

UROP

Fall/IAP/Spring
Hadley Sikes Lab
Department of Chemical Engineering
hsikeslab.mit.edu

Project Title: Engineering Rapid Diagnostic Tests for Infectious Diseases

Project Description: Rapid, accessible, and accurate diagnostic tests can reduce mortality rates and increase awareness around the world, especially in developing countries. In our lab, a non-immunoglobulin hyperthermophilic protein is being investigated as a replacement for antibodies in current rapid diagnostic tests and other assays. Using this protein, we are developing binding proteins against specific antigens for diagnostic applications, such as for Zika virus and malaria. This specific project will involve conducting paper-based assays with engineered proteins to assess their performance on different paper substrates. This project will also involve molecular biology and protein engineering techniques, such as cloning new genes into plasmids, expressing and purifying proteins from *E. coli*, and running protein analytical tests such as SDS-PAGE and BCA assays.

Prerequisites: We are looking for highly motivated UROP(s) with a background in chemical engineering, biological engineering, or related field. The student should be comfortable working independently after being properly trained. Relevant coursework and prior lab experience is preferred, especially prior experience using molecular biology techniques. A commitment of 10 hours/week (ideally in 3-5 hour blocks) is required, and preference is given to those who can commit to at least 2 semesters.

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