

TO: Nakatani Foundation

Nakatani RIES 2024 Final Report

Your Name: Danessia Zan

Your university: Tohoku University

Host Lab in Japan: Yuanyuan Guo Lab

Meaning of Nakatani RIES Fellowship: How would you describe the meaning/impact of the Nakatani RIES Fellowship

This opportunity has absolutely been one of the most meaningful experiences I've had, as I was given the freedom to immerse myself into a very different and exciting culture while sharing my own personal experiences and perspectives with peers that I met both locally and through the Nakatani program. This fellowship not only helped me grow as a biomedical engineering student, strengthening my technical skills in terms of research and communication, but it also sparked a sense of autonomy and determination to continue pursuing my degree in different parts of the world.

Complete the following sentences with the intended audience for these responses being potential applicants to the Nakatani RIES Fellowship.

- My favorite experience in Japan was...
 - Traveling to Hiroshima, witnessing the floating torii gate in Miyajima, and summiting Mount Fuji! I also loved Ginzan Onsen, which is a splitting image of the bathhouse from my favorite Studio Ghibli film, *Spirited Away*. Each of these experiences are ones I've yearned to be a part of, so having the opportunity to take part in them has been incredible.
- Before I left for Japan, I wish I had...
 - Not packed as much as I did. The consequence of me already bringing too many belongings resulted in taking back about 7 bags on the return flight AND having to pay extra for overweight luggage.
- While I was in Japan, I wish I had...
 - Tried more street food. In Sendai, where I conducted research at Tohoku University, street food was more limited. However, when I travelled to various locations, such as Tokyo, Kyoto, Osaka, and Okinawa, there were more opportunities to discover various street snacks and food that I didn't always take advantage of.

Research Internship Overview: Provide a description of your research project and experience during your research internship. How did your project relate to your current or future academic interests? What was the experience of working in an international research setting like? What will you take away from your research experience this summer and what impact do you think this has had or will have on your future academic career or research interests?

During my time in the Yuanyuan Guo Lab, I was able to conduct research on two different research topics. The first one was improving the mixing efficiency of microfluidic devices, namely twisted microfibers, by varying different parameters such as aspect ratio, eccentricity,

and pitch dependency. The second topic involved developing surface modification methods for dynamic monitoring of various neurochemical substances to maintain balances in the brain. In terms of relating to my current research interests, the second topic I investigated more closely aligned with my passion for neuroengineering, particularly in studying the intersection of neuroscience and technology. Working in the Guo Lab reinforced my aspiration of pursuing a graduate degree in this fascinating field, and I was also inspired to potentially seek out further research opportunities in Japan, particularly at the Okinawa Institute of Science and Technology.

Lab Environment Overview: Provide an overview of what the personal environment of the lab was like. Describe the personality and working style of your research group? What was it like working with your research mentor/s and the overall group dynamic in the lab?

The lab itself was truly a welcoming and wholesome environment in which I spent time getting to know my fellow lab members and professors while learning more about their experiences of living in Japan. In fact, my lab members and I even traveled to Tokyo one weekend to visit the Studio Ghibli Museum in Mitaka. During my stay in Sendai, our lab group would often meet up after research hours and bond over dinner and karaoke, creating some of the most meaningful memories I cherish from my time in Japan. Both of my mentors were wonderful, patient with me when I had questions or misunderstood the protocol, and always taking time to explain information thoroughly so I would understand the importance of the work I was doing. On my last day of conducting research in the lab, each lab member, including the PI, came together to the desk where I worked and gave me parting gifts. The most memorable gift I received was a collage of letters from every member in the lab and photos the lab secretary put together from the first day I was welcomed into the lab.

Daily Life in Japan: Provide an overview of what your daily life was like in Japan. This could include the people you interacted with outside the lab on a day-to-day basis, food, your housing/living experience, your travels around Japan and the challenges you faced and the rewarding experiences you encountered over the course of the summer.

My daily life would start off with going to the Lawson near my dorm to grab some breakfast (and sometimes buy a lunch for the day as well depending on if I went to the dining hall or not). I would then head to the FRIS research building, where the Guo Lab was located, to start my research for the day (the commute from my dorm to the research building was about 10 minutes). I'd set down my belongings at the desk allocated to me for the summer and then chat with the other lab members and my mentors before beginning my work for the day. The lab space was located on the second floor, and that area is where I conducted experiments and used the machinery to fabricate the microfluidic devices. Around noon, the lab group would walk to a nearby dining hall, and we would spend about an hour enjoying lunch and getting to know each other better. After a delicious lunch, we would all head back to the lab and continue working until early evening. I would then gather my belongings and walk to the Aobayama station to take a train for Sendai station (my absolute favorite location in Sendai). In Sendai Station, I would usually explore unique restaurants to try as many different cuisines as possible, and after dinner, I'd usually go to a cafe (my favorite was Tully's Coffee!) to sit down and finish my computational work.

Experiences with Japanese Culture: Provide an overview of your most meaningful experiences with Japanese culture. This could be program activities or interactions you had with your lab or within your daily life in Japan that you think best exemplify aspects of Japanese culture or values. What did the experience/s teach you about Japan? What did they teach you about yourself?

In addition to spending time in the lab gaining not only valuable expertise in terms of research but also regarding Japanese lifestyle, I was able to better grasp a deep appreciation of Japanese culture and nature by exploring so many beautiful areas all throughout the country. Whether it was conversing with Japanese friends over a cup of delicious piping hot green tea or summiting Mount Fuji with GT friends (and yes, we woke up at 3 am to watch the sunrise!), every moment I spent getting to know more about my peers or Japan itself was truly meaningful.