myeloid leukemic cell line by inducing differentiation it also regulates the growth and differentiation of embryonic stem cells, primordial germ cells, peripheral neurons, osteoblasts, adipocytes and endothelial cells. mLIF has been qualified to maintain undifferentiated ES cells at 1000 Units/ml. Identical results have been achieved with R1 and E14 ES cell lines.

Product Code	Product Description	Size
ECM0800A	mLIF Mouse Leukaemia Inhibitory Factor Medium 10^7 Units/ml	1ml
ECM0800S	mLIF Mouse Leukaemia Inhibitory Factor Medium 10^7 Units/ml	100µl

Kidney Tubule Stem Cell Medium

This medium has been optimised to support the unique growth requirements of mouse kidney tubule stem cells isolated from kidney tissue. This is a basal medium which does not contain any growth or trophic factors, hormones or L-Glutamine. Growth factors and serum may be added as required.

Product Code	Product Description	Size
ECM0882L	Mouse Kidney Tubules Stem Cell Medium	500ml
ECM0882D	Mouse Kidney Tubules Stem Cell Medium	100ml

'N' - a specific basal medium for the long term culture of Neuronal precursor cells

The composition of 'N' has been customised to support the unique growth requirements of embryonic and adult mammalian neural precursor cells isolated from the central nervous system (CNS). This is a basal medium which does not contain any growth or trophic factors, hormones or L-Glutamine. 'N' The specific formulation meets the basic requirements for culturing these cell types and, in combination with supplements such as N2, B27, G5 and NSS, this medium provides an environment for consistent growth and/or differentiation of neural cells

Product Code	Product Description	Size
ECM0883L	'N' Optimised medium for the culture of all neuronal precursor cells	500ml

Human Mesenchymal Stem Cell (MSC) Medium, with serum

Human mesenchymal Stem Cell (MSC) medium is based on a modified DMEM medium containing specific trace elements, FBS and L-glutamine developed to support the long term growth of undifferentiated human mesenchymal stem cells and mesenchymal progenitor cells. It is also used for the preparation of mesenchymal stem cells for differentiation. In order to achieve differentiation it is necessary for cytokines to be added to this medium.

Product Code	Product Description	Size
MED-260	Human Mesenchymal Stem Cells medium	500ml

Human Mesenchymal Stem Cell (MSC) Medium, serum-free

Human mesenchymal Stem Cell (MSC) serum-free medium is a ready-to-use medium developed to support long term growth of undifferentiated human mesenchymal stem cells with retention of multi-lineage differentiation potential. Use of this medium eliminates the possibility of batch-to-batch variation giving increased reproducibility. In order to achieve differentiation it is necessary for cytokines to be added to this medium.

Product Code	Product Description	Size
ECM0889L	Human Mesenchymal Stem Cell (MSC) Medium – serum-free	500ml

Stem Cell Specific Media (continued)

Neuronal Medium, serum-free

Serum-free neuronal medium is intended for the long-term culture and maintenance of central nervous system cells. This specialized medium is intended for supplementation with a variety of neuronal supplements, depending upon targeted cell type. NeuroPlex ™ LO serum-free neuronal medium is intended for the long-term culture of embryonic hippocampal neurons but also performs well with other cell types

Neuronal Base Medium P is a new media formulation which meets the special requirements of adult and postnatal neurons. It provides an optimal environment for the proliferation and differentiation of neural stem cells and neurospheres.

Product Code	Product Description	Size
GEM-600-300-F	Neuroplex Neuronal Medium	500ml
GEM-600-301-F	NeuroPlex™ LO Neuronal Medium	500ml
MED-263	Neuronal Base Medium	500ml
MED-269	Neuronal Base Media P	500ml

Supplements

A range of supplements for use in specific stem cell techniques.

Product Code	Product Description	Size
ECM0600B	B27 NeuroMix supplement for culture of hippocampal and other neurons (50x)	10ml
ECM0605A	G5 supplement for culture glial cells and tumor cells of astrocytic phenotype (100x)	1ml
GEM-400-164	G5 Neuro Supplement	1ml
ECM0610F	N2 supplement for culture of neuroblastomas, for CNS and PNS neurons (100x)	5ml
GEM-400-163	N2 Neuro Supplement	5ml
ECM0615B	NNS Neuronal Stem Cell supplement for culture of CNS progenitors and stem cells (50x)	10ml

Serum for Stem Cell Culture

Foetal Bovine Serum ESC Tested

This serum has been extensively tested and selected as suitable for use with embryonic stem cells. It has been tested for the ability to sustain undifferentiated cellular morphology of embryonic stem cells. The screening includes colony morphology, toxicity testing and plating efficiency. Endotoxin levels are less than 1 EU/ml. The use of ES screened FBS is recommended to efficiently support the growth of undifferentiated colonies of embryonic stem cells.

