Postdoc Profile: Tony Prisco, PhD

The future is now for researchers in regenerative medicine. One of those researchers, Tony Prisco, PhD, a Postdoctoral Fellow in the Greene Lab, at the Medical College of Wisconsin works on understanding the mechanisms involved to regenerate tissue damaged through cardiovascular disease. His research focuses on endothelial progenitor cells (EPCs), a population of bone marrow stem cells, able to regenerate blood vessels in an animal model of cardiovascular disease. A study done in 1997 (Asahara) was pivotal in demonstrating that the field of regenerative medicine was not science fiction, but a viable candidate for research and development. But EPCs from patients with cardiovascular disease behave differently than those from healthy patients. Prisco's work specifically focuses on elucidating the mechanisms by which injected cells incorporate into a damaged tissue, prior to inducing regeneration.

"I have studied the process by which EPCs migrate and bind to damaged tissue in response to TNFα, an inflammatory signal that is overproduced in many disease states. To study migration, we have developed a 3D cell culture assay with software that is specifically designed to determine if EPCs have migrated towards vessels. To study binding, we have designed, developed, characterized, and built a microfluidics system that can pull bound EPCs apart. We then analyze the results of this experiment using a Monte-Carlo based mathematical model. From this work, we have been able to specifically determine how inflammation associated with disease functionally affects the migration and binding of EPCs to damaged tissue" says Prisco.

After completing his Bachelor's degree in Biomedical Engineering from Marquette, Prisco enrolled in the Medical Scientist Training Program at MCW. He has just completed his PhD and will start his third year of medical school in a few months. "In July, I plan to return to Medical School and finish my 3rd and 4th year clerkships. Upon completion of my MD degree, I plan to match into a research-focused internal medicine residency," says Prisco.

"I have been interested in cardiovascular mechanics since I was and undergraduate and I became interested in cardiovascular disease during my basic science courses in medical school. I joined Dr. Greene's laboratory because of the focus on developing new therapies to treat cardiovascular disease and the engineering approach to solving problems," says Prisco. "Throughout my time in the lab I have developed interests in additional areas of novel treatments of cardiovascular disease, for example, implantable pumps to treat heart failure called ventricular assist devices. I don't think the solution to cardiovascular disease will be treatment solely with pharmaceuticals, stem cells, or devices, but a combination of these. For future work, I would like to continue working on projects that span these research areas."

Prisco has also kept busy with extracurricular activities including serving as MCW's representative to the Association of American Medical Colleges, attending Experimental Biology and American Heart Association Council for High Blood Pressure conferences and being a mentor in the Biotechnology and Bioengineering Center's Educational Outreach Program to Milwaukee area K-12 schools.