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A smile on my face as I watched Great Neck fade away from my rearview mirror, I was ready to brace anything that was thrown at me on my month long stay at Rensselaer Polytechnic Institute. Three hours later, I had arrived at this foreign place that would become my home for the next few weeks. I was instantly fascinated by the beautiful campus greens and wide array of buildings that spanned acres of the seemingly small town of Troy, New York.

The first few days of my stay at RPI, I was introduced to Dr. Richard Gross and was assigned to one of his graduate students to work under. Walking into Dr. Gross’s lab was like something out of a dream: equipment more advanced than I had ever seen, chemicals being poured into beakers left and right, lab coats and gloves ready at my disposal.

It was great to be surrounded by such a hardworking group of people. The graduate students gave us great explanations as to what their research was about, and left us to choose. All of their projects mostly concerned chemistry, specifically organic chemistry, research. The common ground for all the projects was polymer research, so I decided to go with the graduate student whose work I found the most fascinating out of them all.

The in depth explanations done by my graduate student helped me gain a much greater understanding of the importance of his research, which focused on this amino acid monomer called lysine. We were to attempt to polymerize the monomer lysine ethyl ester through a completely green way. Previous studies had polymerized this monomer utilizing toxic reactants or using inorganic catalysts to speed up the reaction, but at a cost. Oftentimes, chemical companies might use a toxic chemical such as phosgene in the polymerization process and try to eliminate as much of it as possible in the final product, but there is that small chance that there are still remnants of the toxin in the product.

Thus, we aimed to use a non-toxic method in order to achieve the same results but with a confirmed clean product.

The work that we did at the lab was like none other that I could have accomplished in my prior history of research. For example, the process we used to filter out the lysine so as to prepare it for polymerization allowed me to work with cool equipment. In order to filter the lysine, we had to add in water as a solvent in all chemical reactions, so I was able to use a rotary evaporation machine and handle it all on my own once I got the hang of it. Once I successfully prepared the monomer, I polymerized it by adding heat at three different temperatures, taking out samples at specific times throughout the polymerization.

The end products were then analyzed by a Matrix Assisted Laser Desorption/Ionization Time-of-Flight Spectroscopy (MALDI-TOF MS). Once I pipetted each of the samples I had taken of my polymer onto a target plate, I placed the plate into the MALDI machine, which essentially recorded back data of each sample that I would later use to calculate the poylmers' molecular weights. If the polymers I created had similar molecular weights to those that were already on the market, it would show promise and a step towards the direction of putting more environmentally friendly products into the polymer industry.

My summer spent at Rensselaer Polytechnic Institute taught me so much about a real collegiate laboratory experience, the mechanics of working in a laboratory, and teamwork. The whole process of creating my own polymer and being able to analyze its characteristics was something that I never thought I would have an interest in until this summer, and it gave me an entirely new view of chemistry and chemical engineering. Overall, I gained a greater appreciation for the sciences and the patience and dedication that comes with undertaking such large responsibilities.

I would like to thank Mr. Schorn, the Research Director at Great Neck North High, and Mrs. Knacke, my AP Biology teacher, for both introducing me to the GNBCC's student summer research program in the first place. I would also like to thank Mrs. Laura Weinberg, Mrs. Lisa Levine, and the entire Great Neck Breast Cancer Coalition for granting me the opportunity to fulfill my dreams of working in a professional laboratory. This was a summer that I will never, ever forget.