



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Debra C. Chang	Project Number S0503
Project Title Effects of Solution Composition on the Stability of Antibubbles	
Abstract Objectives/Goals The purpose of this study was to determine the effects of solution compositions on the stability of antibubbles by examining size and lifespan. This project is the result of experimentation of nozzle sizes, polymer additives from varying liquids, and salt concentrations. Methods/Materials The stability of antibubbles was determined by means of injecting a liquid mixture of detergent and water into a specified solution, creating a pocket of liquid enclosed by a thin air film. The nozzle size experiment involved changing the diameter size of the jet stream injecting device from 3.0 mm (control), 2.0 mm and 1.2 mm. 10 mL of liquids, namely egg whites, honey and corn syrup, were added to the base solution to determine the effects of varying polymer additives. Lastly, salt concentrations were varied at 0.000945 g/ mL, 0.0025 g/mL, 0.0050 g/mL and 0.010 g/mL to determine their effects on antibubble stability. Results Results in the trials revealed that smaller nozzle sizes had lower diameters. The antibubbles from polymer additives also resulted in lower life spans compared to the control group. Lastly, the smallest salt concentration ended with the highest antibubble duration and diameter size. Conclusions/Discussion This project indicates that a decrease in nozzle sizes and addition of polymer additives lower durations and diameters. Also, an increase in salt concentration actually decreases the stability of antibubbles. The contributions of this project form a basis for future attempts to understand the mechanisms of antibubble formation and collapse to eventually create micron sized antibubbles for practical uses.	
Summary Statement My study presents the effects of nozzle sizes, polymer additives, and salt concentrations on antibubble stability and contributes towards future research on the practical uses of antibubbles.	
Help Received Borrowed basic lab equipment from Dr. Wenji Chang	