Title:	Deciphering the Function of Saccharomyces cerevisiae FMP40
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Abstract:	Saccharomyces cerevisiae FMP40 is a putative protein of unknown function that has been detected in highly purified mitochondria. Its human homolog, Selenoprotein O, has been characterized as a redox-active mitochondrial protein. In a previous study in the lab, it was observed that fmp40Δ in a glutathione deficient background (gsh1Δ) showed better growth than glutathione deficient yeast. In the present study this observation was confirmed and validated by complementation with wild-type FMP40. To obtain insights into FMP40 function, we tried to isolate genetic interactors of FMP40 by targeting mitochondrial proteins with possible redox related function. FMP40 was disrupted in 27 such mitochondrial-associated gene deletion backgrounds; it was observed that upon FMP40 disruption in grx5Δ and pos5Δ backgrounds, a better growth was seen as compared to their respective single deletions. A common link between glutathione, GRX5 and POS5 happens to be their requirement for NADPH and their role in Fe-S cluster formation/transfer in the mitochondria. Based on these results, it appears that FMP40 is an oxidoreductase that consumes NADPH; thus its deletion could enhance growth in the above deletion backgrounds. To determine whether FMP40 has an NADPH dependent activity, His-tagged FMP40 has been purified from E. coli. and enzymatic assays with the purified protein are ongoing.
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