KEY BIOMARKERS IN BREAST CANCER
AND THE HER2 GENE

WHAT ARE BIOMARKERS?

Biomarkers are genes, proteins, or other substances that help indicate the direction of treatment and information about the type of cancer a person has.

Some key biomarkers include:

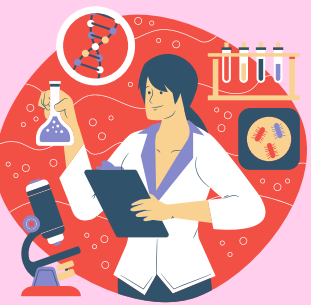**PR**
Progesterone Receptors

ER
Estrogen Receptors

HER2
Human Epidermal Growth Factor Receptor 2

Testing for biomarkers in cancerous cells can aid in choosing the appropriate approach to treatment. Gene overexpression, controlled by some of these biomarkers, is strongly linked to cancer.

There has been 281,550 new cases of breast cancer in the U.S. in 2021

43,600 of these women have been predicated to die from bresat cancer

20%-30% of breast cancer tumors have high levels of HER2 protein

WHAT IS HER2?

HER2, also known as Human Epidermal Growth Factor Receptors 2, is a gene that contributes to the growth of breast cells through producing HER2 proteins. These proteins act as connecting receptors on breast cells that aid in controlling the growth, repair, and division of breast cells (HER2 Status: Tests, Treatments, and More, 2020).

Detections: Immunohistochemistry and Fluorescence in Situ Hybridization.

Normal Function: In healthy functioning breast cells, the HER2 proteins are controlled, and breast cells grow at a normalized pace.

Classification: HER2 is both predictive and prognostic. HER2 is predictive because it helps determine the most effective treatment for patients. HER2 is also prognostic because it can be used to predict the disease outcome on the individual without treatment.

HER2 IN BREAST CANCER

When the HER2 gene is mutated, it replicates itself rapidly and the production of HER2 proteins becomes uncontrolled. The overexpression of HER2 proteins causes uncontrolled growth of breast cancer cells. The rapid amplification of HER2 genes in breast cancer cells is referred to as HER2 Positive Breast Cancer. HER2 Positive Breast Cancers tend to grow rapidly and spread easily.

BY: KHADIJA WALKER AND HOMA KESHMIRI