

# BIOPHOTONICS

BRINGING LIGHT TO THE LIFE SCIENCES®

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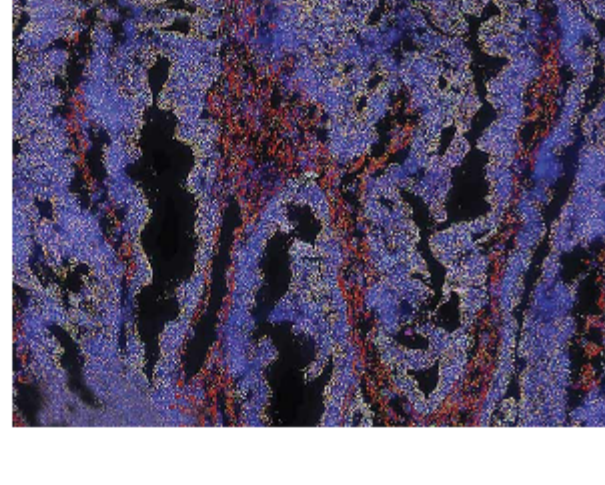
Monthly newsletter focusing on how light-based technologies are being used in the life sciences. Includes news, features and product developments in lasers, imaging, optics, spectroscopy, microscopy, lighting and more. Manage your Photonics Media membership at [Photonics.com/subscribe](http://Photonics.com/subscribe).



**Advancing Insights with the Power of Light**  
Bright, Stable, Long Lived Solid-State Light Engines

## Fluorescence Imaging Deepens the View: From Single Cells to the Subcellular

The human body is made up of trillions of cells, and each one is as unique as the person it is part of. Each individual cell is arranged alongside its neighbors in a specific pattern that is essential to its systemic role within the tissue. In individual organs, numerous cell types — each with different physical characteristics, molecular signatures, and behaviors — act together as a cohesive unit. Fluorescence imaging has been put to use to capture these traits and behaviors in their spatial context.



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## QCL-IR Microscopy: Delivering Molecular Information at Unprecedented Speed

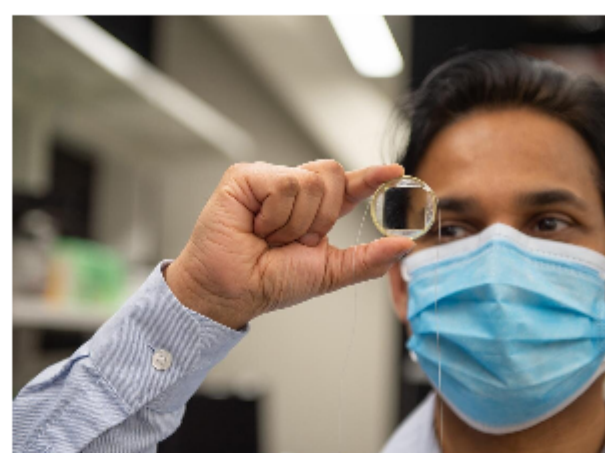
Aiming for faster results, cancer researchers have trended toward novel techniques and technologies that add high throughput without sacrificing data quality or patient care. A variety of techniques involving both spectroscopy and microscopy, such as QCL-IR microscopy, are finding increasing use by researchers and are helping to improve patient outcomes.



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## Transparent Chip Provides View to Multimodal Imaging

A transparent, biocompatible ultrasound transducer chip developed by researchers from Penn State is opening opportunities in cell and tissue stimulation and multimodal imaging. The chip, called a transparent ultrasound transducer, resembles a microscope slide and exhibits greater than 80% transparency. Cells can be cultured and stimulated directly on top of the transducer chip, and the cells' resulting changes can be imaged with optical microscopy techniques.



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## Featured Products & Services



### Rapid Automated Modular Microscope

**Applied Scientific Instrumentation Inc.**

Rapid Automated Modular Microscope is a fully

functional compact automated imaging platform mounted on the frame with mounting holes and support points. The frame supports the assembly and the stage in a manner that ensures coupling between sample and objective.

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### ZIVA Light Engine: Bright, Stable, Fiber Lasers

**Lumencor Inc.**

Lumencor's ZIVA Light Engine delivers bright, stable, robust illumination with seven lasers

and high-end electronics. Narrow bore fibers (<math>\leq 200 \mu\text{m}</math> diameter) generate ultra-high radiance from a compact, pre-aligned, bench top device. Super resolution microscopy techniques are well supported.

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### KeyLight™ by Phoseon Technology

**Phoseon Technology Inc.**

"KeyLight™ is a compact light source that supports 3-7 channel fluorescence

microscopy systems. It brilliantly illuminates your results by delivering intense, broad-spectrum UV and visible wavelengths for a wide variety of colors between 340 nm and 760 nm."

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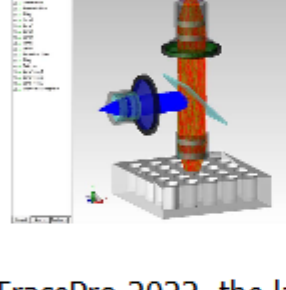
### Product Development through Manufacturing and Assembly

**Optikos Corporation**

Optikos brings 40 years of engineering expertise to serve the development needs of a diverse portfolio of life science clients — from design through manufacturing and assembly in our extensive clean facilities.

