

Image supplied by Cook MyoSite Inc.

An assay a day...

The latest in cell based assays

Cell based assays are a quick and cost-effective way to improve the predictability of drug efficacy and toxicity screens by detecting ineffective and potentially toxic compounds early in the drug development process before significant time and resources have been invested. Some of the latest cell based assays and systems as well as new substrates, tools and services are highlighted below.

Assays and kits

AMS Biotechnology has announced **two new histone deacetylase (HDAC) cell based assay kits** that provide an easy tool for studying the activity and inhibition of the full range of HDAC enzymes (1-11). The new AMSBIO HDAC cell based assay kits provide a fast and fluorescence-based method that eliminates procedures that are often used in traditional HDAC assays i.e. radioactivity, extractions, or chromatography. By using a cell-permeable HDAC substrate in the new assay kits, the activity of various protein lysine-specific deacetylases, including HDAC-containing complexes, can be measured in intact cells in a simple and homogenous manner. The fluorescence of the deacetylated reaction product can be analysed using a plate reader or a fluorometer. In addition, the new assay procedures require only two easy steps, each performed on a single microtitre plate.

QTempo from **InfiniteBio** is a new *in vitro* cardiotoxicity assay technology using stem cell-derived cardiomyocytes developed by **ReproCELL** in Japan. The QTempo assay directly measures the QT interval in stem cell-derived cardiomyocytes for the assessment of drug induced QT/QTc liability. QTempo closely mimics clinical parameters in an assay that cost-effectively screens early stage development compounds. To increase confidence in the safety of a drug before further development, compounds may be screened under a wide variety of conditions and concentrations. The QTempo assay is available in a variety of formats, which use beating cardiomyocytes derived from either human iPS/ES cells

or monkey ES cells. QTempo provides a combination of accuracy and efficiency unmet by other models. It is a perfect tool for verifying hERG assay results, before the time and expense of animal testing.

Cellular Dynamics has introduced **iCell™ Cardiomyocytes**, human induced pluripotent stem (iPS) cell-derived cardiomyocytes. These human cardiac cells are specifically designed to aid drug discovery and improve the predictability of drug efficacy and toxicity screens through detection of ineffective and potentially toxic compounds early in the pharmaceutical pipeline process before significant time and resources have been invested. There are several advantages to using iCell Cardiomyocyte's: the cells provide a fully-functional, human-based cardiac model system; they are homogenous and reproducible; and they are easy to implement.

Primary human skeletal muscle derived cells (SkMDC) and complementary products that can be utilised in cell based assays are provided by the "muscle cell experts", **Cook MyoSite Inc.** SkMDC differentiate into multinucleated skeletal myotubes, which could be useful for assays investigating signaling pathways and small molecule drug discovery and toxicity throughout the development of skeletal muscle. SkMDC are isolated consistently, have high purity and viability, and expand reliably while maintaining phenotype. A gene array characterisation is provided with each SkMDC purchase to clearly define the starting culture, which is an industry-first. Cells are categorised on the company's website by

Material compiled by College Hill

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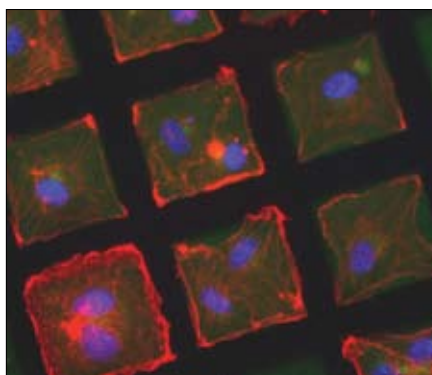
Gentix' CellReporter system

donor age, gender, and other important donor social/medical information so that the desired cell population can be selected easily by customers each time they order. Cook MyoSite offers several varieties of MyoTonic™ Culture Medium to ensure robust and consistent growth and differentiation of SkMDC.

