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

Cancer microarrays and cytogenomics

To address the growing need for researchers to detect both copy number and copy-neutral aberrations in cancer tissue samples in the same experiment, Agilent Technologies has introduced SurePrint G3 comparative genomic hybridization–single nucleotide polymorphisms (CGH–SNP) cancer catalog microarrays. The company also made available, at no charge to array customers, its CytoGenomics 2.0 software for analysis of data from SurePrint experiments. The software's new algorithms allow analysis of samples with tumor heterogeneity, admixtures of tumor and normal cells, and genomic complexity—often observed in cancers as a consequence of copy number changes—such as hematological cancer samples. In addition to the catalog arrays, Agilent offers easy customization of SurePrint G3 CGH–SNP cancer arrays. With the company's eArray online design tool, users can choose from 65 000 SNPs and more than 28 million prequalified CGH probes. *Agilent Technologies Inc, Life Sciences and Chemical Analysis, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051, http://www.agilent.com*

Crystallography systems for structural biology

Bruker has launched the D8 Quest and D8 Venture high-performance x-ray crystallography systems for structural biology. The D8 Quest is based on the IμS microfocus compact x-ray source; the new version of the IμS microfocus source technology features 30% higher intensity. The large-enclosure D8 Venture, which features the new, high-brightness TXS microfocus rotating anode source and a strong x-ray source, combines the advantages of the microfocus source technology with those of a rotating anode. According to Bruker, the compact TXS, in its stable and low-

maintenance package, delivers the highest intensity available for the home laboratory. It is the first rotating anode to offer fast and straightforward downstream alignment, which allows users to easily and quickly align the system with the doors of the radiation enclosure locked, in compliance with the latest radiation safety regulations. *Bruker AXS Inc, 5465 East Cheryl Parkway, Madison, WI 53711-5373, http://www.bruker.com*

Copper foam for biomedical product design

Copper foam from Goodfellow combines the high thermal conductivity of copper with the structural benefits of metal foam. Those features are of potential interest to design engineers working on medical products and devices, defense systems and manned flight, power generation, and semiconductor devices. It is a skeletal structure—not a sintered, coated, or plated product—and its purity is typically that of the parent alloy metal, with no voids, inclusions, or entrapments. The matrix of cells and ligaments is completely repeatable, regular, and uniform throughout the material and yields a rigid, highly porous, and permeable structure with a controlled density of metal per unit volume. Characteristics of copper foam include optimal heat transfer, high strength-to-weight ratio,

and the ability to be coated and plated. Copper foam is available in standard pore sizes of 2, 4, 8, and 16 pores per cm, with a density range of 3–12%. However, the foam can be compressed to achieve densities up to about 70% higher and high pore density of approximately 500 pores per inch. *Goodfellow Corporation, 305 High Tech Drive, Oakdale, PA 15071-3911, http://www.goodfellowusa.com*

UV-visible spectrophotometers

Shimadzu Corp has released updated midrange UV-visible spectrophotometers, core models in their UV-visible spectrophotometer line. The new products not only offer a small footprint but also feature low stray light levels—light with wavelengths other than the target wavelength in the monochromator—that enable the measurement of highly concentrated samples and offer the ability to extend measurements into the near-IR region. The release includes two new models: the UV-2600, with one monochromator, and the UV-2700, which features two monochromators connected in series. UV-visible spectrophotometers are used for research on and quality control of such diverse applications as pharmaceuticals, food products, chemicals, the environment, and life sciences. The UV-2700 is able to measure absorbance levels as high as 8 absorbance units, which means it can measure highly concentrated samples with light transmittance levels of only 10^{-6} % or film samples with especially low transmission characteristics. In addition, by attaching an optional integrating sphere to the UV-2600, the wavelength measurement range can be extended from 220 to 1400 nm, which includes the near-IR region. *Shimadzu Scientific Instruments, 7102 Riverwood Drive, Columbia, MD 21046, http://www.ssi.shimadzu.com*

Biostream monitor

A recent addition to Hiden's QIC series of gas analyzers is the QIC Biostream system. It has been configured for real-time, continuous multistream analysis of both headspace and dissolved species evolving from and within various bioreaction processes. All gaseous species with molecular weights below 300 atomic mass units can be measured. The QIC Biostream system offers a choice of application-specific process interfaces that include fast, automated stream-switching modules. The Hiden Proteus rotary selector valve is used for sequencing from up to 80 individual sampling lines, and the system may be adapted to operate with low sample flow rates of just 4 ml/min up to rates of 10 l/min. Membrane interfaces designed for the measurement of specific dissolved gases accommodate both insertion and flow-through applications. Other applications include analysis of fermentation and synthetic processes, biogas production, monitoring in media such as seawater and soils, and studies of general microbiological processes. *Hiden Analytical Inc, 37699 Schoolcraft Road, Livonia, MI 48150, http://www.hideninc.com*

