

# What are HER2-positive and HER2-low breast cancer?

Not all breast cancers are the same. In HER2-positive breast cancer, **changes in a gene called HER2 trigger breast cancer growth.**

A normal HER2 gene makes HER2 proteins that help cells grow, multiply, or repair damage in a healthy way. When the gene makes too many copies of itself, which tells the breast cells to make too many HER2 receptors (HER2 protein overexpression), it leads to breast cancer. Knowing if a cancer is driven by HER2 helps determine treatment, because HER2-targeted therapies can treat HER2-positive and HER2-low breast cancers.

Fifteen to 20% of all breast cancers are HER2-positive. Another 50-60% test positive for small amounts of HER2, but not enough to be HER2-positive. These breast cancers are considered HER2-low.

## HOW IS HER2 STATUS CONFIRMED?

After biopsy, a tissue sample is tested using an **immunohistochemistry** (IHC) test, a **fluorescence in situ hybridization** (FISH) test, or both. These two biomarker tests show how many HER2 proteins (receptors) are on the surface of breast cancer cells. Usually, an IHC test is performed first because it gives a numeric score. If the IHC score falls in a certain range, a FISH test is performed. FISH results are positive or negative.

### Possible results include:

- **HER2-positive:** an IHC score of 3+
- **HER2-low:** an IHC score of 1+ or 2+, followed by a negative FISH test
- **HER2-negative:** an IHC score of 0

## WHAT TREATMENTS ARE AVAILABLE FOR HER2-POSITIVE BREAST CANCER?

HER2-positive breast cancers are treated with **targeted therapies** tailored to the HER2 receptor. Treatment can also include chemotherapy, surgery, and radiation therapy. If the cancer is also hormone receptor-positive, patients may also take endocrine therapy.

Anti-HER2 biosimilars—drugs that are structurally and functionally similar to anti-HER2 biologic medicines—are also available.

## WHAT TREATMENTS ARE AVAILABLE FOR HER2-LOW BREAST CANCER?

Only one HER2-targeted therapy is FDA approved to treat HER2-low breast cancer: trastuzumab deruxtecan. If the cancer is also hormone receptor-positive, it can also be treated with endocrine therapy. If it tests hormone receptor-negative, treatments may include chemotherapy.

Drug class	Cancer stage
<b>Monoclonal antibodies</b>	
Margetuximab	Metastatic
Pertuzumab	All stages
Trastuzumab	All stages
<b>Tyrosine kinase inhibitors</b>	
Lapatinib	Advanced or metastatic
Neratinib	All stages
Tucatinib	Metastatic
<b>Antibody-drug conjugates</b>	
Ado-trastuzumab emtansine	All stages
Trastuzumab deruxtecan	Metastatic