



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Bonnie Diep; Willie Phan</b>	<b>Project Number</b> <b>S1305</b>
<b>Project Title</b> <b>Microorganisms in Soy-Oil Based Biodiesel Fuel</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> This project is geared towards determining the types of microorganisms present in the different phases in which biodiesel assumes. The objective is to analyze the bacterial content of the different stages of biodiesel#reactants, intermediate forms, and the final products. We are looking for possible consistencies in regards to the different life forms that may be present in the chemicals.</p> <p><b>Methods/Materials</b> Fungi are characterized by chitin, which forms a salt precipitate with HCl. By mixing HCl with biodiesel, we determined whether chitin was present. For qualitative observations, we inoculated fuel samples onto Petri Dishes with tryptic soy agar. To detect sulfate-reducing bacteria, we did an olfactory test for the odor of hydrogen sulfide. Petri dishes, HCl, biodiesel fuel, methanol, soy oil, filter flasks, incubator, pipets, and test tubes were utilized.</p> <p><b>Results</b> In all products and reactants, excluding the soy oil and methanol, a salt precipitated, meaning chitin was present. By observation, the Petri dishes revealed relatively similar colored growth among the samples. No scent of hydrogen sulfide was detected.</p> <p><b>Conclusions/Discussion</b> The reactants did not indicate the presence of fungi, but the products did, which means that they were possibly introduced after the preliminary stages of biodiesel production. There were consistent results among different batches tested. The Petri dishes showed consistent types of microorganisms in the samples, indicated by similar physical characteristics. Results from olfactory test shows that sulfate-reducing bacteria are not likely candidates for the microorganisms growing in biodiesel.</p>	
<b>Summary Statement</b> We are examining the reactants and products of biodiesel for possible consistent microbial life because it can indicate when certain bacterial or fungal strains were introduced into the fuel during production.	
<b>Help Received</b> Mr. Winters supplied contacts and the MMTc, Del Mar Analytical donated supplies, Ms. Della Santana allowed us to conduct experiments in her room, and we collaborated with the biodiesel team.	