



Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Antibiotic Resistance in Escherichia Coli

Finalist's Name: Anmoldeep Singh Gill

School and City: Lamar Middle School, Lamar

Sponsor's Name: Ashley Roseberry

Category: Micro & Molecular Biology

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

This project focused on exploring the effects of various Ampicillin concentrations on E.coli growth and antibiotic resistance. Antibiotic resistant bacteria have made many modern antibiotics ineffective leading to over 1.9 million deaths globally in just 2019. During phase 1 of my experimentation, I used ampicillin concentrations of 5, 10, 15, 20, and 25 $\mu\text{g}/\text{mL}$. Excessive bacterial growth indicated the concentrations were not high enough, so the concentrations were adjusted to 10, 20, 30, 40, and 50 $\mu\text{g}/\text{mL}$. During phase 2, F1 survivors of phase 1 were moved into plates split into thirds since I didn't have enough petri dishes. All plates contained Ampicillin concentrations of 100 $\mu\text{g}/\text{mL}$, which acted as my first trial. In my second trial, survivors of the first were put into plates that contained a concentration of 400 $\mu\text{g}/\text{mL}$. To collect data, I manually counted colonies using grid stickers placed on the back of each petri dish. The average of the surrounding squares was taken for areas that could not be accurately measured. Results from both the 100 and 400 $\mu\text{g}/\text{mL}$ trials demonstrated bacteria from the 50 $\mu\text{g}/\text{mL}$ plates had the highest rates of antibiotic resistance. Remaining plates had bacterial resistant rates that strongly correlated with the concentrations in which they were initially grown (growth decreased as the concentrations decreased). These results support my hypothesis because I predicted that the petri dishes that contained the highest concentration of Ampicillin in phase 1 would yield the most resistant bacteria.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**