Tuesday, December 22, 2020

BIOPHOTONICS
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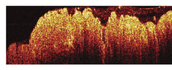
OCT Informs Real-Time Cancer Diagnosis
The origins of optical coherence tomography (OCT), a subsurface imaging technology based on low-coherence interferometry, can be traced to the first decade of the 1800s, when Thomas Young's double-slit interference experiment showed that light could move as a wave and interfere either constructively or destructively. Since 1991, researchers have explored the use of this phenomenon for medical imaging, with the goal of saving lives in clinics and hospitals. Advancements in lasers, optical detectors, and fast electronics have boosted OCT's imaging resolution, signal dynamic range, and real-time imaging capabilities.



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Veterinarians Use OCT to Evaluate Eye Health, Cancer Margins, and Joint Strength
Medical doctors have long understood the value of optical coherence tomography (OCT) for monitoring human health. Veterinarians are learning that the technology can be just as vital in evaluating the well-being of patients in the animal kingdom. Often used in conjunction with other technologies, OCT has the capacity to map out tissue at high resolution as a reference point for further experiments and treatments.

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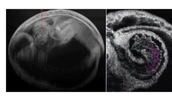
4D OCT Helps to Solve Mystery of Early Embryonic Heartbeat
Scientists from Stevens Institute of Technology and Baylor College of Medicine used 4D optical coherence tomography (OCT) to study the pumping mechanism underlying the developing mammalian heart. 4D OCT allowed them to investigate the functional relation between blood flow and heart wall dynamics within different regions of the embryonic heart at a level of detail not currently accessible by other methods. 4D OCT could potentially enable scientists to assess cardiac pumping over embryonic development as the heart tube remodels, which could reveal functional changes during early cardiogenesis that lead to congenital heart defects.



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.: Featured Products

NEW pE-800 LED Illumination System

CoolLED Ltd.
Discover more with the new CoolLED pE-800 LED Illumination System for fluorescence microscopy. Featuring eight individually controllable LEDs and lightning fast <7 µs TTL switching, the pE-800 delivers the highest quality data at minimum cost.

Visit Website | Request Info

Light Sheet for Cleared Tissue

Applied Scientific Instrumentation Inc.
A flexible and easy-to-use SPIM configuration optimized to image large cleared samples. The sample is mounted horizontally on an XYZ stage. Two multi-immersion objective lenses are held in an upright "V" geometry for light sheet illumination and detection.

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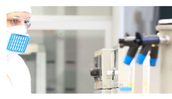
.: In Case You Missed It

Titanate Nanowire Mask Can Trap Pathogens and Destroy Them with Light
A personal protection equipment (PPE) mask made from a membrane of titanium oxide nanowires could provide a safe and environmentally sound alternative to disposable paper masks that trap pathogens but do not destroy them. Developed by researchers at École Polytechnique Fédérale de Lausanne, the membrane for the new mask prototype has antipathogen properties.



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Smartphone-Measured Photoplethysmography Serves as Digital Biomarker of Diabetes
A noninvasive digital biomarker is being developed at the University of California, San Francisco (UCSF) for detecting Type 2 diabetes using a smartphone camera and deep learning algorithm. This innovation could provide a low-cost, in-home alternative to blood draws and clinic-based screening tools.

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Reflection Matrix Microscopy Shows Potential to Expedite Neuroscience Research, Disease Diagnoses
A South Korean research team has developed an optical microscope capable of maintaining spatial resolution and acquiring a microscopic "map" of neural network activity in brain tissue as it images through the width of an intact mouse skull. The device pairs hardware components with computational adaptive optics (AO); the latter was initially conceptualized to correct optical aberrations in ground-based astronomy.

Read Article

.: Upcoming Webinars

Seeing the Sound: Optical Neural Interfaces for In Vivo Neuromodulation
Wed, Jan 6, 2021 1:00 PM - 2:00 PM EST
Optogenetics has transformed experimental neuroscience by manipulating the activity of specific cell types with light, enabling in vivo neuromodulation with millisecond temporal resolution. Current wavelengths used for optogenetics are limiting, however. In this webinar, Guosong Hong, Ph.D., of Stanford University will present two recent methods to address this challenge: "sono-optogenetics" and "macromolecular infrared nanotransducers for deep-brain stimulation (MINDS)."

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Features
Mobile Spectroscopy, Endoscopy, Photoacoustic Imaging, Microscopic Identification of Microplastics, 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, or use our online submission form www.photonics.com/submitfeature.aspx.

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