



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Ryan Ko	Project Number S1516
Project Title Repeated Injection Exposures to Naphthalene Produce Terminal Bronchiolar Clara Cell Tolerance in Female Mice	
Abstract Objectives/Goals Lung cells in male mice can develop a "tolerance," or resistance, against naphthalene, a common toxic pollutant, after repeated injections. This experiment aimed to determine whether tolerance can be induced in female mice. Methods/Materials Three groups of five female mice were used: group one was injected with seven daily doses of naphthalene (200 mg per kg body weight), group two received the same treatment as group one plus an additional challenge dose (300 mg per kg body weight) on the eighth day, and the control group received seven daily doses of corn oil (200 mg per kg body weight). Mice lung cross-sections were imaged under light microscopy and counts of nonciliated, ciliated, and vacuolated cells were tabulated. Stereological techniques were used to calculate bronchiolar epithelium thickness, volume fraction, and volume per surface area of the three cell types. Results An ANOVA statistical test was run, and no statistically significant difference of the parameters measured was found between treated and non-treated cells. However, treated mice showed more areas of hyperplasia than controls. Conclusions/Discussion Repeated injection exposures of naphthalene produced no observable difference in terminal bronchiolar Clara cells of female mice studied. Future research would involve repetition of the study, as well as studying different airways, method of dosage (inhalation vs. injection), and finding the mechanism of tolerance in female mice.	
Summary Statement Stereological techniques and statistical analysis of mice terminal bronchiole cross-sections were used to determine that tolerance to the common chemical naphthalene can be induced in lung cells of female mice.	
Help Received Participated in UC Davis Young Scholars Program in Dr. Laura Van Winkle's lab. Received terminal bronchiole slides from Dr. Van Winkle (mice were originally used for another experiment). Used lab microscope and software, as well as university library resources for literature research.	