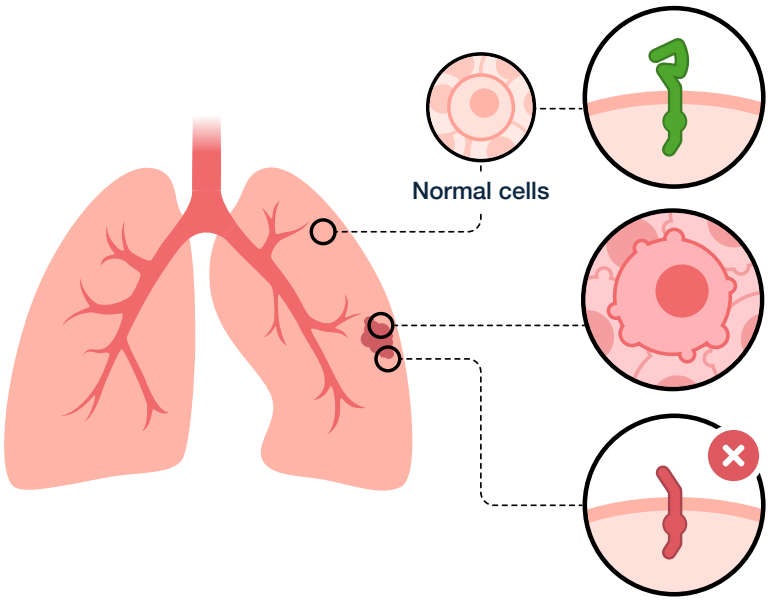
How HER2 and Gene Changes Affect Lung Cancer

What is HER2 and why is it important in lung cancer?



Normal HER2 receptor

HER2, or human epidermal growth factor receptor 2, is a protein found on the surface of cells that helps cells grow and divide. HER2 is found on cells throughout your body, including your **lung cells.** HER2 is involved in normal cell growth.[1]

Cancer cells

Changes to HER2 can cause cells to grow too quickly, which can **lead to cancer**.[1] This makes HER2 an important biomarker* in lung cancer, especially in **non-small cell lung cancer (NSCLC)**, the most common type of lung cancer.[3,4]

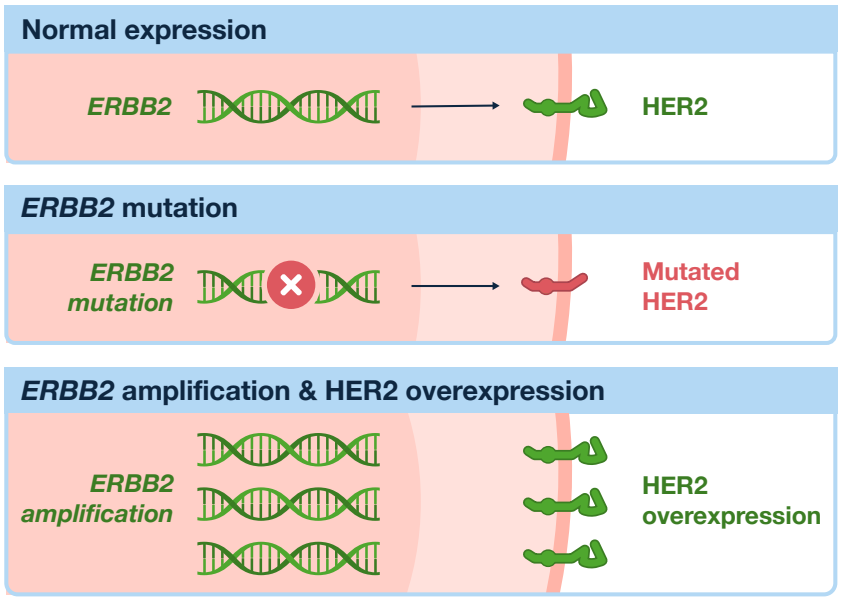
Mutated HER2 receptor

Finding changes in HER2 can help doctors choose the best treatment options for patients.[2,3]

**Biomarkers are measurable signs in the body that help doctors and researchers understand what's happening with your health.*[2]

What are HER2 alterations and who can have them?

