



LASER 2000

Application

Biophotonics



Biophotonics - “Exciting” Photonics

Biophotonics includes all applications dealing with the interaction of light with organic tissue. This includes a variety of spectroscopic methods for analyzing of molecular structures, but also the use of light to manipulate individual cells through to the use of lasers in surgery.

Due to recent developments of lasers and light sources for biophotonics, and the availability of increasingly sensitive detectors and high-quality optical components, groundbreaking progress can be made in many areas of biophotonics such as fluorescence excitation, spectroscopy and biomedical engineering.

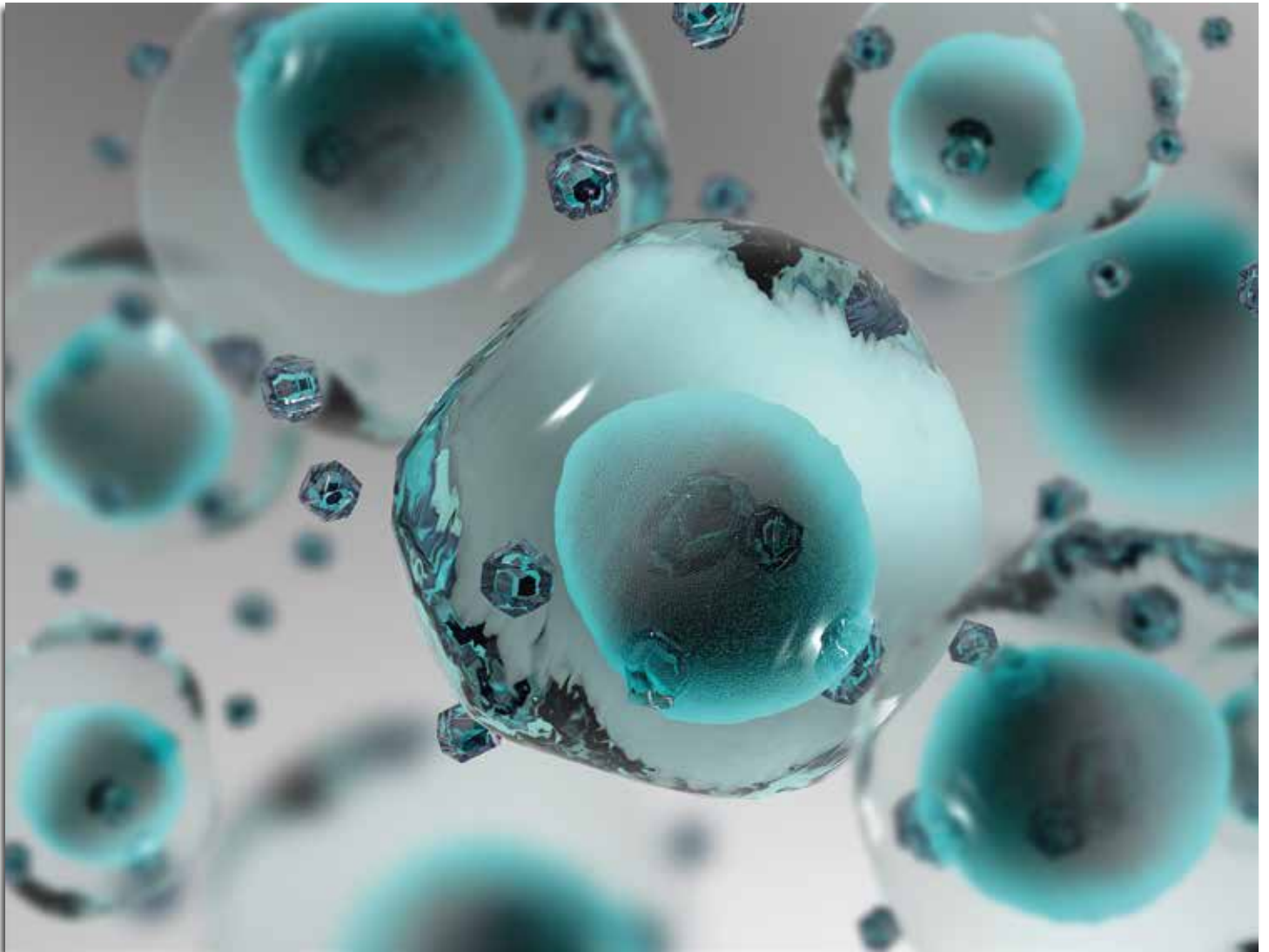


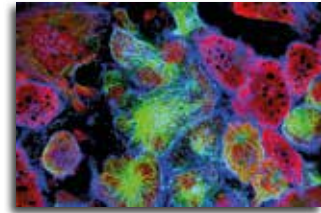
Illustration of blue DAPI fluorescence emission

Fluorescence Excitation

Laser scanning microscopy

Laser scanning microscopy provides spatially highly resolved information about cell structures through laser-induced fluorescence emitted by fluorescent markers.

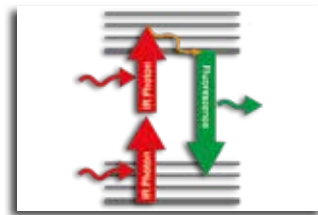
- Reduces background fluorescence
- Provides enhanced image contrast
- Offers 3D information



Multiphoton microscopy

As a special case of fluorescence microscopy, multiphoton microscopy uses nonlinear optical effects to limit fluorescence excitation to the focal point only.

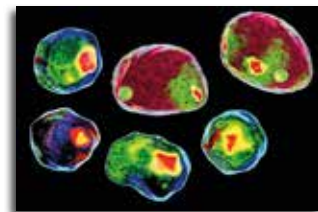
- Offers superior resolution
- Enables higher penetration depth
- Reduces photobleaching



Flow cytometry

In flow cytometry, cells can be analyzed, counted or sorted with regards to their physical and chemical properties by flowing through a laser beam in a liquid.

