



## 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: Bacteria Buster

Finalist's Name: Grace Cullen

School and City: Yuma Middle School, Yuma, Colorado

Sponsor's Name: Amy Melby

Category: Micro & Molecular Biology

Division: Junior (grades 6 - 8)

Abstract (250 words or less):

Although effective, traditional antibiotics can cause many side-effects such as nausea, rash, and dizziness. However, natural antibiotics, like ginger, honey, and oregano prevent these symptoms in most cases and build up an individual's immunity, helping them to not get sick again. The purpose of this experiment was to determine the effectiveness and benefits of using natural antibiotics.

It was hypothesized that: 1. out of the natural ingredients, oregano will have the largest zone of inhibition, 2. peppermint will have the smallest zone of inhibition, and 3. of the two commercial antibiotics, penicillin will have a larger zone of inhibition.

Petri dishes filled with agar and were inoculated with E. coli using sterilized swabs. On each plate, one traditional antibiotic (penicillin or streptomycin), three natural substances and a control were tested. The natural substances tested were thieves, eucalyptus, peppermint, rosemary, oregano, and tea tree. Five replications of each plate were made. Plates were sealed and incubated at 38°C. After one week, zones of inhibition were measured.

The first hypothesis was accepted because oregano had an average zone of inhibition of 17.5 mm as compared to tea tree, which had the next biggest zone of inhibition (8.1 mm). The second hypothesis was accepted because out of the natural antibiotics, peppermint had the smallest zone of inhibition (0 mm). The third hypothesis was rejected because out of both of the traditional antibiotics, penicillin had a smaller average zone of inhibition (0 mm) than streptomycin average zone of inhibition (5.4 mm).

*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.**