

# BIOPHOTONICS

BRINGING LIGHT TO THE LIFE SCIENCES®

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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).

## MULTI IMMERSION OBJECTIVES

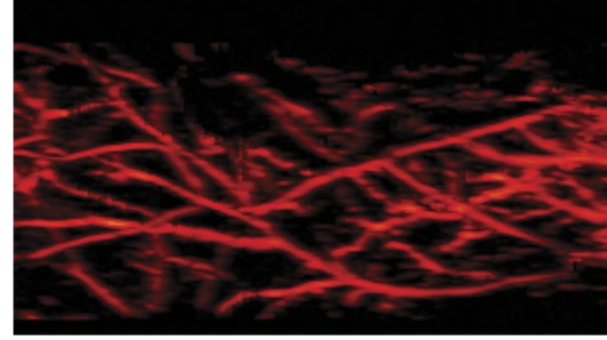


for light sheet microscopy of cleared tissue samples and live cell imaging



### Photoacoustic Imaging Uses LED Light to Guide Cancer Diagnosis and Therapy

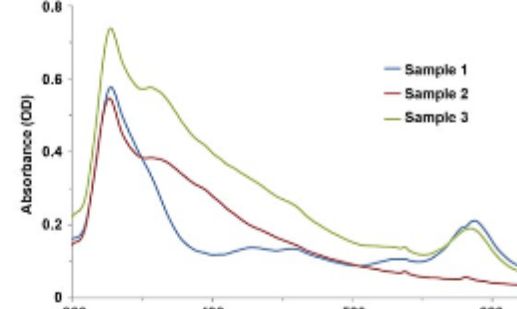
Efficient medical imaging techniques such as photoacoustic imaging help to accurately detect diseases as early as possible, resulting in timely intervention and reducing the need for medication and surgery. Conventionally used medical imaging techniques — such as ultrasound imaging, x-ray computed tomography, magnetic resonance imaging, and positron emission tomography — are rooted in different physics and contrast mechanisms. And their installation and operation expenses, as well as their sensitivities for various clinical applications, also differ. Beyond the limitations of these methods, an ideal medical imaging system should be able to diagnose diseases with high sensitivity and specificity at a cost that is affordable for all clinics around the world.



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### Spectral Monitoring Reveals the Health of River and Lake Ecosystems

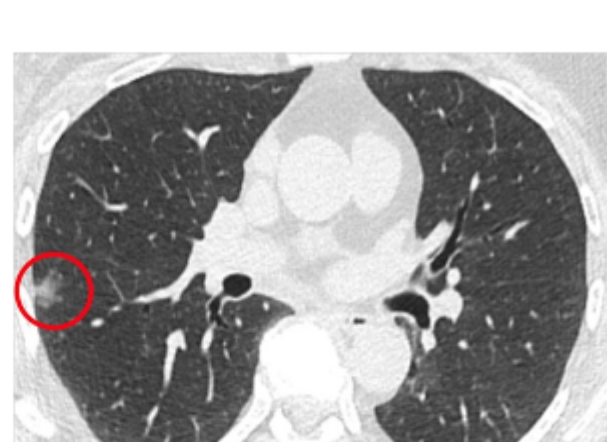
Rivers represent just a small fraction of the water on Earth's surface, but they serve as vital natural resources for numerous cities and communities worldwide. River systems supply food and water, they can be a means of transport and hydroelectric energy generation, and they provide a place to release treated wastewater. So, with so many people dependent on the benefits that rivers provide, scientists are using technology such as spectroscopy to track the stability and health of the flowing water and its surrounding environment.



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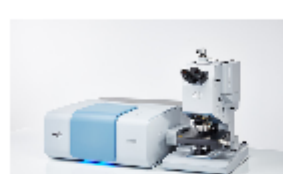
### Laser Endomicroscopy Enables Real-time Detection of Lung Cancer

Researchers at the Abramson Cancer Center at the University of Pennsylvania have developed a method to detect lung cancer at the cellular level in real time during biopsy. The method ensures earlier detection of cancer cells that may have been too small to detect using existing technology.



