

# ERIKA MARÍA LÓPEZ-ALFONZO

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## Education

PhD candidate, Molecular and Cell Biology (MCB)  
University of California Berkeley  
Expected graduation date: May 2022

2016 - Present  
GPA: 3.93

Double BS: Industrial Biotechnology and Chemistry  
University of Puerto Rico at Mayagüez

2010-2016  
GPA: 3.41

## Research Thesis Project

The proteasome is the major eukaryotic protease responsible for regulating protein turnover in the cell. It is composed of three subcomplexes: the barrel-shaped core peptidase, the lid and the base - which include ubiquitin receptors, a deubiquitinase, and an AAA+ ATPase motor-. When a protein substrate is targeted for degradation, ubiquitin chains attached to the substrate first bind to receptors on the proteasome. Then, an unstructured region of the substrate is inserted in the central pore of the heterohexameric AAA+ motor. Engagement of this unstructured region by pore loops in the AAA+ subunits causes a conformational switch in the proteasome from a substrate-free to a substrate-engaged state, which represents the commitment step for protein degradation. My thesis project aims to unravel: Which pore loop configuration causes substrate engagement and commitment to proteasomal degradation? How is ATP-hydrolysis coupled to the engagement and mechanical translocation of substrates? By using bulk and single-molecule fluorescence-based assays, this project will unravel the kinetics of degradation of different 26S proteasome mutants and will provide insight into how related quality control molecular machines work.

In this project, I have had the opportunity to mentor a 1<sup>st</sup> year rotation student (Fall 2020) and an undergraduate student since the Spring of 2019.

## Science Outreach Experience

### NIH Bridges to Baccalaureate Program, UC Berkeley Summer Coordinator, Spring 2019 to Present

- The NIH Bridges to the Baccalaureate (B2B) Program at UC Berkeley aims to increase the number of African American, Hispanic/Latino, Native American, and Pacific Islander community college students who transfer to four-year universities in the biomedical sciences. Every year, we recruit 15 students to participate in a 9-week summer program in which they conduct research full-time in UC Berkeley labs, attend weekly workshops, and make poster presentations of their findings. As one of three coordinators, I am in charge of recruiting graduate students and postdoctoral fellows as research mentors, organize professional development workshops and weekly dinners for community building, as well as guide the students in the building of their final research project.
- During the summer of 2020, the NIH B2B program moved to a virtual platform due to the COVID-19 pandemic. We were able to serve 20 transferring students from underrepresented backgrounds. The format of the program changed into a 7-week scientific research course in which the students learned about molecular biology, plant biology, immunology, and neurobiology, participated in professional development workshops, had journal club discussions, and worked remotely on a research project. I was heavily involved in all aspects of the organization and execution of this program, for which I also mentored a group of four students in their final biochemistry research project.

### **Summer Research Mentor, Summer 2018**

- My mentee was an Eritrean community college student transferring from the College of Alameda in the Peralta Community College District. During 9-weeks I taught her basic biochemistry research laboratory techniques, advanced biological science topics, scientific communication skills, and various paths to graduate school and a scientific career. After transferring we kept in touch and I advised her in different aspects of her scientific aspirations. She was accepted in the McNair Scholars Program and joined Gourisankar Ghosh's biochemistry and biophysics research group. She successfully completed her bachelor's degree in Pharmacological Chemistry from UC San Diego in the Summer of 2020.

### **Molecular and Cell Biology Department, UC Berkeley**

#### **ABRCMS Recruitment Representative, November 2019 & November 2020**

- I participated as a graduate students representative in the UC Berkeley Biological Sciences booth at the Annual Biomedical Conference for Minority Students to recruit undergraduate students to our REU and Amgen summer programs, as well as our different graduate programs.

#### **MCB Student Representative in Ivy Plus Puerto Rico Recruitment, September 2018**

- As part of a group of Ivy League universities, we visited six University of Puerto Rico campuses to recruit students to our summer and graduate programs. Overall, we had 295 submissions of interested students to our program's database.

