Tag-PAINT: Stoichiometric and covalent labelling via protein tags for quantitative DNA-PAINT imaging

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An important challenge for single molecule localization microscopy (SMLM) when attempting quantitative measurements is control over the stoichiometry of the label to the molecule of interest [1]. Recently, DNA-PAINT imaging has been extended to allow quantitative measurements of protein complexes within cells via qPAINT [2]. Here, protein tags (Halo- and SNAP-tags) are used in combination with oligonucleotide functionalised ligands to achieve stoichiometric and covalent labelling of proteins of interest. Multiplexed DNA-PAINT on a variety of cellular targets is demonstrated along with qPAINT imaging of T cell receptor signalling proteins within the plasma membrane.

Fig1. a) Principle of Tag-PAINT. Tagged proteins are labelled with oligonucleotide-bearing ligands, allowing docking of complementary fluor-labelled imaging strands. b) Convolved Tag-PAINT image of single CD3ζ chains in the plasma membrane of Jurkat T-cell. Scale bar = 100 nm.

References
