

BRIDGING The Biomarker Gaps

Recent scientific discoveries have led to a **better understanding of the genomic makeup of many forms of cancer and tumors**, including the identification of “biomarkers” — biological alterations that can identify the underlying drivers of disease and, in some cases, may identify treatment options with potentially better efficacy and safety for your cancer.

When you get tested for biomarkers, your provider will use either new or existing biopsy material collected as part of diagnosing disease, and send the sample to a laboratory for analysis. There, experts examine your DNA or RNA to look for actionable biomarkers.

These findings are shared in a report, which you and your doctor can review. This information can be used to inform a personalized treatment plan. In some cases, a targeted therapy — designed for your specific gene alteration — may be available.



WHAT IS COMPREHENSIVE BIOMARKER TESTING?

Comprehensive Biomarker Testing includes the use of next-generation sequencing (NGS) technologies which can detect many genomic alterations in a single test in order to **potentially provide more accurate diagnosis and therapy guidance** to your doctors.

DID YOU KNOW?

More than 1.8 million Americans will face a new cancer diagnosis this year⁽ⁱ⁾. Each of these cases is unique, but there’s one thing everyone has in common: the right to personalized care.

Biomarker testing gives you — and the thousands of people fighting alongside you — more knowledge and helps empower well-informed treatment decisions.

WHY SHOULD I TALK TO MY DOCTOR ABOUT GETTING TESTED?

1

Testing for the presence of biomarkers is necessary for personalized oncology care, as the results can help identify precise treatment options targeted to your particular cancer.

You have a personal cancer story. Your treatment should be personal, too.

2

As more targeted therapies become available for people with cancer, biomarker testing is quickly emerging as the standard of care: more than half of the cancer treatments released in the past five years required or recommended biomarker testing⁽ⁱⁱ⁾.

3

Patients that are treated with targeted therapies tend to have fewer rounds of “failed treatment” and often experience fewer side effects than with chemotherapy⁽ⁱⁱⁱ⁾.

Biomarker testing, and personalized medicine more broadly, may result in cost savings by narrowing the scope and duration of treatment.

WHEN IT COMES TO CANCER TREATMENT, ONE SIZE DOESN'T FIT ALL – What can you do?



TAKE ACTION

If you or a loved one are diagnosed with cancer, ask your doctor about biomarker testing.



SPREAD THE WORD

Help make biomarker testing common knowledge.

i <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2021/cancer-facts-and-figures-2021.pdf>
ii https://www.iqvia.com/form-pages/institute-gated?redirectUrl=%2f-%2fmedia%2fiqvia%2fpdfs%2finstitute-reports%2fiqvia-institute-supporting-precisiononcology-report.pdf%3f_%3d1619527340470&Name=IQVIA-Institute-Supporting-Precision-Oncology-Report
iii [https://cdn.trustedtechexperts.com/docs/LungCancerInitiativeNC2017/biomarker%20rack%20card%202020\(1\).pdf](https://cdn.trustedtechexperts.com/docs/LungCancerInitiativeNC2017/biomarker%20rack%20card%202020(1).pdf)

About Comprehensive Biomarker Testing

Increasingly, cancer is being approached with precision medicine methods. Biomarker testing plays an important role in ensuring that a patient gets matched to the right treatment at the right time, based on the patient's biomarker status.¹

What is biomarker testing?

The best way to know if a cancer has a treatable alteration is to talk to a doctor about getting tested for all treatable biomarkers.²

Next-generation sequence (NGS) testing is a method to look at multiple genes in a tumor sample all at the same time to test for genomic biomarkers.³



How are biomarker tests conducted for patients with cancer?

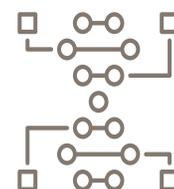
Certain biomarker tests require a doctor to biopsy the tumor,* which means removing some tissue or blood for testing. Some biopsies are surgical, may require sedation, and come with a risk of infection. A doctor will select the right type of biopsy for your tumor.^{4,5}



*If your tumor has been biopsied previously, some tissue may already be available for testing.

Why is it important to test for all treatable biomarkers?

It is important for patients to speak with a doctor about testing for all treatable biomarkers. Knowing what is driving a certain type of cancer may help in the selection of a treatment.²



When is biomarker testing appropriate?

- When the doctors suspect cancer and have recommended a biopsy
- When a patient is already diagnosed with cancer
- When a patient's cancer recurs (comes back) after treatment¹



Are other testing options available?

If NGS is not available, other detection testing methods may be used.



In a time when there are many cancer treatments available, comprehensive biomarker testing may help patients and doctors find the right treatment option.

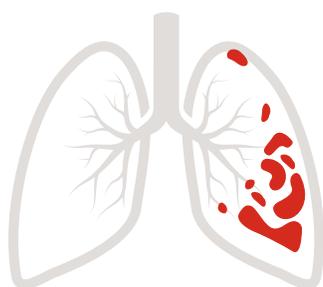
1. Lungevity. Biomarker Testing. Available at: <https://lungevity.org/for-patients-caregivers/lung-cancer-101/diagnosing-lung-cancer/biomarker-testing>. Accessed April 6, 2020.
2. Gregg JP, Li T, Yoneda KY. Molecular testing strategies in non-small cell lung cancer: optimizing the diagnostic journey. *Transl Lung Cancer Res.* 2019;8(3):286-301. 3. Lungevity. Webinar: Comprehensive Biomarker Testing in Advanced-Stage Lung Cancers. Available at: <https://lungevity.org/news-blogs/blogs/webinar-comprehensivebiomarker-testing-in-advanced-stage-lung-cancers>. Accessed April 6, 2020. 4. Biopsy: what you need to know. Medical News Today. https://www.medicalnewstoday.com/articles/174043.php#what_is_a_biopsy. Accessed February 6, 2020. 5. Cheung AHK, Chow C, To KF. Latest development of liquid biopsy. *J Thorac Dis.* 2018;10:S1645-S1651.

