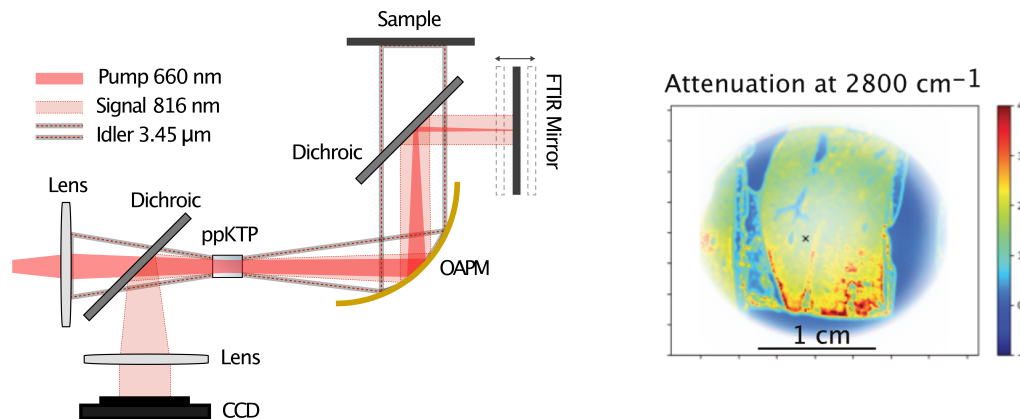


Bachelor thesis project: Hyperspectral Imaging techniques for mid-IR histology

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The goal of this project is to quantitatively compare the performance of (true) hyperspectral acquisition via fourier transform spectroscopy with quasi-hyperspectral acquisition using narrow bandpass filters.

By accessing all molecule-specific vibrational modes, mid-IR spectroscopy can reveal sample compositions non-invasively. Here, the omission of disadvantageous preparation tasks such as labelling is especially helpful for the analysis of biological tissue. For this purpose, a nonlinear interferometer exploits quantum interference to transfer mid-IR molecular fingerprints to near-IR spectral bands [1]. Finally, the interferometer's imaging configuration enables hyperspectral acquisition i.e. conducting the spectral analysis of the samples in a spectrally resolved manner.



- [1] KVIATKOVSKY, Inna ; CHRZANOWSKI, Helen M. ; AVERY, Ellen G. ; BAROLOMAEUS, Hendrik ; RAMELOW, Sven: Microscopy with undetected photons in the mid-infrared. In: *Science Advances* 6 (2020), Nr. 42, eabd0264. <http://dx.doi.org/10.1126/sciadv.abd0264>.
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