OPTICAL PROJECTION TOMOGRAPHY PLATFORM OPTIMIZED FOR THE GASTROINTESTINAL RESEARCH

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We present a fluorescent OPT platform optimized for the mesoscale imaging of the mouse gut at multiple wavelengths. In particular, we demonstrate a sub-30 µm resolution along the 3 dimensions and over more than 60 mm^3 in a single acquisition. Here, we observe the spatial arrangement of the intestinal villi and the vasculature network penetrating until the extremity of the villi. We believe our approach to be of high potential for gastrointestinal pathology research.

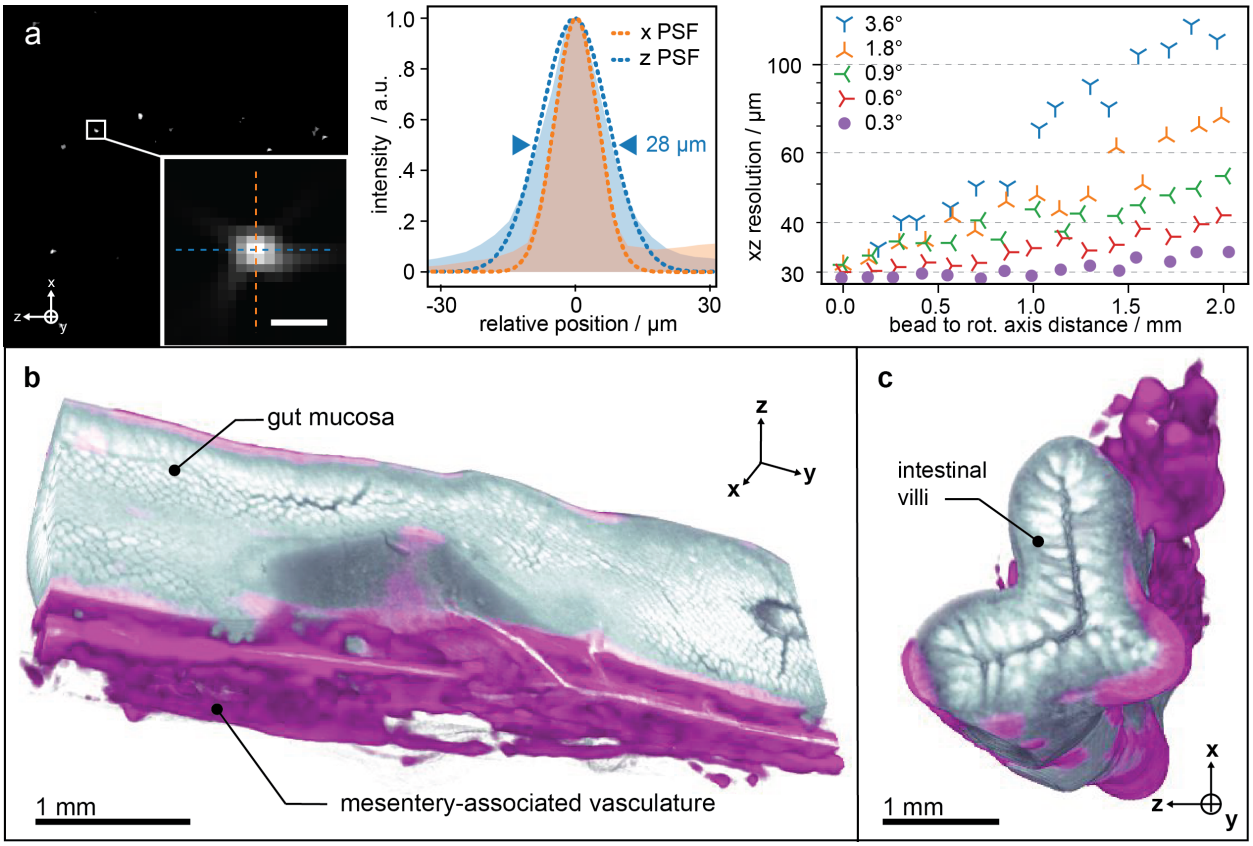

Figure 1: **a** Analysis of the instrument resolution using fluorescent microspheres. The scale bar in the close-up equals 20 µm. The resolution along the x- and z-axes is estimated by the FWHM of gaussian fits. The lateral resolution is measured as a function of the distance to the rotation axis for multiple angular resolutions. **b** and **c** 3D blend rendering of a mouse gut acquired using 2 spectral channels. The vasculature (magenta) is stained using CD31 prepared in 2% gelatin and is excited at 647 nm. The tissue is imaged using auto fluorescence excited at 415 nm. **b** Perspective view emphasizing the mesentery-associated vasculature and highlighting the 3D advantage of the technique. **c** Cross-sectional view showing the typical villi structures.