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## :: Featured Products & Services



### HYPERION II – FPA/FIR/IR Laser Imaging Microscope

**Bruker Optics Inc.**

Bruker's IR microscope

HYPERION has always been synonymous with sensitivity and versatility. For more than 20 years, it has pioneered FT-IR imaging and left its mark in countless high-profile publications. With the new HYPERION II Laser Imaging Microscope, we remain true to our reputation as an innovation leader.

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### Multi-Immersion Objectives

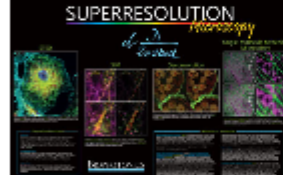
**Applied Scientific Instrumentation Inc.**

ASI and Special Optics have developed two dipping

objective lenses designed for light sheet microscopy of cleared tissue samples, including ASI's ct-dSPIM. These objectives work in any refractive index media without a correction collar because of a unique curved first surface.

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### Superresolution Microscopy Poster

**Photonics Media**

With interest in the

superresolution microscopy field growing rapidly, the editors of BioPhotonics magazine — in collaboration with acknowledged experts — created a poster with readers in mind that is suitable for lab, classroom and office.

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### Keylight™ OEM Microscopy Light Source

**Phoseon Technology Inc.**

KeyLight™ illumination sources for fluorescence microscopy are the perfect

solution to integrate into your equipment. Phoseon's proprietary LED solutions offer intense, broad-spectrum wavelengths for various colors from UV through visible into the infrared.

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## :: In Case You Missed It

### Micro-Ring Resonator Enables Fast, Accurate Ebola Virus Detection

A diagnostic technique for the Ebola virus uses a micro-ring resonator and a biomarker to quickly identify the presence of the virus in blood samples. Researchers at Washington University School of Medicine developed the technique, in collaboration with colleagues at the University of Michigan and biotech company Integrated Biotherapeutics.



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### Fiber-Based Photoacoustic Endoscope Fits Inside Needle

King's College London and University College London researchers developed a photoacoustic endoscope that is small enough to fit inside a 20-gauge medical needle. The needle probe provided functional, molecular, microstructural information about tissue, at subcellular spatial resolution and in real time. The technology could be used as a forward-viewing endoscopic probe and as tool for guiding minimally invasive surgeries.

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### Needle-Shaped Beams Enhance OCT Image Quality

Stanford University researchers have developed a method to create needle-shaped beams of varying lengths and diameters, capable of increasing the quality of images obtained by OCT and other imaging modalities. Adam de la Zerda, research team leader from the Stanford University School of Medicine, said that applied to OCT, the needle-shaped beams extended the depth of focus and improved lateral resolution, signal-to-noise ratio, contrast, and image quality over a long depth range.

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## :: Upcoming Webinars



### Spectral Domain Optical Coherence Tomography Spectrometers for Today and Beyond

Wed, Sep 21, 2022 1:00 PM - 2:00 PM EDT

Spectral domain optical coherence tomography (SD-OCT) is commonly used for ophthalmologic applications, particularly in the diagnosis and treatment of macular degeneration. It is also consistently used in research for new applications in both medical and manufacturing sectors. Heidi Olson of Ibsen

Photonics discusses some of the methods currently available to achieve better SD-OCT images, as well as the new applications that can be unlocked with further development. The limitations of the available products are also explored specifically in reference to how the boundaries can be pushed to achieve better quality data with relaxed performance requirements.

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## :: Next issue:

### Features

Multiphoton Microscopy, Laser Scanning & Diagnostics, Optogenetics, and OCT System Design.

**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](mailto:Doug.Farmer@Photonics.com), or use our online submission form [www.photonics.com/submitfeature.aspx](https://www.photonics.com/submitfeature.aspx).

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