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Stellingen

Behorend bij het proefschrift

“Fluorescent Electrochemistry: Towards Controlled-Redox Switching of a single Metalloprotein”

Namık Akkulç

1. Fluorescence resonance energy transfer (FRET) is an excellent tool to follow electron transfer reactions of redox-proteins.
   
   This thesis, Chapters 1-4

2. Kinetic and thermodynamic dispersion of redox reactions of proteins immobilized on a gold electrode can be measured at the single-molecule level by fluorescent cyclic voltammetry.
   
   This thesis, Chapters 2 and 3

3. Redox state switching of an individual azurin molecule, covalently immobilized on a glass surface, is dependent on the redox potential in solution.
   
   This thesis, Chapters 4

4. When proteins are labeled with the succinimidyl ester of, e.g., a fluorescent molecule it is crucial to add a purification step after labeling, if a homogeneous sample is required.
   
   This thesis, Chapters 3 and 4

5. Electrostatic conditions around the redox-active site of azurin determine the distribution of midpoint potentials of individual molecules.
   
   This thesis, Chapters 2, 3 and 4

6. To realize the potential of stimuli-responsive polymers for biomedical applications it is essential to understand the (lack of) correlation between surface energy and cell adhesion to polymeric surfaces.

7. Azurin is an excellent system to test the relationship between the structure of the redox-active center and the reduction potential of the protein.


8. Scanning tunneling spectroscopy on single protein complexes is best performed by controlling the applied force.

   Reiss et al. (2007) Biotechn. Prog. 23:985-9

9. Prospects for algal biofuels are bleak.

10. The ideal fluorescent probe does not exist.