

OFFICE OF UNDERGRADUATE
RESEARCH

2020-2021

**FLETCHER AWARDS IN
UNDERGRADUATE RESEARCH**



***FLETCHER AWARD FOR BEST UNDERGRADUATE RESEARCH
ACADEMIC YEAR UNDERGRAD RESEARCH GRANT***

Hanna Bertucci (mentored by Erica Hartmann)

Maya Kompella (mentored by Derk Joester)

Sean Obrochta (mentored by Katherine Amato)



FLETCHER AWARD FOR BEST PROJECT OF THE YEAR

ACADEMIC YEAR UNDERGRAD RESEARCH GRANT PROGRAM

Hanna Bertucci (mentored by **Professor Erica Hartmann**)
“Impacts of Phage Specificity on *P. Aeruginosa* Biofilm Formation and Antibiotic Susceptibility in a Microfluidic Flow Cell System”

The independent project that Hanna chose involved developing a new system to examine potential synergies between the antibiotic ciprofloxacin and phage treatment to eradicate *Pseudomonas aeruginosa* biofilm. This project involved adapting existing research infrastructure to examine structural and mechanical properties of biofilms to advance the development of novel bio-inspired therapeutics to reduce our reliance on antimicrobials. That Hanna was able to develop this system and apply it to test hypotheses about phage specificity and phage-antibiotic synergy, all in a limited period of time while lab access was greatly impeded by the ongoing pandemic, is hugely impressive. The postdoc who has worked closely with Hanna on this most recent project described her as, “the most scientifically talented undergraduate I’ve ever worked with.” He further described that in working with her he viewed her, “like an early PhD student because of her strong understanding of scientific fundamentals and eagerness to take experimental risks in the lab. She is not only capable of comprehending the scientific literature, but also has the initiative to apply those ideas to experiments in the lab... I honestly can’t say enough about her capabilities as a researcher.” In short, Hanna has every quality I look for in a researcher at any level. There is no doubt in my mind that she will go on to achieve great things and that receiving the Fletcher URG Prize would be a well-deserved recognition of her exceptional work and will propel her towards continued success.



FLETCHER AWARD FOR BEST PROJECT OF THE YEAR
ACADEMIC YEAR UNDERGRAD RESEARCH GRANT PROGRAM

Maya Kompella (mentored by **Professor Derk Joester**)

“Elucidating the Role of Matrix Proteins in the Sea Urchin
Biomineralization Process of Endoskeletal Spicule Formation”

Maya outdid herself on this one. In a nutshell, she succeeded where a biochemist in my lab had been unsuccessful in reproducing Kitajima’s work. And we did try. Maya was completely unfazed when she learned that the biochemist did not think it was possible. She put together a simple vacuum blotting apparatus from inexpensive components, and then she showed us how it is done. She was even working on a parallel approach as a Backup Plan and made some nice observations there as well. Bradley, Maya graduate student mentor, Keith, and I are absolutely delighted with Maya’s achievements. This is a breakthrough capability for us, and we will now redouble our efforts to generate the monoclonal antibodies and start mapping the spicule and other biominerals. It is hard to overstate how much of an impact this could have on our work.



FLETCHER AWARD FOR BEST PROJECT OF THE YEAR
ACADEMIC YEAR UNDERGRAD RESEARCH GRANT PROGRAM

Sean Obrochta (mentored by **Professor Katherine Amato**)
“Microbiome Analysis of Resident and Migratory Urban Canada Geese”

Sean’s work represents an important contribution to the fields of migratory bird ecology and host-microbe interactions. We plan to submit it as a paper for publication in an academic journal over the summer. Sean will be the first author in collaboration with several other collaborators that study Canada geese. It has been a pleasure working with Sean and watching him mature academically throughout this process. I truly believe that Sean transformed himself into one of the world’s experts on Canada goose microbiomes – learning the theory, molecular biology lab work, and bioinformatics all over the course of one year – and primarily virtually(!). Throughout the whole process his attention to detail at each stage has been remarkable. These are accomplishments and attitudes I would expect out of a graduate student. For this reason, I believe Sean's work is worthy of a prize given the quality of work at each stage as well as the final product and its contributions to science more broadly. Sean has already moved on to a position as a field assistant over the summer and plans to move onto a Master’s that combines urban wildlife ecology and microbiome analyses. I look forward to seeing what he accomplishes in the years to come.



