

# Breast Cancer Moon Shot

Breast cancer is the second most common cancer among American women. In 2022, almost 290,000 new cases are expected to be diagnosed in the U.S., according to American Cancer Society projections. The focus of MD Anderson's Breast Cancer Moon Shot is triple-negative breast cancer (TNBC), a subset of aggressive, difficult-to-treat cancers associated with diagnoses at younger ages than other types. Unfortunately, about half of TNBC tumors are resistant or develop resistance to chemotherapy. When standard chemotherapy fails, patients with TNBC are left looking for answers because most second-line breast cancer treatments target three receptor expressions not found in TNBC tumors.

The Moon Shot is comprised of projects led by world-class researchers: **Junjie Chen, Ph.D.**, chair, Experimental Radiation Oncology; **Kelly Hunt, M.D.**, chair, Breast Surgical Oncology; **Lei Huo, M.D., Ph.D.**, professor, Pathology; **Anil Korkut, Ph.D.**, assistant professor, Bioinformatics and Computational Biology; **Gaiane Maia Rauch, M.D., Ph.D.**, professor, Abdominal Imaging; **Debu Tripathy, M.D.**, chair, Breast Medical Oncology; and **Clinton Yam, M.D.**, assistant professor, Breast Medical Oncology.

In the last year, many developments have occurred in the field now that immunotherapy has been approved for early-stage triple-negative breast cancer. Our researchers have shown that magnetic resonance imaging (MRI) of the breast, especially when analyzed using artificial intelligence, can accurately predict the degree of response to therapy. This sets the stage to adapt therapy to maximize the chances of success. It also allows clinical researchers to test new drugs more efficiently. The Moon Shot team is looking at new antibody-drug conjugates and novel modulators of the immune system as candidate therapies to improve the chances of pathological complete responses – which predict a higher cure rate.

## **FUTURE PLANS:**

We plan to use your support to test newer drugs and imaging algorithms using the ARTEMIS trial platform. The Moon Shot team is working to establish a precision medicine framework that will provide more effective, personalized treatment options for patients with localized TNBC. The goal of this project is to advance new treatments for those with chemo-insensitive disease, while also preventing overtreatment of patients who respond well to chemotherapy. The cornerstone of this project is the ARTEMIS trial. We have submitted our initial paper describing the details of gene alterations (at the DNA level) and gene expression (at the RNA level) to put together a better picture of how to classify TNBC and better study effects of drug treatment – an important step in discovering more precise and powerful therapies.