

***d*STORM: Super-resolution imaging with small organic fluorophores**

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We introduce a general approach for multicolor super-resolution fluorescence imaging based on photoswitching of standard small organic fluorophores. Photoswitching of organic rhodamine and oxazine fluorophores, i.e. the reversible transition from a fluorescent to a non-fluorescent state in aqueous buffers exploits the formation of long-lived triplet radical anions through reaction with thiol compounds and repopulation of the singlet ground state by reaction with molecular oxygen. We unravel the underlying switching mechanism and demonstrate super-resolution imaging with different commercially available organic fluorophores. Furthermore, we provide evidence that the method can be advantageously used for live cell imaging with ~ 20 nm optical resolution.