

## DEEP-TISSUE IMAGING WITH IMPROVED RESOLUTION USING SINGLE-PHOTON NIR RESCAN CONFOCAL MICROSCOPY

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**Keywords:** deep-tissue imaging, rescan confocal microscopy, near-infrared excitation, pathology, lymphoid tissue

Fluorescence excitation in the near-infrared (NIR) allows deep-tissue imaging as tissue scattering and autofluorescence are minimized in this spectral window. However, owing to its linearly-inverse dependence on wavelength, spatial resolution is lost in the near-infrared as compared to the visual spectrum. Here, we present the use of single photon excitation Near-Infrared Rescan Confocal Microscopy (NIR-RCM) for performing fluorescence imaging of thick tissue specimens. NIR-RCM allows imaging with improved lateral resolution at depths comparable with multiphoton microscopy, compensating the loss in resolution as a result of wavelength shift in the NIR. We used a RCM system specifically optimized for deep-tissue imaging with low magnification, large working distance objectives and large field-of-view. In combination with optical tissue clearing, NIR-RCM imaging of pathological tissues at depths of 1.75 mm was reached. The potential of NIR-RCM is showcased for deep-tissue imaging of the organisation of lymphoid tonsil tissue and immune cells in the appendix.