

P1.1.13. INVESTIGATION OF TWO ACCESSORY SUBUNITS OF COMPLEX I FROM YARROWIA LIPOLYTICA

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Mitochondrial complex I is the first component of the respiratory chain coupling electron transfer from NADH to ubiquinone to proton translocation across the inner mitochondrial membrane. FMN and eight iron-sulfur clusters serve as redox prosthetic groups. In prokaryotes, complex I is formed from a “minimal” set of 14 subunits, while in eukaryotes the number of subunits is increased significantly by accessory subunits. Complex I from the yeast *Yarrowia lipolytica* is composed of at least 30 hydrophilic and 7 hydrophobic subunits as determined by evaluation of the genomic sequence and by peptide mass fingerprinting [1]. We have investigated two accessory subunits:

Small (~10 kDa) acidic mitochondrial acyl carrier proteins (ACPM) found in eucaryotic complex I were proposed to play a role in fatty acid and polyketide synthesis. We have deleted the genes for two different ACPMs found in *Y. lipolytica*. One deletion lead to loss of complex I assembly, while the other deletion appeared to be lethal.

A novel subunit exhibiting thiosulfate:cyanide sulfurtransferase (rhodanese) activity was found in *Y. lipolytica* complex I. It had been speculated that rhodanases may take part in iron-sulfur cluster assembly. However, studies of the EPR spectra of complex I from a rhodanese deletion strain showed that the deletion had no effect on the assembly of the iron-sulfur cluster [2]. Further investigation revealed that assembly and activity of complex I lacking rhodanese was normal.

[1] A.Abdrakhmanova, V.Zickermann, M.Bostina, M.Radermacher, H.Schägger, S.Kerscher, U.Brandt. Subunit composition of mitochondrial complex I from the yeast *Yarrowia lipolytica*, *Biochim.Biophys.Acta* 1658 (2004) 148-156.

[2] A.Abdrakhmanova, K.Dobrynin, K.Zwicker, S.Kerscher, U.Brandt. Functional sulfurtransferase is associated with mitochondrial complex I from *Yarrowia lipolytica*, but is not required for assembly of its iron-sulfur clusters, *FEBS Lett.* 579 (2005) 6781-6785.