

P020 Cytochrome c_3 modules as electron transfer nanowires
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The tetraheme cytochrome c_3 from *Desulfovibrio vulgaris* Miyazaki F, is involved in sulfate reduction. It contains four c -type hemes covalently bound to a single polypeptide of only 107 amino acids. The protein surface is highly positively charged at physiological pH with a prevalence of lysine residues. All four hemes are bis-histidine ligated and their reduction potentials are very low, ranging from -239 to -358 mV at neutral pH. With a cyclic heme arrangement and their partial exposure to solvent, cytochrome c_3 can transfer electrons in all directions. We aim to exploit the electrochemical properties of cytochrome c_3 by covalently attaching it to enzymes and electrodes to form unique bioelectronic components. We are developing novel methods of controlling the ligation selectivity of proteins in order to construct well-defined conjugates. Our strategies involve the use of protein-peptide recognition sites to block ligation, electrostatic selection by controlling the surface charge distribution and chemical protection of reactive sites.