

A newbie at the NIH

By Andrew Zureick

The crowded Metro train screeched to a stop. “Medical Center, red line to Shady Grove,” the driver announced. I threw my backpack over my shoulder, climbed a monstrous escalator, and walked out into the almost unbearable summer heat of Bethesda, Md., home of the National Institutes of Health (NIH). After having my badge scanned at the front gate, I made my way to the building that houses the National Eye Institute (NEI), where I’d be spending my summer.

I had just finished my first year as a Dartmouth undergraduate, and I was eager to explore a world of scientific research beyond textbooks and laboratory exercises. Without any prior lab experience, I had no idea what to expect. But working as an intern at one of the largest medical research centers in the world would put me another step closer to my ultimate goal of a career in the medical sciences.

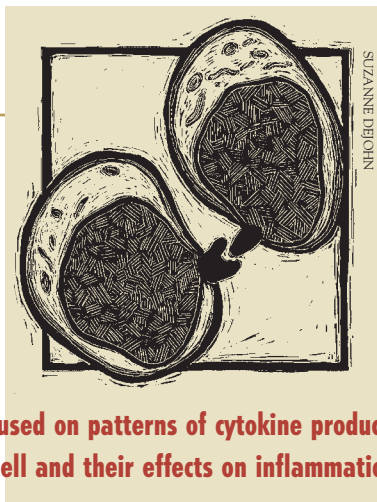
Standing outside the lab where I would be working was Dr. Igal Gery, the head of the section of experimental immunology. The doors of the lab were decorated with postcards from all over the world—and with biosafety level 2 signs. I was nervous, and a bit intimidated by the warnings, but I felt warmly welcomed by Dr. Gery.

Over my head: Next I met Barbara Vistica, a microbiologist, who started explaining the lab’s research. We had spoken over the phone a few months earlier when she invited me to join the lab, so I remembered some of the scientific jargon she was using—words like “uveitis” and “transgenic”—but most of the rest went over my head. I tried to feign understanding and hid my shock with a smile.

Dr. Gery gave me a tour of the Laboratory of Immunology, which spanned most of the hallway. I furiously wrote down where everything—from the ultra-cold freezer to various pieces of equipment to the bathrooms—was located. Later, I found myself inundated with a stack of articles from the *Journal of Immunology*, plus an immunology textbook to give me a stronger foundation in the field.

During my first two weeks, I trained with Barbara and Dr. Cuiyan “Yan” Tan, a postdoctoral fellow, and continued to read journal articles. I still felt overwhelmed, but Dr. Gery sat down with me multiple times to answer my many questions. Barbara and Yan supervised me and provided constructive criticism until I could perform assays by myself and apply the various techniques I learned by looking over their shoulders. The lab’s casual dress code and the classical music on in the background helped to ease my initial stress, and by the third week I felt more comfortable and was able to work independently.

The Student Notebook essay offers insight or opinion from a Dartmouth student or trainee. Andrew Zureick, a sophomore at Dartmouth College, hails from Bloomfield Hills, Mich. He writes for the Dartmouth Undergraduate Journal of Science and this year is an HHMI research fellow at DMS, working in the lab of Ambrose Cheung, Ph.D. He plans to double-major in chemistry and physics and go on to pursue a career in medicine.



My study focused on patterns of cytokine production by a type of immune cell and their effects on inflammation in the eye.

About this time, I began planning my project for the summer intern poster day in early August. I decided to build off of a study that Yan had submitted for publication just prior to my arrival. It focused on patterns of cytokine production by a type of immune cell (T-helper 9 cells, to be specific) and their effects on inflammation in the eye. The study was part of the lab’s long-term goal of understanding inflammatory disorders of the eye, such as uveitis, which in some cases can cause

permanent vision loss. The most fascinating resource in the lab, at least as far as I was concerned, was a collection of histology slides showing the varying severity of inflammatory responses resulting from injecting these immune cells in mice.

Challenging tasks: Running assays and performing experiments using real-time polymerase chain reaction (PCR) were challenging tasks for a newbie like me, but I began to see a general pattern that formed the basis of my upcoming presentation. I polarized T-helper 9 cells with and without a cytokine (called IL-1) that causes inflammation and found that cells with IL-1 produced higher levels of other cytokines to recruit other inflammatory cells. Those cells also had higher levels of genetic expression and intracellular expression, and the more active strain induced more severe inflammation.

The seven-hour experiments were grueling at first, but I became accustomed to the pace. Early on, I had to repeat some assays because of accidents such as incorrect dilutions or not enough mixing, but with practice my techniques improved. I soon learned to take great care to withdraw the exact amounts of every diluent, buffer, and other chemicals I worked with, leading to more successful experiments.

My journey through the scientific process paved the way for the final lap in my internship: designing my poster. There were sessions for summer interns to help us create our posters and improve our presentations, two essential skills in the world of science.

Talking for two hours: Finally, poster day arrived. The hallways and atriums were filled with hundreds of 3.5-foot-by-3.5-foot posters, and the building was packed with students, parents, researchers, and doctors. Wearing a blazer with my NEI pin and carrying my poster in a large tube, I entered a room that was filled with indescribable energy. I visited many of my friends’ posters before setting up mine for the afternoon session. My presentation went well, and despite the fatigue of talking for two hours to the people walking by, I felt very satisfied to have completed my first research experience.

My time at the NIH was rewarding in part because of the many scientific techniques I picked up, but mainly because of the people I met. The NIH teems with scientists who have a passion I hope to develop. Spending a summer learning from them helped me to understand both the difficulty and the beauty of the scientific process. ■