

[PROFESSOR]

[TITLE]

[DEPARTMENT]

[ADRESS]

[ADRESS]

[PHONE]

Fax: 216-368-5162

jason.mears@case.edu

[DATE]

Dear Sir or Madam:

I am writing with enthusiasm to recommend [STUDENT] for your Graduate School program. [STUDENT] is working in my research lab this year through the [PROGRAM] at [UNIVERSITY]. I have been extremely pleased with his performance, and it has been a pleasure to interact with him during his career development. I am confident that [STUDENT] will thrive as a future research scientist, because I have witnessed his serious sense of purpose and enthusiasm for science. Therefore, I offer a *strong recommendation* on his behalf.

[STUDENT] was selected from a large pool of applicants to participate in the [PROGRAM], which provides "hands on" experience for post-bac students in biomedical research. Upon reviewing his application, I noted the strength of his previous research experiences and his personal statement highlighted a desire to learn and improve. After a brief rotation, I was eager to have him join my group, and he immediately fit in with the other scientists in my lab. In a short amount of time, [STUDENT] has already demonstrated a strong work ethic, a professionalism in everyday interactions that I rarely see in younger students, and a drive to succeed. These are attributes that will continue to serve him well as his career progresses.

My lab uses structural, biochemical and cellular methods to characterize functional interactions that regulate mitochondrial dynamics. For [STUDENT]’s project, we are characterizing the structural features of the key protein that drives mitochondrial membrane fission. Previous work by a graduate student in my group had shown that this protein exists as a mixture of dimers and tetramers in solution, and we have been optimizing biochemical isolation methods to perform structural studies on these distinct multimers using cryo-EM. To date, the structure of these proteins in solution is uncharacterized, because we and other scientists use membranes to build helical polymers that are more amenable to structural studies. But one of our goals is to better understand how this protein assembles from a “cytosolic” state in solution to form large polymers that can constrict membranes. I have a more junior graduate student driving this project, and she has largely focused on the smaller dimer complex. I needed someone to work with her to help with the biochemical isolations and to begin assessing whether the tetramer species would be tractable for structural studies. [STUDENT] had some previous experience with computational research, and he jumped at the opportunity to expand his skillset to include protein expression and purification, isolation of distinct complexes using gradient centrifugation with chemical crosslinking, and electron microscopy imaging. His maturity, seriousness of purpose, and easy-going demeanor allowed him to fit in the research environment seamlessly, which also demonstrated self-confidence and a willingness to engage with other trainees. Moreover, he had an ability to quickly grasp complex biochemical and computational protocols. His initial studies included characterizing the multimeric properties of wild-type and mutant proteins, which proved to be a difficult task because of heterogeneity of the sample. Despite some setbacks, [STUDENT] has worked diligently and tried several methods to characterize the effect of these mutations on the multimeric state of the protein. Additionally, he piloted native electrophoresis studies with these samples to help validate results from the gradient centrifugation with fixation.

[STUDENT] has already had opportunities to present his work at the national ABRCMS meeting in California, at the Biomedical Graduate Student Symposium for [UNIVERSITY], at our annual departmental retreat and in our weekly group meeting. Following his presentations at the retreat, I received several positive comments from colleagues on [STUDENT]’s poster presentation. He continues to demonstrate a level of understanding consistent with more senior graduate trainees, and his desire to learn comes across quickly during conversations at these presentations. In my lab meetings, he is not afraid to ask questions, and regularly contributes to our discussions. He has been eager to observe other students at work in the lab as a way to learn more about different techniques that we utilize. He is a sponge, and my goal for the coming year is to introduce [STUDENT] to a wide range of methods that will allow him gain experience in different areas. In fact, he has already demonstrated a proficiency in EM imaging because of his attention to detail. As a complement, he has started to learn how to do confocal imaging to ascertain morphological changes in mitochondria in cells that other trainees are examining. He even came to me with new imaging technological advances that he had learned about through his personal science reading. Collectively, these experiences will allow [STUDENT] to become acquainted with diverse approaches to scientific problems. My hope is that he learns a great deal about his own research interests and contributes significant findings to our research program.

For his project, he has made steady progress on the isolation and imaging of tetramers using both WT and mutant protein. His results have shown us that this complex may be more stable than the smaller dimer that my graduate student had been pursuing. Additionally, his work may have helped identify a novel interface that would explain the regulatory interactions that limit assembly of the mitochondrial fission machinery in the cytosol. His results confirm that conformational rearrangements must be required before the larger polymer builds and contracts the membrane to mediate scission. Moving forward, we are going to begin vitrifying these samples for cryo-EM imaging. He has expressed interest in helping with these experiments, and I will continue to involve him throughout the process because he always provides useful insights and questions that help advance our science. Based on our interactions, I know that [STUDENT] wants to help in any way that can benefit our group.

The [PROGRAM] schedule is demanding, and he is already immersed in class, seminars, workshops, and meetings. Even with these additional commitments, I find [STUDENT] in the lab at all times. He is happy to come in on the weekend as needed, and he regularly offers to help other lab members with their projects. The biggest priority for me in the first week was to get a key so that he could come into the lab as needed. [STUDENT] has a unique ambition and energy that will be a positive for any group. I expect that he will help identify key molecular features of the proteins that we are studying using single-particle EM methods. Overall, I have been extremely pleased with [STUDENT]’s progress and contributions. He is comfortable using this advanced instrumentation, he conducts himself as a professional scientist, and I trust him as I would an early stage graduate student in my research group. I have had first-year graduate students rotating in my lab, and they all have mentioned how committed and helpful he has been for each of their projects. He always treats everyone with respect, and his positive attitude has been a welcome addition to the culture of my lab. He is attentive, kind and eager to learn, and I have appreciated his out-going nature and willingness to fully immerse himself in our research environment. I am excited to see where his training takes him in the coming months. If given the opportunity, I would happily welcome him back into my lab as a graduate trainee.

To summarize, [STUDENT] is ambitious while still being a great colleague. **I am pleased to offer a strong recommendation for him.** Selfishly, I hope he ends up back in [UNIVERSITY] and I can convince him to rejoin my lab. **But I fully recommend his candidacy for your program without reservation and would appreciate your favorable consideration of his application.** I guarantee that your program will benefit from his energy, mental aptitude and leadership qualities. He is exceptional!

Please feel free to contact me with any questions.

Yours sincerely,

[PROFESSOR]

[TITLE]

[INSTITUTION

[EMAIL]

[PHONE NUMBER]