Copper Resistance in MDM35 Deletion in *Saccharomyces Cerevisiae*

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Abstract

Using a multiple concentrations of copper as screen, MDM35 was identified as more resistant to high levels of copper than the parental wild type strain.

Introduction

Copper resistance in yeast is due to the ability of the yeast to localize copper into the mitochondria. Cox17 being one of them. This protein has an twin cx9c motif. The molecular information of MDM35 is unknown at this point. It is within this research for us to understand more about MDM35 and its actual properties.

Introduction (continued)

Cox 17 is a protein that consists of a Twin CX9C motif. The motif consists of cysteines linking together through disulfide bonds and the cysteines are spaced out between 9 residues. The disulfide bonds provide stability for these proteins as they become attached to the inner membrane space. The disulfide bonds also keep the proteins stable once they become oxidized. Cox17 can hold up to 4 copper ions when transferring electrons to Cox(6).

Materials and Methods

- **Media used:** Yeast Peptone Dextrose (YPD). Yeast Peptone Glycerol (YPG)
  - YPG at concentrations consisting of: 0.1% CuSO₄, 0.15% CuSO₄, 0.2% CuSO₄, 0.3% CuSO₄
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- **Measured absorption of Mutant & Wild Type with spectrometer both equal to one at 600nm**
- **(YPD) with serial dilutions at:** 1/10; 1/100; 1/1000; 1/10,000
- **At 6µL per drop, dropped serial dilutions to plates consisting of the CuSO₄ concentrations Wild type and mutant strain side-by-side.**
- **Placed plates of equivalent concentrations at temperatures of:** Room Temp, 30°C, 37°C

Results (continued)

Saccharomyces cerevisiae grown at 37°C

Discussion

Our results show *S. cerevisiae* with a MDM35 deletion have a higher resistance to copper than the parental strain. After MDM35 was eliminated it allows us to begin identifying the function of that specific gene. At concentrations higher than 0.2% copper in YPD, MDM35 showed a higher resistance than the parental strain. This may suggest that the MDM35 gene plays a role in the copper localization into the mitochondria of the cell. Comparing the screening of the initial 14 *S. cerevisiae* strains, MDM35 showed higher resistance to copper than all of the other knock-out strains that were tested side by side under identical conditions.

References