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Hot-wiring azurin on gold surfaces

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Stellingen

behorende bij het proefschrift

Hot-wiring azurin onto gold surfaces

1. Domain formation of arenethiols on the gold lattice is driven mostly by intermolecular lateral interactions.

Chapter 2

2. Stochastic conductance switching of oligo-phenylenevinylenes can be adequately explained by lateral diffusion on the gold surface.

Chapter 2

3. Azurin's potential role as a molecular switch is supported by the presence of its differential negative resistance features, and the lack thereof when copper is reconstituted with zinc.

Chapter 4

4. The reconstitution of azurin H117G with various molecular wires can be performed both on pre-functionalized gold surfaces ("click-on"chemistry) or in solution, followed by adsorption .

Chapters 4 and 5

5. To ensure that the electron properties of adsorbates are not affected, non-specific and adverse interactions with the substrate must be minimized.

Meyer et al., *Science*, **324**, 1397 (2009)

6. In order for the single-molecule experiments to be meaningful, a great many measurements must be repeated.

Walter et al., *Nature Methods*, **5**, 475 (2008)

7. Molecular electronics can only mature as a research field once a complete understanding of the molecule/electrode interface has been reached.

Flood et al., *Science*, **306**, 2055 (2004)

8. The effects of adsorption of enzymes onto bare or functionalized surfaces have also a bearing on how the ancestral polypeptides have begun to evolve.
9. The understanding of the evolving, interdependent biological structures implies not only accurate descriptions, but also predictions and retrodictions of their mutual interactions.

Razvan Stan

Leiden, January 27th, 2010.