

new products

Focus on bioinstrumentation and biotechnologies

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description.

Andreas Mandelis

Evaporative light-scattering detectors

According to Agilent Technologies, its two new evaporative light-scattering detectors, the 1290 Infinity and the 1260 Infinity, provide up to nine times higher sensitivity, better efficiency, and greater reproducibility than other currently available ELSDs. Both detectors are



suitable for studying non- and semivolatile compounds in drug discovery and in pharmaceutical and fine chemical analysis. Because they eliminate interference from dimethyl sulfoxide, a solvent widely used for sample storage in drug discovery, both devices can screen pharmaceutical com-

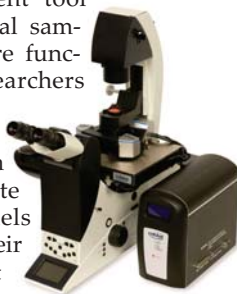
pound libraries without tedious sample preparation. The company claims that the new evaporator design and its proprietary gas-flow programming allow subambient analysis of semivolatile compounds that cannot be detected with other ELSDs. A standby mode enables energy savings and a 50–75% reduction in nitrogen gas consumption. *Agilent Technologies Inc, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051, <http://www.agilent.com>*

Bio-AFM for mechanobiology

Bruker has released a nanomechanics package to expand bio-atomic force microscopy (AFM) applications in mechanobiology research. Included are new analysis models in PeakForce quantitative nanomechanical property mapping (QNM), a new PeakForce capture function, and an enhanced quantitative force-volume mapping mode. The new functionality in PeakForce QNM expands support for a lower modulus range that covers live cells and tissues and makes it a mechanical prop-

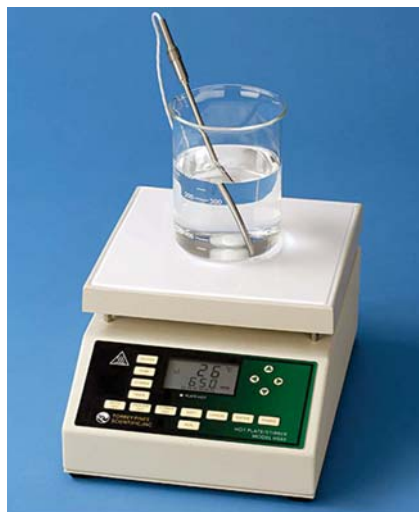
erty measurement tool for soft biological samples. The capture function gives researchers full access to the PeakForce QNM data so they can explore alternate analysis models and validate their results against other techniques.

New analysis capabilities in quantitative force-volume mapping mode enable direct comparisons between it and other mapping mode techniques. Together, the features provide fast, high-resolution, quantitative characterization of nanomechanical properties over a wide range of biological samples. *Bruker Nano Surfaces Division, 3400 East Britannia Drive, Suite 150, Tucson, AZ 85706, <http://www.bruker.com>*



Programmable stirring hot plates

Torrey Pines Scientific offers programmable corrosion-resistant digital stirring hot plates for use with aggressive chemicals in environments where vapors or spills would quickly destroy other stirring hot plates. The EchoTherm model HS70 hot plates are designed to be purged using an inert gas through a fitting on the rear of the



chassis. They feature a 10-program memory with 10 steps per program, temperature ramping, an RS-232 input and output port, a membrane keyboard, and a full-function LCD with all parameters continuously visible. The 600-W heater features solid ceramic tops measuring 8 square inches. Temperature is controlled by proportional-integral-derivative software to $\pm 1^\circ\text{C}$ or $\pm 1^\circ\text{F}$. Temperatures can be set to 450°C and stirrer speeds from 100 to 1500 rpm. The units are supplied with a 6-inch Teflon immersion probe to control solution temperatures directly. *Torrey Pines Scientific Inc, 2713 Loker Avenue West, Carlsbad, CA 92010, <http://www.torreypinesscientific.com>*

Laser scanning microscopes

Olympus has introduced two new microscopes for universities and other research institutions engaged in life science research: the Fluoview FV1200 biological confocal laser scanning microscope and the Fluoview FV1200MPE multiphoton laser scanning microscope. The microscopes can obtain high-contrast 3D images by scanning a specimen with a laser beam and detecting the fluorescence. Olympus claims they are easy to use and offer more rigidity, higher sensitivity, and lower noise. The FV1200MPE uses an IR laser that yields high tissue transparency. It enables deep imaging with thick cells and tissues that is difficult to accomplish even with the FV1200. The microscopes use newly designed silver-coated galvanometer mirrors for scanning specimens. According to the company, the mirrors' high reflectance can detect fluorescence with high efficiency and sensitivity. *Olympus America Inc, 3500 Corporate Parkway, Center Valley, PA 18034, <http://www.olympusamerica.com>*

HPLC columns

Thermo Fisher Scientific has engineered its Accucore XL high-performance liquid chromatography columns to increase the performance of conventional HPLC separations without modifying the instruments or methods. Tests in Thermo Fisher's laboratory have shown that the columns, based on the company's core enhanced technology and using 4- μm solid core particles, enable conventional HPLC methods to perform better than columns packed with 5-, 4-, or 3- μm fully porous particles.

