

Comparison of different DNA labeling techniques for their use in single molecule switching microscopy

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1 Keywords

Single molecule switching microscopy, super-resolution imaging, DNA labeling, photobiotin, cyanine dyes, intercalating dyes

2 Abstract

Recent developments in the field of super-resolution imaging and especially single molecule switching microscopy aim to make it more widely applicable in the life sciences. Inspired by the recent trend of using standard fluorescent dyes in special buffers conditions that promote photoinduced blinking [1] [2] [3] [4], we have focused on the investigation of different options to label DNA with existing cyanine dyes. The imaging scheme requires high density labeling with photo-switchable fluorophores without interfering with the DNA's properties and its interactions with proteins for instance. Monomeric and dimeric intercalating cyanine dyes, as well as the reaction between DNA and photobiotin reaction followed by conjugation with streptavidin-Cy5 have been tested for their suitability. We compare the use of the above labelling strategies in single-molecule based nanoscopy. Our results are generally applicable to any super-resolution study that involves the investigation of DNA topology.

References

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