

BIOPHOTONICS

BRINGING LIGHT TO THE LIFE SCIENCES®

www.BioPhotonics.com

Monthly newsletter focusing on how light-based technologies are being used in the life sciences. Includes news, features and product developments in lasers, imaging, optics, spectroscopy, microscopy, lighting and more. Manage your Photonics Media membership at [Photonics.com/subscribe](https://www.photonics.com/subscribe).



Portable Reflectance Confocal Microscopy for Low-Resource Settings

Reflectance confocal microscopy (RCM) is an optical imaging technology that captures reflected light from tissue to visualize the tissue's cellular morphologic details. The method does not require excitation of the tissue or the use of fluorescent dye for differentiating details. Noninvasive imaging of human tissue using RCM was first demonstrated in the 1990s, and over the last three decades it has been evaluated for its ability to image various types of human tissue, including skin, cornea, and oral mucosa.

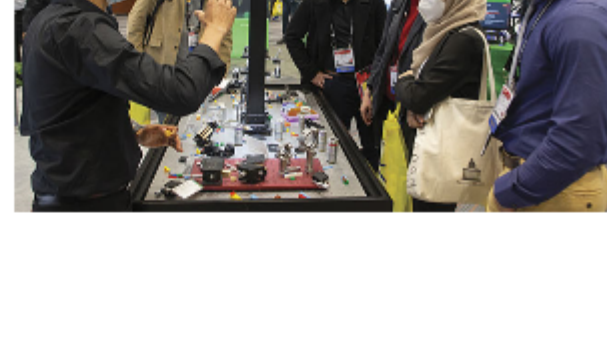
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SPIE BIOS to Highlight System Design and Early Diagnostics

As part of SPIE Photonics West 2023, which will take place at the Moscone Center in San Francisco, the BIOS Expo will run the weekend of Jan. 28-29. The exhibition will include dozens of companies showcasing new photonic system components and the latest adaptations for optical technologies in medicine and the life sciences. BIOS Hot Topics sessions will cover image-guided autonomous robotic surgery, the latest illumination source to be utilized in optical coherence tomography, and several other innovations.

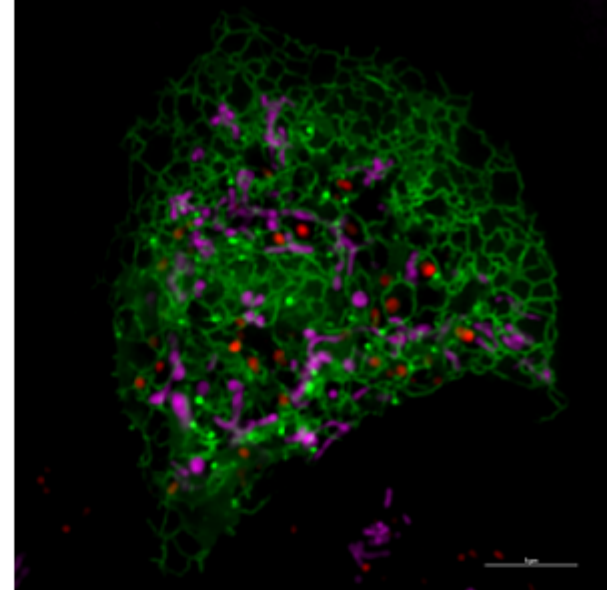
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Optogenetic Tools Use Blue Light to Restore Cell Function

Researchers from the University of Cincinnati, the University of Illinois Urbana-Champaign, and the University at Buffalo used an optogenetic technique to bring together mitochondria and lysosomes in human stem cells, to revitalize the cells' fission process.

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.: Featured Products & Services



NAN Open-Design Upright Microscope

Sutter Instrument Company

The Sutter NAN™ — A focusing nosepiece microscope designed for electrophysiology. The microscope frame has been reimagined around highly stable, adjustable manipulator gantry stands. This design allows for many possible configurations to match the ever-expanding applications for upright microscopes.

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Light Sheet for Cleared Tissue

Applied Scientific Instrumentation Inc.

The ct-dSPIM is a flexible and easy-to-use light sheet microscopy configuration optimized for imaging large cleared tissue samples. The sample is mounted on a motorized XYZ stage and imaged via stage scanning. Two multi-immersion or other objective lenses are held in an upright "V" geometry for light sheet illumination and detection.

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LS850 Fully Automated Microscope

Etaluma Inc.

The LS850 Microscope is the latest generation of our fully automated three-channel flagship model and offers the latest advances in optics, cameras, throughput, and user flexibility delivering image quality, motion speed, illumination, and software flexibility.

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SL160 Slide Loader

Prior Scientific Inc.

The SL160 automated microscope slide loader combines reliability and high capacity with easy set up to provide automated slide scanning to a wide variety of existing upright microscopes or with the use of Prior's OpenStand microscope.

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NEW 4-Wavelength LED Illumination

CoolLED Ltd.

pE-400 Series LED
Illumination Systems build on award-winning technology to offer even more control for widefield fluorescence microscopy and optogenetics, with four powerful LEDs spanning 365-635 nm and covering DAPI through YFP to Cy5.

