



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Henry G. Low</b>	<b>Project Number</b> <b>J2012</b>
<b>Project Title</b> <b>Fungus Busters: Which Antifungal Agent Is the Most Effective?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Fungal infections such as athlete's foot, ringworm, and jock itch are very common problems. To counteract these infections, one must use antifungals. There are many different antifungals that you can get at local pharmacies. In my project, I tested three of the most common antifungals: clotrimazole, terbinafine, and tolnaftate. The objective was to find out which of these three antifungal agents is the most effective at killing fungi. <b>Methods/Materials</b> First, I built a gas collecting system to collect the CO <sub>2</sub> created by yeast, the fungus I used. The gas collector consisted of graduated cylinders, buckets, water, bottles, and tubing. To find the effectiveness of the antifungals, I measured how each medication affected the amount of CO <sub>2</sub> produced by the yeast. For my control group, I created a yeast mixture and poured it into the sealed bottle. The yeast produced CO <sub>2</sub> which displaced the water in the graduated cylinder. I waited 20 min. and then measured the water displacement in milliliters. The process was repeated with each antifungal agent mixed into the yeast. I conducted three trials for each antifungal agent and the control group. <b>Results</b> The amount of CO <sub>2</sub> correlated with the amount of yeast in the bottle: the more effective the antifungal was, the less CO <sub>2</sub> that was produced. Clotrimazole had an average water displacement of 128 mL, terbinafine had 133 mL, tolnaftate had 199 mL, and the control group had 240 mL. <b>Conclusions/Discussion</b> My hypothesis that terbinafine was the most effective antifungal agent was proven incorrect. Clotrimazole was actually the most effective, terbinafine was second, and tolnaftate was the least effective. If you ever get a fungal infection, I would recommend using a medication that has clotrimazole as its active ingredient.	
<b>Summary Statement</b> In my project, I tested the effectiveness of three different antifungal agents in killing fungi.	
<b>Help Received</b> My parents helped me to assemble the gas collector and also took pictures of my experiment.	