**Single molecule imaging of T cell receptor signalling**

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Single-molecule localization microscopy (SMLM) can provide a truly molecular image of complex biological processes. We aimed to better understand how the T cell receptor (TCR) translates antigen binding into intracellular signals on which T cell fate decisions are based. With SMLM and novel analyses, we determined how the spatial organization regulates signal initiation and propagation (Pageon et al. PNAS 2016). We also developed novel FRET sensors to monitor the rate of receptor clustering (Ma et al. Nat Commun 2017) and a sensor that reports membrane charges (Ma et al. Nat Biotech 2017) to understand how biophysical properties of the plasma membrane contribute to TCR signaling. More recently, we developed an improved single molecule microscope that achieves ~2-3 nm localization precisions and thus enables direct distance measurements between membrane proteins.