UT researcher receives three NIH grants to study how cancer spreads

By Rebecca Schwan: August 2nd, 2016

The migration of cancer cells away from the primary tumor and their subsequent metastasis to distant organs is the leading cause of mortality among breast cancer patients.

Dr. Rafael Garcia-Mata, UT assistant professor of biological sciences, has received three grants from the National Institute of Health’s National Cancer Institute to study how cancer cells spread in the body. His focus is on triple negative breast cancer.

“We use this type of cancer because it is highly invasive,” he said. “If we can identify how this type of cancer spreads, the data can be extrapolated to other types of cancers.”

Cancer cells invade other tissues and enter the bloodstream by forming actin-rich membrane protrusions called invadopodia, or “invading feet,” that degrade the extracellular matrix. Once in the bloodstream, the cancer cells can metastasize to form secondary tumors.

Garcia-Mata said it is his team’s goal to learn how these protrusions form and to identify the upstream regulators and downstream effectors of the formations. Their study is three-pronged:

• “Regulation of Invopodia Formation by RhoG Specific GEFs and GAPs” is funded by a three-year, $412,911 grant and seeks to identify what signals the protrusions to begin to form.

• A two-year, $330,544 grant supports the “RhoG Signaling in Invadopodia” project that explores the role of RhoG in invadopodia formation and cell invasion and identifies Rho-G-specific downstream effectors involved in their formation.

• “A Novel RhoG Protein Interaction Network in Invadopodia” seeks to learn more about 10 highly interconnected genes and their roles in the formation of these cancer-spreading pathways. The lab will receive $147,500 over two years for this portion of the research.

“Deregulation in Rho GTPase signaling has been associated with all stages of cancer, and once we understand the role these proteins play in how these invadopodia form, we can begin to research treatments to prevent or slow their progress,” Garcia-Mata said.