



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Yingchen Chen; Yintung Chen	Project Number S1505
Project Title A Comparative Assessment of the Inherited Resistance of Escherichia coli K-12 against Three Common Disinfectants	
<div><div>Objectives/Goals This project compared the ability of bacteria Escherichia coli K-12 to develop inherited resistance against common household disinfectants, triclosan, isopropyl alcohol, and sodium hypochlorite, at different concentrations.</div><div>Methods/Materials In the experiment, Escherichia coli K-12 were tested under different concentrations of three common disinfectants: triclosan, isopropyl alcohol, and sodium hypochlorite. 10 microliters of each disinfectant at varying concentrations were added via a 6.0 mm filter paper disk to agar plates newly streaked with E. coli. After 24 hours of incubation, the diameters of the zones of inhibition were measured in millimeters. The bacteria that had been exposed to the disinfectants were then transferred to new agar plates to be tested as the next generation. There were a total of three generations and three concentrations for each disinfectant.</div><div>Results It was found that the zones of inhibition of triclosan solutions decreased sharply over three generations, while no appreciable decrease was observed for bleach and IPA solutions. For all trials, the percent deviations of the measurements were all less than 6 percent, so the trials were completed with precision.</div><div>Conclusions/Discussion The hypothesis that triclosan would have effects on the inherited resistance of Escherichia coli K-12 was supported. E. coli K-12 demonstrated inherited resistance against triclosan in 3 generations, but no inherited resistance against IPA and bleach was shown.</div></div>	
Summary Statement This project investigated the ability of bacteria Escherichia coli K-12 to develop inherited resistance against triclosan, isopropyl alcohol, and sodium hypochlorite.	
Help Received Parents helped acquire materials; Equipment borrowed from teacher and friend	