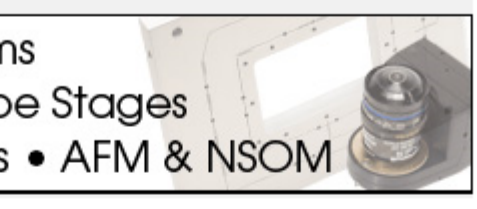
Thursday, March 21, 2019

MICROSCOPY Tech Pulse

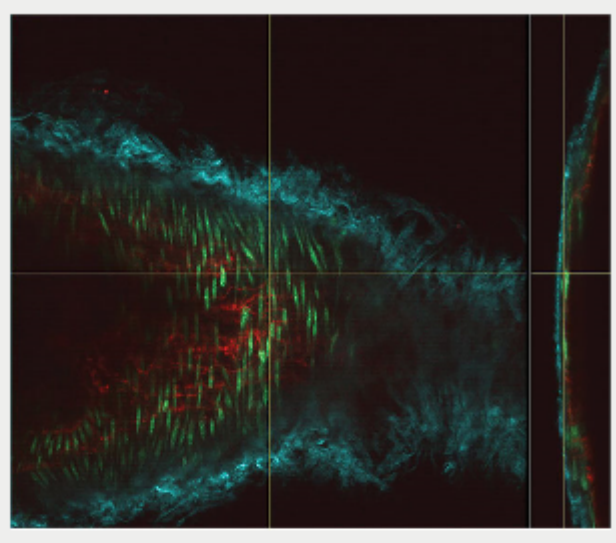
March 2019

Microscopy Tech Pulse is a special edition newsletter from Photonics Media and Mad City Labs Inc. covering key developments in microscopy technology. Manage your Photonics Media membership at Photonics.com/subscribe.



Lasers: A Unique Microscopy Source

Although filtered lamps and LEDs have their uses as simple light sources in wide-field microscopy, the laser is at the heart of most of the advanced techniques and experiments involving fluorescence excitation. The latest developments in lasers for microscopy are delivering a powerful combination of improved functionality and operational simplicity.



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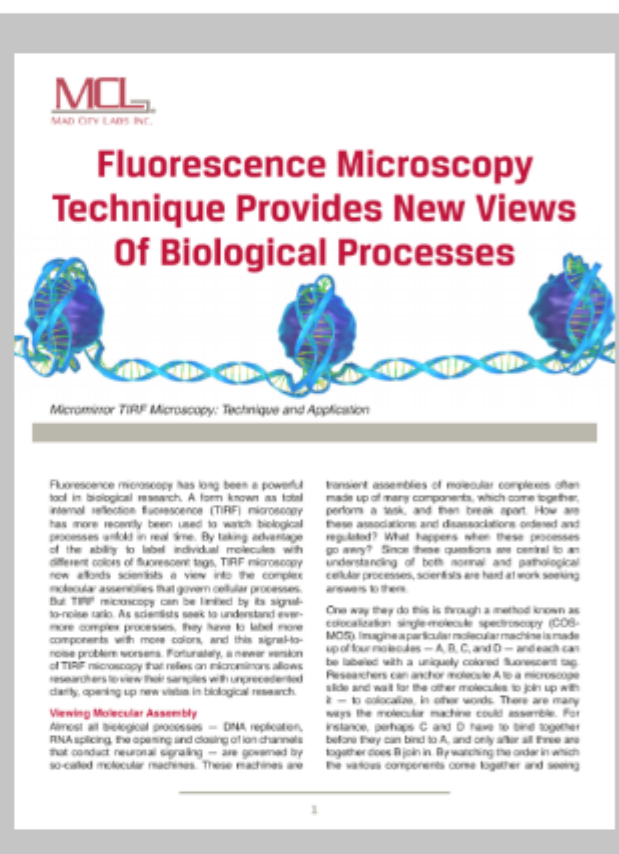
Fluorescence Microscopy Technique Provides New Views of Biological Processes

Introduction to the technique of MicroMirror TIRF (total internal reflection fluorescence) microscopy. The MicroMirror TIRF microscopy technique offers significant signal-to-noise ratio improvements compared to dichroic based TIRF microscopy when using multiple wavelength light sources. Short overview of the types of biological processes that can be studied via this method. Mad City Labs is the only commercial provider of a MicroMirror TIRF microscope.



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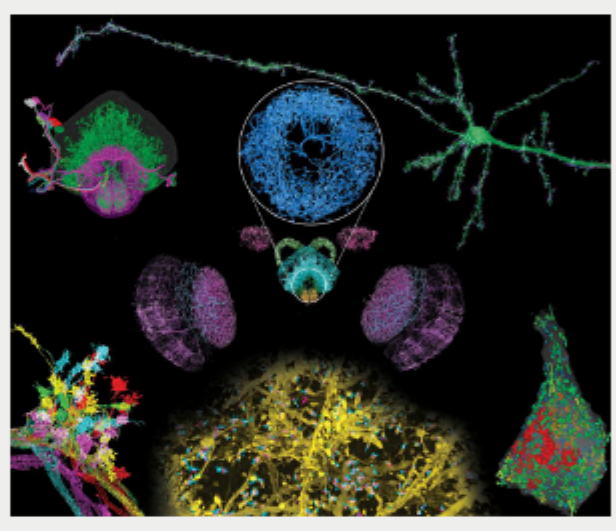
Two Microscopy Techniques Combine for Nanoscale Brain-Wide Optical Imaging

Scientists from the Eric Betzig lab at Howard Hughes Medical Institute's Janelia Campus and the Ed Boyden Lab at MIT collaborated to develop an imaging technique that combines expansion microscopy with lattice light-sheet microscopy for nanoscale imaging of fly and mouse neuronal circuits at the molecular level.



