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Development of multimodal microscope and its application to single-molecule study of mitochondrial transcription initiation

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Optical microscopy can be largely classified into two groups according to how light illuminates specimen: 'wide-field' or 'focused-beam' illumination microscopy. The two microscopy modalities are often integrated into the same instrument, especially for the purpose of combining optical tweezers and fluorescence imaging, with typically employing separate lasers for the two distinct illumination schemes. We have developed a new microscope platform that enables operation of the same laser for the both modalities either interchangeably or even simultaneously in a way scalable to multiple lasers. In this talk, I will present the details of the instrument and its application to single-molecule FRET study of mitochondrial transcription initiation.