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Biomarker Testing in Cancer Treatment

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Trying to understand how biomarker testing fits into your cancer care plan can be overwhelming. But having a sense of how biomarker testing works may help you make better decisions with your doctor on what treatments may be best for you.

Biomarker testing is a way to look for certain biological substances that can provide doctors with information about a person’s cancer. Some biomarkers are unusually high levels of certain proteins made by cancer cells; this is called overexpression. Other biomarkers are specific gene mutations that help cancer develop and grow.

Biomarker testing is for people who already have cancer, either a solid tumor cancer, like lung cancer, or a blood cancer, like leukemia. Some biomarker tests may check for one biomarker, while others may check for multiple biomarkers at once.

Depending on the type of cancer that a person has, a doctor will need to take a sample of that person's cancer cells for biomarker testing. There are different ways this can be done. For people who have a cancer that has a solid tumor (like breast cancer or lung cancer), the doctor would take a biopsy where they remove a piece of tissue or sample of cells from the body. Another way is a liquid biopsy, which is done by taking a sample of blood or other fluids, when a person has a blood cancer or their tumor is too hard to reach to get cells from it. In either case, the samples are sent to a lab to be tested.

Below are some common biomarkers that doctors may test for and the cancer they are often associated with:

Biomarker	**Cancers known to be related to the b**
BRCA1 and *BRCA2* mutations	Breast and ovarian cancers
TP53 mutation	Cholangiocarcinoma, Wilms tumor, and o head and neck, bladder, lung and melanc
KRAS mutation	Colorectal cancer and non-small cell lung
HER2 protein overexpression	Breast, ovarian, bladder, pancreatic and cancers
PD-L1 protein overexpression	Non-small cell lung cancer, liver and ston gastroesophageal junction cancer and cla lymphoma
PSA protein overexpression	Prostate cancer
ALK mutation	Non-small cell lung cancer, anaplastic lar lymphoma, histiocytosis
BRAF mutation	Cutaneous melanoma, Erdheim-Chester d Langerhans cell histiocytosis, colorectal c non-small cell lung cancer
EGFR mutation	Non-small cell lung cancer, glioblastoma, head and neck, breast and pancreas canc
ROS1 mutation	Non-small cell lung cancer

*This is not a full list of all biomarkers and cancer types related to each.

The results of biomarker testing may show that a person’s cancer might respond to an available therapy. Certain therapies might even target a specific biomarker. Or the results may show that the person’s cancer has a biomarker that makes it less likely a specific therapy will work — this information could spare a person from receiving a treatment that was not the best option. Biomarker testing may also help doctors find and recommend a clinical trial investigating a potential new cancer treatment that is related to a specific biomarker.

In short, biomarker testing can be a useful tool to help you and your doctor choose a cancer treatment. To help guide discussions with your doctor about biomarker testing and your cancer care, you can find a list of potential questions to ask here. Asking questions can help you better understand the role of biomarker testing and how it can uncover more information that may help in your cancer care.