Multi-color SMLM cell imaging demonstrated on Abbelight SAFe imaging platform

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Abstract

Biological imaging has successfully pierced the nanoscale in recent years; resolving the intricate interaction of multiple targets in a system naturally represents the next step in the evolution of fluorescence nanoscopy. For Single molecule localization microscopy (SMLM), one of the most promising ideas has been to spectrally demix the fluorescence emission of several dyes with similar spectral properties, mostly applied to Stochastic optical reconstruction microscopy (STORM). Meanwhile, DNA-PAINT (DNA-Point accumulation for imaging in nanoscale topography) inherently holds great potential for multicolor imaging due to its different approach to attaining the “blinking” required for SMLM. DNA-PAINT relies on the rapid hybridization and dehybridization of short complementary DNA strands, retaining a dye long enough close to the target to collect a few thousand photons and “localize it” before the dye diffuses off again.

With this workshop, we would like to demonstrate the versatility of our SAFe imaging platform in acquiring simultaneous multi-color SMLM images using STORM and DNA-PAINT methods. We will image several type of sample: COS7 cells, hippocampal rat neurons and others.

Schedule

10 min Introduction: SMLM (STORM and DNA-PAINT) and Abbelight setup (Presentation)

5 min Acquisition on a one-color image, explanation of the imaging parameters

15 min Simultaneous two-color DNA-PAINT imaging using Cy3b/Atto655 dye combination.

15 min Simultaneous two-color STORM imaging using AF647/CF680 dye combination.

15 min Summary of the workshop & Questions