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Cory Huggins – Engineered to Save Lives



Most students rarely get a chance to change the way people live. What Cory Huggins has been working on could save hundreds of thousands, possibly millions, of lives.

After a year of study at Lubbock Christian University, Cory transferred to UT Arlington to take advantage of the fast-track academic program where students can earn a B.S. in Biology and an M.S. in Biomedical Engineering in five years. It was a very productive move.

Like many students, Cory had a part time job; he was parking cars at a hospital. That changed two years ago when, while looking for a better job, he met Electrical Engineering Professor Jung-Chih “JC” Chiao, who was looking for someone with a biology background to help with a research

project. Dr. Chiao secured a Research Experiences for Undergraduates research assistantship grant from the National Science Foundation for Cory, who became part of Dr. Chiao's team working on a prostate cancer metastasis study.

Prostate cancer is the second most common cancer in men, with 250,000 new cases occurring each year in the United States alone. The American Cancer Society estimates that one in five American men will develop prostate cancer during their lifetime. Metastasis is the spreading of cancer cells to other parts of the body, usually by blood. While it may be said that a man died from bone or lung cancer, in truth he may have died because prostate cancer cells had invaded and destroyed the secondary organs. For example, bone metastasis is incurable and a major cause of death for prostate cancer patients.

Cory and his fellow researchers in the College of Engineering and in the Center for Urologic Oncology at UT Southwestern wanted to find a new way to observe and predict how prostate cancer cells migrate. "We needed to know what causes the cells to move, why they break away, what draws them to a secondary site," Cory explained.

Cory learned about microfluidics, the behavior and control of fluids in a small area, while working on a medical-training manikin with Dr. Chiao and his School of Nursing collaborators, trying to make it perspire realistically. Using this knowledge, he worked with other team members to design a new testing device and fabrication methods that made the device cheap and easy to make, unusual for most medical test equipment. Their devices can conduct multiple tests for multiple cancer types, providing answers to how different factors create different results.

Because of its versatility, several researchers at UT Southwestern want to use the device in their studies of breast and lung cancers. And the word is spreading to other cancer investigations as well, thanks a presentation at the Biomedical Engineering Society's annual meeting. Their paper describing how their device works will soon be seen in an upcoming issue of the *Journal of Nanomedicine*. "Currently, there are no similar studies," said Dr. Chiao. "Our paper will become the very first one showing how prostate cancer cells migrate."

“Sadly, cancer study is a never-ending research,” Dr. Chiao continued. “What we have accomplished is that we have demonstrated observations of cancer cell migration outside the human body in a mimicked-vessel condition. We need more funding and studies to understand how to inhibit cancer cell migration in order to stop the metastasis.”

The team members include, in addition to Cory and Dr. Chiao, Bioengineering Assistant Professor Kytai Nguyen, Electrical Engineering Ph.D. student Smitha Rao (all with UT Arlington) and Jer-Tsong Hsieh, Ph.D.; Ganesh V. Raj, M.D., Ph.D. and Victor Lin, Ph.D. (all with UT Southwestern). The team hopes their device will ultimately be a “smart chemotherapy” tool in every oncologist’s hands, giving almost instantaneous responses to tests.

Cory will be graduating in December. Unlike most students, he is graduating with his name on published peer-reviewed papers and a patent application. The devices he helped to create are currently being used in double-blind clinical trials of new cancer treatment methods, methods that will have life-giving properties.