

Advertisement feature



Image supplied by Nikon

# Animalcules

## Looking at life in progress

Microscopy has come a long way from the time Anton van Leeuwenhoek first observed what he had described as “animalcules,” which are known today as microorganisms, using one of his hand-crafted optical microscopes more than three-hundred years ago. In the present day, microscopy, no longer just a curiosity, has been refined by a myriad of improvements and inventions to become an invaluable tool in research and development. You will find a handful of the most recent improvements below.

**P.A.L.M. Microlaser Technologies**, a subsidiary of **Carl Zeiss MicroImaging**, is introducing new accessories to facilitate live cell research. The **PALM DuplexDish 35** is a 35 mm diameter culture dish for micro-dissection in which cells can be isolated, collected and further cultivated without an additional trypsinization step. Due to its small dish diameter, less reagents are required than before, which may help to reduce costs. The base of the dish is designed to enable gas exchange and exhibits low autofluorescence. Primary use is for studying living and stem cells with an emphasis on downstream applications such as transfection assays. The **PALM DishHolder 35**, designed to hold the DuplexDish 35 on the microscope stage, features an integrated aperture used to check for successful specimen isolation. This aperture can be approached with the CapCheck function so that, after the completed microdissection, the specimen can be examined in the cap without any need to remove the dish from the holder. The **PALM DishHolder 6/35** can accommodate up to six DuplexDish 35 culture dishes. It can also be inserted in the microscope stage, but used for preparation under the clean bench, either with each dish individually closed or with a cover over all six. The culture dish and holders are designed for laser microdissection and pressure catapulting technology (LMPC).

**LiveCell Array** from NUNC, is the first microscope slide-based high content

analysis (HCA) tool that enables multi-parametric, imaging-based assays on thousands of intact individual cells, including non-adhering blood and bone marrow cells. Scientists may observe each cell at its own identified location and track its individual, real-time responses to intervention. Multiple functional assays can be performed on a living cell, followed by post-fixation studies on the same cell to maximize usage of cell samples. The disposable NUNC LiveCell Array microscope slide contains an embedded, transparent array of pico-wells available in sizes of 15, 20, 100 or 250 microns in diameter. Individual cells settle into the pico-wells by means of gravity, and are not displaced by rinsing or staining. Kits that include reagents, buffers and protocols for assays involving apoptosis or CD3, CD4 and CD8 cell surface markers are also available.

**European Molecular Biology Laboratory (EMBL)** introduces a new computational tool that improves **Single Plane Illumination Microscope (SPIM)** image resolution. A deconvolution algorithm developed and applied by scientists at EMBL provides new opportunities for studying sub-cellular processes in large living specimens. SPIM allows scientists to study large, living specimens from many different angles, under real conditions and with minimal harm to the specimens. Snapshots of the specimen obtained in different planes along different directions and at varying time

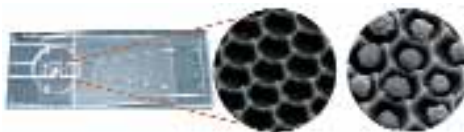
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The Tokai Hit stage incubators introduced by Olympus



The LiveCell Array microscope slide from NUNC

points are assembled into three-dimensional images or movies, which provide insights into the dynamic cellular processes of a living organism.

**Ikonisys** introduces a suite of diagnostic products that automate the time consuming technique of fluorescence *in situ* hybridization (FISH), helping to identify chromosome aberrations associated with various diseases. The **oncoFISH** bladder test uses the Ikoniscope robotic digital microscope platform to detect aberrations for chromosomes 3, 7, 9, and 17 in cells found in urine sediment. This test aids in the initial diagnosis of bladder cancer in patients with hematuria (blood in the urine) and the subsequent monitoring for tumor recurrence in patients previously diagnosed with bladder cancer. Diagnostic tests, such as these, offer improved sensitivity and efficiency in detecting cancer. "We expect to reduce the time required to diagnose bladder cancer," said Petros Tsipouras, M.D., Chairman and Chief Executive Officer of Ikonisys. Automated tests like *oncoFISH* bladder can also counteract the shortages of skilled laboratory clinicians, and the cost issues clinical laboratories face with increasing test volumes and declining insurance reimbursement rates.

**BioStation CT**, new from **Nikon**, is a self-contained cell culture observation device and monitoring system that allows users with minimal microscopy experience to conduct live cell imaging either locally or via remote operation over a secure public or private network. The BioStation CT provides a system for managing, observing and recording cell growth, morphology, and protein expression in culture by providing consistent environmental control of temperature, humidity and gas concentration. The system allows numerous

researchers to perform multiple experiments with the same instrument within pre-described imaging sessions.

**Olympus** introduces three new **Tokai Hit** stage incubators for its advanced MVX10 microscope and SZX2 stereo microscopes. These units are suitable for long-term observation of larger living specimens, such as organisms and tissue cultures, offering live cell imaging directly on the microscope stage. Living specimens may be observed in a stable environment at high resolution and sensitivity, since cell activity is susceptible to minor changes in the environment. Two of the stage incubators incorporate a digital gas flow meter to measure CO<sub>2</sub> levels as it is fed into the incubating chamber, and the other incubator has gas flow set at constant pre-mixed 5% CO<sub>2</sub> concentration for samples requiring standard CO<sub>2</sub> saturation. The new control units have been specifically designed for use with the Olympus SZX2 stereo and the MVX10 microscopes. Glass heating technology has been employed in these systems allowing the glass bottom, glass lid and waterbath of the incubators to be heated from ambient temperature to 50°C. The addition of the waterbath reduces the evaporation of the medium and moistens and warms the incoming CO<sub>2</sub> gas.

**Syncroscopy** introduces its new **Montage Explorer**, an automated sample scanning and image stitching system that enables precisely focused images of entire microscope slides. The new Montage Explorer system consists of a high resolution color CCD digital camera that can be fitted to any microscope, with or without a motorized stage, and integrated into any PC system with the latest version of Syncroscopy's Montage Explorer imaging software installed. Montage Explorer extends the field of view to enable

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simultaneous extension of the depth of field and production of a three-dimensional image, in real time, as a sample is being moved around. Microscopists may use high magnification and high resolution microscope objectives on a wide field of view, eliminating the need for digital photo editing. Montage Explorer can also be used with an automated xyz-stepper stage as part of a Montage Explorer system.

**WPA** introduces the **Biowave II** and **Lightwave II**. These instruments feature enhanced 3 nanometer bandwidth and Gifford optics with no moving parts. The Xenon source combines high energy output and longer lamp lifetime. A wide view graphical display and menu-driven software simplifies operation and provides flash scan capability, fixed wavelength, kinetics and concentration measurements, all with flexible data manipulation options. Up to 90 methods can be stored in user-defined folders. Results may be printed to the optional printer or exported via USB or Bluetooth to a PC.

#### Companies mentioned in this Product Focus:

EMBL – [www.embl.org](http://www.embl.org)  
Ikonisys – [www.ikonisys.com](http://www.ikonisys.com)  
Nikon – [www.nikon.com](http://www.nikon.com)  
NUNC – [www.nuncbrand.com](http://www.nuncbrand.com)  
Olympus/Tokai Hit – [www.tokaihit.com](http://www.tokaihit.com)  
P.A.L.M. Microlaser Technologies – [www.palm-microlaser.com](http://www.palm-microlaser.com)  
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