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I grew up in the suburbs of New York City and moved to Missouri during my early high school years. I matriculated into the University of Missouri-Kansas City School of Medicine's accelerated BA/MD program almost six years ago and graduated with a BA in Biological Sciences in 2003. When I first started medical school, being an idealist and perfectionist, I wanted to become the best physician that I could possibly become. I realized soon that my passion to study medicine and to become an outstanding physician extends beyond the daily rigors and challenges of medical school. I believe that the fundamentals of biomedical research are a necessity to truly prepare physicians for the 21st century and to be constantly engaged in this continuum of discovery and implementation.

Since the beginning of my medical education, I have sought opportunities and experiences to immerse myself in various laboratory settings to understand the mechanics of research and evaluate my interest. I initiated my research interest in immunological sciences during my undergraduate years. Although my research experiences at the University of Missouri were a great introduction to the advancement of medicine, they were limited, given the primary care focus of the institution. Working in a summer research program between my first and second years of medical school at the University of Pennsylvania, provided me with insight into the clinical research process and allowed me to open my mind and explore some of my own ideas. From a sense of curiosity and wonder, to a strong desire to contribute to the canon of biomedical knowledge, I was inspired to pursue additional research training and further evaluate a career as a physician- scientist. I thought, what better way to explore science with creative activity, than to pursue a year-long fellowship in the Clinical Research Training Program (CRTP) at one of the world's largest biomedical research institutes?

I first became aware of CRTP by visiting the NIH training website and reading these very same success stories. I learned more about the program from another student at my institution, who had participated in 2005-2006. I knew CRTP would serve me well because I was not committed to a particular area of research. The idea and liberty of interviewing the myriad of labs at this research powerhouse was something I could barely fathom at the time, albeit, very appealing.

My CRTP project focused on assessing coronary collateral circulation using quantitative magnetic resonance perfusion imaging (MRI) and interventional techniques. I worked under the leadership of my mentor, Dr. Andrew Arai, in the section of Laboratory of Cardiac Energetics of the National Heart, Lung, and Blood Institute. I had the unique opportunity to understand and evaluate basic science physiological principles in a model, which incorporated clinically applicable technological platforms. The idea of learning and being able to perform catheter-based techniques in an angioplasty model was something I had only witnessed in third year. I worked with an interventional cardiology fellow who helped me- from learning the very basics of coronary catheterization, to actual interventional techniques. This allowed us to create infarcts using balloon angioplasty to assess coronary physiology and hemodynamics. This experience, in and of itself, has been by far one of the most intellectually and technically stimulating experiences I have had in my academic career. I was beginning to learn highly technologically advancing procedures in an animal model that are performed at a PGY-7-8 level. What more could I have asked for as an aspiring cardiologist? I was also conducting several bench-top experiments on *ex-vivo* specimens. In addition, I was incorporating MRI technology to assess myocardial perfusion and viability pre-and post infarcts, as a clinically applicable, new and upcoming non-invasive modality. I am also interested in, and currently studying other imaging methods, including high resolution, micro-computed tomography (CT) scanner to identify vessels at the micron level.

I have been fascinated by the heart and its intricacies since my early high school years. I have been an aspiring cardiologist before I even entered medical school. During medical school, I have kept an open mind and explored most areas of medicine as a prospective career, but always found myself leaning towards patient care, balanced with leading technologically advancing and procedural oriented specialties. Foremost, cardiovascular disease is the leading cause of death in industrialized nations. As a society, we follow the news of medical breakthroughs: scientific findings about the causes and prevention of heart disease and cancer; surgical procedures to repair or replace vital organs; and diagnostic tools to pinpoint disease in its earliest and most treatable stages. Two to three generations ago it was suggested that coronary artery disease (CAD) would be a threat to the world as there were no treatment options available. Today as we progress through the new millennium, the folly of this position is increasingly clear with recent therapeutic modalities in the last decade that have changed the standard of care for the management of CAD. There is currently a large body of work in angiogenesis that is being conducted for induction of natural coronary bypasses as a therapeutic modality. My work was focused on understanding the functional significance and using novel, non-invasive modalities to identify these vessels. I believe this area of research holds great promise in advancing longevity, identifying disease in its infancy, and a novel treatment modality for those that have exhausted traditional treatment methods.

