



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: Not For the Squeamish! How Accurate is the Kastle-Meyer Blood Test?

Finalist's Name: Gwendolyn Hohl

School and City: Genoa-Hugo, Hugo

Sponsor's Name: William Mallory

Category: Biomedical & Health Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

This experiment aims to test the accuracy of the Kastle-Meyer blood test. This test is frequently used for blood at a crime scene due to its affordability, speed, and ease of use. However, it is estimated that approximately one-third of the test's positive results are false positives. Peroxidases, such as those in potatoes, have been shown in studies to have the capacity to produce a false positive. Following research, a reasonable hypothesis would be that a positive sample was highly likely obtained from human blood, myoglobin-saturated water, and potatoes.

To perform this experiment, safety gear must first be put on. Next, pour the substances into separate plates. Swab each substance with sterile cotton swabs. Add one drop of 70% ethanol and one drop of Kastle-Meyer reagent to the swab. If the swab turns pink immediately, the test detects a chemical oxidant and is contaminated; restart the process. If not, apply one drop of 3% hydrogen peroxide to the swab. The test is successful if the swab turns a vivid magenta color. The test is considered negative if there is no color change. Compare the outcomes after repeating this procedure with each substance.

After experimentation, the myoglobin-saturated water samples produced false positives, while potatoes produced a true negative. Two out of six samples were false positives: the bovine hemoglobin and porcine hemoglobin.

In conclusion, the hypothesis was partially incorrect because potatoes had a negative result instead of a positive one, but myoglobin samples yielded false positive results.

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.**