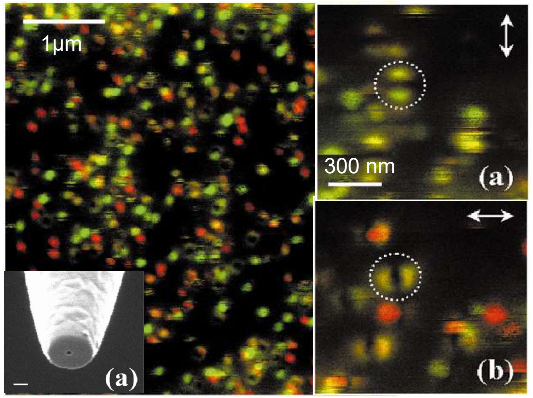
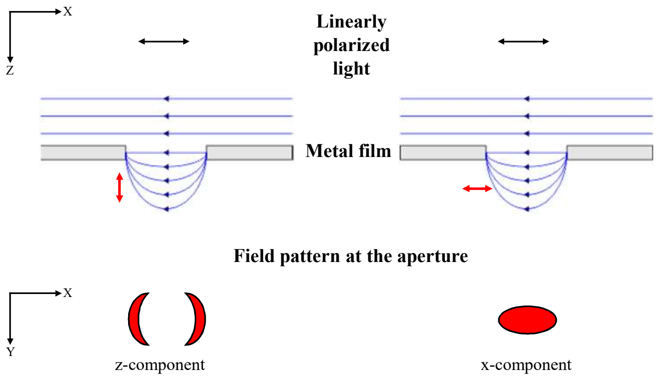
Fluorescence of Single Molecules

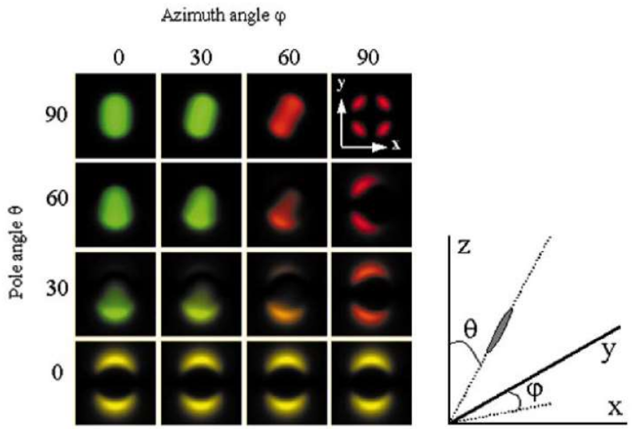


Betzig and Chichester (1993); Veerman et al. (1999)

Field Components at a Cicular Aperture

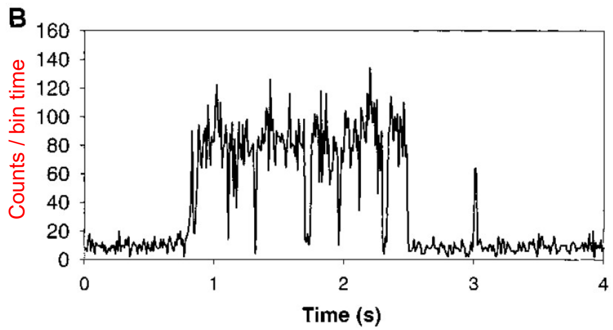


Field Pattern of an Oriented Dipole at a Circular Nano-Aperture



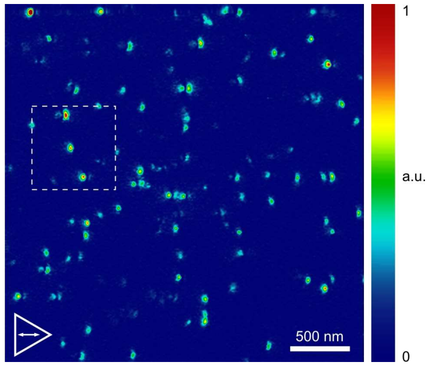
Veerman et al. (1999)

Blinking of Single Molecules



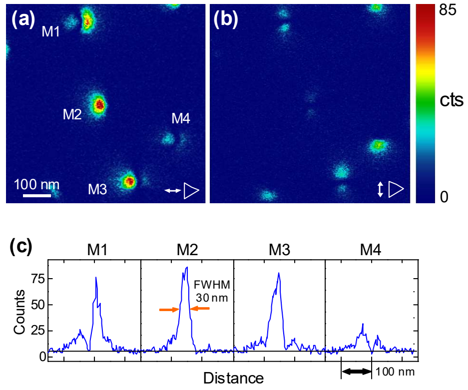
Moerner & Orrit, Science 283, 1999

TA-Probe: Imaging of Single Molecules



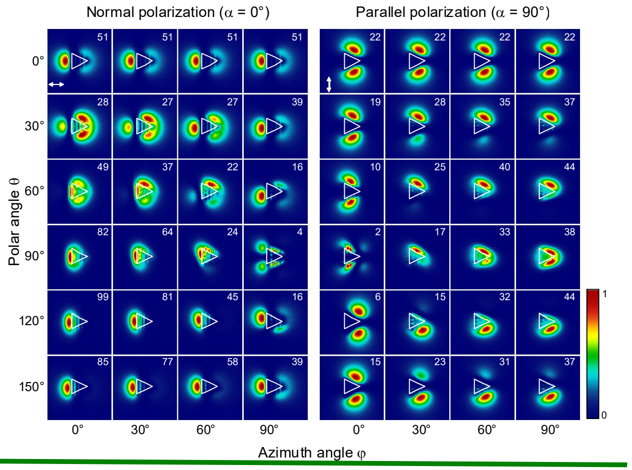
Molenda et al., Optics Express (2005)

