

Product Focus: Fluorescence / imaging

Imagine that!

New advances in fluorescence/imaging

Both fluorescence and imaging have a multitude of uses within life science research, and the advanced techniques and technologies available today can enable powerful applications. Essential tools in research and in diagnostics for the detection and monitoring of structures and processes within living tissues, fluorescence and imaging are increasingly used in biology and the biomedical sciences. Here we take a look at some of the latest developments and product introductions

QImaging®'s new **Rolera EM-C²™** EMCCD microscopy camera is engineered for high-sensitivity and high-speed performance in low-light imaging applications. The Rolera EM-C² camera aids researchers in applications such as spinning-disc confocal imaging, Total Internal Reflection Fluorescence (TIRF) microscopy, ratiometric ion imaging and Fluorescence Recovery After Photobleaching (FRAP). Fast frame rates essential to live cell imaging studies are enabled by the camera's 40 MHz pixel clock rate. The Rolera EM-C² delivers very low noise and high sensitivity across a broad spectrum common to fluorescence experiments. Peltier cooling to -50° C minimises dark current for longer exposures. Variable exposure times range from 200 microseconds to 17.9 minutes. The camera includes the QCapture Suite software.

Olympus has introduced the new **PLAPON 60xOSC** objective lens with an NA of 1.4, offering outstanding levels of chromatic aberration correction for life science imaging applications. This super-corrected objective is designed for fluorescence imaging down to 405 nm. It is therefore ideal for use in cell biology and neuroscience, as well as any applications requiring lasers for inter- and intra-cellular imaging of biological specimens. The lens provides 0.1-0.2 µm of chromatic aberration when working with lasers from 405 to 650 nm. This advanced chromatic aberration enables users to perform

multicolour imaging with the highest possible colour fidelity, even at shorter wavelengths.

Following on from their highly successful BX2 range, **Olympus** has launched **BX3 research microscope systems** to provide users with a "blank canvas" to fully define their own working environment: from the microscope and imaging components to software workflows, GUIs and the positioning of the controls on the desktop. The manual BX53 frame offers complete system flexibility with optional coded and automated modules and the BX63 frame provides advanced automation as standard.

Leica Microsystems has released the first **High Content Screening Automation package** for confocal research microscopes Leica HCS A. Combining the strength of high-resolution point scanners with the new ingenious LAS AF MATRIX M3 software platform delivers a highly flexible tool for automated imaging in multi dimensions. Leica Microsystems enables researchers to customise Leica confocal microscopes according to actual requirements in life science research laboratories. Basic automation like mosaicing of tissue slides or multiwell plate screening in 2D and 3D are part of the starting packages. More sophisticated demands are satisfied by intelligent microscopy: five new auto foci, single object tracking or automated control of water objectives deliver excellent results.

Hamamatsu Photonics has introduced the **ORCA-Flash2.8**, its first high-sensitivity digital camera based on a next-generation Scientific CMOS image sensor and the ORCA-D2, a dual CCD camera which enables simultaneous dual-wavelength imaging and features two CCD devices with interchangeable optical blocks. The ORCA-Flash2.8 is designed for low-light imaging at high frame rates and combines high resolution, high sensitivity, high speed and low noise. The ORCA-Flash2.8



Hamamatsu Photonics ORCA-Flash2.8 digital camera

cameras incorporate a unique 2.8M pixel Scientific CMOS sensor. The camera is suitable for a wide variety of applications such as life-science microscopy, industrial imaging and sensitive analytical measurement. The ORCA-D2 offers ease of use with optical setup steps such as image alignment and focusing. The camera also provides a wide field of view during dual wavelength imaging and is suitable for a wide variety of fluorescence microscopy applications including ratio imaging, FRET and dual wavelength TIRF.

