

**MULTIPHOTON MULTIMODAL TOMOGRAPHY  
OF HUMAN SKIN  
WITH FIBER LASER**

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Multiphoton tomography (MPT) has been employed as high-resolution clinical imaging method to obtain non-invasively and label-free optical biopsies for rapid in vivo histology<sup>1</sup>.

Here we report on clinical studies that have been conducted on patients with suspicious pigmented skin lesions to evaluate femtosecond fiber laser based compact multiphoton multimodal tomography for skin cancer diagnostics<sup>2,3</sup>.

Label-free optical skin biopsies have been obtained based on two-photon autofluorescence excited at 780 nm, second harmonic generation, dermoscopy with an additional white light imager, and confocal reflectance with the NIR ultrashort laser pulses at 80 MHz. Furthermore, fluorescence lifetime imaging (FLIM) based on time-correlated single photon counting has been performed.

[1] K. König (editor). Multiphoton microscopy and fluorescence lifetime imaging. De Gruyter. Berlin, Boston, January 2018. ISBN 978-3-11-042998-5. Free download.

[2] K. König et al. Multimodal multiphoton tomograph using a compact femtosecond fiber laser. SPIE-Proceed 10882(2019)

[3] K. König et al. Clinical multimodal multiphoton tomography of pigmented skin lesions with an ultracompact femtosecond fiber laser. SPIE-Proceed 11211(2020)