TOPTICA PHOTONICS

A Passion for Precision.

Press Release

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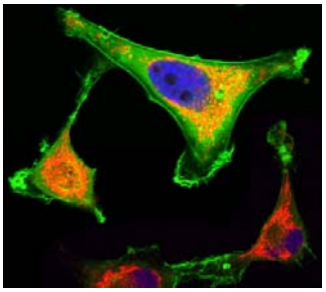
Perfect Laser Flexibility for Biophotonic Microscopy

The ease of fiber lasers combined with a rainbow of colors

When your research involves delicate biological samples you do not want to worry about your instruments. Many researchers in the biomedical field would like to use tunable lasers, or even short-pulsed lasers, but are discouraged by the complexity of these systems. They want to pay full attention to the biomedical analysis, and not waste time and effort on adjusting lasers.

Femtosecond Er:fiber Laser, tunable in the visible. The FemtoFiber Scientific – FFS

As a result, up to now only relatively simple laser systems with one or a few discrete wavelengths have been used. The researcher is therefore severely limited in his or her choice of chromophores. With the new generation of continuously tunable fiber lasers, any chromophore in the range 530 nm – 700 nm can be used, even when its narrow absorption band is not covered by traditional lasers. Despite starting from broadband femtosecond pulses in the infrared spectral range, TOPTICA's proprietary wavelength conversion technique provides quasi-cw, narrow-band output light in the visible. With the high spectral power density in excess of 1 mW per nanometer, excitation is very efficient. The narrow bandwidth in the order of one nanometer ascertains that the fluorescence measurement is hassle-free. At long last, the scientific problem determines the best experimental approach, since the tuning of these fiber lasers really is child's play.



Picture of cell structure acquired by confocal laser scanning microscopy (courtesy of University of Konstanz).

In addition, the FFS offers flexibility to address applications requiring a pulsed character of the excitation source, such as the study of fluorescence lifetimes (FLIM). By virtue of the modular concept, it is also possible to provide two timely synchronized but independently tunable output pulses, as required e.g. for coherent anti-Stokes Raman scattering microscopy (CARS). Finally, high power femtosecond output ports are available at wavelengths of 1.55 µm and 780 nm, ready to provide nonlinear excitation of the sample.

Until recently, femtosecond sources have had a reputation as being fragile and complex instruments. Leading university scientists in cooperation with TOPTICA's engineers have changed this trend by following a fiber-based technology approach. The use of small and reasonably priced telecom components has allowed the design of a very compact and reliable laser, ideal for operation in the biomedical field. With this product, TOPTICA

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complements its series of quality laser products, which are used worldwide in research laboratories – both within industry and fundamental science.

TOPTICA Photonics AG develops, manufactures, services and distributes technology-leading diode and fiber lasers and laser systems for scientific and industrial applications. Sales and service is offered worldwide through TOPTICA Germany and its subsidiary TOPTICA USA, as well as all through 12 distributors. A key point of the company philosophy is the close cooperation between development and research to meet our customers' demanding requirements for sophisticated customized system solutions and their subsequent commercialisation.

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