UNDERSTANDING Metastatic *RET* Fusion-Positive Non-Small Cell Lung Cancer (NSCLC)

ABOUT METASTATIC LUNG CANCER

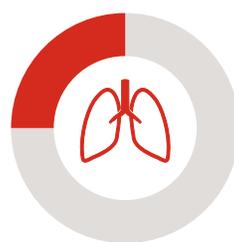
Lung cancer is a cancer that starts in a person's lungs. Metastatic cancer means cancer cells have spread to other parts of the body.

Lung cancer may spread to other parts of the body, including bones, adrenal glands, the brain, and the liver. People with lung cancer whose cancer cells have spread to these places likely have metastatic cancer.



Lung cancer is the:¹

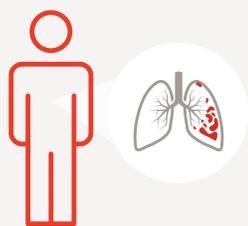
- **2nd most common** cancer
- Leading cause of cancer death among both men and women, accounting for almost **25% of all cancer deaths**.



Every year, more people die of lung cancer than of **colon, breast, and prostate** cancers combined.¹

THE AMERICAN CANCER SOCIETY ESTIMATES THAT IN 2021, THERE WILL BE:¹

About **235,760** new cases of lung cancer in the U.S.



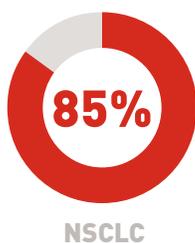
About **131,880** deaths from lung cancer in the U.S.



ABOUT METASTATIC NSCLC

There are two main types of lung cancer: small cell lung cancer (SCLC) and NSCLC.

About 85% of people with lung cancer have NSCLC.



The main subtypes of NSCLC are **adenocarcinoma, squamous cell carcinoma, and large cell carcinoma**.

These subtypes start from different types of lung cells, but are grouped together as NSCLC because they usually have a similar treatment and prognosis.²



WHAT IS METASTATIC *RET* FUSION-POSITIVE NSCLC?

Metastatic NSCLC can be driven by a gene in a person's body. One of those genes is *RET* (rearranged during transfection).³

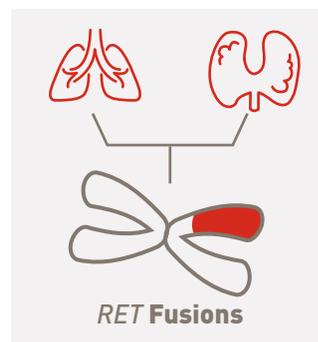
We all have something called *RET* in our bodies, similar to how we have faucets in our homes. When a person has a *RET* alteration, it's like that faucet gets stuck in the "on" position, allowing water to spread, just as *RET* alterations allow cancer to grow.^{3,4}



The two main types of these cancer-promoting *RET* gene alterations are mutations and fusions.^{3,5}

RET fusions can drive cancer growth of several tumor types, and are most commonly found in NSCLC and certain types of thyroid cancer.³

RET fusions have been identified in approximately **2%** of NSCLC cases.³



HOW ARE GENOMIC ALTERATIONS IN CANCER IDENTIFIED?

The best way to know if a cancer has an alteration that can be treated is to **talk to a doctor about getting tested for all treatable biomarkers**.⁶

A biomarker test is a type of genomic test that can tell the doctor a lot about the cancer's DNA.⁷ Certain biomarker tests require a doctor to biopsy the tumor, which means removing some tissue or blood for testing.^{*8,9}

These tests help oncologists develop a treatment plan for their patients. Knowing what is driving the cancer can help the patient and his or her doctor choose the right treatment.⁶



*If a tumor has been biopsied previously, some tissue may already be available for testing.

1. American Cancer Society. Key Statistics for Lung Cancer. Available at: <https://www.cancer.org/cancer/lung-cancer/about/key-statistics.html>. Accessed February 28, 2020. 2. American Cancer Society. What is Lung Cancer? Available at: <https://www.cancer.org/cancer/lung-cancer/about/what-is.html>. Accessed February 28, 2020. 3. Drilon A, Hu ZI, Lai GGY, Tan DSW. Targeting *RET*-driven cancers: lessons from evolving preclinical and clinical landscapes. *Nat Rev Clin Oncol*. 2018;15(3):150. 4. Pinheiro APM, Pocock RH, Dixon MD, et al. Using metaphors to explain molecular testing to cancer patients. *Oncologist*. 2017;22:445-449. 5. Mulligan LM. *RET* revisited: expanding the oncogenic portfolio. *Nat Cancer Rev*. 2014;14(3):173-186. 6. Gregg JP, Li T, Yoneda KY. Molecular testing strategies in non-small cell lung cancer: optimizing the diagnostic journey. *Transl Lung Cancer Res*. 2019;8(3):286-301. 7. Committee on Policy Issues in the Clinical Development and Use of Biomarkers for Molecularly Targeted Therapies; Board on Health Care Services; Institute of Medicine; National Academies of Sciences, Engineering, and Medicine; Graig LA, Phillips JK, Moses HL, eds. *Biomarker Tests for Molecularly Targeted Therapies: Key to Unlocking Precision Medicine*. Washington, DC: National Academies Press (US); 2016: 1-21. 8. Biopsy: what you need to know. Medical News Today. https://www.medicalnewstoday.com/articles/174043.php#what_is_a_biopsy. Accessed February 6, 2020. 9. Cheung AHK, Chow C, To KF. Latest development of liquid biopsy. *J Thorac Dis*. 2018;10:S1645-S1651.