



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Francis C. Yang	Project Number S1527
Project Title Investigation of the Antibacterial Activity of Artemisia californica	
Objectives/Goals To test the anti-bacterial activities of the sagebrush Artemisia californica, and if true, to determine whether the agent behind such activity is a small molecule or protein.	
Abstract	
Methods/Materials Materials Artemisia californica sagebrush Tissue Tearor Model 985370 (BIOSPEC PRODUCTS INC.) phosphate buffered saline (PBS) (GIBCO 14190) Beckman Coulter, Allegra X-15R centrifuge Beckman Coulter, Avanti J-20XP centrifuge, JA-20 rotor Pierce BCA protein assay kit Molecular Device, SPECTRAmax340PC E. coli DH5alpha LB media 37 Degree C Incubator GraphPad Prism5 Procedure -A.californica leaves are collected from a local park,broken by a tissue tearor, and extract are made successive centrifugations. -Bacteria are grown in LB medium and growth rate is measured by following the optical density at 600 nanometers. -To determine whether protein play a role, two methods were used to eliminate proteins; protease treatment and heat treatment.	
Results In the pilot study, bacterial growth inhibition was observed in wells with the extract greater than 350 micrograms. Bacterial inhibition was also observed even when the aliquot was subjected to heat and protease treatment.	
Conclusions/Discussion The sagebrush Artemisia californica has anti-bacterial activity, and is caused by either a small molecule or heat/protease resistant small peptide.	
Summary Statement This project confirmed the anti-bacterial nature of the sage Artemisia californica, and found the agent behind the activity is either a small molecule or a heat/protease resistant small peptide.	
Help Received Used lab equipment at Allergan under the supervision of Dr. Rong Yang	