Biological fluorescence imaging system

Carestream now offers the Gel Logic 6000 PRO to address the needs of researchers who want to be able to image all samples—from DNA gels to chemi blots to fluorescent blots—in one system. According to the company, the system has been designed to enable full and fast field of view and high-intensity fluorescent image acquisition at economical cost. A high-sensitivity camera provides crisp, clear images for all modalities. The system comes with new capture and analysis software for quantification experiments. That software allows simultaneous analysis of four overlaid images with synchronized

region-of-interest definition and manipulation and thus increases the amount of data that can be extracted from a single experiment. Specifications include a 4.2-megapixel camera with an $f/0.95$ fixed lens for rapid, high-resolution imaging. An automated broadband UV transilluminator sample platform has a 3× zoom for samples up to 18 × 18 cm and includes blots,

membranes, and plates. The system provides 16-bit, single-image acquisition with n-bit data accumulation. Platform-mounted illumination includes epi-white lights and five LED modules for white light, RGB, and near-IR imaging. *Carestream Health Inc, 150 Verona Street, Rochester, NY 14608, http://carestream.com*

Laboratory PEF system

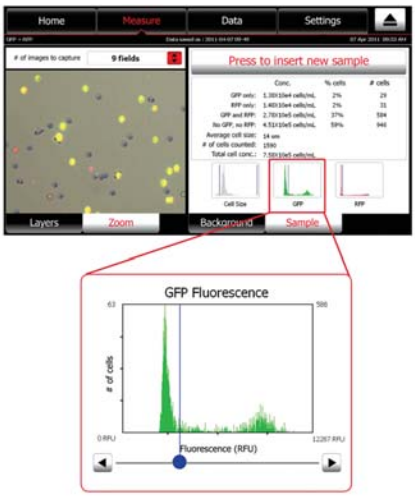
A new pulsed electric field (PEF) system from Diversified Technologies provides flexibility for experiments, batch tests, and process development involving food, algae, wastewater treatment, and other extraction processes. The laboratory PEF system can apply full field strength of 40 kV/cm across the fluid at conductivities up to 10 mS and can also apply 10 kV/cm into seawater. The totally integrated system is designed to perform R&D experiments at up to 50 l/h, depending on the application. Consisting of a high-voltage pulse modulator, power supply, and treatment chamber with a pump, the laboratory PEF system delivers up to 99% efficiency and less than 1-μs rise times into a resistive load. Providing pulse widths from 1 to 20 μs and frequency up to 1 kHz, it offers internal self-protection against over-voltage and over-current conditions. *Diversified Technologies Inc, 35 Wiggins Avenue, Bedford, MA 01730, http://www.divtecs.com*

Correlative system for cell biology microscopy

FEI has announced a correlative cell biology microscope workflow solution for research scientists. The fast and efficient modular automated processing system (MAPS) enables biology and biophysics researchers to see both large-scale context and small-scale detail in one overview. With MAPS, researchers can import and correlate an image from any type or brand of light microscope. The MAPS ultrastructure is obtained from an FEI scanning electron microscope or DualBeam (focused ion beam/SEM) system. Users can quickly navigate to a region of interest identified in the light image and utilize the full resolving power of the electron microscope to reveal ultrastructural detail. They can also use MAPS to assemble high-resolution, large-field images; the system automatically acquires a grid of smaller electron microscope image tiles and stitches them together in a composite image that can reveal large-scale relationships and organization while preserving full-resolution detail throughout. *FEI Company, North America NanoPort, 5350 Northeast Dawson Creek Drive, Hillsboro, OR 97124, http://www.fei.com*

Image cytometer

The Tali image cytometer from Life Technologies is a three-channel—bright field, green fluorescence, and red fluorescence—benchtop assay platform that performs suspension cell-based assays. Using only 25 μl of sample volume, the Tali takes 10–75 s for a typical cell population analysis. Its green and red fluorescence channels enable it to simultaneously count green and/or red fluorescent stained cells and cells expressing green and red fluorescent protein (GFP and RFP). The Tali also presents comprehensive data with graphic reports and allows the export of data for archiving and sample comparisons. It can be used for rapid analysis of GFP/RFP vector transfection efficiency, identification of GFP and/or RFP positive cells, simple two-color apoptosis assays, accurate cell viability population analysis, and quick verification of samples prior to sorting or high-end flow cytometry analysis. *Life Technologies Corporation, 3175 Staley Road, Grand Island, NY 14072, http://www.lifetechnologies.com*



Scientific CMOS camera

Hamamatsu Photonics has introduced the ORCA-Flash4.0 scientific CMOS camera featuring good quantum efficiency, low noise, high resolution, and fast readout. According to the company, it delivers better signal-to-noise characteristics than electron-multiplying and cooled CCDs and first-generation scientific CMOS cameras. Its high sensitivity means that one camera can accommodate a variety of imaging needs, including superresolution microscopy, total internal reflection fluorescence microscopy, live-cell green fluorescent protein imaging, high-speed calcium ion imaging, Förster resonance energy transfer, and real-time confocal microscopy. The ORCA-Flash4.0 offers quantum efficiency values of greater than 70% at 600 nm and 50% at 750 nm and produces only 1.3 e^- of read noise at 100 full-resolution fps. The combination of high quantum efficiency and low noise, in the absence of electron-multiplying CCD multiplicative noise, means that images are no longer limited by the camera. With four megapixels measuring 6.5 × 6.5 μm each, the camera is suitably formatted for demanding microscopy applications. *Hamamatsu Corporation, 360 Foothill Road, Bridgewater, NJ 08807, http://hamamatsucameras.com* ■