PRESS RELEASE

Optical Biopsy with Femtosecond Laser

Launch of the world's first flexible clinical CARS tomograph „MPTflex®-CARS“ at the LASER World of PHOTONICS 2013

The scientists and engineers of JenLab have succeeded in developing the first flexible clinical CARS system. The new laser tomograph enables a precise look into the skin within seconds and provides high-resolution optical biopsies without tissue removal. Staining of the skin is not required. The tomograph is based on nonlinear Raman imaging (CARS: Coherent Anti-Stokes Raman Scattering), multiphoton autofluorescence and second harmonic generation. Single cells, cell organelles as well as elastin and collagen can be imaged with sub-micron resolution and with additional chemical information.

In vivo multiphoton tomography has become quite a promising method for early cancer detection, therapy optimization, and evaluation of cosmetic and pharmaceutical products under natural physiological conditions. It can be used to determine the skin ageing index and the lipid distribution as well as to evaluate the effect of anti-ageing products.

The new CARS tomograph is currently employed at the Charité in Berlin for the detection of chemotherapeutic agents in the skin of cancer patients and to test the effect of antioxidants in the treatment of the hand and foot syndrome.

Multiphoton and CARS imaging has the potential to provide in future label-free optical biopsies within seconds without tissue removal. Furthermore, surgeries can be assisted e.g. to localize tumor boundaries.

JenLab was found in 1999 as a spin-off of the University Hospital Jena and is the pioneer in medical diagnostics systems based on femtosecond laser technology. JenLab’s tomographs are used in Australia, California and Europe for the detection of malignant melanoma. Leading cosmetics manufacturers in Japan, US, and Europe employ JenLab products to evaluate the biosafety of nanoparticles in sunscreens and anti-aging products.