



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Evelyn J. Park</b>	<b>Project Number</b> <b>S0520</b>
<b>Project Title</b> <b>Testing Known Antioxidants for Inhibition of Peroxidation in Organic Solvents</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Organic peroxides are dangerous, explosive chemicals that can form in organic lab solvents, such as diethyl ether tetrahydrofuran (THF), when exposed to light, heat, or air. The formation of these peroxides is caused by the presence of free radicals in the solvent. An inhibitor which blocks the action of free radicals may therefore slow the formation of peroxides. The object of this experiment was to test biological antioxidants as inhibitors of peroxide formation and compare them to BHT, a commercial inhibitor. <b>Methods/Materials</b> Several vials were prepared, using dilutions, with different solvents (THF or ether) and different concentrations of Vitamin E, retinol, Vitamin C, BHT, selenium, and beta-carotene. The peroxide levels of each vial were measured weekly with EM Quant semiquantitative peroxide test strips. <b>Results</b> The study found that ether formed peroxides at a much slower rate than THF, and that increasing concentrations of the antioxidants would decrease the concentration of peroxide formed, with the exception of retinol. When retinol's concentration was increased, the concentration of peroxide formed increased. Also, the peroxide levels in the vials with selenium and Vitamin E were roughly equal to the peroxide concentrations in the vial with BHT. <b>Conclusions/Discussion</b> The results show that Vitamin E and selenium are equally effective as BHT in inhibiting formation of peroxides in THF, contrary to the hypothesis that some antioxidants will be more effective than BHT as inhibitors of peroxide formation. The results also show that retinol promotes rather than inhibits formation of peroxides.	
<b>Summary Statement</b> The aim of my project was to test various biological antioxidants for their ability to inhibit the formation of dangerous organic peroxides in the organic solvents THF and diethyl ether.	
<b>Help Received</b> Used lab equipment and chemicals at UCLA under the supervision of Dr. Kwon	