



The role of biomarkers in planning treatment for secondary breast cancer

What is a biomarker?

A biomarker is a substance found in blood, urine, or body tissue that can give your doctor useful information about a cancer. It helps your doctor know which treatments might work best for that specific cancer.^{1,2,3} Important biomarkers in breast cancer include hormone receptors (HRs) and the protein HER2.³

In this guide we will break down what biomarkers are used for, which hormones and proteins healthcare professionals will look for and examples of questions to ask your doctor about biomarkers.



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The Moments That Count campaign has been developed and funded by Novartis Pharmaceuticals UK Limited. It has been created in collaboration with breast cancer patients whose knowledge and insights have informed the content and direction for the campaign.

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What are biomarkers used for?

Biomarker testing may help your doctor determine and discuss with you the appropriate treatment plan for your type of cancer.^{3,4,5}

Treatments like targeted therapies and immunotherapies may only work for people who have specific biomarkers; therefore, your biomarkers are tested in order to determine the best course of action.

How are biomarkers tested?

Usually, a sample of your cancer cells will be taken and sent to a special lab for testing. If your tumour is solid however, they may have to take a sample during the surgery.

If you aren't having surgery, a tumour biopsy might be required to get a sample to test for which biomarkers are present. Once tested, the lab will provide a report of which biomarkers were found and which treatments are appropriate for your cancer.⁶

Important markers in breast cancer

Biomarker testing helps your healthcare team determine which treatment is appropriate for your cancer.

HRs (hormone receptors)

Some breast cancer cells use hormones, such as oestrogen or progesterone, to grow and divide. These hormones bind to cells using docking stations known as receptors.⁶

- HR+ (hormone receptor-positive): hormone receptors are found in the breast cancer cell⁷
- HR- (hormone receptor-negative): hormone receptors are not found in the breast cancer cell⁷

HER2 (human epidermal growth factor receptor 2)

HER2 is a protein that helps cells grow and divide. When there is too much HER2, cancer cells may grow more quickly and be more likely to spread to other parts of the body.⁸

- HER2+ (HER2-positive): breast cancer cells that have high levels of HER2⁸
- HER2- (HER2-negative): breast cancer cells that do not have high levels of HER2⁸

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Gene mutations

Genes carry instructions that tell cells what to do. When genes are changed (mutated), cells can grow in the wrong ways. This can lead to medical conditions, such as breast cancer.^{7,9} The most common type of mutation to cause cancer is called “somatic.”¹⁰

Somatic mutations:

- Occur from damage to genes in a cell during a person’s life
- Are not passed down from parent to child (not inherited)

A far less common mutation to cause cancer is called “germline.”⁹

Germline mutations:

- Occur in a sperm cell or egg cell
- Are passed directly from parent to child (inherited)

BRAC1 and BRAC2 are genes that help repair DNA (the genetic information inside cells). When a germline mutation affects the BRAC1 and BRAC2 genes their repair function can be altered. As a result, cancers including breast cancer are more likely to develop.^{7,11}

What questions should I ask my healthcare team at my next visit?

Below are questions that you may have about breast cancer, your biomarkers and/or your treatment. This may help you get the conversation started and take a more active role in your care.^{12,13,14}

Biomarkers and testing

- Where has the cancer spread?
- What is my biomarker status?
- What test can tell me if I have a biomarker or mutation?
- Where is this test available?
- What kind of sample is needed: blood or tumour tissue?
- How will you get tumour tissue for testing? What is involved in this procedure?
- If the test shows I have a biomarker or mutation, what does this mean for my treatment?

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Reporting of side effects

If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in the package leaflet. You can also report side effects directly via the Yellow Card Scheme at <https://yellowcard.mhra.gov.uk/>

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