



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Elan E. Filler	Project Number S1508
Project Title Investigating an Outbreak of Cryptococcus gattii Infection	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals When inhaled, the fungus <i>Cryptococcus gattii</i> causes life-threatening meningitis and pneumonia in humans and animals. Two species of <i>Cryptococcus</i>, <i>C. neoformans</i> and <i>C. gattii</i>, cause infection. These two species are not routinely distinguished from each other in clinical laboratories. Currently, there is an outbreak of <i>C. gattii</i> infection in California. Previously, I discovered that <i>C. gattii</i> grew on two species of trees near two outbreak cases in South Central Los Angeles, but these results were preliminary. This year, my objectives were to 1) further define patients with infection caused by <i>C. gattii</i>; 2) map the location of patients with <i>C. gattii</i> infection; and 3) further delineate the environmental sources of <i>C. gattii</i>.</p> <p>Methods/Materials I analyzed 48 de-identified patient isolates of <i>Cryptococcus</i> for the presence of <i>C. gattii</i> by plating them onto CGB agar. Next, I swabbed 56 trees and collected 39 soil samples from 17 different sites in South Central Los Angeles near the <i>C. gattii</i> outbreak cases. To isolate and identify <i>C. gattii</i>, I plated these samples onto NGS agar and then onto CGB agar.</p> <p>Results Of the patient samples, 25% were positive for <i>C. gattii</i>. Surprisingly, the majority of the outbreak cases were tightly clustered within a two kilometer radius in South Central Los Angeles. My environmental sampling revealed that <i>Cryptococcus</i> species was present in 23 tree and soil samples from 11 locations. Of these samples, 6 contained <i>C. gattii</i>. Notably, all were isolated from locations that were in the same area as the outbreak cases.</p> <p>Conclusions/Discussion In conclusion, I discovered that there is an alarming cluster of <i>C. gattii</i> outbreak cases in South Central Los Angeles. My results verify my hypothesis that <i>C. gattii</i> grows on trees that are in the same area as the outbreak. Therefore, <i>C. gattii</i> is endemic in this region and is the likely source of the outbreak.</p>	
Summary Statement I discovered a <i>Cryptococcus gattii</i> outbreak in patients clustered in South Central Los Angeles and found that the likely environmental source of this outbreak is the trees, <i>P. canariensis</i> , <i>L. styraciflua</i> , and <i>M. excelsa</i> .	
Help Received Dr. Deborah Springer at Duke University oversaw project; physicians in LA County provided de-identified patient isolates; father drove me to sampling sites; LABioMed provided space and equipment for lab work.	