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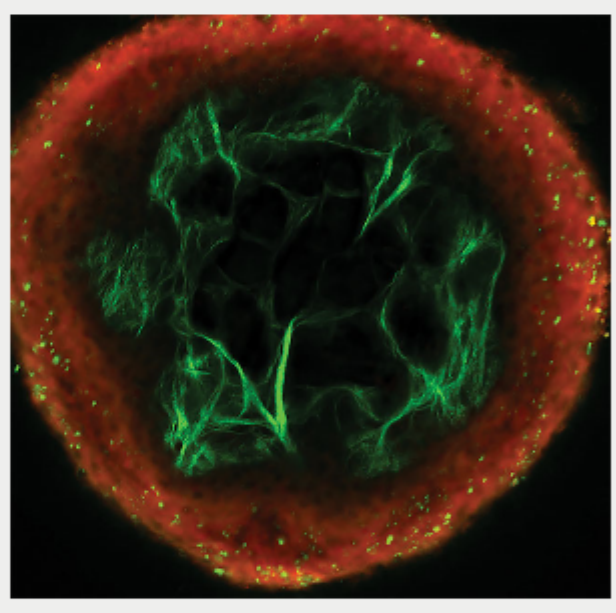
SHG Microscopy Brings Live Cells into 3D Focus

Second-harmonic generation (SHG) microscopy highlights biomolecules that follow a specific structural organization within biological tissues, and complements two-photon excited fluorescence (TPEF) microscopy, as both imaging modalities can operate simultaneously on the same laser scanning microscope.



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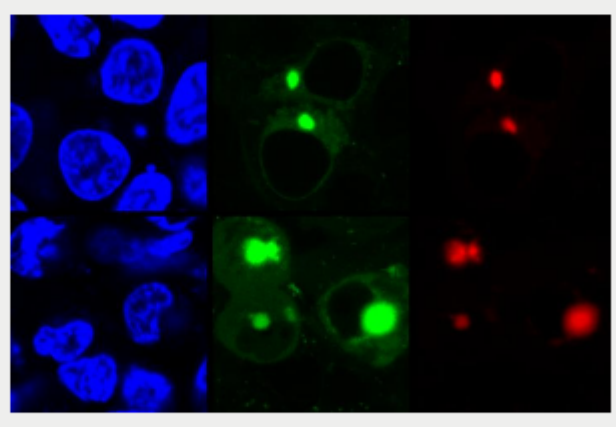
New Fluorogenic Method Can Simultaneously Detect Aggregation of Two Proteins in Live Cells

Researchers re-engineered a fluorescent compound and developed a method by which two different proteins can fluoresce at the same time as they misfold and aggregate inside a living cell, highlighting forms that could play a role in several neurodegenerative diseases.



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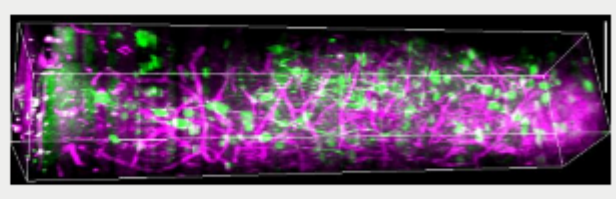
Three-Photon Microscope Reveals All Cortical Layers of Awake Mouse Brain

A new three-photon microscope can deliver rapid, short, low-power light pulses capable of reaching deep targets within the brain without causing functional disturbance or physical damage. It can then detect the resulting fluorescence emitted by cells with high efficiency and produce images with sharp resolution and a fast frame rate.



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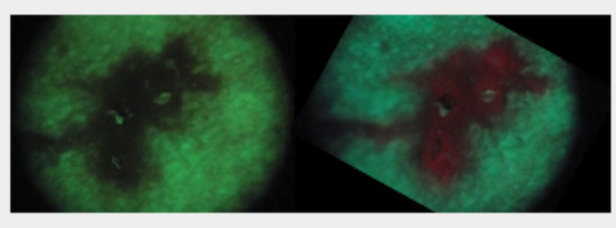
PDT, Customized Protocols Team Up for Enhanced Clinical Translation

Photodynamic therapy (PDT) is a robust treatment procedure that can be designated to treat some types of cancer, as well as infectious diseases and other tissue disorders. It involves the use of a photosensitizer — a chemical compound that is activated by light — which results in the production of reactive species (mainly singlet oxygen) and further induction of cell death.



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