



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Joyce Huang; Neymika Jain	Project Number S1511
Project Title The Effect of Chemosensitization on the Efficacy of Antifungal Agents	
Abstract Objectives/Goals Fungal agents have shown increasing signs of resistance towards regularly used antimycotic agents. With our research, we hope to find a combination of both antifungals & natural chemosensitizers that may potentially benefit the medical & agricultural community. Methods/Materials The antifungals tested included Azoxystrobin & Difenoconazole, which are commonly applied on cereals & grains. For our chemosensitizers, we chose Thymol & 4-HBA. In order to study the effects of the drugs combined with the chemicals, the fungus, fusarium oxysporum, was grown on potato dextrose agar supplemented with concentrations of the sensitizers or various doses of the antifungals. After performing qualitative research, we decided the final concentrations and measured percentage of growth in order to compare data. In order to conduct our research, we used 42 Petri Dishes, a mixture of hydroxide & methanol, ethanol, Difenoconazole, Azoxystrobin, Thymol, 4-HBA, Potato Dextrose Agar, and fusarium oxysporum. Results The combination of Azoxystrobin & 4-HBA showed little inhibition. By adding Thymol with lower dosage, inhibition was showcased but was not the most effective group. With higher dose, there was more growth compared other Azoxystrobin experiment groups. With the Difenoconazole & 4-HBA experiment groups, growth was significantly more than all other combinations. With Thymol, both experiment groups' growth only began on the eighth day of observations, but lower dose showed more inhibition. Conclusions/Discussion After experimentation with different combinations of various antifungal agents & chemosensitizers, the combination of Difenoconazole & Thymol most effectively inhibited growth. We also discovered that growth with the application of lower antifungal dose seemed more effective when combined with chemosensitizing agents. Overall, against Ascomycota fungi, the project revealed that combinations of chemosensitizers with antifungals did increase the efficacy of antimycotic activity. For further research, we could focus on the concentration & amount of dosage in order to determine whether there is a correlation between lower doses & higher efficacy with natural compounds as well as experiment with other fungi in the Ascomycota section and later branch to other fungal sections.	
Summary Statement Our project determines the most effective combination of an antifungal and a natural compound as an ideal antimycotic treatment to inhibit fungal growth.	
Help Received Used lab equipment at Harker under Dr. Blickenstaff. Dr. Blickenstaff helped pour agar into plate while my partner and I pipetted the antifungals and chemosensitizers. Printed board at Kinkos	