***FLETCHER AWARD FOR RISING UNDERGRAD RESEARCH STAR
ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM***

Hannah Christensen (mentored by Sarah Bartolome)

Samuel Jung (mentored by Niall Mangan)

Shayan Malik (mentored by Megan Geigner)

Sue Um (mentored by Danielle Beverly)

Julian Zigelboim (mentored by Adam Becker)



FLETCHER AWARD FOR RISING UNDERGRAD RESEARCH STAR ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Hannah Christensen
(mentored by Sarah Bartolome)

During this very challenging pandemic year, Hannah provided outstanding research assistance on two different research projects. I was consistently impressed with her flexibility and willingness to engage with whatever task I offered. She completed observations and interviews alongside me and my co-researcher, providing thoughtful insight and commentary during our weekly research meetings. She also accomplished important administrative tasks, organizing consent documents, archiving observation videos and interview recordings, and overseeing the spreadsheet that catalogued our ongoing fieldwork activity. Since it took longer than usual to get the study off the ground, Hannah also enthusiastically took on the task of transcribing and annotating musical recordings that I collected during my fieldwork in Lithuania. Through this process, Hannah developed her ability to accurately transcribe music by ear and integrate separately recording text into those musical transcriptions. All of these research skills will be useful to Hannah as she prepares her own research study investigating folk music in French-speaking countries in Europe and Africa. It has been my great pleasure to mentor Hannah Christensen this year and I recommend her for this award without hesitation.



FLETCHER AWARD FOR RISING UNDERGRAD RESEARCH STAR ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Samuel Jung
(mentored by Niall Mangan)

Samuel is working on a numerical methods development research project in collaboration with graduate student Jithin George in my group. This type of research is very difficult to do at an undergraduate level because mathematical research often requires graduate level classes before it is approachable. With the help of Jithin, Samuel has been able to break the problems down into simple, approachable computational challenges and make excellent progress. By creatively exploring the problems via simulations he has discovered many interesting and unexpected behaviors, and then used a combination of theory from classes this past winter quarter and further numerical experiment to understand them. I have been impressed by his hard work, but more so by his infectious enthusiasm. I believe Samuel is at the start of an exceptional research career.



FLETCHER AWARD FOR RISING UNDERGRAD RESEARCH STAR ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Shayan Malik
(mentored by Megan Geigner)

Shayan is a freshman and has only been on campus for a quarter. But she took impressive initiative at every step of the process. First, she proposed that she and [the other mentee] present this research at the Chicago Area Undergraduate Research Symposium. She filled out the application on her own, and she helped [the other mentee] understand the rules and regulations of making the poster and doing the presentation. She also submitted to NU's research expo on behalf of this project with no guidance from me. Secondly, she learned to be a pro at using the NU library website. She dug through the MLA International Bibliography to find journal acceptance rates that I requested. (If you have ever tried to find journal acceptance rates for humanities journals, you will know what a task this was!) Finally, she and [the other mentee] built an amazing One Note notebook for me that has all the photos and descriptions I asked them to compile from my research. It was hours and hours of work. Never did [they] complain or express frustration at my request that they find extremely obscure research about 19th-century traveling tent performers.



***FLETCHER AWARD FOR RISING UNDERGRAD RESEARCH STAR
ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM***

Sue Um

(mentored by Danielle Beverly)

Sue Um's work to author two interactive Women & Documentary Historical Timelines not only was thorough, creative, skillful and rigorous, her contributions served as example to the students in the course about how to create a robust digital project. She came to the class to demo the Historical Timelines, speaking with authority and poise, fielding questions, and encouraging the students through her own authorship and research. Students were able to envision how they, too, might create a final research project - one that lives in the digital space but is research-driven, centers women documentary makers from diverse backgrounds, and tapped into a students' own interests.



FLETCHER AWARD FOR RISING UNDERGRAD RESEARCH STAR ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Julian Zighelboim
(mentored by Adam Becker)

Julian took on several projects for my team. He participated in two qualitative analysis projects with no prior experience. He was a quick learner and no one had to revise his work in any way. He created a database for some of our raw data, did a thorough review of typical sample sizes in health-focused journals that accept qualitative data, and created data tables using SPSS Output. In every project he did, he was given instructions one time and always came back with a product that surpassed our expectations. He worked independently, was always on time with his deliverables, and had a tremendously positive attitude through it all. I would work with him again or recommend him to any of my colleagues without hesitation!