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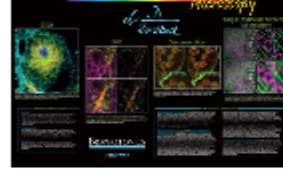
KeyLight™ by Phoseon Technology

Phoseon Technology Inc.

KeyLight™ is a compact light source that supports 3-7 channel fluorescence microscopy systems. It brilliantly illuminates your results by delivering intense, broad-spectrum UV and visible wavelengths for a wide variety of colors between 340 nm and 760 nm.

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Superresolution Microscopy Poster

Photonics Media

This superresolution microscopy poster features visually stunning, high-resolution images that reveal never-before-seen worlds at the sub-cellular level, illustrating the value of the techniques. Useful, at-a-glance definitions make this poster a great resource.

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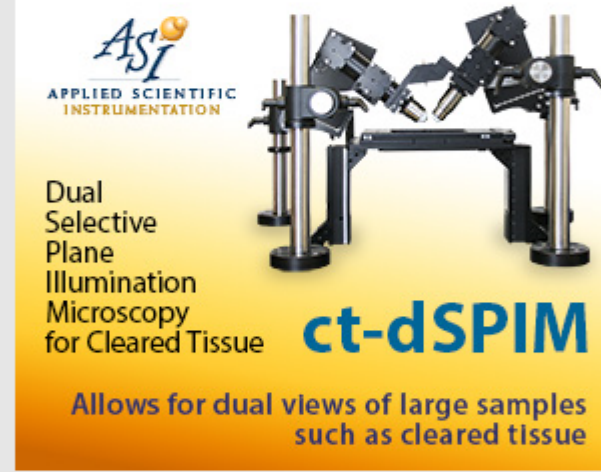
Ultima 2Pplus Multiphoton Imaging

Bruker Nano Surfaces

With new advances in field of view, sensitivity, wavelength, and sample accommodation, Bruker's Ultima 2Pplus delivers the best commercially available combination of flexibility, resolution, imaging depth, and speed, allowing users to perform simultaneous imaging, stimulation, and electrophysiology protocols with greater efficiency and effectivity.

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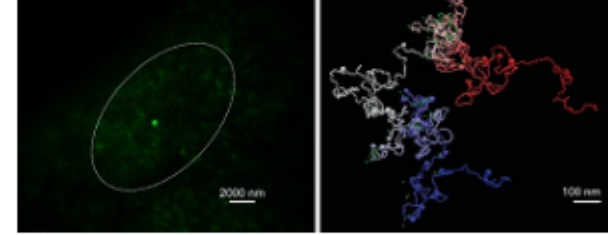
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.: In Case You Missed It

Superresolution Method Poised to Improve Gene Function Understanding

An interdisciplinary team from the Centre for Genomic Regulation and the Institute for Research in Biomedicine has developed an imaging technique that captures the structure of the nucleosome level — the fundamental units constituting the genome's three-dimensional architecture. The technique integrates superresolution imaging with advanced computational modeling.



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Cascaded Neural Networks Help Virtually Re-Stain Tissue Samples

Using a cascaded deep neural network structure, a UCLA research group led by professor Aydogan Ozcan developed a computational approach for chemical-free re-staining of tissue specimens. The AI-powered technique to virtual stain transfer provided high-quality virtual images of different stains using existing, histochemically stained slides. It is a repeatable process that saves time and costs, reduces waste, and preserves the biopsied tissue so that it can be used for additional testing.

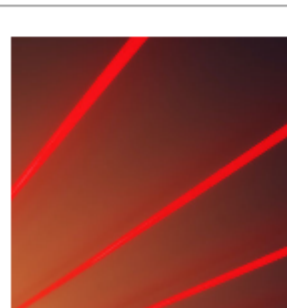
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Optical Interfaces Power Nerve-Operated Prosthetics

Engineers at the University of New South Wales demonstrated an approach to measure neural activity using light. The team's optical sensors, called optrodes, achieved accurate registers of the neural impulses traveling along a nerve fiber in a living animal.

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.: Upcoming Webinars



Key Considerations for Part and Sample Holding in Interferometric Characterization

Wed, Jan 18, 2023 1:00 PM - 2:00 PM EST

Interferometry is a powerful tool when used to characterize optical surface form errors, as well as accumulated errors, when measuring transmitted wavefronts. Opticians and engineers have many methods available to facilitate such measurements but can often overlook the effects caused by part holding or fixturing. Frank DeWitt of XONOX Technology Inc. discusses what should be considered when approaching part holding and fixturing for interferometric measurements, the features that are critical to the item being measured, and the required outputs of the measurement.

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Features

Light Sources & Imaging, Laser Scanning Microscopy, Single-Molecule Spectroscopy, and Optogenetics

Photonics Media is currently seeking technical feature articles on a variety of topics for publication in our magazine *BioPhotonics*. Please submit an informal 100-word abstract to Senior Editor Doug Farmer at Doug.Farmer@Photonics.com, or use our online submission form www.photonics.com/submitfeature.aspx.

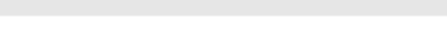
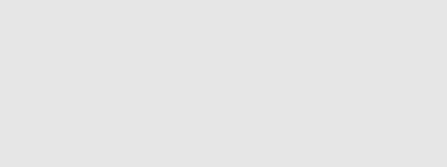
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