



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Ella Q. Michaels	Project Number 34509
Project Title The Effect of Antioxidants on H(2)O(2)'s Ability to Kill Saccharomyces cerevisiae Yeast	
Abstract Objectives/Goals This experiment examined the ability of four antioxidants (vitamin C, alpha-lipoic acid, coenzyme Q-10, and selenium) to dampen the harmful effects of hydrogen peroxide on Saccharomyces Cerevisiae yeast. Methods/Materials In four different dosages (5mcLs, 20mcLs, 40mcLs, & 80mcLs) each antioxidant was added to a solution of sterile YPD Media, sterilized yeast culture, and hydrogen peroxide. The antioxidant solutions were incubated for 24 hours. They were then diluted, plated, and their optical density was recorded by a spectrophotometer (Beckman DU640). The plates were incubated for as long as it took for colonies to be visible and easily counted (44 hours). Results were recorded and compared to controls for analysis. Results All four antioxidants and corresponding dosages had a positive impact on yeast growth compared to the hydrogen peroxide control. Vitamin C was most effective followed by alpha-lipoic acid, coenzyme Q-10, and finally selenium. The least effective tube, 5mcLs of selenium, still increased yeast growth by 149.2% and the most effective, 40mcLs of vitamin C, increased yeast growth by 4057.1%, which was on par with the positive yeast control. Conclusions/Discussion My hypothesis, which looked at the order in which the antioxidants would begin working, proved incorrect (in this test) as they all began working at the same time. Results showed that the antioxidant power of vitamin C far exceeded that of the other substances tested. I noted that in all of the antioxidants except CoQ-10, the highest dosage, 80mcLs, was not the most effective. The most likely explanation for this occurrence is that the antioxidant had reached its maximum level of effectiveness and had begun to bring some harm to the yeast (an overdose situation).	
Summary Statement I tested the effect of four antioxidants on hydrogen peroxide's ability to kill Saccharomyces cerevisiae yeast.	
Help Received Dad got supplies and ran solutions through a spectrophotometer at work (as under those 18 weren't allowed)	