Beyond Pink

Understanding Biomarker Testing

Biomarker and genetic testing often get tossed around in the world of cancer. While they both play an important role in your treatment journey, the two forms of testing are very different. This guide serves to define biomarker and genetic testing, explain how each fit into your diagnostic and treatment decisions, and how to communicate this important information to your loved ones.

What is Biomarker Testing?

Just as each patient has a unique personality, so does each tumor. Some tumors are driven by the presence of unique sets of alterations, often called biomarkers. It may be helpful to think of a "biomarker" like the "thumbprint" of a tumor, and this thumbprint may be measured or convey certain aspects of your tumor that can help guide your treatment options. When doctors identify the specific thumbprint of a tumor – its pattern of biomarkers – through biomarker testing, they can often prescribe medicines that are designed to target those specific traits.

Biomarker testing is different from genetic testing, which is used to look at the genes inherited from a person's parents to find out one's lifetime risk of developing certain cancers. It's important to note that a genetic alteration can be hereditary (passed down from a parent) or acquired (developed later in life through certain environmental risk factors).

Possible MBC Types

Biomarker testing can help determine which type of metastatic breast cancer (MBC) you have, helping your doctor make informed treatment decisions. Hormone receptors (HR)—including both estrogen and progesterone receptors—and human epidermal growth factor receptor 2 (HER2) are the most common biomarkers examined, but others may also be considered. The following is an overview of the most common current MBC types:

- Estrogen receptor positive (ER+)
- Estrogen receptor negative (ER-)
- Progesterone receptor positive (PR+)
- Progesterone receptor negative (PR-)
- Human epidermal growth factor receptor 2 positive (HER2+)
- Human epidermal growth factor receptor 2 negative (HER2-)
- Triple negative (TN)

How Can Hormones Influence MBC

Breast cancer can be hormone driven and the progression of the disease can be directly related to the types of hormones present.

Approximately two-thirds (60-70%) of MBC patients have breast cancers that are HR-positive, meaning their growth is fueled by either estrogen or progesterone. Some breast cancer cells contain proteins that act as estrogen or progesterone receptors. When estrogen or progesterone attach to these receptors, they drive cancer growth. Cancers are called HR-positive or HR-negative based on whether or not they have these receptors.

If your doctor tells you that you are ER- or PR-, that means your MBC is not driven by either of these proteins.

What are HER2 and Triple Negative?

HER2 is a protein that acts as a receptor on the surface of a cancer cell. When there are too many HER2 proteins present, the cancer is considered to be HER2-positive. About 20% of cancers have too much of this protein and are considered HER2-positive.

Triple-negative MBC occurs when the tumor tests negative for estrogen and progesterone and HER2 protein. In this case, cancer growth is not supported by hormones nor by the presence of too many HER2 proteins. About 15% of MBC is triple negative.

HER2 expression may help shape the view in breast cancer, and it is recommended that all patients with invasive breast cancer be tested for HER2 levels of expression to help guide treatment decisions.

How is Biomarker Testing Done?

Biomarker testing is typically done by testing a tissue sample from your tumor after surgery or biopsy, or, in some cases, with a blood test.