Core enhanced technology combines Thermo Fisher's particle technology and experience in phase bonding and packing. The columns feature tight control of particle diameter, advanced bonding technology, and automated packing processes. High separation efficiencies that use standard HPLC instruments and conditions provide increased peak resolution and lower detection limits. An ultrastable packed bed results in robust columns that show excellent retention and response reproducibility. *Thermo Fisher Scientific Inc, 355 River Oaks Parkway, San Jose, CA 95134, <http://www.thermofisher.com>*

Recirculating chiller

A compact, economical recirculating chiller designed to provide reliable heat removal for lasers and other precision laboratory equipment is now available from PolyScience. Capable of maintaining process temperatures from 41° to 95 °F (5° to 35 °C), the DuraChill 1.5 HP provides up to 6328 W of cooling at 68 °F (20 °C) ambient. It is available with a built-in heater for use with equipment operating at elevated temperatures. Versatile and flexible, it comes with various standard and optional features and, according to the company, offers reliability and operational simplicity. All DuraChill models



have a microprocessor-based controller and displays for digital temperature, one-touch set point, and digital pressure and flow rate. For operational and process safety, the rugged chillers also come with user-adjustable fluid temperature, pressure, and flow rate alarms and a high ambient temperature alarm. *PolyScience, 6600 West Touhy Avenue, Niles, IL 60714-4516, <http://www.polyscience.com>*

Workstation vacuum system

Warner designed its dedicated workstation vacuum system to facilitate removal of waste solutions from cell imaging and recording chambers. A complete out-of-the-box aspiration system, it can be used in laboratories that either do not have in-house vacuum or do



have in-house vacuum but need optimization to correct for vacuum-line fluctuations that cause problems with chamber aspiration. The heart of the system is a low-noise, medical-grade, linear piston vacuum pump with a single moving part to ensure long life and quiet operation. All wetted materials are made from chemically resistant components. One of the twin 2000-ml flat-bottom flasks acts as a trap; the other offers vacuum storage for increased stability. A needle valve adjusts the vacuum pressure, making it easy to achieve an even 50:50 air:fluid mixture from the recording chamber. A vacuum gauge indicates vacuum level in the catch pot. *Warner Instruments LLC, 1125 Dixwell Avenue, Hamden, CT 06514, <http://www.warneronline.com>*

Workstation for variable-volume DNA isolation

Tecan and Promega have developed a turnkey workstation for fully automated extraction of gDNA from whole blood samples. Designed for biobanks and high-throughput genomic laboratories, the compact Freedom EVO-HSM workstation provides reliable walk-away extraction using Promega's ReliaPrep large-volume HT gDNA isolation system. To streamline biobanking workflows, the system offers intelligent one-tube gDNA extraction from up to 32 samples in less than four hours. Tecan's TouchTools touchscreen inter-

face controls the system, which features preinstalled protocols tested and verified by Promega. Using the platform's liquid-level detection function, the system can automatically calculate the reagent volumes for each sample, which ensures efficient walkaway extraction of high-quality DNA from 1 to 10 ml of blood and meets the requirements of next-generation sequencing methods. *Tecan Group Ltd, Seestrasse 103, CH-8708 Männedorf, Switzerland, <http://www.tecan.com>*

Biosystem digital imaging

Leica Microsystems' Biosystems Division has introduced a scalable, multisite picture-archiving and communication system, Digital Image Hub (DIH) Enterprise. It provides an optimized PACS environment to support clinical and pharmaceutical digital pathology networks where scanners reside at multiple physically separate locations. With on-demand access, DIH Enterprise allows for viewing and searching of images concurrently from different sites through a single database. That eliminates unnecessary transfer of large files over networks and facilitates real-time access to content anywhere on a collaborative network. Compatible with multiple whole-slide file formats and the new Digital Imaging and Communications in Medicine 145 digital pathology image standard, DIH Enterprise provides a flexible platform to network sites that may be using slide scanners from different vendors. *Leica Microsystems Inc, 1700 Leider Lane, Buffalo Grove, IL 60089, <http://www.leicabiosystems.com>*

Light sheet microscopy system

The Lightsheet Z.1 microscope from Carl Zeiss provides users with a new method of imaging dynamic processes in living organisms. They can observe the development of entire organisms over several days. Very low phototoxicity and integrated incubation enable insights into the differentiation of cell



groups without harming the specimen. The light sheet system uses a new type of optical concept that combines cylindrical lens optics with laser scanning. Users receive homogeneously illuminated optical sections of complete examination objects. Images are captured at a 90° angle to the light sheet. Multi-view imaging allows data acquisition from different viewing angles, and images at different angles can be combined through mathematical algorithms into 3D reconstructions and time-lapse videos. *Carl Zeiss Microscopy GmbH, Carl Zeiss Promenade 10, 07745 Jena, Germany, <http://microscopy.zeiss.com>*

