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Super-resolution optical microscopy of DNA conjugated gold nanoparticles



Ground-state depletion with individual molecule return (GSDIM) is a microscopy technique in which the positions of fluorescent dye molecules are localized well below the diffraction limit of light using point-spread function fitting. When a densely dye-labeled object is irradiated, most of the dye molecules are shelved in a dark state while individual dyes relax into the ground state and fluoresce one by one, allowing us to reconstruct an image of the object. We have used GSDIM to image DNA conjugated gold nanoparticles, revealing information about particle topography, as well as the distribution of DNA molecules on the surface, which is vital to understanding the functionality of nanoparticle bioconjugates.

(Note: Dr. Mayer carried out this work as a member of the Willets Lab at UT-Austin.)



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