Systems and services

A significantly enhanced capability for quantification of cellular responses is offered by the **Genetix' CellReporter** system. The multi-application platform is suitable for a wide range of cell based assays such as cell cycle analysis, cytotoxicity studies and protein translocation monitoring. These assays can be used as biological models of physiological situations, for example when investigating the effect of drug candidates on a cancer cell model. CellReporter is supported by flexible image analysis software which identifies and analyses each object, such as the cell nucleus, thereby distinguishing between the responses of individual cells within heterogeneous populations. This means users can optimise and standardise image interpretation for each assay, view cell morphology and check data quality. Thus, using the CellReporter system enables scientists to increase throughput of these assays without compromising image or data quality.

TTP LabTech launched its **new contract screening service** based around the company's HCS technology, the Acumen® microplate cytometer. The service will provide clients with high-content data using cell based assays for the investigation of various biological phenomena - including cell cycle, RNAi profiling, angiogenesis and signal pathway profiling. Initially run from TTP LabTech's headquarters in the UK, the service is currently available in two forms, Standard and Full. The Standard Service offering includes the rapid scanning and analysis of pre-prepared experimental plates, whilst the more extensive Full Service incorporates the entire process from cell culture through compound/reagent treatment, to screening, analysis and data reporting, and can include assay development where required.



Intelligent Substrates' BioWrite™ protein micropatterns

Substrates and tools

Intelligent Substrates offers new **BioWrite™ line and grid protein micropatterns** on glass coverslips for cell based applications. The fibronectin patterns have feature sizes ranging from 15 to 100 µm, which by restricting the sites of cellular adhesion, and spreading can define the location, size, and morphology of cultured cells; control cellular functions; direct migration; and minimise variability in cell based assays. BioWrite micropatterned protein substrates have a number of significant benefits over standard substrates: 1) Patterned substrates can increase the sensitivity and lower the variability of cell based assays by constraining cells to defined shapes suitable for cell averaging analysis. 2) The predefined placement of cells on the substrate simplifies automated imaging, image processing, and image analysis. 3) Greater sensitivity, lower variability, and simpler automated image analysis means that researchers will get better results faster. "It is clear that micrometer-scale manipulation of the cellular microenvironment will likely be a foundation of 21st-century biomedical research and cell based applications," said Will Heinz, Ph.D., CEO of Intelligent Substrates.

The **Oris™ Pro Collagen I Cell Invasion Assay** has been added to **Platypus Technologies** cell motility assays product line. The assay uses a non-toxic biocompatible gel (BCG) to form a centrally located and temporary cell-free zone on cell culture surfaces. Cells are seeded into the 96-well plate and attach in a monolayer around the BCG. The BCG dissolves to reveal a Detection Zone and a Collagen I overlay is added to create a 3-D environment for cell invasion into the Detection Zone. This new kit enables researchers to save time and cost by utilising automated liquid handling equipment for fast set-up of high throughput assays. Researchers can capture and quantify real-time cell migration data using microscopes and High Content Screening and High Content Imaging instruments. Cell invasion is measured *in vitro* by the ability of adherent cells to move through a 3-D extracellular matrix (ECM) that mimics an

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in vivo environment. The new assay offers a versatile method that allows for imaging and quantitating cells invading through a 3-D ECM in real-time.

Bangs Laboratories offers polymer and magnetic microspheres that may be used to support cell based assays. Antibodies, peptides, and other ligands may be coated on the company's new **1µm ProMag™ microspheres** to magnetically separate target cell populations and the new **Bind-IT™ pre-activated chemistry** simplifies bead coatings. Submicron fluorescent particles have been employed to analyze the expression and distribution of cell surface markers, with peptide-coated versions used to study intracellular signaling networks.

Companies mentioned in this Product Focus:

AMS Biotechnology – www.amsbio.com
Bangs Laboratories – www.bangslabs.com
Cellular Dynamics – www.cellulardynamics.com
Cook MyoSite Inc. – www.cookmyosite.com
Genetix – www.genetix.com
InfiniteBio – www.infinitebio.com
Intelligent Substrates – www.intelligentsubstrates.com
Platypus – www.platypustech.com
TTP LabTech – www.ttplabtech.com

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