



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Elan E. Filler	Project Number J1503
Project Title What Is the Environmental Source of Cryptococcus gattii?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Cryptococcus gattii is a fungus that grows on trees and in soil in regions of the world, including Vancouver and Australia. C. gattii causes life-threatening meningitis and pneumonia in humans and animals. Currently, there is an outbreak of C. gattii infection in California; however, the environmental source of this fungus is unknown. My objective was to identify the environmental source of C. gattii in California.</p> <p>Methods/Materials I swabbed different trees and collected soil samples in various regions of California, near known C. gattii outbreaks. Afterwards, I plated these samples onto Niger seed agar, upon which Cryptococcus species appear brown. To determine whether these organisms were C. gattii or other Cryptococcus species, I plated them onto canavanine-glycine-bromothymol blue (CGB) agar. On this agar, only C. gattii grows as blue colonies. The identification of C. gattii was verified at a reference lab by DNA sequencing.</p> <p>Results Samples from 12 different locations in California were obtained from 84 trees, representing 30 species, and 25 soil samples. Twenty-four samples from five locations yielded yeast that turned brown on Niger seed agar, indicating the presence of Cryptococcus species. Two of these colonies turned blue on CGB agar, demonstrating the presence of C. gattii, which was confirmed by DNA sequencing. C. gattii was isolated from Liquidambar styraciflua (sweet gum tree) and the soil under Pinus canariensis (Canary Island pine).</p> <p>Conclusions/Discussion In California, C. gattii grows on L. styraciflua and P. canariensis, near known outbreaks, suggesting these trees are the environmental sources of infection.</p>	
Summary Statement Through my research, I discovered the environmental source of Cryptococcus gattii, which is a fungus that causes life-threatening infections in humans and other mammals.	
Help Received Dr. Deborah Springer (Duke Univ.) was the project supervisor and gave me protocol for making agar and environmental sampling. My father drove me to sampling sites and helped me take pictures of the trees. Richard Dykzeul helped me identify trees. Lab work was performed at LABiomed.	