#### **MCB Admissions Committee Student Representative, May 2018 to May 2019**

- I was involved in the selection of applicants from different backgrounds for the graduate program interview process, as well as their admission to the program to form the 2019 graduate class.

#### **1<sup>st</sup> Year MCB Class Representative, Fall 2016 to 2017**

- With the goal of recruiting students to our MCB program, I was one of the two organizers for student-lead activities for the recruitment of the 2017 MCB graduate student class, in collaboration with the Graduate Affairs Office. These activities included: housing tours, lunches, a poster session, a diversity and inclusion student panel, and others.

### **Science Education Experience**

#### **MCB Graduate Student Instructor, Fall 2017, Spring 2019**

- I assisted in the instruction of the course Macromolecular Synthesis and Cellular Function (MCB110, 120 enrollment) and Survey of the Principles of Biochemistry (MCB102, 410 enrollment).
- In the Spring of 2020, I received an Outstanding Graduate Student Instructor Award from the Graduate Division at UC Berkeley for the work done supporting Berkeley students and facilitating their learning.

#### **Bay Area Scientist in Schools (BASIS) Steering Committee Member, Fall 2017 to Present**

- The goal of BASIS is to gather teams of undergraduate and graduate student volunteers is to visit K-5 classroom in the East Bay Area to teach STEM related lessons.
- Our goal as a committee is to strategize around departmental volunteer recruitment and outreach for BASIS. We organize a volunteer Kick-Off recruitment event during the Fall of each semester with a turnout of 150 current and new volunteers and several new BASIS teams formed.

#### **BASIS Volunteer, Fall 2016 to Present**

- As a team, we teach a lesson called "Can we see your DNA?" in which we talk to the students about the building blocks of DNA, DNA replication, along with an experiment using household materials to extract DNA from fruits. We have visited schools in Richmond, East & West Oakland, and Downtown Berkeley.

#### **Boricuas in Berkeley Member (Fall 2017-Present), Event Coordinator (Fall 2020 to Present)**

- Boricuas in Berkeley was founded in 2017 by me and other Puerto Rican graduate students in UC Berkeley to serve as a platform for new Puerto Rican & Latino students to network and for current students to educate on the political and cultural issues that affect the island of Puerto Rico. After the pass of Hurricane María, we organized two fundraisings events for the affected populations in the island and supported educational events on this topic for the Berkeley community.
- As the event coordinator, I programmed social and educational events for our membership. Some of these events included “Lightning Talks” where our members presented on topics of interest and guest speaker talks from Puerto Rican scientists in the diaspora.

## Awards and Acknowledgements

Outstanding Graduate Student Instructor Award	2020
Pre-Doctoral Fellowship Ford Foundation	2019 to Present
ABRCMS Biochemistry Poster Presentation Judge	2019
NSF Graduate Research Fellowship Program Honorable Mention	2018
Chancellor’s Fellowship for Graduate Study – UCB	2016 to 2018
Leadership & Role Model Award – Industrial Biotechnology UPRM	2015
Minority Access to Research Careers Program Scholar, UPRM	2014 to 2016

## Publications and Presentations

HHMI Virtual Science Meeting: Metabolism and Disease	Poster 2021
Conference of Ford Fellows	Poster 2020
AAA+ Proteins: From Atomic Structures to Organisms	Poster 2020
Conference of Ford Fellows	Oral 2019
Biochemistry, Biophysics, and Structural Biology Departmental Retreat	Poster 2018 to 2020

Chen, X., Htet, Z., **López-Alfonzo, E.**, Martin, A., & Walters, K. (2020). Proteasome interaction with ubiquitinated substrates: from mechanisms to therapies. *The FEBS Journal*. <https://doi.org/10.1111/febs.15638>

Román-Morales, E., **López-Alfonzo, E.**, Pietri, R., & López-Garriga, J. (2016). Sulfmyoglobin conformational change: A role in the decrease of oxy-myoglobin functionality. *Biochemistry And Biophysics Reports*, 7, 386-393. <https://doi.org/10.1016/j.bbrep.2016.07.002>