A typical week at the NIH consisted of one day devoted entirely to conducting a large animal experiment. The following days were spent dissecting, slicing, sectioning, and staining the heart specimen from my experiment. Since I had become quite independent, and this was my own project, I also had the responsibility of ordering necessary supplies, including: catheters, pressure wires, microspheres, and various other equipment. I also conducted data analysis on a MRI perfusion imaging workstation for the perfusion studies I had acquired during my experiment. Usually, the entire week was devoted to analyzing the data from one day's experiment and sending tissue samples to an outside company for microsphere analysis. In addition, I had the

opportunity to work in a lab which had cardiology fellows acquiring further training with cardiac MRI. This allowed me to sit in on "read-outs" 1-2 afternoons a week as my mentor and the fellows reviewed cases from that day. This was a great learning opportunity and kept me quite tuned with the clinical aspect of my academic year at the NIH. In addition, I attended our weekly cardiology clinic from time to time to be engaged clinically. I also had meetings with other co-investigators, staff scientists, and my mentor. Lastly, if that didn't keep me busy enough, there was always a well-renowned, interesting speaker or two each week that garnered my attention.

My year at the NIH has truly been one of the most rewarding and stimulating years of my life, both academically and personally. When I first came to NIH, I had a very remote interest in medical imaging. After working in a lab which focuses in cardiac imaging, I have become fascinated by the advancements in this technological platform that is a fundamental component in the practice of medicine. When I first started in Dr. Arai's lab, I felt like I was in an environment that was beyond my ability and scope of understanding. The people were brilliant, full of ideas, and more concerning to me at the time was the foreign MRI language they spoke, which I could not fathom. I did not have a physics background and was not interested in it, but realized I needed to learn this language to be effective in the lab. I took a MRI physics course that was offered at NIH, which taught me the language I needed to know to function in the lab and communicate with my mentors. It was a very challenging and advanced course, taken mostly by cardiology and radiology fellows, which quite honestly, initially intimidated me. Aside from learning the principles and physics of MRI, I learned of my capabilities and potential when put to the challenge. For me, this year became more than science; there was tremendous personal growth, and being in an environment with 29 other students provided for a very nurturing and humble experience. I am realizing (as the year is ending) that being in this constantly stimulating and engaging environment, and the ability to work with such renowned mentors who respected and treated me as their colleagues, has truly been an exceptional opportunity. An experience that I hope to take with me as I start my career. My mentor's open door policy, and communication on a first name basis established a great rapport and a very congenial mentor-mentee relationship. He provided me with enough independence to carry out my own project and was very helpful, supportive, and available at any time of the day. My goal at the beginning of the year was to gain a small fraction of his breadth of knowledge by the end of the year, and I can now attest to this accomplishment. The NIH is a remarkable place for anyone interested in pursuing creative activity with science. I am truly impressed with the collegial and humble nature of some of the world renowned experts in science and the diverse, myriad number of scientific discoveries that are being studied and implemented. Aside from the researchers, the wonderful and extremely hard working CRTP staff truly makes this year as seamless as possible. They are the backbone which holds the program together, and I am grateful to have had the opportunity to know some of them on a personal level.

In addition to the academic experience at the NIH, this year allowed me to spend more time in some of the other things I am interested in outside of medical school. I was able to meet many young professionals in the DC area with similar interests. The friendships and professional relationships I developed with both CRTP and non-CRTP colleagues are invaluable and will be fostered for years to come. I was able to explore the unique culture and diversity that DC has to offer including: the great museums, plays, concerts, and landmarks. I spent more time with fiction reading, sharpening my tennis skills, participating in physical fitness, and taking weekend

trips to a host of world-class cities within driving vicinity. I also had the unique opportunity to become involved with a very novel, collaborative project with Johns Hopkins University, which fostered relationships with world-class scientists and mentors outside of the NIH.

I am preparing to return to my home institution to finish my last year of medical school and apply for residency training in internal medicine, followed by subspecialty training in cardiology. Participating in CRTP was not only an experience, which I hold to a great degree of esteem, but it was one which elucidated that my future and passions lie in that of a clinical scientist. Someone who not only endeavors to ease suffering and increase longevity on a daily basis, but also one who has the opportunity to directly contribute to our every increasing fund of knowledge. While some may find their calling in the various practices of medicine, I see myself as a physician- scientist that bridges this "gap" between discovery and implementation.