



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alexander N. Fan</b>	<b>Project Number</b> <b>J1705</b>
<b>Project Title</b> <b>Essential Oils vs. Medications: A Quest to Find the Most Effective Antifungal Agent</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Since the 1940s antimicrobial medications have been widely used. They have benefited our society in many ways, but over the last decade there has been a growing problem called antibiotic resistance. Each year around 23,000 people die in the United States due to the uprising issue of medication resistance. When this happens medications no longer serve their purpose. One potential way to fight this issue is through the use of essential oils. The objective of my project is to find out if essential oils are more effective antifungal agents than medications.</p> <p><b>Methods/Materials</b> Candida Albicans was obtained from Bakersfield Dermatology, various Essential Oils from Doterra, Nystatin solution and Clotrimazole cream from a Kaiser Pharmacy, agar plates, swabs, tweezers, disks, incubator, gloves, and a sharpie. I used the Kirby Bauer Disk Diffusion Test for my experiment. I plated agar plates with Candida Albicans. Then I placed a disk, soaked in either a medication or Essential Oil, into the middle of each agar plate. Over a period of 72 hours, I recorded the "Zone of Inhibition" on each agar plate which shows us the area that each substance inhibited at the specific time intervals.</p> <p><b>Results</b> The Essential Oils inhibited the growth of the Candida better than the medications. I measured my results by measuring the "Zone of Inhibition" of each agar plate. After two days the difference between the averages of the essential oils and medications was about 7.23 cm, and after three days the difference was about 5.73 cm. My data suggests that Essential Oils are better antifungal agents than medications.</p> <p><b>Conclusions/Discussion</b> The results from my experiment suggest that Essential Oils are more effective antifungal agents than medications. I am hoping my experiment will stimulate further research about Essentials Oils and ultimately provide another form of treatment for infections. I am also hoping that essential oils can be one solution to overcoming the issue of antimicrobial resistance. My project definitely has opened the door for further medical providers to consider other treatment forms for cutaneous fungal infections.</p>	
<b>Summary Statement</b> I tested essential oils and medications to find out if essential oils are more effective antifungal agents than medications.	
<b>Help Received</b> My mother helped transport me to and from the lab where I conducted my experiment. Dr. Treanor helped me perfect my experimental methods and provided me the lab space and Candida albicans.	