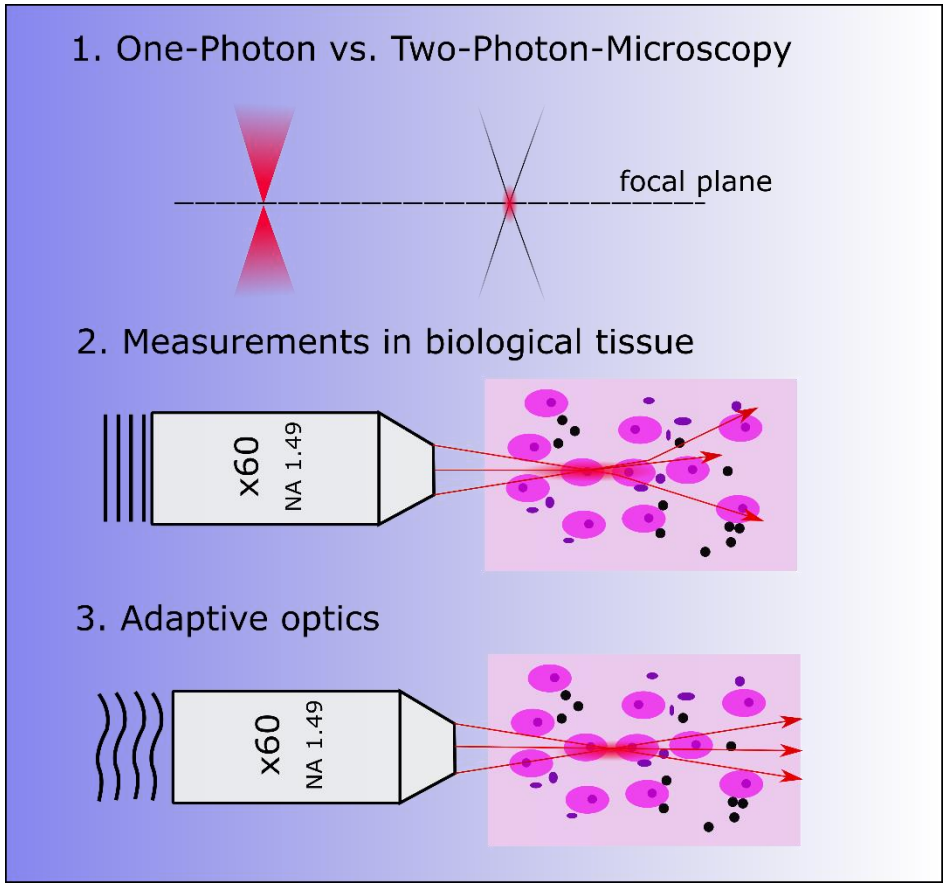
Two-Photon-Microscopy for Deep-Tissue Imaging

MA, DA or SA in MB/IST/Biomedizintechnik

Background

Understanding developmental and organizational processes in living cells is an important part of biomedical research (see Nobel Prizes Physiology/Medicine 2022 and 2016) and needs optical methods for observation. Two-photon microscopy is one such method to look deep into living tissue without physical slicing. For this purpose, an optical setup of a two-photon microscope needs to be realized, characterized and complemented by adaptive optics. Adaptive optics enable pre-shaping of light before it enters the sample, by doing so disturbing influences of the surrounding tissue (optical aberrations) can be corrected. Thereby, the obtained images have higher resolution and the focal plane can be shifted deeper into the tissue.



Tasks

- Build and characterize a two-photon-microscope
- Measure bio-tissue samples
- Add adaptive optics for wavefront shaping

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