



*Roy J. and Lucille A. Carver  
College of Medicine  
University of Iowa*

Date

Selection Committee

RE: Student Name

Dear Committee members,

It is a pleasure to give **Student A** my strongest endorsement and serve as a mentor for her Summer Research Fellowship. Student A has been an undergraduate research assistant in my lab for nearly 4 years, starting the summer before her freshman year.

Student A's project will be to test the role of a thalamo-cortical circuit in mouse model of photophobia. This project builds on her undergraduate work looking at the circuitry of neurons expressing the neuropeptide CGRP in the brain using cutting edge brain clearing and visualization techniques. She identified an unexpectedly robust group of CGRP neurons in the visual cortex not previously reported in the literature. Given my lab's interest in CGRP and the molecular basis of photophobia associated with migraine, this was exciting. We had previously found that optogenetic activation of posterior thalamic nuclei causes light aversive behavior in mice, which we use as a surrogate for photophobia. And others have shown that the posterior thalamus sends axons to the visual cortex. So, when Student A expressed an interest in continuing her research as a summer fellow, I was delighted.

Specifically, her project will involve optogenetic stimulation of fibers that project from the posterior thalamus to the visual cortex. Similarly, she will optogenetically stimulate CGRP neurons in the visual cortex. The mice will be tested in a battery of behavioral assays beginning with light aversion. This project will expose her to a nice combination of anatomical and behavioral neuroscience experiments.

I anticipate interacting with Student A on a daily basis with informal chats in the lab. We have weekly round table lab meeting during which she will update the group on her progress. In addition, we have weekly journal clubs during which there is an interactive discussion of a relevant paper from the literature. Hence, there will be ample interactions between Student A and myself and other lab members throughout the fellowship period.

In sum, I believe Student A is an outstanding student who will benefit from this summer research experience.

Sincerely,

Signature



## College of Engineering

Roy J. Carver Department  
of Biomedical Engineering

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Date

Medical Student Summer Research Fellowship Committee Members:

I am very pleased to provide this letter of support for Student A's summer research proposal, "Associations between quantitative CT markers and inflammatory biomarkers of COPD exacerbation risk."

Given the considerable morbidity and mortality associated with COPD globally, it is important to improve our understanding of the disease. Treating and managing COPD exacerbations is a major component in the cost of caring for COPD patients. Our team has discovered strong associations with CT-based biomarkers and risk for future frequent and severe COPD exacerbations. Correlating these findings with inflammatory markers would provide further evidence towards our hypothesis that these predictive associations between CT-based markers and COPD exacerbation risk are due to an inflammatory mechanism, and this would be of great importance for future research.

Student A will be the main investigator in this project. He will organize and analyze the image and clinical data and will perform the statistical analysis for the variables of interest. He will also write up a scientific report to explain the research process and its results. Student A will be able to interact with my research and clinical collaborators, including Drs. B (Radiology), C (Internal Medicine), and D (Anesthesia).

I met with Student A several times over the course of multiple weeks to assist in the development of this proposal. I will be able to help supervise his work this summer and believe that he will learn a lot from this experience and will produce some very interesting findings.

Sincerely,

Signature



University of Iowa Health Care

*Department of Psychiatry  
8985 JPP, 200 Hawkins Drive  
Iowa City, Iowa 52242*

Date

To: Medical Student Summer Research Fellowship Committee Members

I am pleased to provide this letter of support for Student A's application "Functional Connectivity in Presymptomatic Juveniles with the Gene Expansion for Huntington's Disease".

This study utilized a unique program – the Kids-HD program – in which children 6-18 years of age who are at risk for Huntington's Disease (HD) participate in a brain structure and function study. HD is an autosomal dominant disease caused by a triplet repeat in the Huntingtin gene. This is the only study of its kind in the world and we've amassed a large data set of children who've inherited the Gene Expansion (the GE group, children who will develop the disease as adults) and those who are Gene Non-Expanded (GNE, did not inherit the expansion and won't develop the disease). The main aim of the grant is to evaluate brain structure using MRI scans and we have done many analyses of our primary data set. However one portion of our imaging data base – functional imaging – has yet to be analyzed.

