IMAGING OF SINGLE MOLECULES IN COMPLEX ENVIRONMENTS

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Single molecule optical microscopy has emerged as an advanced tool for studying nanoscale behavior of a wide variety of complex systems in chemistry, physics, and biology. Here, we highlight our recent developments in single molecule detection with emphasis on the application to investigate the photophysics and photostability of individual dye molecules embedded in ultrathin polymer layers [1] or surface-anchored pluronic micelles [2]. The 3D orientation determined by means of confocal microscopy in combination with azimuthally or radially polarized laser beams [3], together with a fascinating aspect of its capability to detect a chemical reaction in a single chromophore [4,5]. This is followed by the observation of long-time trajectories of enzymatic activity on an individual enzyme molecules encapsulated within surface-tethered lipid vesicles [6].

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