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# research narrative

## Finding a Lab: My Niche

Toral Patel

Before coming to the University of Alabama at Birmingham (UAB), my career goal had always been to be a doctor. Not sure about the specialty, I held onto the options of being a cardiologist, endocrinologist, or oncologist. Swayed by family and my interest in helping people through the use of medicine, I decided to pursue Molecular Biology and a pre-medical degree...only to realize that at UAB I would be inspired by research.

Spurred by a genuine curiosity in developing and answering questions that could increase our understanding of the world and enable us to save lives, I began a search for laboratories I could become a part of. I looked for opportunities in which I could fulfill my desire to travel the bridge between practical science and a clinical setting. With no knowledge of the office of undergraduate research or faculty at UAB, I narrowed my interests to the pathogenesis of cancer and cardiovascular disease. From there I began an online search and came to the page of Dr. Dale Benos, Ph.D., Chair and Professor in the Department of Physiology and Biophysics. I was intrigued by his molecular-based research in evaluating potential mechanisms involved in the pathogenesis of cancer, human immunodeficiency virus (HIV), and cystic fibrosis. I learned of and established techniques such as tissue passaging, cell counting, basic light and fluorescent microscopy, wound-healing or scratch assays, quantification by spectrophotometry, Real Time-PCR, restriction digests, gel extraction, subcloning, and minipreps of bacteria. I began to understand what a true hands-on experience in science was as I applied what I had just been taught.

With the thrill of being able to perform experiments and develop new findings in a particular field, I volunteered in the Department of Physiology at The University of South Alabama with Dr. Mary Townsley, Ph.D. After being shown a few of the basics, I was given responsibility for my own research project in determining the presence of certain TRP isomers in whole lung samples and pulmonary microvascular endothelial cells (PMVEC). Specifically, I examined TRPV1 and TRPV4 through PCR and gel electrophoresis. My findings informed Dr. Townsley's own research project, but more important the work allowed me to think independently and to apply what I knew without someone's assistance. Being able to work alongside researchers who were eager to share their passion with students and heighten our experiences in research was invaluable. The support and guidance I received ultimately persuaded me to consider a Ph.D. in the future.

While working in both Dr. Benos and Dr. Townley's labs, I re-

alized that there was an interdisciplinary if not multidisciplinary nature of science and research. In order to further understand research, I ventured into the world of research seminars and conferences, where posters, powerpoint presentations, lectures, and national meetings embodied the work of many individuals and greatly displayed the collaboration of many disciplines. These seminars and meetings featured research in everything from physics and biomedical sciences to biology and biochemistry. There were many scientific implications of the experiments done by other people, but none of them seemed to satisfy my own desire to experience the entire adventure from writing a proposal to running experiments and evaluating data.



While participating in seminars during the fall semester of my sophomore year, I came across a laboratory in the Department of Medicine that used molecular-based techniques to work on projects for understanding the role of novel synthetic drugs (specifically peptides) in atherosclerosis. Branching medicine and coronary artery disease together, I was intrigued by the approach and began to familiarize myself with the laboratory and the research projects. After a year in the lab, I began my own research project under the supervision of Dr. David Garber, Ph.D. I have been able to work with Dr. Garber in determining the effect of the mimetic peptide 4F on the enzyme paraoxonase-1 (PON-1). I was given the opportunity to work with human cell lines, primary mouse hepatocytes, and animal models. Working in the Atherosclerosis Research Unit is great as I use an interdisciplinary approach to determining the effects of the peptide and the requirement of the enzyme for the anti-oxidative effects of peptide 4F. I have been able to take what I learn from my classes in molecular genetics, biochemistry, and organic chemistry and incorporate it into my understanding of this topic. Today, I can look back on my journey from not quite understanding research to finding my niche in a lab that bridges both basic science and medicine and excels in developing novel therapeutic interventions that I could one day use as a physician.



I advise, if not encourage, students with curiosity and eagerness to explore new areas to try research. Go into a lab and learn its techniques and experience thinking independently and incorporating everything you have learned from your classes. Even if you are not interested in lab-bench science, other opportunities for research in other fields can be found on campus and can allow you to gain an appreciation for how scientific or medical research is conducted.

The best part of research for me has been getting involved in behind the scene research that might be applied to medical practice in the future. Even though my journey in research has led me through many labs and through much searching into my own personal motivation and determination, there are many programs at UAB through which students can explore fields of science, enhance their creativity and intelligence, and work with nationally and internationally claimed researchers.