

Supporting information

Transparent gold as a platform for adsorbed
protein spectroelectrochemistry: investigation
of cytochrome *c* and azurin

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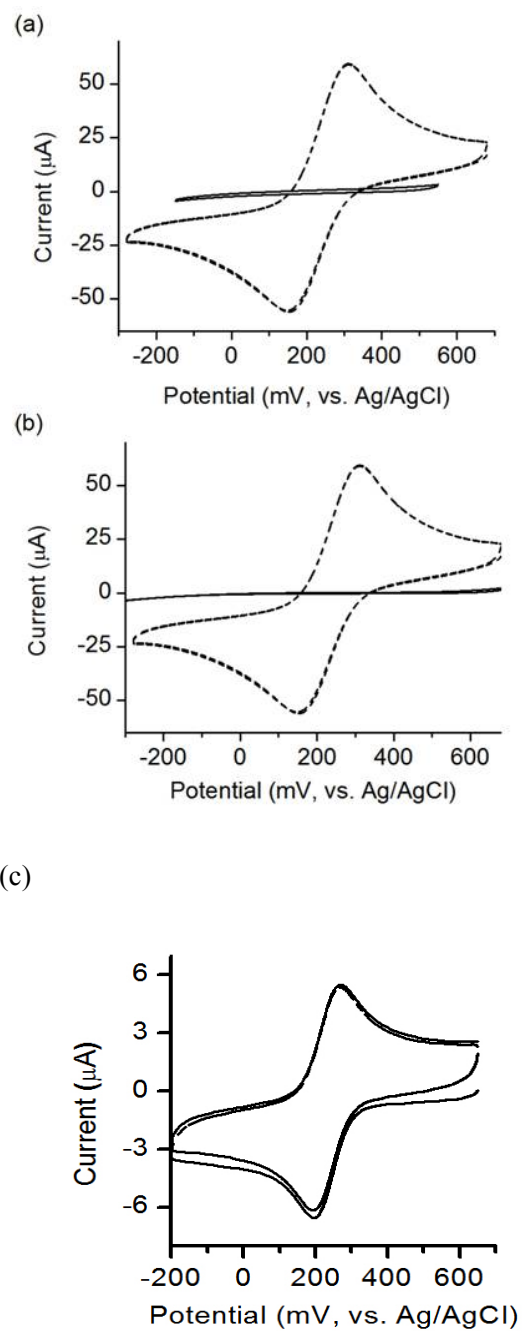


Figure S1: Cyclic voltammetry responses of 1 mM $\text{K}_3\text{Fe}(\text{CN})_6$ in 0.05 mM (pH 7.0) PBS at different tAu substrates: (a) MUA_MUOH/tAu (solid line) and bare tAu substrates (dashed lines); (b) HEX/tAu (solid line) and bare tAu substrates (dashed lines) and (c) a disk gold electrode. Data recorded at 100 mV s^{-1} at room temperature.

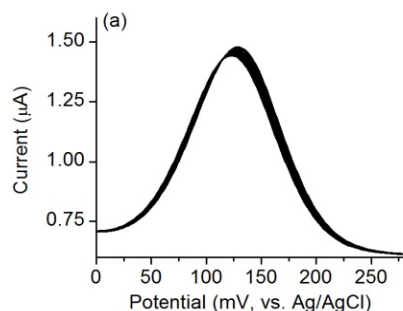


Figure S2: Square wave voltammetry responses of Az/HEX/tAu in an anaerobic solution of 100 mM Na₂SO₄, 50 mM NH₄OAc (pH 4.1) at 4 °C. Scan parameters: SW amplitude 25 mV, frequency 15 Hz, and potential step 2 mV.