Fluid-delivery syringe pump

Harvard Apparatus has released a new PHD Ultra CP syringe pump that can infuse fluids under constant pressure by



automatically adjusting the flow. It couples to virtually any commercially available pressure transducer or amplifier with a 0- to 10-V output to deliver fluids with an applied force of up to 4448.2 N with less than $\pm 2\%$ pressure accuracy. The PHD Ultra CP family of syringe pumps features applied forces between 333.6 and 4448.2 N, a touchscreen LCD with icon interface, advanced programming, flexibility in connectivity with a USB serial port, RS-232 and RS-485 ports for daisy chaining, an input and output port, and transistor-transistor logic. All PHD Ultra CP syringe pump models can infuse and withdraw and are offered in various configurations. *Harvard Apparatus, 84 October Hill Road, Holliston, MA 01746, <http://www.harvardapparatus.com>*

Pulsed electric field cell extraction

Diversified Technologies has introduced a low-energy pulsed electric field (PEF) process to extract intracellu-

lar materials from biomass pumped in slurry. The PowerMod PEF system features a chemical-free, nonthermal, low-energy-consumption process. The solid-state system applies 1- to 40-kV/cm high-voltage pulses for 2–20 μ s to break cell membranes and release intracellular materials to the surrounding solution; the company claims its method is about 10% of the cost of a thermal process. Consisting of a high-voltage pulse modulator, power supply, and treatment chamber, the PowerMod PEF system is capable of up to 40 kl/hour of throughput. Providing simple, push-button operation, the compact unit is 4 ft tall and requires low maintenance. Applications include any biomass in slurry or other liquid that can be pumped. *Diversified Technologies Inc, 35 Wiggins Avenue, Bedford, MA 01730, <http://www.divotecs.com>*

High-definition microscopy camera

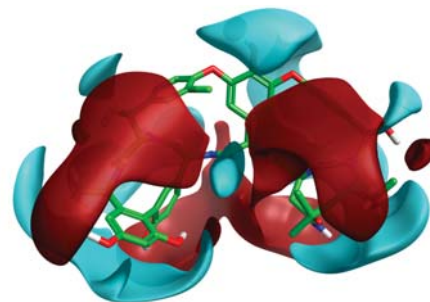
The HD-210U from Dage-MTI is an advanced high-definition (HD) video camera for microscopy, scientific, and industrial applications. The single-chip CMOS camera delivers true HD resolution (1920 $\times$ 1080 pixels) and full-screen video (16:9) with smooth motion at 60 frames per second. Dual DVI/HDMI and USB 2.0 outputs make it easy to set up and view good quality color and detail in real-time video and simultaneously capture selected HD images to a PC for review, documentation, and analysis. The HD-210U includes Dage-MTI's proprietary "MagicApp" software, which allows intuitive one-left-click mouse operation for image capture, display, and instant review.



The C-mount provides easy connectivity to industry-standard microscopes, adapters, and lenses. The camera system is suitable for full-screen viewing of live microscopy samples using digital light processing projectors and HDTV displays with matched pixel-to-pixel resolution. *Dage-MTI, 701 North Roeske Avenue, Michigan City, IN 46360, <http://www.dagemti.com>*

Molecule viewing in 3D

Cresset's torchV10lite molecular viewer, editor, and sketcher software offers an informative view of how molecules behave in biological systems. It shows molecules in 3D overlaid with field patterns, their associated 2D structure, and physicochemical properties.



TorchV10lite gives insight into how a compound's activity, absorption, distribution, metabolism, excretion, and toxicity profiles relate to its molecular fields. Molecules can be filtered based on the exact mix of properties required in a given project. Copy and paste support allows users to transfer molecules between applications and to share results. Users can sketch chemical series to study how field and activity patterns are related; import and compare up to 10 000 compounds from structure data format, MOL2, and Cresset applications; and convert from 2D to a minimized 3D conformation. TorchV10lite uses Windows, Linux, Mac, and Konstanz information miner platforms and may be downloaded free of charge. *Cresset Group, BioPark Hertfordshire, Broadwater Road, Welwyn Garden City, Hertfordshire AL7 3AX, UK, <http://www.cresset-group.com>*

Solenoid pump

The Lee Company has made available a new inert solenoid pump that offers design flexibility and cost savings to medical and scientific industries. The LPL2 pump features a new port head design that enables users to test the fluidic system using connections to soft 1/16-inch tubing. Once the system design has been finalized, the same pump can be manifold mounted using standard O-rings. The pump also features a contoured end cap that provides secondary connector retention and is compatible with standard AMP connectors. *The Lee Company USA, 2 Pettipaug Road, P. O. Box 424, Westbrook, CT 06498-0424, <http://www.theleeco.com>*