

Regulated Research Institutional/Industrial Setting Form (1C)

This form must be completed AFTER experimentation by the adult supervising the student research conducted in a regulated research institution, industrial setting or any work site other than home, school or field.

Student's Name(s) Deeti Patel

Title of Project Optimizing Hyperswarming Bacterial Plate Assay Serving As a Diagnosis Method For Inflammatory Bowel Diseases

To be completed by the Supervising Adult in the Setting (NOT the Student(s)) after experimentation:

(Responses must be on the form as it is required to be displayed at student's project booth; please do not print double-sided.)

The student(s) conducted research at my work site:

1. Did you or your proxy (e.g. graduate student, postdoc, employee) mentor or provide substantial guidance to the student researcher? ☒ Yes ☐ No
- a. If no, describe your and/or your institution's role with the student researcher and his/her project (e.g. supervised use of equipment on site without ongoing mentorship and sign below.
- n/a

b. If yes, complete questions 2–5.

2. Is the student's research project a subset of your ongoing research or work? ☒ Yes ☐ No
- Use questions 3, 4 and 5 to detail how the student's project was similar and/or different from ongoing research or work at your site.

3. Describe the independence and creativity with which the student:
- a. developed the hypotheses or engineering goals for the research project

This was a project initiated and conceptualized by her based on work that was ongoing in our laboratory. Specifically, she formulated what might be studied and then pursued her ideas after discussing the concepts and design of experiments with her immediate supervisors. The project arose from the combination of the project area the student was interested in and had her own ideas (bacterial movement) (~60%), our interests and data in the lab (~20%), and the student's discussion with her mentors (20%). Our laboratory has previously described a new phenomenon that links bacterial swarming to a marker of intestinal stress. The research question Deeti was interested in answering was whether she could optimize a swarming assay using human fecal samples where the conditions were that the samples were frozen and not fresh. This is a significant research question from the view-point of developing a standard operating procedure that optimizes assay condition from FROZEN samples. The latter is the most common way to perform large clinical studies where tissue is usually banked in frozen vaults.

- b. designed the methodology for his/her research project

She spent the larger part of the summer executing these ideas, experimenting, and troubleshooting. In this regard, she kept very careful notes and meticulously handled data and experimental errors.

- c. analyzed and interpreted data

At the conclusion of her summer program with us, she had generated sufficient data to put together a concise manuscript. The manuscript entitled " Optimizing a human fecal assay that elicits bacterial swarming " has now been submitted for peer-review. Briefly, this paper, establishes conditions for an assay (volume of sample, agar density and thaw conditions), that predicts for the occurrence of intestinal inflammation in a mammalian host. The assay elicits competitive behavior in bacteria resident in human feces, allowing for the emergence of a " winner " strain. If such a winner or swarming strain of bacteria is present, the assay is interpreted as being " test positive ". Deeti worked out the optimal conditions required to study such behavior in frozen fecal samples. The latter is important as this assay is applied for study in larger populations where data is retrospectively collected from fecal banks or from prospective new studies on predicting intestinal inflammatory states in humans.

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Regulated Research Institutional/Industrial Setting Form (1C) Continued

Student's Name(s) Deeti Patel

4. Detail the student's role in conducting the research (e.g. data collection, specific procedures performed). Differentiate what the student observed and what the student actually did.

The student suggested that we optimize our assay which hitherto was an assay that was not rigorously optimized in terms of an SOP. Second, the student combed the literature and herself focus on the feasible variables that were important to study in this assay and developed those into the experimental setup. This was done by the student herself. Her mentors were there really to ensure safety and that lab rules were obeyed. Third, she altered conditions of plating and inoculations by trial and error on her own. She wrote the paper with some assistance in the language of scientific writing from all of us. In her discussion of the results, she suggested that ongoing work should now validate the conditions of the assay she optimized in an "independent" dataset of feces. She was adept at using the Image J software to capture images and convert them to area measurements.

5. Did the student(s) work on the project as part of a group?
If yes, how many individuals were in the group and who were they (e.g. high school students, graduate students, faculty, professional researchers)?

☐ Yes ☒ No

I attest that the student has conducted the work as indicated above and that any required review and approval by institutional regulatory board (IRB/IACUC/IBC) has been obtained. Copies are attached if applicable.
I further acknowledge that the student will be presenting this work publicly in competition and I have communicated with the student research regarding any requirements for my review and/or restrictions of what is publicized.

Sridhar Mani

Supervising Adult's Printed Name

Albert Einstein College of Medicine

Institution

1300 Morris Park Avenue, The Bronx, 10461

Address

Sridhar Mani

Signature

Digitally signed by Sridhar Mani
Date: 2019.11.13 11:05:12 -05'00'

MD

Title

11/13/19

Date Signed (must be after experimentation) (mm/dd/yy)

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