

# BIOPHOTONICS

BRINGING LIGHT TO THE LIFE SCIENCES®



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).



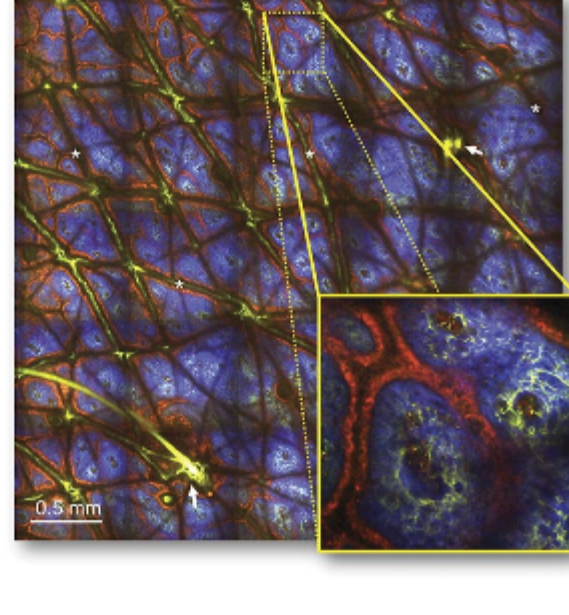
**PRODUCTS FOR HIGH RESOLUTION LIGHT SHEET MICROSCOPY**  
Perfect for super resolution microscopy applications.



## Multiphoton Exoscope Broadens Noninvasive Imaging of Skin

Skin imaging at the cellular level is critical for understanding how diseases and aging affect the skin, and for developing strategies and therapies to prevent and combat these effects in a clinical setting. Visualizing dynamic cellular and molecular processes during the progression of skin disease and throughout the course of therapy requires an effective compact and portable imaging tool that can provide noninvasive imaging of wide (millimeter to centimeter scale) skin areas, rapid scanning and image acquisition time, submicron resolution, and label-free molecular contrast from multiple sources to enhance imaging specificity.

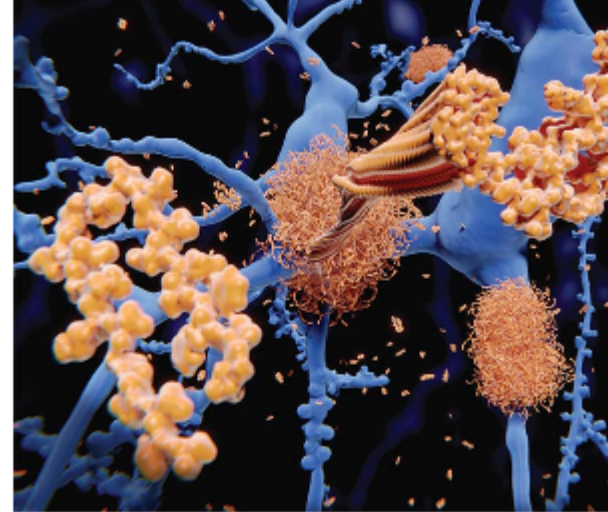
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## The Hyperspectral Camera Looks Alzheimer's in the Eyes

Alzheimer's disease is one of three so-called trillion-dollar diseases, along with cancer and diabetes — meaning that financial and societal costs are approaching \$1 trillion worldwide. Diagnosis has historically been a complex task, requiring several specialists who perform many tests that cover an individual's history, physical health, and cognitive performance. Following this initial analysis, more invasive and expensive tests are usually needed to make a definitive diagnosis. Recent technical developments may make this process far simpler — within the context of a simple eye examination — thanks to a combination of hyperspectral imaging, OCT, and machine learning.

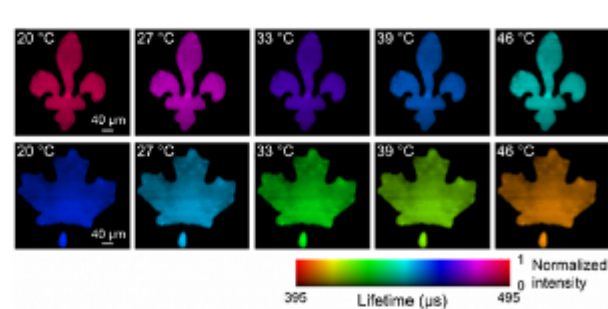
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## Temperature-based Method May Improve Detection of Skin Cancer

An imaging technique developed by researchers at the Institut national de la recherche scientifique, can measure temperature in 2D, without contact, and in real time. The technology — single-shot photoluminescence lifetime imaging thermometry — is based on the luminescence of nanoparticles doped with rare earth ions. The method could improve photothermal therapy and help deliver early diagnoses of skin cancers.

