For patients who have been diagnosed with non-small cell lung cancer (NSCLC)

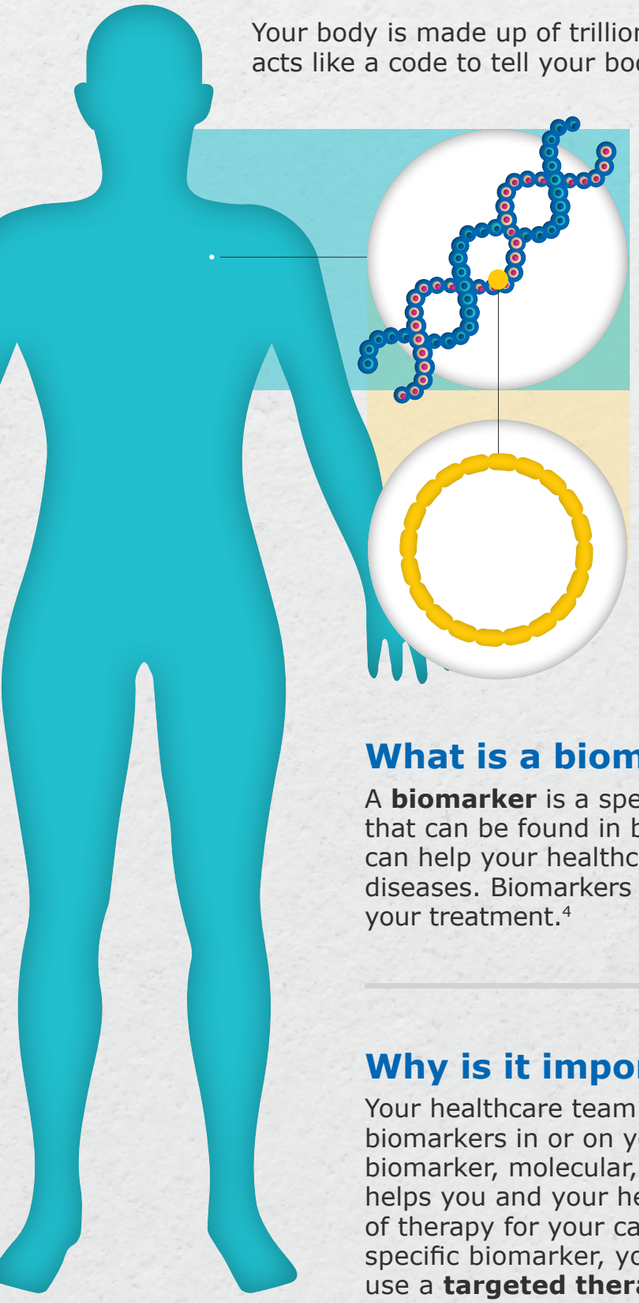
What is biomarker testing and how can it help with your treatment?

After you've been diagnosed, it can be shocking and confusing, and you likely have a lot of questions. This brochure has been created to help you understand some important steps in your treatment journey, and to help you and your healthcare team make decisions that are best for you.

Your healthcare team needs as much information as possible to provide you with the best treatment options. This is why **your healthcare team has recommended biomarker testing, which may identify specific biomarkers in your tumor that can help you and your healthcare team better understand your lung cancer**. This brochure will explain what a biomarker is, why it is important to test for them, which ones you should be tested for, how the testing is done, and what the test results will mean.

What is cancer and how is it treated?

Cancer is a disease that happens when some **cells** in the body grow uncontrollably. Sometimes, these cancerous cells will spread throughout the body.[1]



Your body is made up of trillions of cells, and these cells carry **DNA**, which acts like a code to tell your body how to properly develop and function.[1]

You can think of DNA like words in a book. Your body reads this book to know how to function. But if there's a mistake in a word, like a typographical error, it can change the word's meaning (think of *shar**k*** and *shar**e***).[1]

These errors (or **mutations**) in your DNA may lead to uncontrolled cell growth and cause masses in your body known as **tumors**.[1,2]

These mutations in your DNA are a type of biological marker, or **biomarker**.[3] These biomarkers can help you and your healthcare team decide on the best therapy for you.[3]

What is a biomarker?

A **biomarker** is a specific indicator or mutation in your tumor that can be found in blood, tissues, or other bodily fluids. They can help your healthcare team better understand conditions and diseases. Biomarkers may also help healthcare teams personalize your treatment.[4]

Why is it important to test for biomarkers?

Your healthcare team will test your **tumor** to identify specific biomarkers in or on your tumor.[3] These tests are sometimes called biomarker, molecular, or genomic testing.[3] Testing for biomarkers helps you and your healthcare team decide what the best course of therapy for your cancer might be. If you test positive for a specific biomarker, you and your healthcare team may decide to use a **targeted therapy** that is specific for your tumor type.[3]

How is biomarker testing performed?

