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Meaning of Nakatani RIES Fellowship: The Nakatani RIES fellowship was meaningful from both a cultural and academic viewpoint. To put it succinctly, the Nakatani RIES fellowship was an unforgettable 10 weeks where I had an extremely rewarding and exciting research experience with a renowned professor while at the same time I was able to gain a deeper appreciation for Japanese culture, traditions, food, music, public transportation, geography and events that have most importantly led to lifelong friends who I still message constantly and keep in touch with to this day! I am extremely grateful for the opportunity given by the Nakatani Foundation and have a deep thanks for the Foundation and Ogawa-san as I have learned and grown so much from this summer. This was the most engaging and fun experience I have ever had and hope this program can continue working with Georgia Tech! Hontoni arigatogozaimasu!

Research Internship Overview: The goal of my project was to optimize the protocol for fabricating microfluidic chips so that they may be used to measure pressure changes and extract physical properties of the hydrogel. Using these new chips along with gels and cells, physical properties can then be extracted from pressure measurements after developing a mathematical model and then compare these measured values to known values of physical properties such as permeability, stiffness, and more to verify the similarity in behavior of the chip vs. the issue of interest. This project was extremely interesting to me because as a biomedical engineer, the opportunity to work with laser cutting tools and microfluidic chips was everything I had hoped for. I was able to synergistically apply all the skills I had learned the past three years (MATLAB, cell physiology, Fusion360, system physiology, etc.) in my degree in an interdisciplinary action that drove me to learn more and put my best foot forward every day in lab. The notion behind developing physiologically relevant tools in lab to help drive more accurate therapeutics and solutions is what really solidified my interest in medical devices and desire to work at the forefront of such research. Research in an international setting was super exciting as I was able to meet researchers throughout the world during talks at lunch or special lectures throughout the week in addition to the Deign Lab visit which really opened my mind to the world of medical devices in ways I had never thought of before. Seeing researchers from Japan and those visiting from places such as France and Singapore allowed me further delve into my interests and figure out what I want to do in the future. My goal is to work at the fusion of clinical medicine and translational research where I envision a career as a clinical researcher that has sufficient background in clinical sciences which when combined with my engineering and wet lab experience will help to address unmet needs thoroughly through frugal engineering.

Lab Environment Overview: Although I was working in a similar research field, it was far from an identical lab setting. I learned how differently day-to-day activities such as lab cleaning, footwear, clothing, lunch, and waste disposal were conducted. You could wear shorts in lab but always had to wear in-lab footwear when switching from the office to the lab. Waste disposal and electricity were meticulously regulated to minimize the environmental footprint which was very different from here in the US where we quickly run through tons of lab equipment disposables weekly and waste disposal is for the most part dumped into one tank

without any need to document the amount of each chemical. Another thing that shocked me was how friendly everyone was and the amicable lab community where the PI and lab members really made sure I settled in and was taken care of. We would all go to lunch at noon together and there was a welcome dinner for me. I was overwhelmed by the kindness and sense of community as that is not very widespread here in the US as the PI is too busy to ever talk or bat an eye. We also had a tradition where anyone who traveled anywhere would bring back a few snacks from that area to share with everyone in the lab. This was a new experience but was nonetheless exciting and enjoyable as I learned more about Japan's history and geography while having an opportunity to try food from regions throughout Japan. Overall, my mentor was amazing and really made sure I understood all the concepts during experiments and taught me great skills in both presentation and wet lab. He was always there for support and still challenged me in important ways that helped me grow and utilize my existing skills to their max. My PI was also extremely kind and always kept checking on me and provided valuable input and life advice. She would always greet me during lab and make sure I was doing fine. Additionally, she also helped me grow and learn more about microfluidics research and even offered to let me visit and work in the lab in the future (will definitely come back for this!).

Daily Life in Japan:

My daily life was extremely busy but exciting. Each day was a new experience and I was elated for the adventures each day would bring. I would get up early in the morning and go running around Komazawa Olympic park and take in the fresh air. From then, I'd quickly get ready and grab an onigiri I'd saved from the previous night and some ocha to go along with it. I would then work in lab for the remainder of the day till evening with a lunch break from 12-12:30 where I would either bring a bento box from a konbini or buy lunch at the cafeteria. By the end of my stay, I believe I had sampled nearly every meal and type of onigiri available at the university cafeteria and konbini! In the evenings, after finishing up reading some papers for lab, I would plan out some type of excursion in Tokyo or meet with some of my new friends to shop and explore more of Shibuya and Shimokitazawa (my favorite area). One of my best friend's was Kengo Nakata and we became very close during my time there. I met him through my lab and am extremely grateful I was able to do so. He helped me explore Japan and took me around in unique ways that a tourist would never be able to. I was able to truly witness local life and ways of living. It was with him and two of his other friends that I embarked on my most memorable experience of all which was a trip to Tochigi for stargazing and the Nikko Toshogu shrine during the long weekend. Besides this, I was able to travel and experience a wide range of Japanese through the program events such as the fireworks festival, sunset BBQ in Osaka, tatami mat dinner on a boat, and more. On top of all this, the alumni network of the program was phenomenal and really allowed me to explore Tokyo and settle in easily as they were able to guide me and help me whenever I needed! My housing was situated in a fantastic location. Although it was an hour commute to lab, I believe the quiet of my neighborhood combined with the proximity to groceries, pharmacy, konbinis, cafes, and more allowed me to learn the public transit like the back of my hand and also led me to get creative and ride a bicycle to lab on multiple days!

Experiences with Japanese Culture: One of my most meaningful experiences with Japanese people was during a night out in a ramen shop. I had originally gone to teamlabs with a friend and we were really hungry afterwards. We found a ramen shop nearby and walked to it. However, the menu was only in Japanese and we had a bit of difficulty translating the menu. Nevertheless, we ordered anyway using our best judgement. While we were eating, a lady next to us reached out to us while we pointed at one of the food signs. My friend and I were talking amongst ourselves if whether what the lady was eating was the special item in the picture or not. However, she noticed us and immediately reached out to tell us it was in fact the same item and she joined our two tables and started making conversation with us. We were super excited to talk to her and we learned so much about her and her family. It was a wonderful evening and it really exemplifies the spontaneity of living in Tokyo and how you may never who you will stumble across. The lady was around 80 years old and her husband had passed away but she still had her head held high and talked to us with the energy of a 20 year old. She had actually traveled almost every country in the world including America when she was much younger. It was only through her that I learned that back in her day flights from America to Japan had to stop in Alaska to refuel because they simply could not make the journey in one shot. This night also reminds me again how kind everyone is in Japan as she started sharing lot of her food with us and expected nothing in return. The other moment that really stands out to me is when I was throwing the shells with my wish during the JP fellows and US fellows mid-program meeting on Chikubu Island in Lake Biwa at the sacred Tori Gate. I wrote my wish down and threw my shells, hoping for the best. I was so afraid initially of throwing them as none of the participants before me had made theirs through the tori gate. Expecting nothing more, I threw my first shell. Miraculously, it went not only through the gate, but through the small hole in the top left of the gate. Weird, it must be a fluke, I thought to myself. Then, I threw my second shell. This one also made it through not just the gate, but this time it went through the small hole in the top right of the gate. I was astonished and had no words. Something in that moment felt magical and calming and I decided to cherish the simple moments in life.