



# What You Need to Know About Lung Cancer Molecular Testing

## What is lung cancer molecular testing?

When your doctors suspected you had cancer, they had to take a small portion of your tumor (a biopsy) to have it examined. As part of that examination, a specialized doctor, called a pathologist, looked at your tumor cells under the microscope and found out you had lung cancer. The pathologist should also have been able to tell whether you have small cell lung cancer or non-small cell lung cancer (NSCLC), and, if you have NSCLC, if it was adenocarcinoma, squamous cell carcinoma, large cell or a more rare form.

Now, more detailed testing can be done on your tumor if your doctor requests it. These tests are sometimes referred to as molecular testing, and may involve:

- looking for changes (mutations) in the DNA make-up of the tumor
- looking at levels of specific proteins present in the tumor.

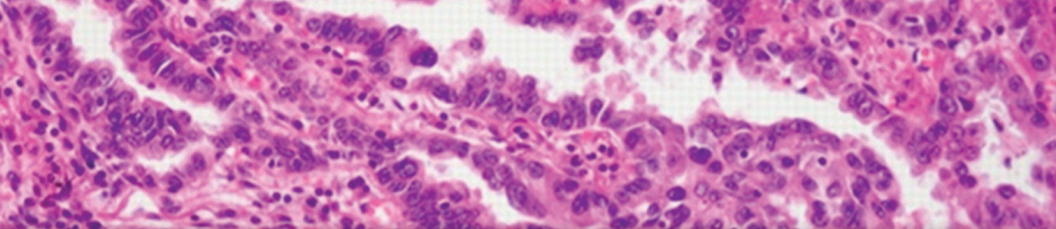
These characteristics are usually present in your tumor only, not in other tissues in your body.

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## Why should my tumor be tested?

Some lung cancer treatments are called “targeted therapies” because they are designed to target specific tumor characteristics. It is important to know if you have a tumor with one of these characteristics so you and your doctor can make well-informed decisions about your treatment.

Characteristics that can be targeted with commercially available treatments include (as of the writing of this resource):

### **Epidermal Growth Factor Receptor (EGFR) mutation:**

In normal cell growth, small chemicals called growth factors are produced by one cell and attach to proteins called receptors on that same or nearby cells - like a baseball fitting into a catcher’s glove. By attaching to these receptors, the growth factors start a chemical reaction inside the cell, which causes the cell to grow and multiply. In cancer, there may be too many growth factors present, or the receptor may be mutated so that it “thinks” the growth factor is attached when it really isn’t. One such receptor that can be mutated in lung cancer is the EGFR.

### **Anaplastic Lymphoma Kinase (ALK) gene rearrangement:**

- ALK is another growth factor receptor that can be present in cancer cells.
- ALK appears to be essential during fetal development, and is normally present in adults only in brain tissue.
- However, in some cancer cells, a type of mutation called a gene rearrangement occurs that fuses another gene to ALK and “turns it on,” telling cancer cells to multiply.

Testing for EGFR and ALK mutations is particularly recommended if you have the adenocarcinoma sub-type of NSCLC, though other sub-types can also contain these characteristics. Generally, if one of these tumor characteristics is present, the other is not.



**Multiple other therapy options for specific genetic and protein level changes are being examined in clinical trials:**

**Clinical trials** are research studies where patients participate to help evaluate new cancer treatments. Many clinical trials for lung cancer require tumor testing to match a therapy being tested to the patients it is most likely to benefit.

To find clinical trials that match your particular type of cancer, stage of disease and other health factors, call 1-800-698-0931 or visit

[www.emergingmed.com/networks/NationalLungCancerPartnership/](http://www.emergingmed.com/networks/NationalLungCancerPartnership/)

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## How do I get my tumor tested?

If there is enough tissue from the original biopsy of your tumor, this tissue can be tested. If not, you may need a second biopsy or minor surgery to get enough tissue to test. Results are usually sent back to your doctor between one and three weeks later.

If your doctor doesn't recommend tumor testing for you, it is okay for you to ask why not. Testing may not be appropriate in all cases, but it is best for you to know as much as you can about your disease so you and your doctors can be full partners in your care. If you have questions about the response you receive from your doctor, it is okay to ask for a second opinion from another doctor.

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## What if my test results don't qualify me for targeted treatment?

Even if your tumor does not have known characteristics that can be matched to a targeted treatment that is available commercially or through a clinical trial, molecular testing can still help you and your doctor decide on the right treatment option for you.

In these cases, the very best care will still be given to you.



For additional information on lung cancer,  
molecular testing and where to find a  
lung cancer doctor, please visit  
[www.NationalLungCancerPartnership.org](http://www.NationalLungCancerPartnership.org).