

Advertisement feature

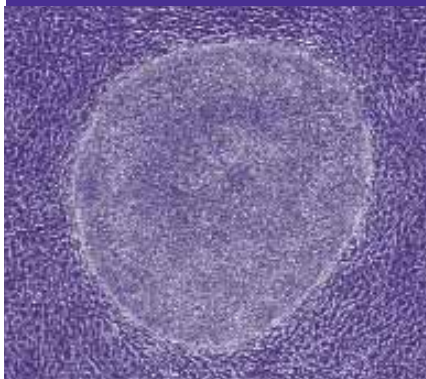


Image supplied by Millipore

Progenitor Potential

Cell lines, kits & equipment that stem from research

Stem cell research holds amazing potential for the future of medicine. The exciting possibility that illnesses which were previously thought of as incurable, can become treatable in the near future, fills patients with hope. The tools below will help researchers unlock that great potential.

Millipore offers both stem cell lines and animal component-free medium especially for human stem cell culture. **MEL cell lines** are low passage, human embryonic stem cells (hES) that are available under license from the Australian National Health and Medical Research Council. Provided at early passage (p10–p12) the cell lines are designed to ensure extended research time in a stable, pluripotent state. Late passage cell lines can have a limited workable shelf-life as karyotype stability may decrease and pluripotent characteristics may shift to reflect a multipotent state. MEL cell lines grow as well defined colonies, with compact cells displaying high nuclear to cytoplasmic ratios and prominent nucleoli. **HEScGRO** medium is the first commercially available animal component-free medium tested successfully for human embryonic stem cell culture and shown to maintain hES cells in their undifferentiated state. The medium is serum-free and formulated to be ready to use for growing human embryonic stem cells. Media with animal-derived components are subject to wide variability and may contain factors that promote differentiation of hES cells, as well as toxic proteins or immunogens that can adversely affect the cells themselves. HEScGRO medium is a defined, animal component-free formulation that successfully addresses these problems and allows scientists to grow human stem cells with confidence.

Rockland Immunochemicals has developed a wide range of antibodies to assist in stem cell research. Notch 1, Notch 1 / 2 intra, Notch 2 are highly characterized reagents. Notch is synthesized in the endoplasmic reticulum as an inactive form which is proteolytically cleaved by a furin-like convertase (S1 cleavage) in the trans-

golgi network before it reaches the plasma membrane to yield an active, ligand-accessible form. Cleavage results in a C-terminal fragment N(TM) and a N-terminal fragment N(EC). Following ligand binding, it is cleaved (S2 cleavage) by TNF-alpha converting enzyme (TACE) to yield a membrane-associated intermediate fragment called Notch extracellular truncation (NEXT). This fragment is then cleaved by presenilin-dependent gamma-secretase (S3 cleavage) to release the intracellular domain (NICD) from the membrane. Scientists at Rockland Immunochemicals have extensive experience in antibody production and offer end users turnkey support for assay development using Notch products.

The **CO₂ incubators** from **New Brunswick Scientific** have been updated to increase usable chamber space, minimize contamination risk and make cleaning a snap. A unique fanless design means there is no ductwork to disassemble and clean and, no crevices or blades for mold to grow on. An innovative shelving system without brackets or fittings can be removed or reinstalled in seconds, and eliminates another potential area for contaminants to collect. The seamless chamber with rounded corners makes wipe down simple, and a high-temperature decontamination option is available for the ultimate in contamination control.

SCSR Fecal Cell Isolation Kits from **NonInvasive Technologies** enable researchers to isolate viable host cells from mammalian fecal samples, including functional epithelial cells, leukocytes, and progenitors. Progenitors cell lines obtained from fecal samples have been cultured for over 90 generations. The SCSR

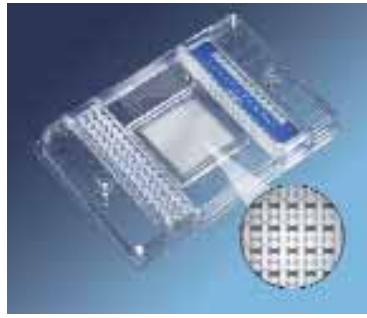
Material compiled by
Kenyon Hoag Associates

KENYON
HOAG
ASSOCIATES

Your Expert in Marketing to the World of Science.
www.kenyonhoag.com



The Acumen eX3 from TTP LabTech



BioMark digital arrays from Fluidigm

system includes a transport medium that allows fecal samples to be transported at room temperature for several days prior to isolation.

