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## Fluorescence of single copper proteins : dynamic disorder and enhancement by a gold nanorod

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# Propositions

accompanying the dissertation

## Fluorescence of Single Copper Proteins: Dynamic Disorder and Enhancement by a Gold Nanorod

1. The shortened lifetimes observed in fluorescence-enhancement experiments using plasmonics are primarily due to nonradiative losses to the metal surfaces.  
*Chapter 2 and 3 of this thesis.*
2. Kinetic studies of biomolecular processes by plasmonic sensing require partial or full immobilization.  
*Chapter 2 and 3 of this thesis.*
3. Interphoton time-delay is an overlooked parameter in single-molecule fluorescence spectroscopy.  
*Chapter 4 of this thesis.*
4. Histograms of bright and dark times in the time trace of the fluorescence of a single molecule can hide rare events.  
*Chapter 5 of this thesis.*
5. Immobilization can alter catalytic activities of enzymes.  
*Francesco Secundo, Chem. Soc. Rev. 42, 6250-6261(2013).*
6. The magnitude of fluorescence enhancement by plasmonics is only informative when the quantum yield of the unenhanced fluorophore is specified.  
*Puchkova et al., Nano Lett. 15, 12(2015); Acuna et al., Science 338, 506(2012); Yuan et al., Angewandte Chemie 52, 1217-1221(2013).*
7. Contrary to what is reported by Yang et al., the relative orientation of donor and acceptor might provide the major contribution to the variation in the electron-transfer rates in single proteins.  
*Yang et al., Science 302, 262-266 (2003).*
8. The term 'protein dynamics' does not give much insight into the detailed fluctuations as long as length and time scales are not specified.  
*Kern et al., Nature 450, 964-972 (2007).*
9. 'Data available on request' is equivalent to 'data inaccessible'.
10. Publishers should restrict the usage of color to those suitable for both color-blind and non color-blind people.

Biswajit Pradhan  
Leiden, April 3, 2018