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### TracePro 2022

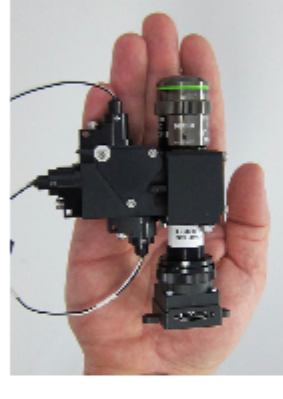
**Lambda Research Corp.**

Lambda Research Corporation is proud to announce the release of

TracePro 2022, the latest release of our award winning TracePro software. TracePro 2022 incorporates many new and improved features.

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### Compact Fluorescence Imaging Modules for your Instrumentation Project

**Etaluma Inc.**

Our powerful commercial-ready fluorescence microscope modules use modern LED excitation, multi-

bandpass filters, and CMOS cameras to solve your custom imaging needs. We provide easy integration in the minimum space for analytical and clinical instrumentation development.

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**Rapid Automated Modular Microscope**  
**RAMM**

- simple or complex
- many part options
- accessible light path
- amazingly affordable
- upgradeable/modifiable

**REAL FLEXIBILITY FLEXIBLE REALITY**

**ASI**  
APPLIED SCIENTIFIC INSTRUMENTATION

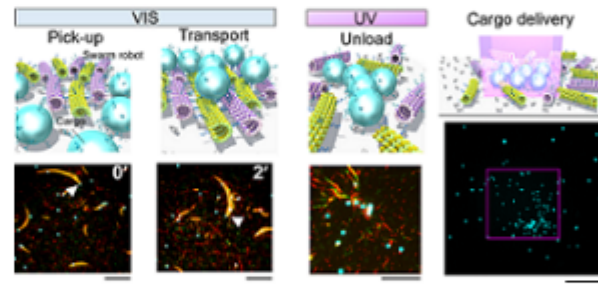
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## In Case You Missed It

### Microsize Molecular Machines Swarm for Drug Delivery

Scientists at Hokkaido University demonstrated light-manipulated microsize molecular machines, or robots, that performed cargo delivery through a swarming strategy to ultimately achieve a transport efficiency 5x greater than that of single robots. The discipline of swarm robotics, which is inspired by the cooperative behavior of living organisms, focuses on the fabrication of robots and their use in swarms to accomplish complex tasks. The cargo used in the team's experiments consisted of polystyrene beads — laying the application for light-activated microbot swarms to be used in various fields including drug delivery.



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### Light Irradiated Coating Augments Nonsurgical Obesity Treatment

A multi-institutional research team in South Korea has enhanced the existing functionality of appetite-suppressing implants in the stomach with photodynamic therapy, coating such an implant with light-activated dye that kills cells that produce ghrelin, known as the "hunger hormone." The researchers used and coated intragastric satiety-inducing devices, or ISDs in the work. The researchers in the current work designed and introduced these implants in 2019.

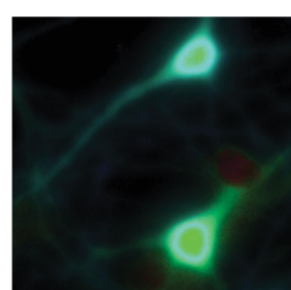
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### Optical Targeting of Cancer Cells Leaves Healthy Tissue Unharmd

A research group at Okayama University is working on a way to prevent healthy cells from incurring damage during cancer treatment. The group is developing a light-induced method for triggering cell apoptosis in targeted cells only, using a light-activated protein rather than chemicals.

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## Upcoming Webinars



### Advances in LED Illumination for Fluorescence Imaging

Thu, Jun 2, 2022 10:00 AM - 11:00 AM EDT

LED illumination for fluorescence imaging systems has progressed significantly in recent years. Kavita Aswani Ph.D. describes the latest advances in illumination for fluorescence imaging, from near-UV to NIR fluorophores. New LED illumination systems are successfully replacing traditional arc lamps

in calcium imaging applications and producing equivalent results with the convenience of LEDs. IR versions of the light sources allow imaging of the popular ICG (Indocyanine green) and IR800 dyes and provide high signal to-noise ratios because of the low background in the NIR region. NIR wavelengths also allow for greater depth penetration in thicker tissues and living animals. Presented by Excelitas Technologies Corp.

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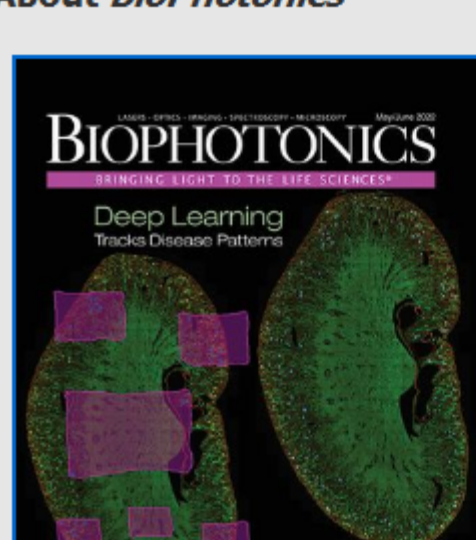
## Next Issue:

### Features

LED-based Photoacoustic Imaging, Spectroscopy & Disease, Wearable Optical Tech, 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](http://www.photonics.com/submitfeature.aspx).

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