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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