

P013 Characterization of the interaction between cytochrome bc_1 complex and its substrate cytochrome c from *S. cerevisiae*

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In cellular respiration, the soluble protein cytochrome c (CYC) transports electrons from the cytochrome bc_1 complex (QCR) to cytochrome c oxidase. The interaction of QCR and CYC is transient and amazingly efficient enabling turnover rates higher than 100 per second. The x-ray structure for the complex was determined at 1.9 Å resolution in reduced state. In the crystal structure, the homodimeric complex QCR binds only one CYC. The two CYC binding sites show no differences at the given resolution. Monovalent CYC binding is correlated with conformational changes of the Rieske head domain and subunit QCR6p and with a higher number of interfacial water molecules bound to cytochrome c_1 , QCR subunit interacting with CYC. Pronounced hydration and a 'mobility mismatch' at the interface with disordered charged residues on the CYC side are favourable for transient binding. Within the hydrophobic interface, a minimal core was identified by comparison with the novel structure of the complex with bound isoform-2 CYC. We have characterised the interface residues by site directed mutagenesis. Also, the thermodynamic interaction parameters for the redox pair have been determined using isothermal titration calorimetry (ITC). Results from ITC show millimolar affinity interaction. The enthalpy of the interaction is endothermic. Both these observations are consistent with the nature of interface where hydrophobic interactions are dominant but the interface is highly hydrated.