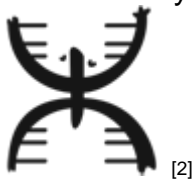
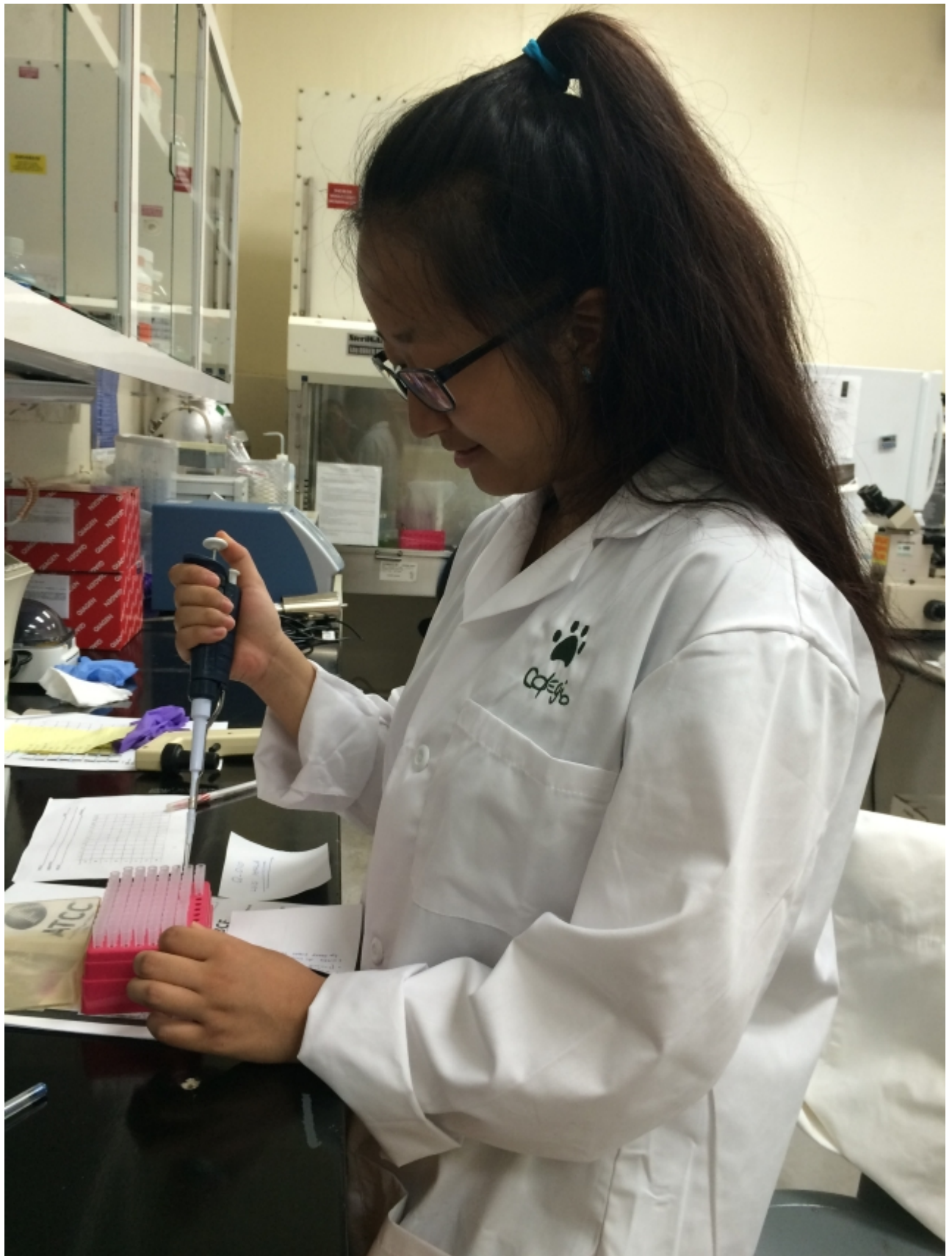


Nanoparticles with a Not-So-Nano Impact ^[1]

Submitted by [Hyeon Ju Song](#) ^[2] on 31 July 2015 - 10:42pm





July 31st. Today marks the final day of the REU Soft Matter Research program at the University of Mayaguez. Needless to say, it has been richly rewarding both academically and culturally.