- Allows cell-by-cell detection
- Offers real-time high-throughput analysis
- Provides fully automated process



Biomedical Engineering

Optical tweezers

Optical tweezers use the forces generated by a focused laser beam to grip and move micron-sized objects with an accuracy of several hundred nanometers.

- Provides non-contact cell moving
- Enables remotely control even through glass
- Avoids sample contamination



Ophthalmology

Ultrashort pulse lasers with high pulse intensities produce photodisruption in optically transparent materials making them ideal for corneal surgery.

- Offers blade-free and safe cutting method
- Enables preparation of a thinner flap
- Prevents further damage to the cornea

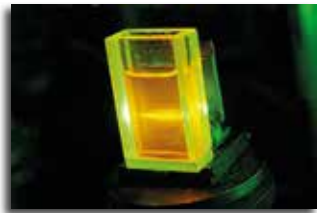


Spectroscopy

Fluorescence spectroscopy

Molecules excited by light emit characteristic spectra that provide precise information about their physical properties or chemical compositions.

- Allows non-invasive measurements
- Provides high sensitivity and specificity
- Analyzes fast processes time resolved



Raman spectroscopy

Raman spectroscopy enables rapid analysis of structural and functional properties of biomolecules. At low concentrations, a large variety of chemical compounds can be identified.

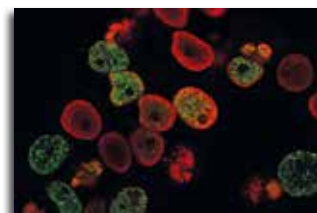
- No cell labelling or staining is required
- In vivo analysis of cells is possible
- Time-dependent biochemistry can be monitored



Coherent anti-Stokes Raman spectroscopy

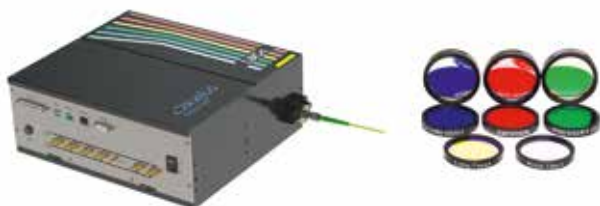
Coherent anti-Stokes Raman scattering is a third-order nonlinear optical process used for high-resolution spectroscopy of molecules.

- Allows non-invasive label-free imaging
- Delivers strong signals without fluorescence
- Produces inherent 3D resolution



Special Products for Demanding Applications

Fluorescence Excitation



Laser combiners and optical filters

- Up to six wavelengths in one box
- Low noise lasers
- Various extension and output modules
- Customizable and field upgradeable
- Wide range of bandpass and dichroic filters

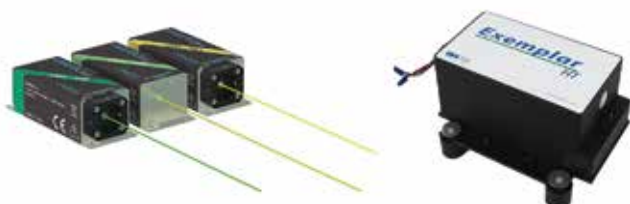
Multiphoton Microscopy



ALCOR fixed wavelength fs laser

- 520 nm, 920 nm, 1064 nm
- Up to 5 W optical power
- Optional AOM & fiber output
- Plug & Play
- Dual wavelength option

Spectroscopy



SLM lasers and spectrometers

- Exceptional wavelength stability
- Fiber coupling options
- Up to 95 % quantum efficiency
- Ideal for ultra low light level applications
- Customization options

Ophthalmology



DIADEM ultrashort pulse laser

- 1030 nm, 1064 nm, 1300 nm, SHG, THG
- Up to 40 μ J at < 400 fs pulse duration
- Rugged industrial-grade design
- Air cooled
- Various pulse control and output features

Our All-Round Service (Solutions)

The comprehensive consulting for your project

Photonics is considered one of the most important technologies of the future. Products from that field of are finding their way into a steadily growing number of applications and are opening up new, innovative and efficient approaches to solutions. At the same time, however, photonics also confronts manufacturers, plant engineers and system integrators with new, major challenges.

As a photonics expert, Laser 2000 supports you in your project. Our specialists with many years of experience advise you, show approaches to solutions, provide special concepts and accompany you with know-how from prototype development to series production.

Our broad product and solution portfolio as well as our extensive expert knowledge enables our customers to face and successfully master new challenges in photonics.



All Photonics Products from a Single Source

Experts in Photonics

Since 1986, we have supported well over 100 international photonics manufacturers as a leading partner in covering the European market. In doing so, we are an important link between users, integrators and suppliers. Our success is based on our solution-oriented consulting, the close exchange with our partners as well as our profound product and application understanding.



Laser & Light Sources



Laser Safety



Solutions



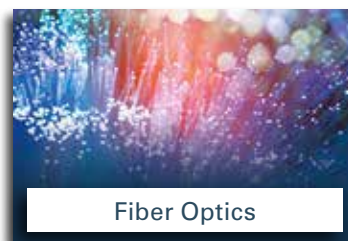
Test & Measurement



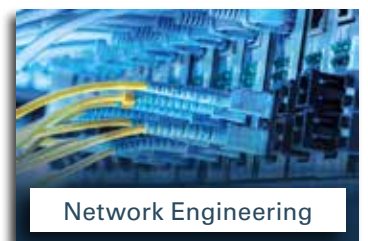
Optics & Optomechanics



Machine Vision



Fiber Optics



Network Engineering

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