Student A will be responsible for directing the analysis of functional brain imaging connectivity between GE and GNE children. In preparation, Student A met with me and we discussed HD in general and the tenets behind our study and protocol. He then performed a literature search on functional connectivity studies done on ADULTS with HD in order to gain a better understanding on what we might expect from our sample of children.

Student A first will be taking a lab-specific workshop in how to utilize the statistical package R. He will then also get training on the use of the software program used to create connectivity maps across several brain networks. Finally, he will utilize these tools to complete the statistical analysis of the group comparison.

I have met with Student A several times and discussed with him not only this project, but his interest in joining and completing the Research Distinction Track. I am familiar with both the summer fellowship program and the RDT and am confident I can provide the needed mentorship for his needs.

Signature

Date

To: Medical Student Summer Research Fellowship Committee Members

I am pleased to provide this letter of support for Student A's summer research proposal, "Metabolomic Profiling of Human Vestibular Schwannoma and Meningioma Before and After Radiation Therapy." Meningiomas and schwannomas account for approximately 45% of all primary intracranial neoplasms. In most cases, these tumors can be treated with surgical resection and/or radiation with good outcomes. However, when those treatments fail no further options exist. Metabolomics is the study of metabolic networks, which are critical for tissue phenotype and function and represent a common downstream pathway from genes, RNA, and proteins. Few efforts have been made to characterize the metabolomics of most central nervous system (CNS) neoplasms, including meningiomas and schwannomas. Doing so can provide insight into novel therapeutic targets. Accordingly, we intend to characterize the metabolomic changes in meningiomas and schwannomas before and after radiation, with the goal of identifying key metabolic pathways that can be therapeutically targeted to limit tumor growth and increase the efficacy of radiotherapy.

Student A will be one of the main investigators for this project. After receiving training from Dr. B and me, he will help conduct the mass spectroscopy analysis, establish xenografts in mice, check on mice after surgery, assist with radiation, tumor sampling, fluorescent microscopy, cell counting, and metabolomic and pathway analysis. Additionally, he will participate in authorship for manuscripts and present his work at the end of the summer at the CCOM Medical Student Research Conference and likely at a national meeting. The research team for this project met with Student A several times over the course of multiple weeks in the development of this proposal. Dr. B and I will both be able to help supervise his work this summer. I will meet at least weekly with Student A and he will interact on a nearly a daily basis with Dr. B. Additionally, we regularly meet with members of the Dr. C lab to discuss metabolomics and of the Free Radical and Radiation Biology team to discuss radiation biology. This will be a tremendous opportunity for Student A to gain experience in early stage translational research with clinician-scientist and likely motivate further ambition and growth in research.

Sincerely yours,

Signature

Date

To: Medical Student Summer Research Fellowship Committee Members

We are pleased to provide this letter of support for Student A's summer research proposal, "Comparison of Factors Associated with an Elevated BMI among Hispanic and Non-Hispanic Preschool-Aged Children."

Given the associated risks of obesity and its high prevalence in Iowa and among Hispanics, our study seeks to compare different factors that may contribute. Among these potential factors are diet, physical activity, and parental perceptions on the child's health and needs. Accordingly, we intend to track these measures using the ASA24 24-hour-recall diet survey, a physical activity tracker, and a parental survey. This data will be compared among Hispanic, non-Hispanic, obese, and non-obese children to identify trends.

Student A will be one of the main investigators in the project. He will be involved in the recruitment aspect, both on the phone to encourage families to come in and to enroll them once there. While in the clinic he will administer the diet and parental survey. He will be open to calls and emails from participants to answer questions. He will also provide instructions on how to use the physical activity tracker and on how to return them.

Student A will be in charge of inputting the raw data and assisting in the statistical analyses. He will be in charge of writing up a scientific report to explain the research process and its results.

We met with Student A several times over the course of multiple weeks in the development of this proposal. We will both be able to help supervise his work this summer and believe that he will learn a lot from this experience and have some very interesting findings.

Sincerely,

Signature Dr. A

Signature Dr. B