

High peak power ultrafast lasers for in vivo 3D imaging

Ultrafast lasers with high peak powers have enabled a wide range of techniques for 3D live tissue imaging. Widely tunable systems are particularly suited for multiphoton excited fluorescence microscopy of fluorescent proteins, opsins, and calcium indicators. Higher peak power ultrafast lasers are also driving development of 2-photon light sheet, 3-photon excited fluorescence and optogenetics photo-stimulation. We present the latest advances in ultrafast lasers and their application in advanced bio-imaging techniques, and we discuss relevant examples illustrating their impact in the biological sciences.