Product Code	Product Description	Size
EU-000-HE	Foetal Bovine Serum – EU Grade: Tested for murine ES cell culture	100ml
EU-000-FE	Foetal Bovine Serum – EU Grade: Tested for murine ES cell culture	500ml
GEM-100-525-H	Foetal Bovine Serum – US Origin: Tested for murine ES cell culture	100ml
GEM-100-525-F	Foetal Bovine Serum – US Origin: Tested for murine ES cell culture	500ml
GEM-100-125-H	Foetal Bovine Serum – USDA Grade: Tested for murine ES cell culture	100ml
GEM-100-125-F	Foetal Bovine Serum – USDA Grade: Tested for murine ES cell culture	500ml

Gem-Cell ™ US Origin Human Serum AB

GemCell ™ human serum AB is collected from healthy male donors of the AB serotype at FDA-licensed facilities in the United States. This material is defibrinated from source plasma AB. All donor units are tested for viral markers and found to be non-reactive. This material is supplied sterile filtered

Product Code	Product Description	Size
GEM-100-512	Gem-Cell ™ US origin Human Serum AB Male (converted)	100ml

Extracts

Culture media containing traditional serum have often been found to be growth inhibitory to many cell types, especially those of epithelial origin, necessitating the use of alternative supplementation. Many purified growth factors and hormones are available but most primary or stem cell culture systems still require additional supplementation from crude tissue extracts such as bovine pituitary extract (BPE) or Chick Embryo Extract (CEE) for extended passaging and tissue specific phenotypic expression.

Bovine Pituitary Extract (BPE)

The addition of BPE to stem cell media improves colony formation, growth and in vitro longevity of a variety of epithelial cells. BPE is a highly concentrated source of putative mitogens and growth factors, it is effective at a fraction of the volume typically required when using traditional serum products.

Product Code	Product Description	Size
BPE-1078-NZM	Bovine Pituitary Extract (BPE) New Zealand Origin	25ml
BPE-1078-NZS	Bovine Pituitary Extract (BPE) New Zealand Origin	50ml
BPE-1078-NZH	Bovine Pituitary Extract (BPE) New Zealand Origin	100ml
BPE-1078-NZL	Bovine Pituitary Extract (BPE) New Zealand Origin	1000ml

Bovine Brain Extract (BBE)

BBE also provides benefits for the growth of mammalian, avian and human endothelial cells, smooth muscle cells, keratinocytes, melanocytes and hybridomas. This preparation from whole brain sourced in New Zealand is a cost effective alternative to ECGS as well as providing more population doublings and phenotypic expression in these cell types.

Product Code	Product Description	Size
BBE-2007-NZM	Bovine Brain Extract (BBE) New Zealand Origin	25ml
BBE-2007-NZS	Bovine Brain Extract (BBE) New Zealand Origin	50ml
BBE-2007-NZH	Bovine Brain Extract (BBE) New Zealand Origin	100ml
BBE-2007-NZL	Bovine Brain Extract (BBE) New Zealand Origin	1000ml

Bovine Insulin

Insulin is a polypeptide hormone produced in the pancreatic islets of Langerhans that has a molecular weight of ~5800 Da. Insulin primarily regulates the uptake and storage of glucose in cellular systems. It also plays a related role in the metabolism of certain amino acids and fatty acids. Bovine insulin is remarkably similar to human insulin, differing in molecular structure by only three amino acid residues. Seralab Bovine Insulin Powder is cell culture tested.

Product Code	Product Description	Size
GEM-700-112-P	Bovine Insulin Powder	100mg
GEM-700-912-P	Bovine Insulin Powder – gamma irradiated	100mg

Chick Embryo Extract (CEE)

Chick Embryo Extract is used as a supplement in some growth media formulations. It is an essential source of growth factors for growing rat neural crest stem cells and other types of neural explants.

Product Code	Product Description	Size
CE-650-J	Chick (chicken) Embryo Extract - frozen	20ml
CE-650-F	Chick (chicken) Embryo Extract - frozen	500ml
CE-650-LD	Chick (chicken) Embryo Extract - lyophilized	10ml
CE-650-LJ	Chick (chicken) Embryo Extract - lyophilized	20ml

Extracellular Matrix Products

The extracellular matrix (ECM) is the extracellular part of animal tissue that usually provides structural support to the animal cells in addition to performing various other important functions. The extracellular matrix is the defining feature of connective tissue in animals.

Formation of the extracellular matrix is essential for processes like growth, wound healing and fibrosis. An understanding of ECM structure and composition also helps in comprehending the complex dynamics of tumour invasion and metastasis in cancer biology as metastasis often involves the destruction of extracellular matrix by enzymes

Components of the ECM include:

Collagens: In most animals, the most abundant protein in the ECM. In fact, collagen is the most abundant protein in the human body and accounts for 90% of bone matrix protein content. Collagens are present in the ECM as fibrillar proteins and give structural support to resident cells. Collagen is exocytosed in precursor form (procollagen), which is then cleaved by procollagen proteases to allow extracellular assembly.

