Identification of Mitochondrial Proteins Involved in the Function of Respiratory Complexes in *Saccharomyces cerevisiae*

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ABSTRACT Mitochondria are essential eukaryotic organelles that perform key roles in cellular functions, including ATP production via oxidative phosphorylation. There are more than 750 different mitochondrial proteins that have recently been identified from *Saccharomyces cerevisiae*, among which 25% of the proteins are still poorly understood or of yet unknown function. Since yeast is regarded as an ideal model for gaining insight into the molecular basis of human mitochondria, the functional characterization of mitochondrial proteins from *Saccharomyces cerevisiae* is key to understanding diseases resulting from impaired mitochondrial metabolism. Our main interest is to screen mitochondrial proteins involved in the function of respiratory complexes in *Saccharomyces cerevisiae.*

We used one Yeast Knock-Out collection, homozygous diploids for non-essential genes, to screen approximately 50 strains for specific phenotypes under a range of experimental growth conditions. The primary screen identified four strains which showed the dysfunction of respiratory complexes. The phenotypes of the four strains, sensitivity to H_2O_2, the distribution of hemes inside the cell, and the activities of complexes II, III and IV are reported. Our preliminary studies indicate that some of these proteins might be involved in the assembly of complex II or III. Additional experiments are currently being carried out to identify the specific function of each protein.