

My Internship Experiences

By Rajeev Chorghade, Natick HighSchool, Natick, MA

From article in The Nucleus, March 2010

NESACS has benefited from having countless geniuses and scientists of stature from the triad of academia, government and industry. I have been inspired by works that illustrate the pride and joy they took in research, how insatiable scientific curiosity led them to question the status quo and make groundbreaking discoveries. My scientific hero was the Nobel Laureate Robert Burns Woodward, who when questioned by a Senator about how his work would contribute to the defense of America, replied that it “would make America a lot more worth defending.”

I have a fascination and passion for learning science and performing laboratory experiments. My parents and high school teachers instilled a love for the natural sciences in me at an early age. I love to delve deeper into the scientific rationale of why things work the way they do, am intellectually curious, ask numerous questions, and am the proverbial sponge for the answers. I watch cooking shows where chefs experiment with new methods and ingredients to bring out exotic flavors. I am fascinated with chefs like Heston Blumenthal, who adds unique scientific flair to the culinary world by making desserts with liquid nitrogen!

I strive for a career in research and medicine, and aspire to secure M.D. and Ph.D. degrees. I am resolved to conduct research directed at understanding causative and curative factors of sports injuries, and exploring novel options for preventive care and cure. I wanted to start research early and embarked on a quest to work in laboratories that would provide me training and intellectual stimulation. I was privileged to obtain fabulous summer internships in Cambridge, UK (Physics), California Institute of Technology (Chemistry), and Harvard Medical School (Biomedical Sciences). Stepping into these hallowed institutions where so much wonderful work was done filled me with awe and inspiration. Working with such extraordinarily distinguished scientists as Steven Ley (Fellow of the Royal Society), Robert Grubbs (Nobel Laureate), and Vikas Sukhatme (Chief Academic Officer, Harvard Medical School) were memorable experiences that have truly shaped my scientific acumen, aspirations and career goals.

I learned techniques in flow chemistry, synthetic chemistry and biomedical science, respectively. These internships provided me with unique opportunities to discuss with distinguished academicians, post-doctoral fellows and graduate students their love for science. At Caltech, I met Professors Robert Grubbs, Peter Dervan, and others who stimulated my thoughts and encouraged me by discussing how they were attracted to science. Professor Grubbs showed me the laboratories where luminaries Gilbert Lewis, Robert Millikan and Linus Pauling had worked. Seeing the laboratories where all the scientists about whom I had read in my school text books was truly a memorable experience. In Professor Grubbs' lab, I participated in projects on chiral reductions and also conducted experiments on olefin metathesis.

I was honored to work in the laboratories of Professor Steven Ley and Syrris/Dolomite Industries in Cambridge, England. Microfluidics, known as “lab-on-a-chip,” enables small-scale fluid control and analysis, allowing manufacturers to develop smaller, more cost-effective, and powerful systems. I joined a team that conducted proof of concept,

development, and trials for a novel plastic microcapillary flow disc (MFD) reactor. Steven Ley was extremely gracious and hospitable; his students made me feel completely at home in their midst. I was able to appreciate the history of science by visiting the fabled Cavendish laboratories where 29 Nobel Prizes were won in the early part of the last century. Seeing the laboratories where Lord Thompson discovered the electron, where Wilson invented the cloud chamber, where Lord Todd explored the chemistry of nucleic acids, and where Watson and Crick postulated the structure of DNA was a dream come true. I even saw the famous pub where Watson and Crick burst in at lunch and announced "We have now found the secret of life."

Professor Vikas Sukhatme and colleagues at the Harvard Medical School introduced me to the magical world of molecular medicine. I learned how to run cell enzyme assays to study the effects of pharmaceutical drugs on living cell lines. I felt welcome to experience the art and science of discovery, ask questions I had, and have the benefit of distinguished scholars patiently explaining the workings of the methodology. I am truly grateful to have experienced the atmosphere of these fantastic laboratories and am especially privileged to have seen them as a teenager.

These experiences led me to collaborate in establishing a Science Club at Natick High School. I insisted on taking AP Chemistry, even though it was not being offered. My teacher, Kathi Browne, a NESACS Councilor, personally mentors me and I am completing the course by independent study.

I am thankful for these exciting opportunities; few high school students have had such a stimulating introduction to science. I will use these learning experiences to optimize my academic potential, secure an M.D. and Ph.D and participate in varied activities of NESACS.