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Press Release

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LASER World of PHOTONICS 2017

Photonics sheds light on the molecular interrelationships of our life

At the world's leading trade fair [LASER World of PHOTONICS](#) (June 26–29, 2017 in Munich) exhibitors, application panels and symposiums will demonstrate just how closely medical progress is intertwined with photonics techniques. When today's researchers embark on voyages of discovery, they eagerly enlist photons to transport themselves into miniature worlds. Photonics is ubiquitous when peering into living cells, neural brain processes or pathologically altered tissue.

Application-oriented [Application Panels](#) in Hall B2 and the European Conference on Biomedical Optics ([ECBO 2017](#)) being held in parallel with the trade fair address topical photonics trends in medical science and research. This includes deep tissue imaging. [Optical Coherence Tomography](#) (OCT) enables medical professionals to look a few millimeters below the tissue surface in real-time using infrared laser. The optical systems provide 3-D scans with microscopic resolution without exposing patients to harmful radiation.

Lasers control brain functions

LASER 2017 will also shed light on a promising, young field of research: optogenetics. This uses laser to illuminate neural processes. To achieve this, researchers introduce special light-switchable proteins into areas of the brain. The proteins enable

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them to use laser light selectively to control the ion flow within the neural network. Research is proceeding at breakneck speed. Brain functions and cognitive processes are proving increasingly [amenable](#) to being controlled to permit their systematic investigation.

Even the activities of individual neurons can be observed. [Femtosecond lasers](#) are being [employed](#) because they enable light manipulation even in deep brain areas. At the same time they deliver 3-D live transmissions from the functioning brain by means of multiple photon stimulation.

Optical techniques assist with the diagnosis

[Microscope](#) and [imaging technique](#) resolution is advancing in tandem with progress in computer processor, software and light source performance. Thanks to these [more profound insights](#) medical research is increasingly knowledgeable about the origins of diseases and how to combat them.

In the development of new drugs as well, optical techniques provide more timely evidence of whether they work or not. Optical techniques also enable quicker diagnoses – for example to gain vital time in the fight against multi-resistant germs. In the medium-term, photonic diagnostics will pave the way for personalized medicine with therapies individually tailored to the patient.

Biochips, tolerable implants and minimally-invasive surgery

Nowadays, optical techniques play a key role in the development and fabrication of miniaturized [biochips](#) just as they do in the fabrication of perfectly customized, 3-D scanned and [3-D printed implants](#). Thanks to accurate imaging and diagnostic techniques and miniaturized endoscopes, they provide doctors with minimally invasive insights into the patient's body. Developments are proceeding apace. For example, in the field of multi-photon

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tomography, which is yielding three-dimensional insights into skin and eye tissue by means of femtosecond lasers.

To this end, the LASER exhibitor LASER [JenLab GmbH](#) is pushing ahead with a [research project](#) to harness the technique for diagnosing skin cancer or dangerous deterioration of the cornea within mere seconds.

If in the course of the optical diagnosis doctors determine that surgery is required, it is also performed using optical techniques. Examples include OP assistance systems, augmented or virtual reality, and lasers in lieu of manually guided scalpels.

Ophthalmologists in particular use [lasers](#) to measure and operate on eyes. The concentrated light beam is also used to machine [corneal transplants](#) with micron-level precision.

You will find out more about the applications from the biophotonics and medical technology arenas at LASER World of Photonics 2017 in Munich from June 26–29.

LASER World of PHOTONICS

The LASER World of PHOTONICS is the world's leading platform of the laser and photonics industry. World of Photonics Congress, Europe's largest photonics congress, will be taking place in parallel with the trade fair. The program comprises five scientific conferences of leading global organizations. Supplementing this Messe München will be offering practical lectures on the applications of photonics ("Application Panels"). The combination of trade fair and congress brings together research and application, thereby promoting the use and continued development of optical technologies. In 2015 the trade fair set an exhibitor record with 1,227 exhibitors from 42 countries. A total of 31,279 trade visitors from 72 countries entered the Messe München site. In 2015 the World of Photonics Congress registered 5,600 participants with an offering of more than 2,700 lectures and presentations including poster presentations.

The LASER World of PHOTONICS has been organized every two years by Messe München since 1973; the next event will take place in Munich from June 26-29, 2017, the next World of Photonics Congress will take place in parallel from June 25-29, 2017 in the ICM - International Congress Center Munich. www.world-of-photonics.com/index-2.html

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The LASER World of PHOTONICS global network

LASER World of PHOTONICS has developed an international trade fair network. LASER World of PHOTONICS in Munich is the world's leading platform of the laser and photonics industry. World of Photonics Congress is Europe's largest photonics congress. LASER World of PHOTONICS CHINA and LASER World of PHOTONICS INDIA are leading regional trade fairs for laser and optical technologies and are staged annually in China (Shanghai) and India (alternating between Bangalore and New Delhi). With a total of 2,168 exhibitors and more than 83,000 visitors in Munich, China and India, Messe München is the world's leading trade fair organizer for lasers and photonics.

Messe München

Messe München is one of the world's leading trade-show companies. It organizes some 40 trade shows for capital and consumer goods and key high-tech industries in Munich and abroad. Each year more than 30,000 exhibitors and some two million visitors take part in events held at the Messe München trade-fair center, the ICM – Internationales Congress Center München and the MOC Veranstaltungszentrum München. In addition, Messe München organizes trade shows in China, India, Turkey, South Africa and Russia. Messe München has a global business presence with affiliates in Europe, Asia and Africa and more than 60 foreign representatives serving more than 100 countries.

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