



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

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Project Title Acne: An Herbal Alternative to Modern Treatments	
Abstract Objectives/Goals The objective is to determine the effectiveness of various essential oils on Propionibacterium acnes, in comparison to the antibiotic Erythromycin. Methods/Materials First, an isolate of P. acnes was obtained from my pores. P. acnes was then grown in the presence of previously prepared essential oil treatments and placed in home made anaerobic chamber and incubated at 37 degrees C. The zone of inhibition was measured and compared to that of an Erythromycin zone of inhibition. Kirby-baur disc diffusion method was followed in this experiment. Results The zones of inhibition for several oils such as neem, echinacea, and grapefruit showed small zones of inhibition in repeated experiments, less than 10 mm in diameter, proving a relatively low effectiveness of these treatments. The more successful disks contained thyme, cinnamon, and tea tree oils. The high dosage (15 uL) Thyme in particular exhibited a zone of inhibition 67 mm across, approximately 50% larger than the 15 ug erythromycin disk. Treatments of turmeric and eucalyptis served as a moderately effective treatments but were not so successful as to stand out against the other disks. Conclusions/Discussion Through our experiment we were able to show that various essential oils exhibit quantifiable levels of cytotoxicity against P. acnes. In particular, we have found that Thyme - yielding a zone of inhibition of 68 mm - poses a very plausible alternative treatment for people afflicted with acne.	
Summary Statement We tested the cytotoxicity of essential oils on Propionibacterium Acnes, a primary factor in the pathogenesis of acne, and compared those results to those of the antibiotic erythromycin.	
Help Received Our teacher answered our inquiries and allowed us to work in her classroom. Also Los Robles Hospital allowed to us to use their facilities to perform a gram stain of our bacterial culture.	