To begin, I entered this program with zero research experience. I just finished my freshman year of college and only took a couple of introductory engineering, science, and math classes. My mentor Delva taught me basic scientific experiments that are fundamental for scientists. For example, she taught me how to extract RNA, perform qPCR, culture and preserve cells, and tag cells with fluorescence and observe them under a microscope.

In addition to learning how to perform fundamental lab experiments, my mentors Liliana, Delva, and I synthesized nanoparticles. To provide some background on our project, colorectal cancer is a very common cancer that occurs in the colon and rectum (which are in the large intestine). Docetaxel (DTX) is a chemotherapeutic drug used to cure colorectal cancer. However, resistance to DTX has been preventing DTX from properly working. To target colorectal cancer cells, we synthesized nanoparticles that are tagged with small interfering RNA. These molecules attach to the mRNA on the cancer cells and silence the genes that cause cancer expression. Furthermore, our nanoparticles can encapsulate other chemotherapeutic drugs in order to kill cancer cells. We characterized our nanoparticles with 2 different analysis tests. One test measured the hydrodynamic diameter, which is the diameter of the nanoparticle when suspended in water. The second test measured the zeta potential, which is the electrostatic charge of the surface of the nanoparticles. We found that the nanoparticles were slightly too big and are looking into different ways we can decrease their size without negatively impacting their functionality. The zeta potential results were very good; the high magnitude of the zeta potential was predictive of the long term stability of the nanoparticles. If you were wondering what I meant by my title, here it is: something so small as a nanoparticle can have a huge impact on someone's life. These little nanoparticles are so powerful because they are a potential treatment for cancer patients. Although they are very small in physical size, the magnitude of their impact on someone's life is so tremendous. I think that this made me enjoy my project even more. Knowing the applications of my project and its possible benefits on society encouraged me to pursue my research with passion and dedication.

Overall, this REU program was a thrilling ride. I loved learning from my mentor in the lab and performing scientific experiments. I loved touring Puerto Rico and visiting beautiful beaches. I loved eating Mofongo (a fried-plantain dish) and arroz con habichuelas (rice and beans). I loved visiting different towns and admiring local architecture. Most of all, I enjoyed spending time with my peers. I came here for research and received so much more than a summer research experience. I made friends, whom I plan on keeping in touch with, learned and improved my research skills under my mentor, presented a poster, wrote a final report, improved my Spanish speaking, listening, writing, and reading skills, and had a fantastic summer overall. I would recommend this REU program 100% for anyone who is interested in not only gaining scientific research experience and advancing science, but also interested in exploring a different world that we do not have access to in the continental United States. I will definitely miss seeing the rare Flamboyant trees around campus and taking a break in the pool after walking under the scorching Puerto Rican sun. Next week, when I go home, I will probably take a hot shower in my bathroom, eat my mom's delicious Korean food, and lay down on my comfortable bed. I will probably be

pretty satisfied at home, after spending 10 weeks in an island. But some part of me, maybe a tiny inch of me, will miss Puerto Rico. I will miss my loud roommate. I will miss my next door neighbors, whom I became best friends with. I will miss taking a 20 minute walk to Pueblo, the local supermarket, and buying overpriced tomatoes and yogurt. I will miss walking to lab every morning at 8:30 AM. I will miss the Wednesday Soft Matter Series seminars that I learned so much from. I will miss Puerto Rico a lot. And maybe, just maybe, I will apply to attend graduate school at the University of Puerto Rico - Mayaguez.

Tags: • UPR-Mayagüez REU RMSM Blog ^[3]

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