Gold nanorod photoluminescence : applications to imaging and temperature sensing

Carattino, A.

Stellingen

behorende bij het proefschrift

GOLD NANOROD PHOTOLUMINESCENCE

APPLICATIONS TO IMAGING AND TEMPERATURE SENSING

1. Seemingly identical nanorods can have unexpectedly different luminescence properties.
   Chapters 2 and 4 of this thesis
2. Even when the anti-Stokes luminescence of a gold nanorod is weaker than the Stokes luminescence, it can have a higher signal-to-background ratio.
   Chapter 3 of this thesis
3. The anti-Stokes emission mechanism proposed in Chapter 4 can be extended to nanoparticles with different geometries without further modifications.
   Chapter 4 of this thesis
4. The applications of temperature sensing through anti-Stokes luminescence are not limited to photothermal therapy.
   Chapter 4 of this thesis
5. Measuring the temperature of a liquid by means of surface enhanced Raman spectroscopy only allows to determine the temperature in the hotspot.
   Pozzi et al., J. Phys. Chem. C 119, 21116-21124 (2015).
6. The future of plasmonic enhanced fluorescence correlation spectroscopy may lie in cleverly designed nanoparticles.
   Langguth et al., Opt. Express 22, 15397 (2014).
7. Thermometry in living cells requires very careful data analysis and interpretation. Sloppy raw data processing may lead to artifacts and false conclusions.
   Baffou et al., Nat. Methods 11, 899–901 (2014).
8. Superlocalization requires more than fitting bright pixels by a Gaussian.
   Titus et al., ACS Nano 7, 6258–6267 (2013).
9. Gender equality at universities cannot be improved only through university hiring policies.
10. Failed research is much riskier for a PhD candidate than for someone with a permanent position.
11. It should be scientists' responsibility to bring science closer to society.
12. The *publish or perish* behavior is not imposed, it is embraced.

Aquiles Carattino
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