

# 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) Cheryl Chang

Title of Project Suggesting possible functions of GABRB3 and establishing a connection between GABRB3 absence and the onset of Autism spectrum disorder

## 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

While Cheryl's project is a subset of my project, she examines a part of the brain that I have never looked at before. Specifically, my research is centered around the barrel cortex of the primary somatosensory cortex. Cheryl, on the other hand, focuses on the axonal projections across the corpus callosum and between the primary and secondary somatosensory cortex.

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

The methodology was designed by a collaboration between Cheryl and I in that I simply provided some recommendations as to how she might research/confirm her hypothesis. Cheryl was the one who decided to build off of existing research, and methodical, and utilize staining and confocal imaging of slides I had used in a previous experiment to research her hypothesis. However, the step by step use of equipment and methods carried out by Cheryl was in accordance with established lab protocols.

- c. analyzed and interpreted data

In regarding to the data analysis, I showed Cheryl how to carry out the analysis once (specifically, I showed her how to measure the width of axonal projections across the corpus callosum and find the percentage of active pyramidal cells within the S1-S2 border) and allowed her to independently analyze the remainder of the data she collected. For interpretation of the data, we discussed together what statistical analyses would be best for the data set and I offered some suggestions as to how she could graphically portray her data. Additionally, we went over what her data depicts and some the significance of her findings.

(Continued on next page)

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

### Continued

Student's Name(s) Cheryl Chang

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.

Cheryl began her internship by reviewing past literature and publications, established methodology commonly carried out by our lab, and shadowing either my peers or I in order to first establish a foundation and general knowledge on what our lab specifically focuses on. From there, I introduced her to my ongoing study, which focuses on the how environmental factors may interact with genetic predispositions to give rise to neurodevelopment diseases, specially the impact of early GABAergic signaling on long-range cortical output. After she was exposed to my research, I allowed her freedom to develop her own hypothesis and experimental design to research her hypothesis, so long as it did not violate lab restrictions and was a reasonable experiment in the limited time frame.

While Cheryl had no contact with the animals sacrificed for this experiment, I did allow her to shadow me while I was slicing tissue and preparing the slides (although these were neither the tissue nor slides that she used for her experiment). Additionally, she observed a wide array of lab methodology, not specific to her experiment, that included western blocking, genotyping, and gel electrophoresis. Cheryl, with my supervision, carried on immunohistochemistry with pre-prepared solutions at specified concentrations and, after demonstrating how the confocal microscope worked and could be applicable to her experiment, independently decided which and how many slices to image, per slide, of frozen tissue I had previously used for a portion of my ongoing study. Furthermore, Cheryl analyzed the pictures and collected data on them largely individually, while I did provide guidance and ensured that she was conducting the analysis correctly.

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.

Rachel Babij  
Supervising Adult's Printed Name

Rachel Babij  
Signature

MD/PhD Candidate  
Title

Weill Cornell Medical College  
Institution

413 East 69th St, New York, NY, 10021  
Address

9/24/19  
Date Signed (must be after experimentation) (mm/dd/yy)  
rab2037@med.cornell.edu  
Email/Phone ed4