HER2 alterations are changes in the HER2 gene (also called the *ERBB2* gene). HER2 alterations can occur in various forms, such as ***ERBB2* mutations** and ***ERBB2* amplification**, which can cause **overexpression** of the HER2 protein.[1,4]



The *ERBB2* gene in your body normally gives instructions to make the right amount of a protein called HER2.[1,3]

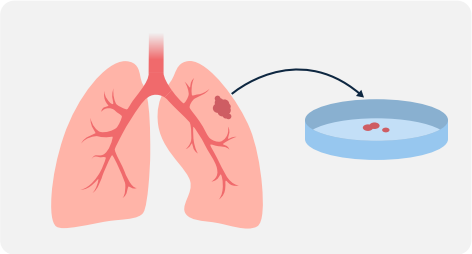
A mistake in the *ERBB2* gene, known as an ***ERBB2* mutation**, can prevent the HER2 protein from working normally. This may cause cells to keep receiving "grow and divide" signals without getting a "stop" signal, making them multiply uncontrollably and potentially leading to cancer.[3,4]

If there are additional copies of the *ERBB2* gene, known as ***ERBB2* amplification**, this may cause the body to create too much HER2 protein. In some instances, there can be too much HER2 on your cells, which is known as **HER2 overexpression.** Both these alterations can cause the cells to grow and divide more rapidly than normal cells.[1]

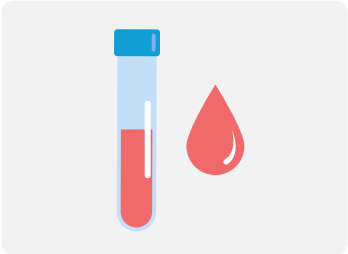
! **HER2 mutations occur in about 1-4% of all lung cancer cases. They are more often found in certain groups of people, like younger people, women, and those who have never smoked or smoked very little. They are also commonly found in patients with lung adenocarcinoma, which is a common type of non-small cell lung cancer (NSCLC).**[1,4]

How can I know if I have a HER2 mutation?

The only way to know if you have a **HER2 mutation** is through **biomarker testing**.[1]



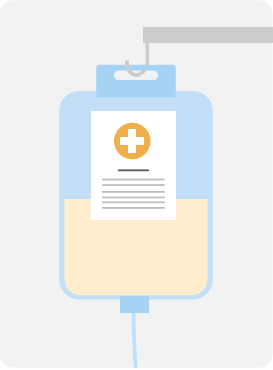
This will involve your doctor taking a **small sample of your lung tumor (called a tissue biopsy)**, which they use to check for changes in the *ERBB2* gene.[1]



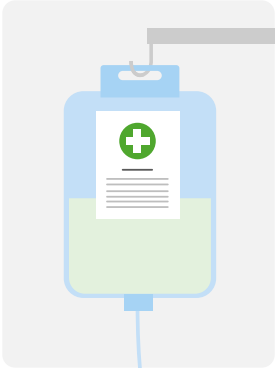
If you can't have a tissue biopsy, your doctor may use a **blood sample** instead. This is called a "liquid biopsy".[1]

In lung cancer, tests for HER2 usually look for *ERBB2* mutations, but they may also check for *ERBB2* amplifications or HER2 overexpression. Please be sure to check with your doctor which HER2 tests you are receiving.[1]

What are treatment options when you have a HER2 mutation?



If you have a **HER2 mutation**, this could affect the way your lung cancer is treated. For example, the **most advanced lung cancer (stage 4) with an *ERBB2* mutation** is usually treated with chemotherapy (anti-cancer drugs) first, sometimes along with immunotherapy (a treatment that uses a person's own immune system to fight cancer).[1,5]



If a change in treatment is needed, you might have the option to receive a therapy that affects only the HER2 protein **(HER2-targeted therapy).**[1,5]

To date, there is only one HER2-targeted therapy that is approved by the FDA. But several new treatments are being tested for lung cancer with **HER2 mutations**. If you have some type of HER2 mutation, you may be able to join a clinical trial.[1]

Knowing that you have a HER2 mutation may give you access to different treatment options, so it's a good idea to **talk to your doctor about getting tested**. Once you know, you can discuss your treatment options and whether a clinical trial might be a good option for you. Treatment and trial options might be different based on the specific type of HER2 mutation you have.[1]

Where can I find a clinical trial?

Lung Cancer Research Foundation (LCRF) Clinical Trial Finder
lcrf.careboxhealth.com

Clinical Trial Finder
clinicaltrials.gov

Where can I go for support or to learn more?

LCRF Lung Cancer Support Line
LCRF.org/support-line or (844) 835-4325

LCRF Online Support Community
LCRF.org/facebookgroup

LCRF Resources
LCRF.org/resources

Exon 20 Group
exon20group.org

References:

1. American Lung Association. HER2 and Lung Cancer. Available at: https://www.lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer/symptoms-diagnosis/biomarker-testing/her2 (Accessed June 2025).
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3. Murphrey MB, et al. Biochemistry, Epidermal Growth Factor Receptor. 2023. StatPearls [https://www.ncbi.nlm.nih.gov/books/NBK482459/]. (Accessed June 2025).
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5. My Cancer Companion. Lung cancer with HER2 mutation. Available at: https://www.mycancercompanion.com/content/lung-cancer-with-her2-mutation (Accessed June 2025).
6. American Cancer Society. Targeted Drug Therapy for Non-Small Cell Lung Cancer. Available at: https://www.cancer.org/cancer/types/lung-cancer/treating-non-small-cell/targeted-therapies.html (Accessed June 2025).

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