

**P015** 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. 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.