If you are having problems seeing this newsletter, please click **here to view**

Wednesday, October 25, 2023

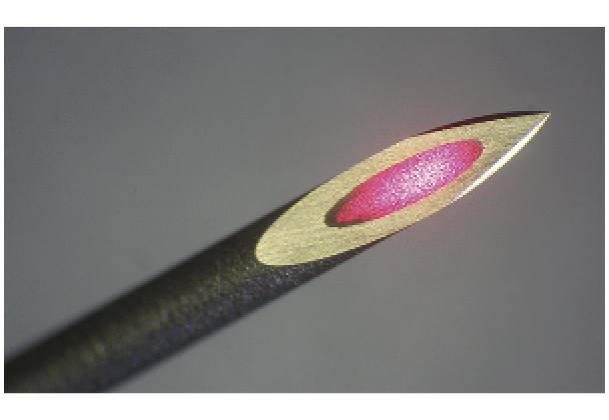
BIOPHOTONICS

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.

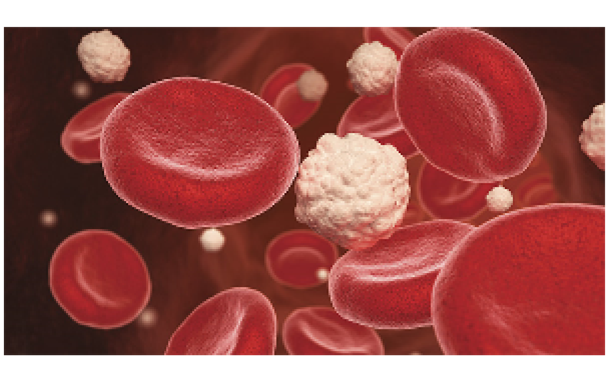
Fiber Optic Probes Help Customize Spectroscopic Diagnosis



Diffuse reflection spectroscopy and fluorescence spectroscopy are having a major effect in medicine and the life sciences, with expanding application in physics, chemistry, biology, and medicine. And fiber optic-based probes are becoming an essential and versatile solution for collecting the necessary spectroscopic measurements for analysis. This data ultimately informs both in vivo and in vitro analysis and diagnosis to detect cancer cells or the presence of specific diseases and may in some instances render traditional biopsies unnecessary.

Read Article

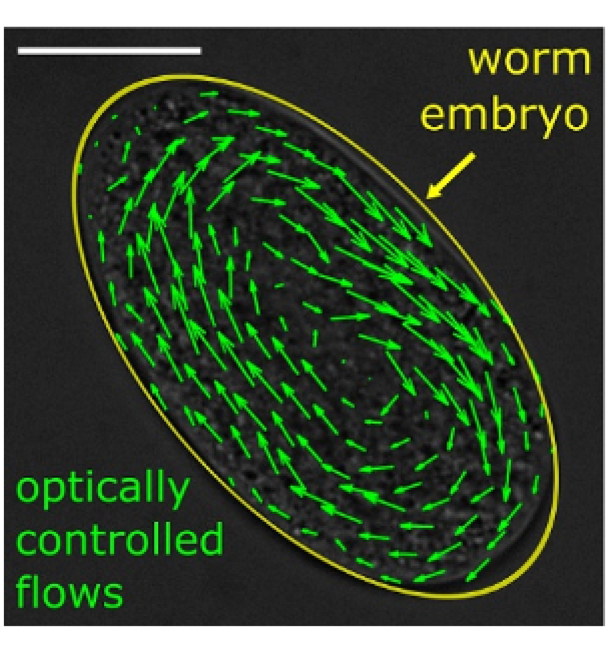
QCL-IR Powers Photoacoustic Spectroscopy in Translational Medicine



Mid-infrared (MIR) optoacoustic spectroscopy is a well-established technique that is currently being leveraged with modern instrumentation to push boundaries in life sciences research and medical diagnostics. Researchers recently demonstrated significant improvements to MIR optoacoustic imaging and detection techniques that have yielded promising results in noninvasive glucose monitoring and label-free analytic histology as well as other applications.

