

# Nanoparticles for nanoscopy

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## ABSTRACT:

The resolution of conventional optical microscopy is ~200 nm, which limits the biological research to visualize clearly the subcellular organelles. To overcome this, different optical nanoscopy techniques have been invented, but each of them has its own pros and cons. The nanoparticle can be specifically designed to meet the requirements of super-resolution microscopy, thereby empowering the applicability and performance of optical nanoscopy.

I will present several novel techniques: (1) Upconversion nanoparticle (UCNPs) enabled ultralow power STED. Owing to the rich energy levels, unique “route” for STED pump-probe process can be generated, allowing ultralow power STED [1, 2]. (2) With SERS gold nanoparticle and super-resolution dipole orientation microscopy, the dipole orientation can be employed to improve the resolution, as well as provides further information for particle tracking of the endocytosis process, providing a new dimension for super-resolution [3-5]. (3) For quantum dots (QDs), the large-Stokes shift of can be used for STED, and the blinking behavior can be used for SOFI [6-8]. With their fantastic luminescent features, the little nanoparticles have made great impact on next generation optical nanoscopy.

## References

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