TA-Probe: Imaging of Single Molecules

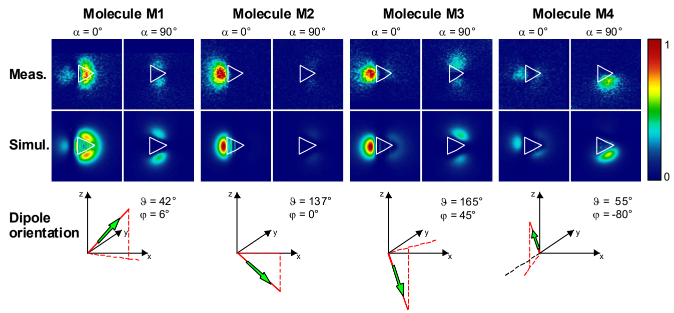


Molenda et al., Optics Express (2005)

Field Patterns for Various Molecule Orientations

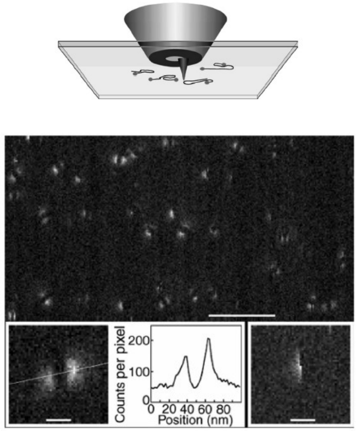


Assignment of Molecule Orientation



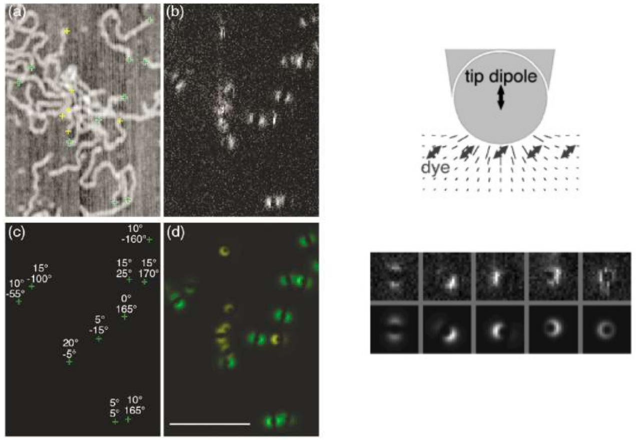
Molenda et al., Optics Express (2005)

TOA-Probe: Single Molecule Microscopy



Frey et al., PRL 2004

TOA-Probe: Single Molecule Microscopy



Frey et al., PRL 2004

Optical Nanoantenna

Purcell-Effect
By increasing the density of final states ρ for the photons emitted from a molecule its spontaneous life time τ will decrease.

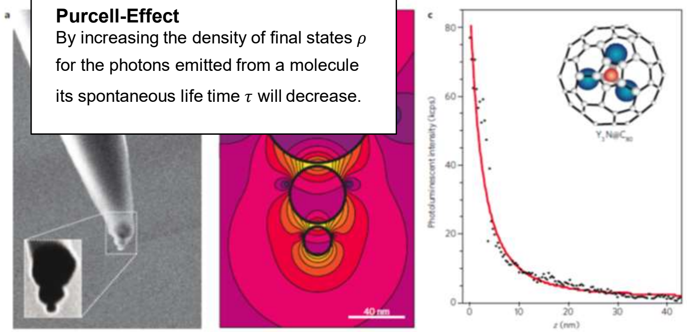


Figure 5 | Example of a bottom-up fabricated optical antenna. a, SEM image of a gold trimer antenna consisting of gold nanoparticles supported by a dielectric tip. The particle sizes are 180, 90 and 50 nm. **b**, Computed intensity near a trimer antenna irradiated at a wavelength of 650 nm. Adjacent contour lines differ by a factor of two in intensity. **c**, Fluorescence from a metallofullerene ($Y_3N@C_{80}$, pictured inset) as a function of its distance from a gold nanoparticle antenna. Because of the low intrinsic quantum yield of $Y_3N@C_{80}$, the antenna enhances the fluorescence by two orders of magnitude. Figure **c** reproduced with permission from ref. 98, © 2010 ACS.

Novotny and Hulst, Nature Photonics (2011)