Read Article

Optofluidic Micromanipulations Show Aptitude in Laser Biomedicine

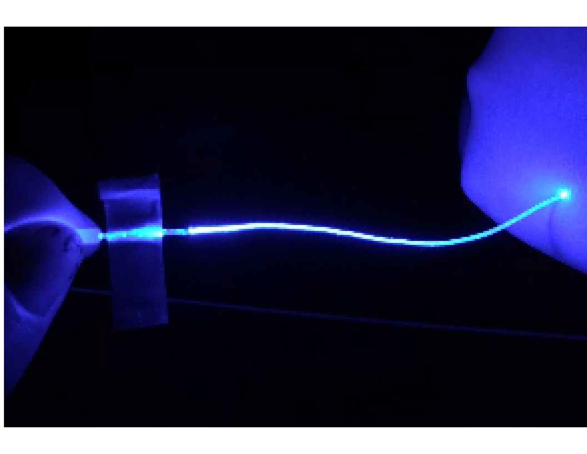


Techniques for micromanipulation support nanostructure assembly, particle trapping, and the spatiotemporal analysis of cell organization. Introducing optically induced thermoviscous flows can be used to optically move the cytoplasm in cells and developing embryos, for example, and can be used in intracellular rheology. Scientists at Karlsruhe Institute of Technology have now developed nearly isothermal scan sequences that exploit symmetry relations during laser scanning to disentangle laser heating and flow induction. The researchers' scan sequences use dynamic photothermal stimuli and spatiotemporal symmetry relations of scanning bridging up to three distinct timescales.

Read Article

.: In Case You Missed It

Optogenetic Tool Blocks Pain, Not Movement



Engineers at MIT have developed soft and implantable fibers that can deliver light to major nerves through the body. When these nerves are genetically manipulated to respond to light, the fibers can send pulses of light to the nerves to inhibit pain. The optical fibers are flexible and stretch with the body.

Read Article

Deep Learning Delivers High-Quality Optoacoustic Images in Real Time

High-quality medical imaging from multispectral optoacoustic tomography (MSOT) could be used to diagnose and evaluate a range of diseases, including breast cancer, Duchenne muscular dystrophy, inflammatory bowel disease, and many more. However, the length of time currently required for MSOT to process high-quality images makes it impractical in clinical settings. To provide high-quality, real-time optoacoustic imaging via MSOT, researchers from the Bioengineering Center and the Computational Health Center at Helmholtz Munich and the Technical University of Munich developed DeepMB, a deep-learning framework. DeepMB expresses model-based reconstruction with a deep neural network.

Read Article

Wearable Sensor Could Lower Mortality Due to Postpartum Blood Loss

Postpartum hemorrhage, the leading and most preventable cause of maternal mortality, can be hard to detect, because physiological compensation mechanisms can mask excessive bleeding. To diagnose postpartum hemorrhage in its early stages, a multidisciplinary research team at Washington University in St. Louis developed a wearable optical device that is worn on the wrist. The device uses laser speckle flow index to continuously monitor the body's compensatory mechanisms triggered by blood loss elsewhere in the body.

Read Article

.: Upcoming Webinars

Optimization of Surface Enhanced Spatially Offset Raman Spectroscopy for Applications in Pre-Clinical Cancer Imaging

Thu, Nov 16, 2023 1:00 PM - 2:00 PM EST

In the field of optical imaging, the ability to image tumors at depth with high selectivity and specificity remains challenging. Fay Nicolson of the Dana-Farber Cancer Institute and Harvard Medical School discusses the optimization of spatially offset Raman spectroscopy (SORS) instrumentation and imaging approaches as well as the subsequent application of SESORRS to pre-clinical cancer imaging and the delineation of tumor margins in Apcfl/+, Apcfl/+;KrasG12D/+, and finally GL261 mouse models of colorectal cancer and glioblastoma. Moreover, using a SESORRS approach, she demonstrates that it is possible to detect secondary, deeper-seated lesions through the intact skull. This approach enables improvements in the non-invasive detection of these cancers due to improvements in SNR, spectral resolution, and depth acquisition, and can complement clinically approved image-guided surgical techniques.

Register Now

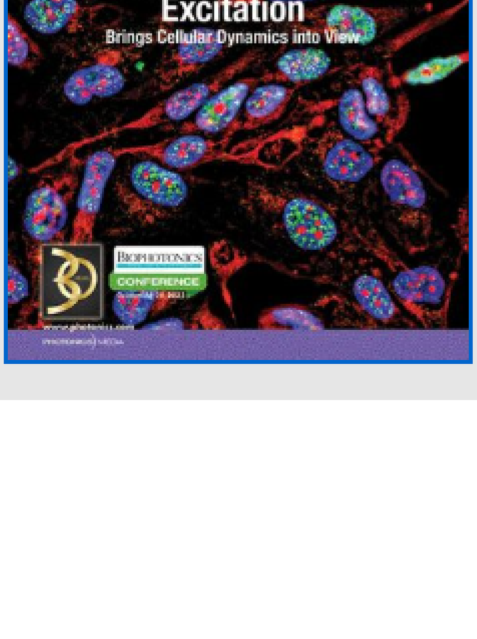
.: Next Issue:

Features

Virtual Staining of Tissue, Raman Photothermal Microscopy, Medical Sensors in fNIRS, and Optical Filters in Raman Spectroscopy

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.

About *BioPhotonics*



BioPhotonics is the global resource for research, business and product news and information for the biophotonics community and the industry's only stand-alone print and digital magazine.

Visit Photonics.com/subscribe to manage your Photonics Media membership.

View Digital Edition **Manage Membership**