

Advertisement feature

# It's a screen!

## Advances in high throughput screening technologies



Image supplied by Hamilton Storage Technologies

High Throughput Screening (HTS) is a powerful approach that enables researchers to identify active compounds, genes or molecular pathways that modulate a specific biological response. HTS was born out of the need to identify drug candidates more rapidly. The approach became possible with advances in robotics and computer technology, and as technology continues to advance, so too has come the ability to screen more and more candidates in shorter time frames and at reduced cost. HTS continues to evolve today as an approach for drug discovery and molecular research.

### Microplate readers

Combining filter-based and quadruple monochromator-based fluorescence detection technology, the **Synergy™ 4** Multi-Detection Microplate Reader from **BioTek** enables endless flexibility in microplate-based assay choice. The system includes Intensity, Luminescence, Fluorescence Polarisation, Time-Resolved Fluorescence, and UV-Visible Absorbance measurement. The filter-based technology provides optimal light filtering and purification for the best sensitivity, while the quadruple monochromator-based fluorescence technology offers flexible wavelength selection. The combination of both these systems in a single unit gives increased flexibility and true multi-detection in one compact footprint.

**Thermo Fisher Scientific** has launched the **Multiskan FC** microplate photometer, which combines the reliability of the Multiskan range with a series of new features for enhanced usability. Designed to process 96- and 384-well microplates, the Multiskan FC can be controlled as a standalone instrument or via the Thermo Scientific SkanIt® Software in a number of different languages. Ready-made sessions for the SkanIt software can be downloaded for the most common assays. The system is equipped with an onboard shaker and optional incubator and can be used for a variety of photometric applications, including end point, dual wavelength and kinetic assays. For improved performance and quality control the Multiskan FC has built-in and optional quality, verification and self-diagnostic tools.

### Screening platforms

**GE Healthcare** has launched the **IN Cell Analyzer 2000**, a flexible cell imaging system for high content analysis with excellent image quality, speed and ease-of-use. The flexibility of the system enables scientists to perform a wide variety of previously challenging experiments with a single instrument: from investigative microscopy through to automated screening, and imaging of organelles, cells, tissues and whole organisms. The IN Cell Analyzer 2000 has a unique combination of hardware and software features for extremely fast image acquisition, making it ideal for screening. The robust construction of the instrument ensures its reliability for high throughput use when carrying out demanding applications in a multi-user environment.

Producing label-free data at six to eight seconds per sample, **BioTrove's RapidFire® 300** mass spectrometry system allows researchers to analyse *in vitro* ADME assays in a fraction of the time required for conventional HPLC mass spectrometry techniques. The RapidFire 300 MS system can be used for a variety of ADME applications such as CYP inhibition, metabolic stability, P-glycoprotein inhibition and plasma protein binding. The RapidFire 300 can fully integrate with any manufacturer's triple quadrupole mass spectrometer and provide data compatible with existing laboratory information management systems. "ADME data is critical in all phases of a fully integrated drug development programme, but data in the lead discovery stage was previously limited by time and labour-

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The PREVI Isola from bioMérieux

intensive screening platforms,” says Can Özbal, Ph.D., Vice President and General Manager, BioTrove RapidFire Business Unit. “RapidFire 300 was developed to meet investigators’ demands for high quality *in vitro* ADME data with a short turnaround time.”

### Assays and kits

**The Methyltransferase HT Activity Kit from Assay Designs** is designed for screening candidate compounds that may alter normal methyltransferase (MT) activity, and is suitable for use with all S-adenosylmethionine (SAM/AdoMET) dependent MTs. The kit includes a high concentration of SAM as a separate component allowing users to customise the amount needed for specific MT/substrate systems. This is ideal for driving the kinetics of low turnover enzymes and fine tuning high throughput screens. MT activity is measured without the need for radio-labelled samples, with both endpoint and kinetic assay options available for highly sensitive fluorometric detection (380ex/520em).

**The STX™ Scalable Transfection System from MaxCyte** enables the transfection of HTS quantities of primary cells, stem cells, and cell lines with DNA, RNA, proteins, and other loading agents for high throughput, high content and cell-based assays. The sterile bench top system provides consistent cell loading within a run, and from run to run. The scalability of the MaxCyte STX allows for a research quantity of SE5 cells to be transfected in seconds, and a HTS quantity of up to 1E10 cells to be transfected in less than 30 minutes with equivalent results. The system combines computer controlled flow electroporation and allows for the cells to be used immediately or cryopreserved for subsequent use.

Facilitating the detection and screening of enzyme classes that convert ATP to ADP the **Transcreener ADP<sup>2</sup> Assay from BellBrook Labs** enables the detection of ATPase activity in a choice of three fluorescent readouts. The assay is based on the immunodetection of ADP and allows the screening of diverse enzymes



BioTek's Synergy™ 4 Multi-Detection Microplate Reader

with native and synthetic substrates, or enzymes with intrinsic ATPase (no substrate) – all with the same set of reagents. The Transcreener ADP<sup>2</sup> Assay is available in fluorescence polarisation (FP), fluorescence intensity (FI) and time-resolved-Förster-resonance-energy-transfer (TR-FRET) formats. All three assays emit in the red region of the visible spectrum to minimise compound interference and can accommodate between 0.1 to 1,000  $\mu$ M ATP.

### Accessories

The **multiSUB4** electrophoresis unit from **Cleaver Scientific** is capable of running up to 1200 samples in four vertically stacked gels in a single run. Typical applications of the high throughput system include its use as a screening tool for DNA mini-preps prepared in 96-well plates or PCR products. Each gel tray is UV-transparent to ensure easy visualisation of samples directly on the transilluminator following electrophoresis. The inclusion of 4 double sided multi-channel pipette compatible combs allows rapid sample loading from 96-well gel trays and thermal cycler blocks. Gel trays are available in 6cm, 12cm and 18cm formats.

Delivering secure, high-capacity storage and tracking of compounds the **asmServer<sup>ST</sup>** from **Hamilton Storage Technologies** is an active sample management system that integrates Hamilton's proprietary SealTite™ technology for automatic microplate lidding and unlidding. SealTite technology features unique stainless steel lids that form a liquid-tight seal, eliminating the risk of contamination that can occur with traditional foil or adhesive seals. Ideal for high-throughput screening labs in drug discovery research, the asmServer provides a complete, integrated solution for compound management and storage at temperatures from ambient to -20°C. The plate-sealing module integrates easily with Hamilton STAR® liquid handling robotics for increased unattended automation. SealTite seals are available for standard SBS 96- and 384-well microplates and include a DMSO-compatible inner layer.

**bioMérieux** has introduced the **PREVI Isola**, an automated specimen and agar

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Dr Can Özbal,  
Vice President and General Manager,  
RapidFire Business Unit, BioTrove

plate management system that offers clinical microbiology labs new flexibility for routine processing of samples. The system features revolutionary streaking technology, which maximises colony isolation through pressure-controlled contact with the agar surface during inoculation, and uses the same quantity of inoculate every time to standardise results. The PREVI Isola can process different sample and container types at a rate of up to 180 plates per hour. An additional advantage of the system is the elimination of cross-contamination between samples, and the provision of traceability through automated barcode labelling. The PREVI Isola is particularly suited to high throughput applications where negative results are prevalent, such as MRSA or urine specimen screening.

### Companies mentioned in this Product Focus:

Assay Designs – [www.assaydesigns.com](http://www.assaydesigns.com)  
BellBrook Labs – [www.bellbrooklabs.com](http://www.bellbrooklabs.com)  
BioTrove – [www.biortrove.com](http://www.biortrove.com)  
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