To: Nakatani Foundation

Nakatani RIES 2026 Final Report

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Meaning and Impact of the Nakatani RIES Fellowship:

Before the Nakatani RIES Fellowship, I distinctly remember driving to the Atlanta airport and telling my roommate how worry overshadowed my initial excitement for this experience. While I studied abroad previously, the proposition of working full time with a prestigious research group, starting an unfamiliar research project, meeting new US and Japanese (JP) fellows, and living on my own was enough to create pause. This feeling was only compounded by the idea of navigating an entirely unfamiliar culture and language throughout these new experiences. Reflecting now, I am very lucky to say that these worries were wholly unfounded.

The Nakatani RIES Fellowship programming provided vital preliminary support in the form of foundational linguistic and cultural studies, bonding our US fellow cohort, and connecting us with the JP fellows from the first week. From there, I was quickly able to find my footing in Tokyo and felt confident in relying on my newfound local network of students when I needed advice, asked questions, or just wanted a big family dinner.

I am coming away from the Nakatani RIES Fellowship with a sense that the world is wider than ever. Beyond gaining a deeper appreciation for Japanese history and culture, as well as increased personal confidence, I see how some of the smartest, kindest, funniest people you will ever meet may be students you've just never crossed paths with at Georgia Tech, or across the Pacific Ocean. I am beyond grateful for the Nakatani Foundation's support in providing this experience, and I look forward to maintaining the connections I have made over this summer.

- My favorite experience in Japan was...
    - As someone who enjoys all things outdoors, summitting Mount Fuji is easily a highlight from my summer!
- Before I left for Japan, I wish I had...
    - I wish I learned Hiragana and Katakana before I arrived in Japan as it would have especially helped with navigation and traveling.
- While I was in Japan, I wish I had...
    - I wish I had planned some weekend trips in advance, so I was able to ensure we had time for certain locations and experiences.

Research Internship Overview:

My main project for the summer was focused on developing a collagen covering for a anatomically equivalent dynamic robot. The goal of the project was to create a collagen-based tissue layer that could be incorporated into a dynamically moving system and evaluate how the material performed under natural, human-like movement. I worked on fabricating and optimizing the collagen covering for the specific geometry of the robot I designed, which gave me experience with both biomaterial fabrication and adapting biological materials to a dynamic mechanical system. I was also able to work on an additional project focused on fabricating an innervated in vitro skin equivalent model. The goal of this

project was to provide proof of concept for using the dermis layer to cover and model a new region of the human body that had not previously been fabricated using this approach. I worked on optimizing the fabrication process for this specific anatomical region using NHDFs in a collagen and cell matrix solution. With more time, I would have continued by fabricating an epidermal layer on top of the dermis to verify that it completely covered the channel and created a full barrier between the dermis and the open-air environment.

I have only worked in dry-lab environments and felt comfortable utilizing CAD software and 3D printing techniques. However, learning how to culture cells in a wet-lab environment was a new experience, which has inspired me to get outside of my engineering comfort-zone back at Georgia Tech.

Lab Environment Overview:

The overall group dynamic of the lab was aired on both extremes of the "work hard, play hard" mantra. On one hand, lab members are very accomplished, with university, national, and international recognition being standard announcements at weekly Monday meetings. Most members, including undergraduates, worked extremely long hours and were expected to practice presentation skills monthly. Much of this success, I believe, can be attributed to the laid-back, collaborative, and open concept of the lab. I was often asked by other students about my research project and was afforded invaluable advice in addition to a consistent support system throughout my time. I especially appreciate my lab members for answering my many questions and incomprehensible comments while learning Japanese. Despite the standard of excellence set in lab, members were never too busy to connect over lunch, dinner, snacks in the lounge, or even impulsive Lawson trips. One memory that I will never forget is our overnight trip to Chiba following B4 presentations, where I had the chance to destress alongside students by participating in – what I would call – Japanese "field day" games, help make dinner for all 20 of students, and complete a ropes course. Overall, I can confidently say I met some of the smartest, kindest, funniest, and hardworking people I will ever know win the Biohybrid Systems Lab.

Daily Life in Japan:

Because the University of Tokyo was about a 45-minute commute from my apartment, I usually woke up fairly early to get to lab before 10:00am. While my tasks in lab varied day-to-day, each Monday we had our full lab meetings and clean up assignments. Usually, I would eat lunch at the food truck or small restaurants right outside the engineering building with the other University of Tokyo fellow, as well as the other American fellow in my lab. After lab, there was usually not much time for travelling due to leaving lab late and the long commute, but I would try to find something new to do each day. This could be anything from trying a new restaurant, buying Onitsuka Tigers, playing pickleball under Tokyo Tower, shopping in Ginza, visiting Round 1, or meeting up with the Tokyo fellows. Each weekend, as a full or partial fellowship cohort, we usually travelled somewhere in Japan, with highlights like Kamakura, Kyoto, Okinawa, Osaka, Sendai, and Mt. Fuji. Two of my daily challenges included finding trashcans and ways to get rid of the small coins I continuously accumulated overtime.

Experiences with Japanese Culture:

One of my biggest takeaways from living and travelling in Japan in the Japanese meiwaku o kakenai spirit. Essentially, it is the rule, rather than the exception, that one should treat others with respect without expecting compensation; a universal standard of social harmony and care. Littering is rare, standing single file before trains and buses is the default, trains are silent, students are always on time, backpacks are worn on the front. I distinctly remember one 4:00am kombini run, where I waited alongside a man to cross a completely empty one-way street, which is a situation any American would have jaywalked without second thought. As someone interested in disability advocacy, I especially took note of the expansive accessible infrastructure and policies all over the country. Because of the high cost and effort, it is rare to find a city covered in tactile walkways and properly designed roadways that allow for the full participation of all in everyday life, but Tokyo prioritizes it. While I am aware there is some discourse about the extensiveness of this sense of social order, I am personally inspired from the daily experiences I had with such values, and hope to employ this spirit more in my everyday life at Georgia Tech.

Returning to Japan:

I would love to continue learning Japanese and return following graduation to put it to good use! If I had the financial means and time, I plan to explore northern Japan including Hokkaido and more of the Tohoku region. I would also visit Japan's northern alps, with the intention of summiting Mount Yari and Hotaka. Of course, I would make time to visit my lab at the University of Tokyo, see the JP Fellows, and take another trip to my home base in Monzen-Nakacho, along the Sumida River.