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## :: Featured Products

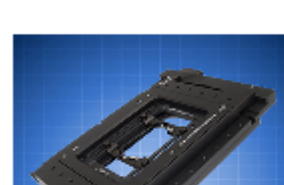


### Alluxa Ultra Series Filters and Coatings

**Alluxa**  
Alluxa Ultra Series Filters, including Narrowband, Dichroic, UV, IR, and Notch filters, provide the highest performance optical thin film solutions available today. For example, the Ultra Series Flat Top Narrowband filters offer the narrowest bandwidths and squarest filter profiles in the industry.

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### Ultra Precise Piezo-Z Focus Stage

**Applied Scientific Instrumentation Inc.**  
The stage is capable of XY resolutions down to the 10-20 nm and Z resolutions to the 1nm range. It is able for use with rapid z-sectioning and autofocus systems. It prevents focus drift when used with our CRISP system.

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### OpenStand Custom Microscopes

**Prior Scientific Inc.**  
Whether developing new automation techniques and software or developing new imaging methods, you can quickly find that you need a microscope system tailored to your application and business needs. Prior Scientific has developed OpenStand® to offer a working platform to build OEM solutions and one-off customizations...

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### NEW from Bruker – 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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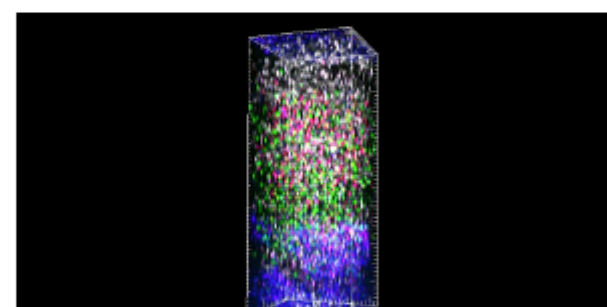
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## :: In Case You Missed It

### Three-Photon Microscopy Reveals Immune Cell Behavior in Real Time

A research group from Cornell University has used three-photon microscopy to image the full depth of the popliteal lymph node in a living mouse — reportedly for the first time. The researchers successfully observed the dynamic interactions of immune cells in the lymph node in real time and at micron-scale resolution. The three-photon imaging technique for visualizing lymph nodes could provide the same level of precision for cancer biology and other biomedical research fields, according to the team.



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### Quantum Sensors Measure Brain Activity with Pinpoint Accuracy

Quantum sensors could be used to indicate early biomarkers for brain diseases in space and time, based on the results of a University of Sussex (England) study. Researchers showed that quantum sensors, when used with magnetoencephalography, can track changes in the brain, such as a slowdown in brain activity, spatiotemporally. In the future, the sensors could be used to scan patients periodically to check for changes in brain activity, according to the researchers.

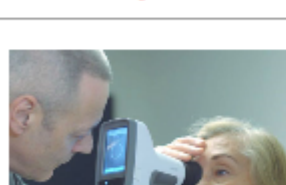
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### Optical Biopsy System Cuts Potential for Misdiagnoses of Liver Cancer

An optical biopsy system that combines diffuse reflectance spectroscopy and fluorescence lifetime measurements can distinguish between cancerous and healthy tissue in the liver. The technology could make it easier to diagnose liver cancer, which is the sixth most common cancer globally. Researchers from Orel State University in Russia developed the system, which combines the two light-based techniques to evaluate markers that relate to cellular metabolism — which differs between healthy and cancerous tissue cells.

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## :: Upcoming Webinars



### Emerging Technologies Changing Ophthalmology Access and Point of Care

Thu, Mar 17, 2022 10:00 AM - 11:00 AM EDT

This webinar — for those interested in visual optics, ophthalmology, and biomedical devices — introduces five technologies that are using optics, photonics, or imaging to redefine how patients are served along the point-of-care continuum, from diagnosis and treatment to surgical selection and correction. It also showcases how technologies are being applied to make tools more mobile and accessible, minimize workflows, and reduce the risks associated with COVID-19 to significantly improve both the patients' and the practitioners' experience. Presented by Luminate.

[Register Now](#)

## :: Next issue:

### Features

Hyperspectral Imaging, Optofluidics, PARS Microscopy, and more

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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