



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: MIC Drop: Determination of the MIC of Phenol, Hydroquinone, and Naphthalene for Two Species at the Base of an Aquatic Food Web

Finalist's Name: Taelynn Rojas

School and City: Liberty School, Joes

Sponsor's Name: Linda Fogale

Category: Micro & Molecular Biology

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

This project was to determine the minimum inhibitory concentration (MIC) of the chemicals Phenol and Hydroquinone for the bacteria *Pseudomonas putida* and the Cyanobacteria, *Synechocystis nigrescnes*. The hypothesis was that the MIC of these chemicals would be very minimal, considering the size and simplicity of the organisms. The *Pseudomonas* was tested by plating the bacteria on nutrient agar containing concentrations of each chemical at 20, 10, 5, 2, 1 ppm, and 0 ppm as the control, in triplicate. The plates were incubated and then CFU's were counted at 24 and 48 hours. The control plates showed substantial *Pseudomonas* growth, but there were no CFUs on any concentration of the plates containing phenol or hydroquinone. This suggests that even 1 ppm is too high of a concentration for *Pseudomonas putida* to be able to survive. Additional trials at concentrations in the parts per billions will need to be done to determine the MIC for this species. The cyanobacteria thrives in a liquid environment, therefore, cultures of Algo-grow seawater medium were produced having the 20-1 ppm concentrations of each chemical and 0 ppm as a control. The cyanobacteria were inoculated into these cultures and incubated. At 24 and 48 hours, aliquots were taken from each and plated on solid agar plates so that CFU's could be counted. These plates were read at 24 and 48 hours after inoculation. This test yielded very different results, as the *Synechocystis nigrescnes* grew abundantly in the presence of both chemicals even at the highest concentrations, especially from the 24 hour pull. This is contradictory to the literature that documents the toxicity of these chemicals. Further testing is required to complete this study and determine the toxicity and MIC of phenol or hydroquinone on *Synechocystis nigrescnes*.

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.**