Microscopy Tech Pulse

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THE PULSE OF THE INDUSTRY

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FRET Pursues Affordable, Robust, User-Friendly Instruments

Combining Förster resonance energy transfer with other single-molecule techniques such as magnetic tweezers, optical tweezers and atomic force microscopy could be a game changer. "Such combinations will allow combined global (through a force-based method) and local (through FRET) views of a system, as well as provide the ability for nanomanipulation of a molecule while monitoring changes in its structure and conformation," said Dr. Achillefs Kapanidis, professor of biological physics and head of the Gene Machines Group at Oxford University in England.

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Ultrafast MEMS Mirror Boosts Genetic Research

A programmable MEMS chip consisting of more than 65,000 micromirrors can be used to illuminate numerous targeted areas smaller than single cells. This stimulates specific light-sensitive molecules in groups, which is conducive to genetic exploration, researchers say.

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Superresolution Imaging Adds Another Dimension

Conventional light microscopy is generally constrained by the diffraction limit, the fundamental maximum resolution of an optical imaging system resulting from the diffraction of light. In more recent years, however, researchers have developed a host of techniques – broadly known as superresolution imaging techniques – that enable them to overcome the diffraction limit.

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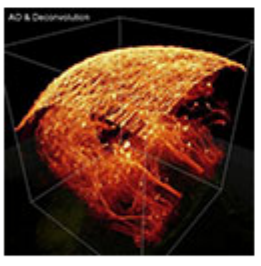
Adaptive Optics Enhances Subcellular Imaging



A new adaptive optics approach sharpens microscope images, rapidly correcting for distortions in transparent, nonscattering tissues at the millimeter scale without exposing them to damaging levels of light.

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Microscopy Enables Detailed Insights into Mitochondria

A new technique combining confocal and two-photon excitation microscopy with in situ pharmacological and genetic manipulation has given researchers insight into how the nervous system responds to disease and injury at the mitochondrial level.

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Raman Scattering Sped Up for Microscopy

Improvements to Raman spectroscopy using laser frequency combs allow multiple signals from different parts of a molecule — or even different molecules — to be monitored simultaneously using a single detector. The advance is seen as a major step toward the holy grail of real-time, label-free biomolecular imaging.

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