



Colorado Science and Engineering Fair

2024 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: The Effects of Heat on Bacterial Evolution

Finalist's Name: Izzy Barter

School and City: Denver Jewish Day School, Denver, CO

Sponsor's Name: Melanie Knowles

Category: Micro & Molecular Biology (MCRO)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

Bacteria have been evolving against antimicrobial agents, but does living in warmer or colder climates affect whether bacteria evolve faster against antimicrobial treatments? I split six plates of E. coli into three temperatures: room temperature, 37^o, and 40^o, putting one plate at each temperature through a sublethal dose (5ml, 1000 ppm) of an antibacterial agent, and all of the bacteria through a lethal dose (10ml, 1500 ppm) of the same agent, hoping that the bacteria exposed to the sublethal dose at the bacteria's optimal temperature (37^o) would evolve the fastest. I found that exposure to ambient temperatures does affect the rate of bacterial evolution in the presence of an antibacterial agent, and exposing the bacteria to temperatures closer to their optimum growth rate results in higher rates of evolution.

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.