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) Riya Patel

Title of Project Characterization and Performance of Next Generation Ultrafiltration Fouling-Resistant Polymeric and Lyocell Cellulose Nanofiber Wastewater Treatment Membranes

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.

   b. If yes, complete questions 2–5.

2. Is the student's research project a subset of your ongoing research or work? 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. ☑ Yes ☐ No

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

      Riya's idea for finding a more economical, environmentally-friendly and efficient wastewater treatment alternatives arises from her passion to mitigate the global water epidemic. The initial research question was a subset of another project, however Riya added new objectives and explored associated and diverse questions regarding wastewater treatment and the project submitted herein. Her project develops an all-cellulose based membrane for efficient wastewater treatment that shows great potential for ultrafiltration technology.

   b. designed the methodology for his/her research project

      Although many of the methodologies involved in Riya's research were already established, Riya introduced transformative methodologies that were not originally part of the summer's plan such as the in silico mechanisms of fouling on a Jupyter Notebook Code. She was also trained in numerous basic laboratory methodologies such as water contact angle, FTIR and SEM and underwent a lot of trial and error to find optimal parameters for the instruments.

   c. analyzed and interpreted data

      All data presented in the research report were collected by Riya including pre-fouling (SEM and zeta potential) and post-fouling (FTIR, water contact angle and in silico mechanisms of fouling) and dead-end filtration tests (under different DOs and ADs). After initial instruction, Riya was able to individually and comprehensively complete her data analysis. I would often test her comprehension of our analyses and it was because of her questions throughout the summer arising from her reading that she was able to analyze difficult data at an advanced level. All her filtration flux rate data for the different membranes were analyzed to determine optimal antifouling properties and all other membrane investigations were also analyzed by Riya independently.

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

Student's Name(s) Riya 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.

Overall, Riya was very eager and self-motivated to collect data and draw conclusions and she also learned and caught on to graduate level experiments at a fast pace. Most of the data in this project is the fouling tests which are 5 to 6 hours experiments to test a membrane's filtration over time. Riya collected all this data herself for more than 25 tests. For the membrane creation, Riya observed the first few processes because of the delicacy of creating them however later she was able to create membranes independently. For the SEM, zeta potential, FTIR, and water contact angle, Riya would observe the procedure once and then independently conducted the procedure. She was very careful and intelligent that I felt comfortable allowing her to work individually.

5. Did the student(s) work on the project as part of a group? ☑ Yes ☐ No
If yes, how many individuals were in the group and who were they (e.g. high school students, graduate students, faculty, professional researchers)?

There were two group members involved: Riya and I (Graduate Student)

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.

Mengying Yang	Mengying Yang	Graduate Student
Supervising Adult's Printed Name	Signature	Title
Stony Brook University		8/26/19
Institution		Date Signed (must be after experimentation) (mm/dd/yy)
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Address		Email/Phone