Product Code	Product Description	Size
RPRO-479-A	Collagen I, human recombinant	10mg
RPRO-480-A	Collagen III, human recombinant	10mg

Fibronectins are proteins that connect cells with collagen fibers in the ECM, allowing cells to move through the ECM. Fibronectins bind collagen and cell surface integrins causing a reorganization of the cell's cytoskeleton and facilitating cell movement. Fibronectins are secreted by cells in an unfolded, inactive form. Binding to integrins unfolds fibronectin molecules, allowing them to form dimers so that they can function properly. Fibronectins also help at the site of tissue injury by binding to platelets during blood clotting and facilitating cell movement to the affected area during wound healing.

Product Code	Product Description	Size
RPRO-448-A	human Fibronectin, recombinant	200 µg

Interleukins

Product Code	Product Description	Size
RCYT-208A	Human IL-1B recombinant	2 µg
RCYT-209A	Human IL-2 recombinant	10 µg
RCYT-370A	Mouse IL-2 recombinant	5 µg
RCYT-210A	Human IL-3 recombinant	2 µg
RCYT-371A	Mouse IL-3 recombinant	2 µg
RCYT-211A	Human IL-4 recombinant	2 µg
RCYT-213A	Human IL-6 recombinant	5 µg
RCYT-254A	Human IL-7 recombinant	2 µg

Growth factors

Product Code	Product Description	Size
RCYT-217A	Human Epidermal Growth Factor (EGF) recombinant	100 µg
RCYT-554A	Mouse Epidermal Growth Factor (EGF) recombinant	10 µg
RCYT-560A	Bovine Fibroblast Growth Factor (FGF) recombinant	2 µg
RCYT-218A	Human Fibroblast Growth Factor (FGF) recombinant	10 µg
GEM-400-448	GM-CSF recombinant	5 µg
RCYT-216A	Human (IGF-I) recombinant	20 µg
RCYT-229A	Mouse (IGF-I) recombinant	10 µg
RCYT-265A	Human (IGF-II) recombinant	10 µg
RCYT-440A	Mouse Nerve Growth Factor (NGF) recombinant	5 µg
RCYT-255A	Human Stem Cell Factor (SCF) recombinant	2 µg
RCYT-275A	Mouse Stem Cell Factor (SCF) recombinant	2 µg
RCYT-323A	Rat Stem Cell Factor (SCF) recombinant	2 µg
RCYT-561A	Human TGF-beta 1 recombinant	1 µg
RCYT-223A	Human (TNF-alpha) recombinant	10 µg
RCYT-252A	Mouse (TNF-alpha) recombinant	5 µg

Stem Cell Specific Growth Factor

Effectine

A growth factor developed to protect human embryonic stem cells from apoptosis following cryopreservation, FACS and cell dissociation. The use of Effectine significantly increases cell viability and cloning efficiency.

Product Code	Product Description	Size
REA-301	Effectine	5 x 200µl

Freezing Media

Freezing Medium, with serum

Freezing Medium is a classical medium based on DMEM/Ham's F12 containing cryoprotective agents, 20% FBS and 10% DMSO. This is provided as a ready-to-use solution developed to preserve a wide variety of cell types during storage in liquid nitrogen. The cryoprotective reagents, along with the serum content, help to minimise the effects of dehydration and improve the viability of cells after thawing. Vivify is a classic formulation of DMEM, serum and DMSO providing a ready-to-use freezing media offering high viability.

Product Code	Product Description	Size
ECM0617N	Freezing Medium with 20% FBS	50ml
GEM-600-100	Vivify-1X Complete Cell Freezing Medium	5 x 10ml

Freezing Medium, serum-free

Serum-free freezing medium is a cryoprotective medium containing 10% DMSO, buffer systems, disaccharides and colloid dextran which effectively suppresses the formation of ice crystals during the freezing process. This optimised medium is suitable for a wide variety of cell types, offering reproducible results.

Product Code	Product Description	Size
ECM0625N	Freezing Medium – serum free	50ml

Split Kits

SplitKit is a fully flexible cell dissociation system specifically designed for use in both serum-based and serum-free methodologies. SplitKit has been developed using a vegetable-based enzymatic reagent. SplitKit contains no animal or bacterial derived proteins making it suitable for use in a wide variety of cell culture systems without risk of contamination. The gentle action of SplitKit ensures that the surface epitopes and cell membranes remain unaltered and fully functional, making this an ideal product for use in such disciplines as flow cytometry.

SplitKit is available containing 100ml of SplitCell, the active ingredient, together with 100ml of SplitCell Buffer thereby allowing for the individual system to be adapted depending upon the adhesion strength of the cells used.

Product Code	Product Description	Size
SK-KIT	Split Kit containing 100ml SplitCell code: ASC-010-H and 100ml SplitCell Buffer ASC-011-H	Kit
SK-SAMPLE	Evaluation SplitKit available as a sample pack containing 30ml SplitCell code: ASC-010-T and 30ml SplitCell Buffer Code: ASC-011-T	Kit
ASC-010-H	SplitCell	100ml
ASC-011-H	SplitCell Buffer	100ml

KirkleesBIO
Kirklees Biosciences Ltd

seralab
www.seralab.co.uk