R&D Systems has developed **fluorochrome-conjugated antibodies** to antigens of several human embryonic stem cells that were recently characterized by the International Stem Cell Initiative. These markers include SSEA-4, Oct3/4, PODXL, TDGF/Cripto, CD9, and CD90. Using flow cytometry, these antibodies offer researchers a convenient method for the identification of stem cells within cell populations.

TTP LabTech announced the availability of its new triple laser **Acumen eX3** microplate cytometer for high content screening systems. The Acumen eX3 may be equipped with up to three lasers offering a wavelength range for excitation that is similar to that of white light source instrumentation and significantly increasing the variety of fluorescent reagents compatible with the system. Scanning up to 64 whole wells at a time, the Acumen range of laser-scanning fluorescence microplate cytometers can perform cytometric analyses at throughputs of up to 200 plates - or 300,000 data points (1536 plates) - per day. "The Acumen eX3 offers huge flexibility: researchers can select the optimum laser combination required to excite the fluorescent probes being used," said Wayne Bowen, TTP LabTech's chief science officer. "Since nuclear staining is not required to locate the cells, all probes may be used for reporting biological responses. The upshot is that, with simultaneous four color detection, the Acumen eX3's possible performance exceeds the limits of current multicolor, multiplexed assay protocols, giving an assurance of future-proofing," he added. Available software for exporting TIFF images enables a seamless transfer from assay development on microscope-

based CCD Imagers to assay screening on the Acumen eX3 with minimal changes to experimental protocols.

BioMark digital arrays from **Fluidigm** have been used for research into regulatory states in stem cells. In a publication in the Proceedings of the National Academy of Science (November 21, 2006), digital arrays were credited as superior to microwell plates because digital arrays can measure very subtle differences in gene expression and do so using a single cell as the sample. This is important because data from a single cell is more reliable than data from large populations of cells, which may be heterogeneous. Digital arrays work on the principle of digital PCR, in which a sample is diluted such that only one copy of the target sequence may be present in a well after the sample is distributed to all wells. The digital array makes the process very straightforward because a sample/assay mixture is loaded through one inlet and automatically dispersed into about a 1,000 nano-volume reaction chambers.

Glycosan has launched the **Extracel** family of hydrogel kits for stem cell cultivation. Extracel is a synthetic extracellular matrix (ECM) based on hyaluronic acid, a major component of native ECMs. With Extracel, researchers benefit from using a hydrogel that is chemically defined, easily modified, and highly biocompatible. Additional ECM proteins can be easily incorporated into Extracel to meet specific experimental requirements. Before Extracel, researchers were limited to two options: animal-derived ECMs of unknown composition, and synthetic ECMs that are often unsuitable for *in vivo* studies. To address these challenges, Extracel provides a platform to which researchers can add specific amounts and types of growth factors and native ECM components for the desired cellular

"We believe that digital array technology will have significant impact on the pace of stem cell research."

Dr. Irving Weissman,
Professor of Stem Cell Biology & Regenerative Medicine,
Stanford University

environment *in vitro* or *in vivo*.

Importantly, researchers using Extracel can also control stiffness, a critical regulator of cell differentiation. In addition, Extracel forms a hydrogel in 20 minutes at physiological pH and at temperatures ranging from 15 °C to 37 °C. The Extracel formulation is biodegradable and non-immunogenic.

TargetAmp 1-Round and 2-Round aRNA Amplification Kits, from **EPICENTRE**, yield high quality aRNA while maintaining the relative transcript abundance in a total RNA sample. The TargetAmp 2-Round aRNA Amplification Kit can produce microgram amounts of aRNA from the total RNA of a single cell (>5,000,000-fold amplification) and can be completed in 2 days. The aRNA produced yields high quality data using Affymetrix GeneChip and other commercial and self-spotted arrays. Kits are available for producing biotin-aRNA, aminoallyl-aRNA or unlabeled-aRNA. The kits have been validated for use by many researchers, including a leading pharmaceutical company.

Companies mentioned in this Product Focus:

EPICENTRE – www.epicentre.com
Fluidigm – www.fluidigm.com
Glycosan – www.glycosan.com
Millipore – www.millipore.com
New Brunswick Scientific – www.nbsc.com
NonInvasive Technologies – www.noninvasivetech.com
R&D Systems – www.rndsystems.com
Rockland Immunochemicals – www.rockland-inc.com
TTP LabTech – www.ttplabtech.com

"This article was compiled by Kenyon Hoag Associates and submitted to Nature. It has not been written by or reviewed by the Nature editorial team and Nature takes no responsibility for the accuracy or otherwise of the information provided. Submit press releases for consideration to productfocus@nature.com with the topic in the subject line."