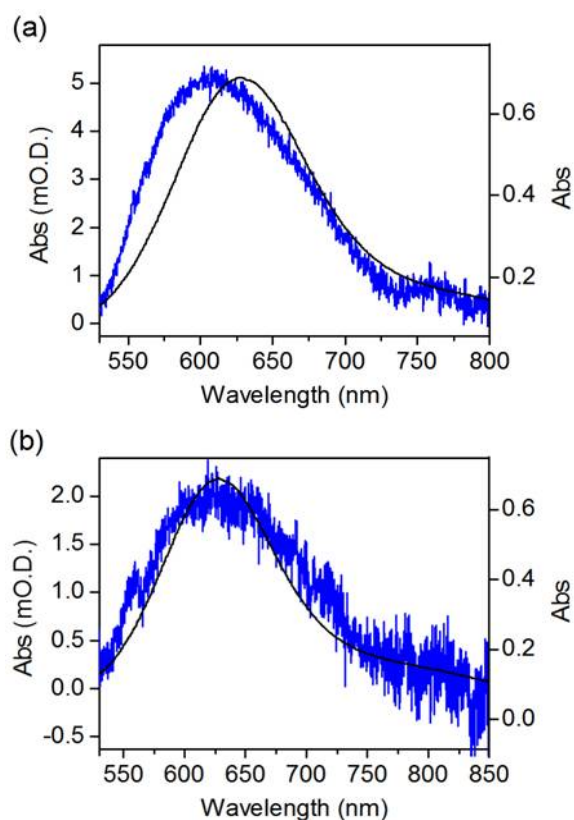


Figure S3: Optical absorption spectra of azurin adsorbed onto alkanethiol modified tAu substrates (blue lines, corresponding to the left ordinates) together with a superimposed spectrum of 120 µM of dissolved azurin (black lines, corresponding to the right ordinates). (a) spectrum of Az/HDT/tAu (b) spectrum of Az/DEC/tAu. The spectra were recorded in the spectroelectrochemical cell by which spectroscopic and electrochemical data were acquired under anaerobic conditions. Background corrections were performed by subtracting the spectra of bare tAu substrates from that of the adsorbed protein, followed by a linear baseline subtraction. Solvent: anaerobic 100 mM Na₂SO₄, 50 mM NH₄OAc (pH 4.1) at 22 °C.

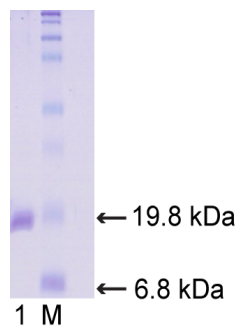


Figure S4: SDS-PAGE verifying purity of azurin. The SDS-PAGE was prepared with 12% acrylamide and was Coomassie stained. Lane 1 is purified azurin. The Bio-Rad broad range prestained protein ladder was used as a standard molecular weight marker, designated lane M. It consists of the following proteins: myosin (198.5 kDa), β -galactosidase (116.3 kDa), BSA (84.7 kDa), ovalbumin (53.9 kDa), carbonic anhydrase (37.4 kDa), soybean trypsin inhibitor (29.0 kDa), lysozyme (19.8 kDa), and aprotinin (6.8 kDa).

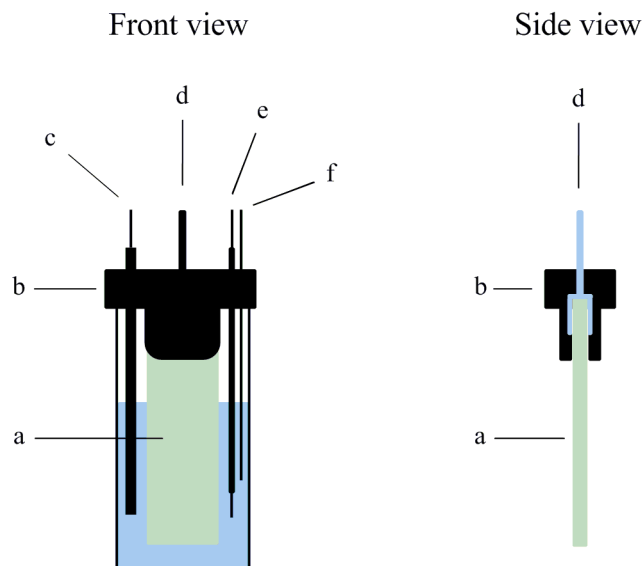


Figure S5: Diagram of the spectroelectrochemical cell. (a) transparent Au working electrode; (b) Teflon cap; (c) Ag/AgCl reference electrode, 2 mm diameter; (d) Pt clasp; (e) Auxiliary Pt electrode; (f) Gas insertion tube.