Researches novel triple-negative breast cancer treatments

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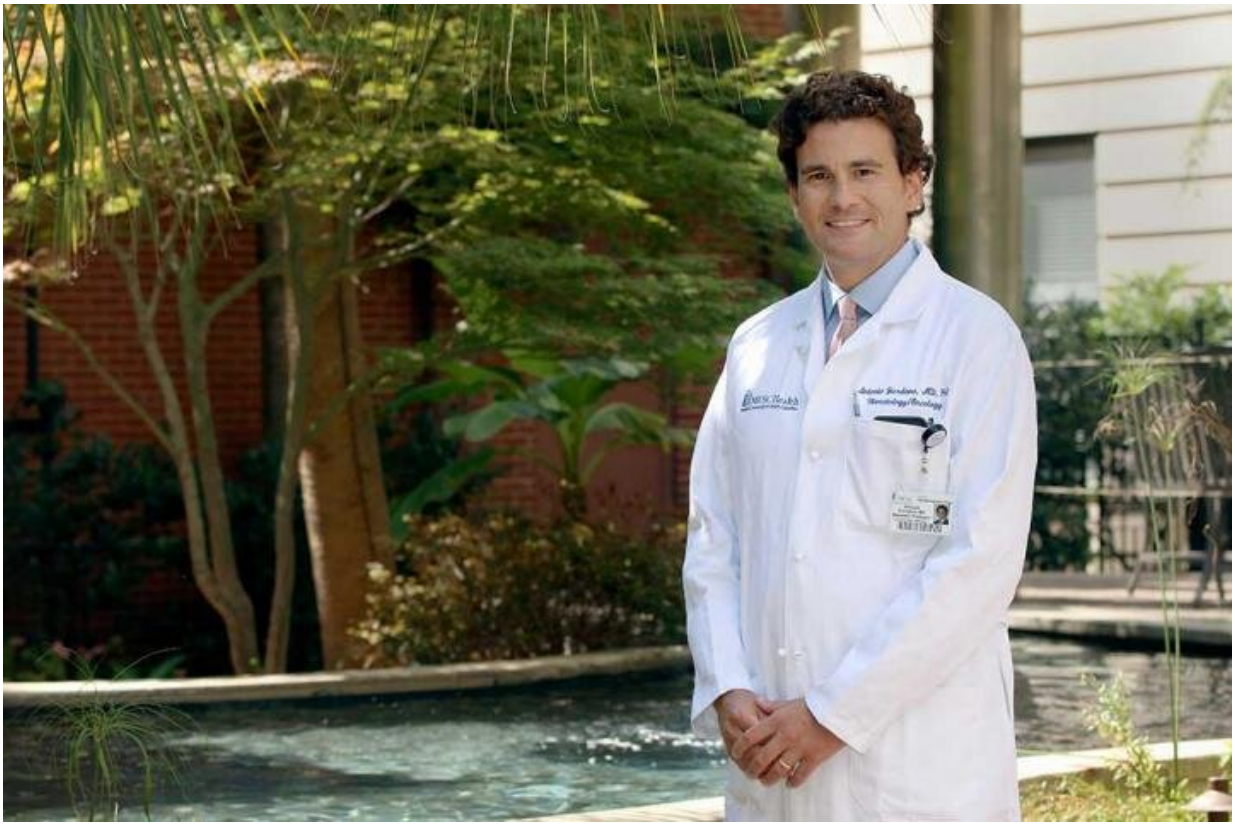

Dr. Antonio Giordano received an award that will help him research triple-negative breast cancer treatments. Credit: Sarah Pack

Working with patients while also doing research is the dream for translational physicians. As the newest Hollings Cancer Center clinical

scholar, that dream will come true for Antonio Giordano, M.D., Ph.D., a Hollings Cancer Center breast cancer oncologist.

"It's exciting and will allow me to dedicate part of my work to cancer research," he says. "I think it's nice for patients to know that their doctor is also involved in finding the new possible cure."

This designation is accompanied by a scholarship that will fund his research time for two years and allow him to participate in three research projects. The project focus is on triple-negative breast cancer.

Below, Giordano discusses triple-negative breast cancer and the importance of his research.

What is triple-negative breast cancer?

Triple negative means that the three receptors are all negative. There are three main receptors in breast cancer: ER, estrogen receptor; PR, progesterone receptor; and HER2, human epidermal growth factor receptor two. When all of the three receptors are negative, so they are not "overexpressed" on the membrane of the cancer cells, the subtype is called triple negative. It affects 20% of all the breast cancer patients we see here in the United States and has less treatment options compared to the other subtypes.

What research projects are you working on?

We tried to find a mechanism to revert the resistance to standard chemotherapy, combining the chemotherapy with onvansertib—a polo-like kinase 1, PLK1, inhibitor. We found that PLK1, a protein that controls cell cycle, was really important for survival of the cell lines that were triple negative. We were lucky to find a PLK1-inhibitor drug

company that was available to collaborate and participate in preclinical experiments. In one of the scholarship projects, we will check safety and preliminary anti-cancer activity of onvansertib in patients with triple-negative breast cancer.

In another project we are going to look at the characteristics of tumor-infiltrating lymphocytes, TILs, in the metastatic deposits of triple-negative breast cancer patients. We will try to analyze and characterize those TILs to understand how important they are for the prognosis of patients. We can analyze those lymphocytes and see if they are lymphocytes that can attack the cancer versus lymphocytes that are exhausted and not effective.

We also take part of a national cooperative oncology group, SWOG (formerly the Southwest Oncology Group), and are writing and developing a clinical trial for immunotherapy that combines checkpoint inhibitors with different immunotherapy. This is mainly designed to overcome resistance to immunotherapy and checkpoint inhibitors. It's really exciting being co-chair on such a big national clinical trial.

Why is researching triple-negative breast cancer important?

It's important because, right now, there is a lack of treatment options for triple-negative breast cancer.

It's important to offer additional treatment options to our patients. Triple negative is such an aggressive type of cancer that has such a poor prognosis.

The three projects have the potential to offer progress in the treatment of triple-negative breast cancer. The common theme among these three

specific aims is overcoming resistance in triple-negative breast cancer. We aim to find novel treatment options for triple-negative breast cancer and hopefully offer better treatment options to such critical population of breast cancer patients.

Why is this scholarship important to you?

Without the scholarship, I would not have the opportunity to participate in the SWOG collaboration group, to build the basis of the clinical trial and be the chair for a national trial. I'm really thankful to have the scholarship and the protected time for research.

It will also give me the opportunity to dedicate time being principal investigator of the PLK1 trial. I started working with cell lines and PLK1 inhibition in 2016, passing through the in vivo experiments and arriving now to the last step, developing a phase 1 clinical trial for patients.

Being a physician scientist, I have worked in the lab and know how complex and long this type of work can be. Bringing novel approaches for cancer treatment, from the lab into the clinic, it's the dream of every translational physician. The ultimate dream is to offer better options to our patients that are less toxic and more effective against cancer.

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