Jennifer Jordan, Ph.D., Assistant Professor
scaffolds called decellularized muscle matrices (DMM). Made possible by the VCU Commercialization Awards from new awards

Jennifer Puetzer, Ph.D., Assistant Professor
Carrie Peterson, Ph.D., Assistant Professor

SANTIAGO LOPEZ IMMIGRATED TO THE U.S. AT A YOUNG AGE WITH A PASSION FOR STEM THAT CULMINATED IN A PRESTIGIOUS NSF FELLOWSHIP

Santiago Lopez is a recipient of the 2023 National Science Foundation Graduate Research Fellowship. The grant will help support his research as a doctoral student at Vanderbilt University. His research—looking at the tumor environment and how its environment triggers cancer metastasis—builds upon his work at VCU as an undergraduate.

Lopez’s current research focuses on looking at cell-to-cell junctions and how altering these junctions affects the cells’ behavior—an interest that a VCU biomaterials class helped solidify.

“I was really interested in cellular interactions with different materials and implants and how our immune system responds to these different phenomena,” he said. “Everything just coiled me in that class and I had an amazing teacher—Jennifer Puetzer, Ph.D., assistant professor of biomedical engineering—that not only explained the concepts really well but also challenged us to think of solutions for problems currently in the world.”

The summer after his sophomore year, Lopez investigated cancer heterogeneity in breast cancer cells at Vanderbilt as part of the NSF Research Experiences for Undergraduates.

“My experience at VCU engineering has had its ups and downs, but overall it helped me give the toolbox necessary to solve today’s biggest problems,” Lopez said. “VCU engineering sculpted me to become the best engineer and scientist that I could be.”

FUELED BY NATIONAL CANCER INSTITUTE GRANT, PRISCILLA HWANG, PH.D., FURTHERS STUDY OF CANCER CELL MIGRATION

Priscilla Hwang, Ph.D., assistant professor in the Department of Biomedical Engineering, is studying metastasis and the microenvironments cancer cells live in. She is partnering with Gregory Longmore, M.D., and Amit Patel, Ph.D., on a new phase of research fueled by a grant from the National Cancer Institute (NCI).

When cancer metastasizes, it often means that a group of cancer cells is moving. Hwang and her partners’ research combines biomedical and mechanical engineering with molecular biology in hopes of developing a comprehensive understanding of how and why groups of cancer cells move together.

Early on in their research, Hwang and the team borrowed electrical engineering concepts to design a “cancer-on-a-chip model,” a microfluidic model of breast cancer. Researchers draw out their blueprint and etch it on a silicon wafer to make a mold. They can then make copies of the print and insert breast cancer cells into this constructed environment and get different cells to move by adding different signals.

“From the first phase, we identified certain cells that can drive or initiate migration,” says Hwang. “Now, this new grant from the National Cancer Institute is focused on investigating what those actual pathways are that might be regulating the phenomenon that we’ve observed.”

When there are clusters of tumor cells moving together, there are many different types of cells wrapped up in the cluster, such asstromal helper cells or immune cells. Hwang and her fellow researchers want to understand how different signaling pathways in the various cells within the moving cluster work separately or together to contribute to metastasis.

Priscilla Hwang, Ph.D., received a National Cancer Institute “cancer-on-a-chip model,” a microfluidic model of breast cancer.

Jennifer Jordan, Ph.D., Assistant Professor
Priscilla Hwang, Ph.D., Assistant Professor
Michael McClure, Ph.D., Assistant Professor
Carrie Peterson, Ph.D., Assistant Professor
Jennifer Puetzer, Ph.D., Assistant Professor
Priscilla Hwang, Ph.D., assistant professor of biomedical engineering, uses a microfluidic model of breast cancer.

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