TTP LabTech has launched **Mirrorball™**, a new high sensitivity laser scanning microplate cytometer for antibody discovery. Mirrorball is set to fill a critical role in the antibody discovery process by rapidly and reliably performing mix-and-read, cell- or bead-based assays. The instrument offers a simple and easy solution to automated hybridoma screening and does not

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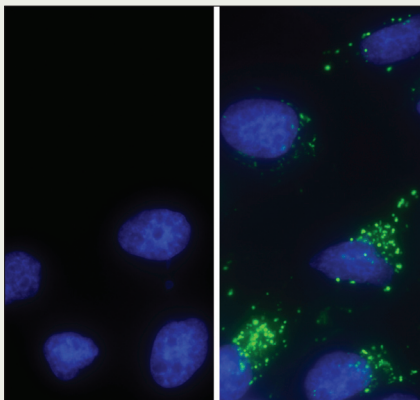
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Ludl Electronic Products Piezo focus Z stage with plate holder

require the reworking of existing protocols. Mirrorball combines high sensitivity with high performance, low-loss optics. Mirrorball is also the first laser scanning microplate cytometer to offer simultaneous laser scanning. This will enable superior multiplexing resulting in higher throughput single pass scanning. The instrument is available in three upgradeable configurations; the highest specification will offer dual laser excitation (488 nm and 640 nm), four fluorescence data channels and a single laser scatter channel. Mirrorball's laser scatter channel enables label-free object recognition independent of fluorescence, which can be combined with concurrent collection of fluorescence data for even greater sensitivity in multiplexed assays.

TILL Photonics' new **iMIC-Andromeda** is an imaging workstation capable of combining a broad range of imaging applications. The modular approach of the iMIC allows the integration of methods such as TIRF, FRAP, Photoactivation, FRET, FCS, Multiphoton,



Enzo Life Sciences Cyto-ID™ Autophagy detection kit monitors autophagy at the cellular level

Structured Illumination, and TILL Photonics' proprietary Laser Spinning Disk Confocal Andromeda. The heart of the Andromeda is a single spinning disk which derives its performance and versatility from its fundamentally new optical concept. Instead of using microlenses and two synchronised rotating disks Andromeda needs only a single disk and places (longpass) dichroics where they belong, into the infinity space. This greatly improves the point spread function (PSF) and provides higher resolution and better optical sectioning than achieved by previous approaches.

R&D Systems now offers a **Human/Mouse/Rat Neural 3-Color Immunocytochemistry Kit**. This kit contains three fluorochrome-conjugated primary antibodies that can be used together for single-step immunocytochemical staining of human, mouse, or rat neural cell types. The antibodies included in the kit are NorthernLights™ 557-conjugated anti-Oligodendrocyte Marker

O4, NorthernLights 637-conjugated anti-betaIII Tubulin, and NorthernLights 493-conjugated anti-GFAP, which stain oligodendrocytes, neurons, and astrocytes, respectively. NorthernLights fluorochromes are stable in xylenes and alcohols, and are resistant to photobleaching, making them ideal for immunocytochemistry.

The **Cyto-ID™ Autophagy detection kit** from **Enzo Life Sciences** provides a rapid, specific and quantitative approach for monitoring autophagy in live cells by fluorescence microscopy and flow cytometry. The 488 nm excitable green fluorescent detection reagent supplied in the Cyto-ID™ Autophagy detection kit becomes brightly fluorescent in vesicles produced during autophagy and has been validated under a wide range of conditions known to modulate autophagy pathways. Tamoxifen, a known inducer of autophagy, is included as a positive control.

Ludl Electronic Products recently released the **BioPrecision 2** series of **Piezo focus Z stage inserts**. The 99A602 Piezo Z stage features all the performance advantages of piezo focus while adding improved compatibility with standard microscope stage accessories such as multi-well plate holders, slide holders, on-stage incubation and perfusion chambers. This design is the first to provide such flexibility in a removable stage insert format compatible with Ludl motorised stages and microscope OEM manual stages. Design features include high speed travel through a 350 micron range, large industry standard aperture opening (160mm x 110mm), external synchronization options, and closed loop operation with nanometer resolution in a highly stable mechanical package.

Companies mentioned in this Product Focus

Enzo Life Sciences

www.enzolifesciences.com

Hamamatsu Photonics

www.hamamatsu.com

Leica Microsystems

www.leica-microsystems.com

Ludl Electronic Products

www.ludl.com

Olympus

www.olympus.co.uk/microscopy

QImaging

www.qimaging.com

R&D Systems

www.RnDSystems.com

TTP LabTech

www.ttplabtech.com

TILL Photonics

www.till-photonics.com

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