

Abstract Please provide a 3 - 5 sentence abstract (no more than 250 words) that clearly describes what is proposed and how the proposed experience will enhance the applicant's education significantly. Please note: This abstract must be suitable for use in a media release if the proposed activity is funded.

The Cell Physics 2017 conference in Saarbrücken, Germany, is a global conference for the sharing of cutting-edge research in the field of cell physics. Attending this conference is a unique opportunity to discuss research in the same field as my work with researchers I would likely otherwise not encounter here in the United States. Physics, especially biophysics, is a community-oriented field in which we work together with other researchers to generate new knowledge that we would otherwise have not individually had the expertise to do so, and being well-versed in what other researchers in one's field are doing around the world by discussing research with them is a vital part of this work. This conference directly provides the ability for me to do this. At the conference, I will present a talk on my research, and will also learn about other's research from their talks/posters. I will be able to network with cell physics researchers from around the world with the goal of developing relationships for potential future colleagues and/or collaborators.

Detailed proposal of research/scholarly work In no more than 1000 words, describe the objectives and approach of your proposed research activity. Make clear how it relates to your immediate and long-term doctoral goals. Include a time-line for preparing for and completing the proposed activity.

Physics is a field centered around community. In physics, we encourage working and learning together as a vital part of the learning and research process. The research group I am in is a biophysics research group. The ideas of community learning are especially important in biophysics. Biophysics researchers are not interested only in physics; specifically, we are interested in the physics of biological and/or biochemical systems. This means that biophysics by nature is an interdisciplinary field which requires cooperation with both biologists and chemists; mathematicians, engineers, and others are also crucial to the development of biophysics. Attending conferences related to one's field of research is crucial to the research experience and the community building. The Cell Physics 2017 conference in Saarbrücken, Germany, is the perfect opportunity. Going to this conference will allow sharing of my research with others, which helps spark ideas for new and current research projects. There is also the opportunity to network, giving me the chance to build relationships for potential future positions/collaborations in my career. Moreover, going to Germany gives the ability to meet with researchers in the field which I would most likely not encounter here in the United States. Indeed, only a small handful of the invited speakers are from the United States.

The relevance of this conference to my work is very clear. My work is in the field of actin and regulation of actin dynamics. Currently, I study formins at the molecular level using computational simulations—a subject matter which is mostly lacking in the literature. We are interested in understanding how the formin regulates actin polymerization, as there are unanswered questions relating to, among other things, formins' diverse mechanosensitivity, length/distribution of its unique proline-rich motifs in its Formin Homology (FH) 1 domain. We have already learned how profilin(-actin) occupancy on the FH1 expands the FH1 and suggest a weaker effect than has been proposed in the literature already. We have also been able to confirm the common belief in the literature that FH1 is disordered by showing that the size of FH1 is consistent with a typical intrinsically disordered protein.

We are currently working on drafting a paper to submit on this research, and we plan to move on to study formin-mediated actin polymerization in more detail by building a model of binding between the various players in the system, so we can begin to answer the aforementioned questions. Thanks to our collaboration, we already have a preliminary model of binding between two of the most important players in this system: FH1 and profilin.

In general terms, the categories of research that this work fits under is as follows: cytoskeletal dynamics, cell mechanics, and proteins. Specific applications can also be related to cancer research. Comparing this to the list of topics at the Cell Physics 2017 conference, one can see that many of the talks there will be relevant to my research. Even the talks which are less directly related will be important as I look for future topics of study, or related issues which may play a role in my work that I had not previously considered.

Specifically, the approach of the conference is simple: people in the research community gather together to share their ideas. A select group of invited speakers will give higher profile talks regarding their research. Conference attendees have the ability to find the talks that seem most interesting and/or related to their research and attend these talks. This gives great flexibility to me as the attendee to find other researchers in my field and discuss research with them after their talks. Additionally, there are other presentations given by attendees, such as myself, either in the form of a talk or a poster. Typically, a number of the researchers in this position are graduate students and post-doctorate researchers. I have been selected to give a talk. Giving a talk directly shares my research with others via a digital platform (note the importance of the digital platform because it makes it easier to communicate the ideas behind my computational research). Furthermore, I can learn what others in similar positions to myself are doing and develop new and budding relationships for collaborations. The poster platform is also an extremely important part of the conference experience. In the talk platform, the presenter is limited to the time allotted for the talk to share/discuss research with others, unless an attendee chooses to find the speaker after the talk session is over to discuss further the research. As for the poster platform, this is much more open-format. Here, one can discuss research with the presenters for as long as is desired. This is an important way to share research with others, as it can lead to the generation of new ideas, more personal research interests can be followed, and poster sessions are more conducive to networking.

To summarize, physics, especially biophysics, is a community-oriented field of research. Attending the Cell Physics 2017 conference is a uniquely tailored experience that will spur my community experience of learning and researching together. The research that will be presented here is directly relevant to the research I am working on, and will provide me the ability for learning and networking. In other words, this conference is in direct alignment with both my short- and long-term goals as a researcher, and I am quite excited to attend.

Timeline:

September 27, 2017: Finish research to present and draft talk.

October 4, 2017: Finalize talk.

October 9, 2017: Fly from Newark, NJ, USA, to Frankfurt Germany

October 10, 2017: Arrive in Frankfurt, Germany. Train from Frankfurt to Saarbrücken.

October 11-13, 2017: Cell Physics 2017 Conference in Saarbrücken, Germany.

October 11 2017: Present my research in the form of a talk

October 14-15, 2017: Personal days to explore Germany with my co-attende, Danielle Holz (dah414), for which we will cover the cost.

October 16, 2017: Fly from Frankfurt, Germany to Newark, NJ, USA.

Total budget. Enter numbers only, no currency signs.

1323.95

Funds secured from other sources. Please list each source and the amount below. Enter numbers only, no currency signs.

College of Arts & Sciences: 300

Graduate Student Senate: 150

Remaining balance. Enter numbers only, no currency signs.

873.95

Amount you are requesting as a DTG-GO grant. Enter numbers only, no currency signs.

873.95

Please upload a Faculty Letter of Support Specifically detailing the impact this experience will have on your degree program.

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