FLETCHER AWARD FOR EXCELLENCE IN RESEARCH MENTORSHIP
ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Alexandria Volkening (mentees Harita Duggirala and Emma Mansell)

Lia Wendeln-Bernardi (mentee Rachel Okine)

Shuyi Weng (mentees Jade Zhang and Mercedes Sandu)

Ida Yalzadeh (mentee Alex Chang)



FLETCHER AWARD FOR EXCELLENCE IN RESEARCH MENTORSHIP ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Dr. Alexandria Volkening
(mentees Harita Duggirala and Emma Mansell)

My mentor, Alexandria Volkening, is exceptional in how much time and energy she puts into her students. In every interaction, it's evident that she cares about you personally and professionally, and she goes out of her way to find opportunities for you and share her knowledge. Doing research with her was not only a great learning experience but truly enjoyable.

I am nominating Dr.Volkening because she truly was an exceptional mentor. She took her role beyond the scope of the project and mentored & guided me through various external opportunities as well. For example, she helped me write a cover letter for a summer internship opportunity. She took the time to help research summer research opportunities I could apply for and constantly reminded me of new opportunities she found. She encouraged me to sign up for the Undergraduate Research Expo and gave me tips on writing my abstract. Overall, Dr.Volkening truly went above and beyond and I am truly so grateful that she was my mentor and I most definitely will stay in touch.



FLETCHER AWARD FOR EXCELLENCE IN RESEARCH MENTORSHIP ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Dr. Lia Bernardi (mentee Rachel Okine)

My faculty mentor, Dr. Lia A. Bernardi, was exceptional this year. Through her guidance, I learned the important skills of writing an IRB, creating and distributing a survey, and analyzing data. She was determined to help me acquire more researching knowledge and took time out of her week to meet with me. She was always interested in how I was doing personally and professionally, creating a space for us to connect through our work. Meeting Dr. Bernardi has further encouraged me to pursue the field of fertility and endocrinology because of the amazing work she does. If I could do this all again, I would have reached out to Dr. Bernardi earlier in my undergraduate career as I have learned more about fertility and medicine than I would have ever expected. Dr. Bernardi splits her time mentoring other medical students and residences, so she had a lot of experience. This was beneficial to me because she never made me feel like an imposter, and never left me confused. She connected me with her other mentees and created a research team that I could always reach out to when I had a question. Ultimately, Dr. Bernardi's enthusiasm, patience, dedication, and strong work ethic have substantially impacted me and how I view my future. She is a strong role model to me, and it was an honor to work with her throughout this past school year.



FLETCHER AWARD FOR EXCELLENCE IN RESEARCH MENTORSHIP ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Dr. Shuyi Weng

(mentees Jade Zhang and Mercedes Sandu)

Shuyi Weng was exceptional in every aspect of being a mentor: from the beginning, his hands-on teaching method was incredibly effective not just in learning the background research in the field, but also in teaching us how to ask the right questions. Later as we did more new research, he brainstormed with us how to work through the problems we faced, sharing his thought process as he did so so we could learn not just the right answers but also how to think as a researcher. In our meetings he created a professional, but comfortable environment where all kinds of questions were encouraged—an environment where I felt like I grew exponentially as a research mentee. Finally, he was very understanding of the pressures of being a student, especially during midterms and finals.

Dr. Shuyi Weng was just phenomenal in every way possible, so caring and intelligent and encouraging. He made the experience so exciting and forgiving and gave me so much confidence in pursuing the work we started beyond URAP.



FLETCHER AWARD FOR EXCELLENCE IN RESEARCH MENTORSHIP ACADEMIC YEAR UNDERGRAD RESEARCH ASSISTANT PROGRAM

Dr. Ida Yalzadeh
(mentee Alex Chang)

Professor Yalzadeh is a Visiting Professor at Northwestern University who has been an exceptional mentor throughout this year. Her approach to URAP was all about mentorship. A few highlights:

- She coordinated multiple meetings with the subject librarian to develop my research skills, and the primary intention of these meetings was always to support my future independent research, not her own. Thus, these trainings were very personalized and have helped me as I prepare for my senior thesis.
- Professor Yalzadeh always wanted me to be an engaged and interested research assistant, and she did not assign me work just to assign me work. She was very intentional with my assignments and provided opportunities for me to build on my personal interests while supporting her project. We had weekly check-ins throughout the winter and spring quarters, and at the beginning of each quarter, we assessed my research goals and interests in order to adjust my assignments accordingly.
- Upon graduation, I hope to apply to graduate school. Before URAP, I did not have much knowledge about graduate school, especially PhD programs, but Professor Yalzadeh has worked with me in order to progress toward this long term goal. Throughout spring quarter, she has been setting aside 30 minutes of our weekly hour-long meetings to support me in the application process and answer any questions that I have. Most significantly, she has connected me with many useful resources to find programs that best fit my interests.
- Overall, Professor Yalzadeh has been an extremely generous and thoughtful mentor.