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Laboratory overtures

Instrumental advances in laboratory equipment

From basic tools to speciality equipment, no lab can function without its essential instruments, and in order to continually improve efficiency, accuracy and ability in the lab, new innovations are regularly introduced. In this feature we look at the latest advances in laboratory equipment, including innovations in sample preparation, imaging and analysis, and safety and compliance.

Analysis and imaging

BioTek Instruments and Gyrasol Technologies offer the unique combination of the **Gyrasol Sensor** fluorescence-based assay platform with BioTek's **Synergy™ 4 with Hybrid Technology™ Multi-Mode Microplate Reader**. "Flexibility is critically important to us because we develop diverse assays to solve a wide range of customers' problems," noted Susan K. Burgess, President and CEO of Gyrasol Technologies. "We need an instrument that is agile enough to create new validation assays for emerging drug targets, and readily adaptable to scale up assays for high-throughput screening. The Synergy 4 is a perfect fit as it performs reliably in a variety of readout formats in both kinetic and end-point modes, and its monochromator-based technology is essential for streamlined platform development." The Gyrasol Sensor detection platform screens for kinases and phosphatases in a homogeneous format. BioTek's Synergy™ 4 Hybrid Microplate Reader is the first in a new class of readers to combine sensitive filter-based and flexible quadruple monochromator-based fluorescence detection technology in one compact unit.

GE Healthcare's NanoVue™ is a sensitive UV/Vis spectrophotometer that accurately quantifies DNA, RNA, oligo and protein samples. Users pipette directly onto the sample plate, with results delivered in less than five seconds, as a result of the system's proprietary "drop-and-measure" hydrophobic sample plate and user-friendly in-built software. Between reads the sample plate can simply be wiped clean. NanoVue does not require a computer and the user can select predefined methods, or create their own directly from the system's in-built display.

NanoVue's sensitivity enables measurements of sample volumes as low as 0.5 µL. The system eliminates the use of cuvettes or capillaries and is extremely easy to clean, reducing the risk of contamination.

mRNA-Seq from **Illumina** is a new platform for full-length, complementary DNA (cDNA) sequencing on the Illumina Genome Analyzer. In contrast to tiling and exon arrays, researchers can use mRNA-Seq to obtain a more in-depth, comprehensive view of the transcriptome, revealing aspects previously unseen using array-based or expression sequence tag (EST) technologies. Powered by Illumina's sequencing technology and the Genome Analyzer, mRNA-Seq delivers unbiased and unparalleled information about the transcriptome because it does not require design of probes or primers. Researchers can use this platform to quickly generate a full sequence from any poly-A tailed RNA to discover and profile novel transcripts, novel isoforms, alternative splice sites, rare transcripts, and cSNPs (coding region single nucleotide polymorphisms) in one experiment. Adam Lowe, Director of Product Marketing for the Life Sciences Business at Illumina, said: "Simplicity of the sample preparation and sequencing chemistry, combined with an automated workflow of the Genome Analyzer II makes it easy for just one person to generate a rich RNA sequence database in one month."

Genetix has introduced the first slide loader capable of unattended scanning and automated cell capture in oil for use in cytogenetics laboratories. The new **GSL-120**, when integrated with the company's CytoVision® platform, provides a complete scanning and auto-capture solution that efficiently processes large batches of slides without user intervention.



GE Healthcare's NanoVue

The **UltraVIEW® VoX** from **PerkinElmer** is a complete solution for advanced live cell 4D confocal imaging. The system includes the latest in spinning disk technology, the CSU-X1 head, for maximum optical efficiency, minimal phototoxicity and photobleaching; a patented ProSync® unit for optimum synchronisation of hardware; and solid-state lasers and optional PhotoKinesis™ accessory for FRAP and related techniques. The UltraVIEW VoX is driven by **Volocity®**, the market leading high performance 3D software from Improvion, now a PerkinElmer company. Volocity provides a full suite of tools to acquire, measure, analyse and deconvolve 4D image data, right through to creating images and movies to share and publish. The UltraVIEW VoX is compatible with a range of cameras, microscopes and accessories for choice and flexibility, and is the ultimate solution for advanced performance, high speed 4D confocal imaging for life scientists. Applications include developmental biology, cell signalling, protein trafficking, infection, immunity and many other research areas.

Safety and compliance

The **VACUSAFE comfort** from **INTEGRA Biosciences** is a highly safe vacuum system that has been specifically developed for easy and rapid handling of hazardous liquids. The new generation VACUSAFE comfort is designed for aspiration, disposal or filtration of biological or chemical liquids in a clean and professional way. All required functionality is integrated in a compact design and ready to use at the push of a button.

RAE Systems has introduced the **MiniRAE Lite**, which joins the MiniRAE 3000 and ppbRAE 3000 in this range of photoionization detector (PID) based instruments. This is a non-intrinsically safe instrument that uses standard alkaline AA size batteries or optional rechargeable batteries. This instrument is intended for outdoor environmental and construction site use where hydrocarbon-based volatile organic compounds (VOCs) and chemicals pose a toxic threat.



The GPR-800 from Protea Biosciences

Agilent Technologies has launched the enhanced **Agilent Enterprise Edition 1.60** for instrument qualification in regulated laboratories. Agilent's Enterprise Edition is a flexible, automated, convenient and paperless way to comply with laboratory regulations worldwide. The service covers all major laboratory instruments, regardless of manufacturer. Enterprise Edition, which reduces qualification report review and approval time by as much as 66% compared with manual methods, is an approved choice for chromatography equipment qualification.

Sample prep and accessories

Whilst a prep HPLC run can be completed in less than 15 minutes, it can take 8-24 hours to recover the purified compound, dry it, reconstitute it in the desired solvent and format it into a compound library. **Anachem's** new **FT-LC system** virtually eliminates this bottleneck, dramatically reducing the water content of fractions collected from the prep HPLC system from 88% to less than 1% in under 15 minutes. Included in the process is a step to automatically convert compounds from acid to base form.

High quality ultra pure water is essential for many specialised laboratory applications, including gel preparation, PCR experiments and sequencing. The **PURELAB® Ultra** from **ELGA** offers the ultimate in water purity, with ELGA's innovative PureSure® system guaranteeing inorganic purity beyond 18.2 MΩ-cm. The PURELAB Ultra incorporates complete ongoing sanitisation, real-time TOC monitoring, full spectrum UV treatment and automatic self calibration for absolute confidence in your laboratory water.

Protea Biosciences' GPR-800 is an advanced, microfluidics-based gel protein recovery (GPR) system for the rapid and efficient extraction of proteins from polyacrylamide gels. The GPR-800 system uses a proprietary plastic microfluidic chip in a high voltage environment, to allow fast recovery simultaneously in eight parallel microchannels. Protea's GPR-800 is a closed

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Susan K. Burgess,
President and CEO, Gyrasol Technologies

system with minimal dead volume, assuring no introduction of contaminants. The recovered proteins can easily be analysed by mass spectrometry to determine intact mass or perform top down proteomics experiments.

Companies mentioned in this Product Focus:

Agilent Technologies - www.agilent.com
Anachem - www.anachem.co.uk
BioTek Instruments - www.biotek.com
ELGA - www.elgalabwater.com
GE Healthcare - www.gelifesciences.com
Genetix - www.genetix.com
Illumina - www.illumina.com
INTEGRA Biosciences - www.integra-biosciences.com
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