To perform a biomarker test, your healthcare team will need to take a sample of your tumor. This may be done by performing a **tissue biopsy** or collecting a blood sample for a **liquid biopsy**.[5]

Your healthcare team will work with you to determine the best type of biopsy for you at this time.

A **tissue biopsy** involves obtaining a small amount of tissue from your tumor. This sample is tested for the presence of biomarkers. Because the tumor sample used for testing is taken directly from your tumor, this is a more direct approach.[5]

A **liquid biopsy** involves collecting a blood sample. This sample is used to examine any DNA that may have been "shed" by tumor cells into your bloodstream to determine the presence of biomarkers. Some tumors may not be detected by liquid biopsy.[5]

What will the test results mean?

The results of your biomarker testing will help your healthcare team determine which type of treatment you should get, such as **targeted therapy, immunotherapy, or chemotherapy**.[3]

Targeted therapy is a type of cancer treatment (might be a pill that you swallow in some instances)[6] that specifically destroys cancers cells.[7]

Immunotherapy is a type of cancer treatment that boosts your body's own immune system to help target and destroy cancer cells. This is usually delivered by an intravenous infusion.[8]

Chemotherapy is a type of cancer treatment that is also administered to kill cancer cells.[9,10] This is usually delivered by an intravenous infusion.[11]

If you have more questions about your illness, testing, or treatment, talk to your healthcare team.

Key takeaways

Biomarkers may show how well your body will respond to a particular treatment and help you and your healthcare team personalize the best therapy option for you.[3,5]

Tissue and/or liquid biopsy samples may be used for biomarker testing. Your healthcare team will work with you to choose the method that is right for you.[5]

Results of your biomarker testing will help you and your healthcare team determine which type of treatment is best for you.[3]

Notes

The endorsement mark certifies that the information presented in this resource is reliable and credible.

Glossary

Biomarker[4] A specific marker or mutation found in blood, tissues, or other bodily fluids. They can help your healthcare team better understand conditions and diseases.
Cell[12] Microscopic units that make up the human body. The body is made of trillions of cells that work together.
DNA[13] A molecule that carries genetic information for the development and functioning of an organism.
Immunotherapy[8] A type of cancer treatment that boosts the body's own immune system to help target and destroy cancer cells.
Liquid biopsy[5] A procedure that involves collecting a blood sample. This sample is used to examine any DNA that may have been "leaked" by tumor cells into the bloodstream to determine the presence of biomarkers.
Mutations[5] "Alterations" that happen within the body's DNA that can lead to illnesses, such as cancer.
NSCLC[5] Non-small cell lung cancer.
Targeted therapy[7] A type of cancer treatment that uses drugs to target and destroy cancer cells directly.
Tissue biopsy[5] A procedure that involves cutting a small amount of tissue from a tumor. This sample is tested for the presence of biomarkers.
Tumor[1,2] A mass of cells that grows in the body as the result of DNA mutation.

References

1. Canadian Cancer Society. How cancer starts, grows and spreads. Accessed March 3, 2023. https://cancer.ca/en/cancer-information/what-is-cancer/how-cancer-starts-grows-and-spreads
2. Canadian Cancer Society. Types of tumors. Accessed August 21, 2023. https://cancer.ca/en/cancer-information/what-is-cancer/types-of-tumours
3. American Lung Association. Lung cancer biomarker testing. Accessed March 3, 2023. https://www.lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer/symptoms-diagnosis/biomarker-testing
4. National Cancer Institute. Dictionary of cancer terms. Accessed March 3, 2023. https://www.cancer.gov/publications/dictionaries/cancer-terms/def/biomarker
5. Lungevity. Biomarker testing. Accessed March 3, 2023. https://www.lungevity.org/for-patients-caregivers/navigating-your-diagnosis/biomarker-testing
6. Liu GH, Chen T, Zhang X, et al. Small molecule inhibitors targeting the cancers. *MedComm (2020)*. 2022;3(4):e181. doi: 10.1002/mco2.181
7. American Cancer Society. Targeted therapy. Accessed March 3, 2023. https://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html
8. American Cancer Society. Immunotherapy. Accessed March 3, 2023. https://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html
9. American Cancer Society. How chemotherapy drugs work. Accessed August 9, 2023. https://www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy/how-chemotherapy-drugs-work.html.
10. American Cancer Society. How is chemotherapy used to treat cancer? Accessed August 9, 2023. https://www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy/how-is-chemotherapy-used-to-treat-cancer.html.
11. Canadian Cancer Society. Chemotherapy. Accessed September 18, 2023. https://cancer.ca/en/treatments/treatment-types/chemotherapy
12. Visible Body. What are cells and what do they do? Accessed March 3, 2023. https://www.visiblebody.com/learn/biology/cells/cell-overview
13. NIH National Human Genome Research Institute. Deoxyribonucleic acid (DNA). Accessed September 18, 2023. https://www.genome.gov/genetics-glossary/Deoxyribonucleic-Acid

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