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) Damien Edele, Christopher Jannotta, Danielle Levanti

Title of Project The Complete Structural Refinement and Analysis of the Protein Anaplasma phagocytophilum tRNA (guanine-N1)-methyltransferase

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

      Students established a goal of completely refining the structure of the protein to submit the structure to the Protein Data Bank (PDB). This included refining and identifying the specific amino acid sequence of the protein as well as the structural conformation of two previously unresolved regions.

   b. designed the methodology for his/her research project

      Students had to first identify the correct data sets to analyze. They then began the process of identifying each amino acid in the sequence and determined the correct amino acid residue using electron density and molecular replacement. Once the structure was refined, relevant data such as beamline conditions, structural information, and refinement parameters were assessed prior to submission of the structure to the PDB.

   c. analyzed and interpreted data

      This entire body of work was centered on analyzing a data set and running the sequences through several iterations of structural analysis programs to refine the structure and obtain the optimal model for deposition to the protein data bank.

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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.

Students used several structural analysis and refinement programs to refine the structure. They compared the sequence to other similar proteins to determine homology within the TrmD family of proteins and then began to refine the structure by looking at the known sequence similarities and comparing these to the electron density regions from the data collected at the beamline. The students performed all data analysis and refinement and met with the research mentor to verify the refinement process was progressing appropriately and correctly. Students also prepared, verified, and submitted data for the final PDB submission.

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)?

Students analyzed the data collected at a previous beamtime in March of 2019. There were a total of 10 individuals in the group 6 were high school students, two were professional researchers, and two were high school faculty.

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.

Vivian Stojanoff — Supervising Adult's Printed Name
Signature
Physicist — Title
Brookhaven National Laboratory — Institution
1/13/2020 — Date Signed (must be after experimentation) (mm/dd/yy)
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