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: Enhancing Microbot Functionality Through Single Layered Hydrogels

Finalist's Name: Arnav Venkatesh

School and City: Grandview Highschool, Aurora

Sponsor's Name: Lalita Raman

Category: Micro & Molecular Biology

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Hydrogels are rapidly developing materials with a variety of applications, including in the field of microbots. This project investigates the magnetic properties and pH adaptability of single-layered hydrogels compared to double-layered hydrogels for microbot applications. Double-layered hydrogels are commonly used in microbots because of their pH-responsive properties, which allow them to move through the body. These microbots are also manipulated through magnetic actuation, where magnetic fields are used to generate force or motion. This study proposes that single-layered hydrogels may offer faster adaptability and stronger magnetic properties, making them a potential option for future microbot designs.

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.**