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Novel High-Throughput Screening Technologies

Fluorescence, Bioluminescence & Flow Cytometry Aid Drug Discovery

by Ilene Schneider

Several technologies for high-throughput screening were highlighted last month at "LabAutomation 2003" in Palm Springs, CA (see GEN, March 1, "New Products Introduced at LabAuto 2003," p.26). Among them were some familiar names, as well as a few newcomers.

Union Biometrica (Somerville, MA) demonstrated its Complex Object Parametric Analyzer and Sorter (COPAS™) Biology On A Bead (BOAB) flow-sorting technology, which enables researchers to achieve routine screening speeds of 100,000 compounds per hour or up to one million compounds per day, according to Johan Geysen vp and director of European scientific operations of the company.

"When used in combination, these innovations have facilitated the development of more sophisticated bead-based combinatorial assays offering higher through-put," Geysen says.

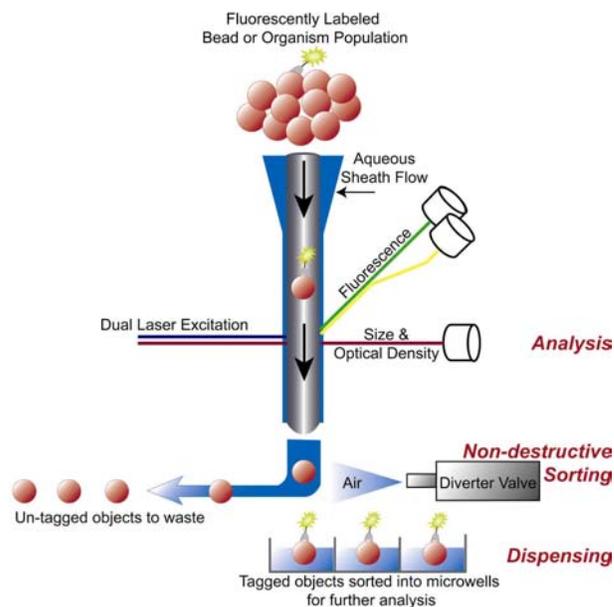
COPAS refines the principles of flow cytometry to accommodate objects larger than individual cells. It provides a gentle, nondestructive sorting mechanism that enables sorted objects to be collected intact and undamaged and then dispensed into multiwell plates for further analysis or observation.

It has been used for sorting and dispensing model organisms such as *Caenorhabditis elegans*, *Drosophila melanogaster*, *Danio rerio*, and *Arabidopsis thaliana*. It can sort organisms at a rate of more than 100,000 per hour, or more than 1,000 times faster than manual picking, according to the company.

COPAS instruments have flow cell diameters of up to 1 mL, enabling the flow sorting of beads with diameters of up to 500 microns, a size large enough to allow for single

bead structure identification. These instruments provide a reading of two physical parameters (size and optical density) of each bead.

In addition COPAS can simultaneously read two fluorescent emission wavelengths emitted from the bead. COPAS BOAB instruments are based on the same flow-sorting principle but also can be configured with a UV laser for excitation of fluoreophores typically used in the combinatorial chemistry laboratory, with speeds of 50 beads per second or 180,000 beads per hour.



Schematic of Union Biometrica COPAS flow sorting technology.

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