

Student Endeavors: UF Biodesign

BME SENIORS PARTNER WITH TAMPA BIOTECH COMPANY TO EVALUATE CANCER-CELL-SEPARATION TECHNOLOGY

Julian Rey admits that he was a tad intimidated last fall when he started the College of Engineering's Integrated Product and Process Design (IPPD) program.

The J. Crayton Pruitt Family Department of Biomedical Engineering senior considers it the closest to a real-world scenario he's experienced in his undergraduate career. Classes are usually based on absorbing information for an eventual test, he says, but IPPD requires students to work with actual companies to develop applicable technologies.



Above: Cellparation team working in the lab on their prototype
Left: Julian Rey presenting at the IPPD's annual event

Another “real-world” challenge: being on a team of six seniors from four different engineering departments at the University of Florida. Such an interdisciplinary effort was new after studying alongside just BME students, Rey says.

“What I learned most throughout the process was how to interact with my team to get the deliverables finished, how to communicate effectively with our sponsors so that we could really clarify what their needs were, what their expectations of us were,” says Rey, the team’s leader.

The six-student team — which included another BME senior, Sophia Bou-Ghannam — partnered with Tampa-based biotech firm Morphogenesis Inc. to further its Polymer Antibody Cell Separator technology.

The company uses polymer microspheres (basically tiny plastic beads) that have their surfaces molded so they attach to specific types of cells, such as circulating tumor cells that could spread cancer to other locations in the body. The cells can then be filtered from complex mixtures — bone marrow and blood, for example — containing a variety of cells.

The technology is meant for use in cancer diagnostics and therapy.

The specific goal for the team, called Cellparation, was to perform research on a device that filters out the beads and their attached undesirable cells.

The students’ intention wasn’t to fully develop the device themselves but rather help Morphogenesis researchers with the design and evaluating how well it separates the cells.

Cellparation was one of 25 teams in this year’s IPPD program, a two-semester College of Engineering course that starts with defining a problem at the beginning of the fall semester and goes all the way to having a prototype built by the end of spring.

Headed by Dr. Keith Stanfill, IPPD celebrated its 20th anniversary this year. The program groups students into teams, each of which is mentored by a faculty member and is partnered with a private-sector company to develop technology.

Cellparation was mentored by Dr. Carlos Rinaldi, a joint professor in BME and chemical engineering.

“The IPPD program provides engineering students with an opportunity to participate in a project that has real, practical elements,” Rinaldi says.

“In real life, as an engineer, you work in a diverse group, and you’re suppose to learn to bring in your expertise and also listen to the expertise of others,” he adds.

He describes how he pushed his team hard over the past two semesters.

“Did they meet all the objectives I set out? No,” Rinaldi says. “But I set objectives that were harder than what was needed. They met everything that Morphogenesis was expecting and then some.”

“This was the students coming up with the ideas because ... I don’t tell you a solution. You have to come up with it because when you’re an engineer, you have to figure it out.”

Cellparation’s project received funding from the J. Crayton Pruitt Foundation Inc. in St. Petersburg, another namesake of BME’s founder and his family.

“It’s great to see after a lot of time making calculations and talking about what materials to purchase that, in the end, something does come together that you can show your sponsor company and your classmates,” Rey says.

BY MICHAEL STONE