



A PATIENT GUIDE TO GENOMIC TESTING

Know *what to ask* before treatment starts.

The broadest genomic tests available for your cancer type,
and the questions worth bringing to your oncologist.

INSIDE

10+

broad genomic tests
compared side by side

20+

specialized tests listed by
cancer type

10+

questions to bring to your
next appointment

START HERE

Why this guide exists

The more you and your oncologist know about your cancer, the more informed your treatment decisions can be.

Genomic testing reads a tumor to look for what is driving it. Tests differ a great deal in how much they read. Some look at only a handful of DNA genes, and many do not read RNA at all. A test cannot report on what it never looks at.

Many patients are left in the dark when the testing decision is made. This guide lays it out in one place, in plain language, so that you can walk into your next appointment knowing what exists and what is worth asking about.

1 More information, more informed decisions

A test can only report on what it reads. The broader the test, the fewer potentially treatable findings are left unseen.

2 You should know what is out there

Every patient deserves to see the range of tests that exist and what separates them, whether or not it comes up in the clinic.

3 Good questions make better appointments

You do not need to be an expert. This guide gives you the words and the questions to start a real conversation.

4 Your oncologist decides with you

This guide does not recommend a test and does not know your medical history. Your oncologist is the one who can weigh what fits your case.

THEN

<50

DNA genes analyzed by standard tests historically



NOW

~21,000

DNA and RNA genes examined by the broadest tests today

How to use this guide

1 Read the five things worth knowing

The ideas behind the tests, each with questions to ask.

Pages 2 and 3

2 Find the tests for your situation

Tissue, blood, blood cancers, and tests by cancer type.

Pages 4 to 8

3 Take the question sheet with you

Tick the ones that apply and write down the answers.

Page 9

 No company pays to be listed or influences the ranking, and this guide does not recommend any specific test.

THE BASICS

Five things worth knowing

Cancer testing does not have to be complicated. Here is what matters, explained simply.

1

✂ More complete testing = More informed treatment decisions

Historically, many cancer tests searched for a limited number of DNA genes (fewer than 50 typically). Broader sequencing was simply too slow and expensive. Today, advanced testing can examine roughly 21,000 genes while analyzing RNA too, revealing cancer-driving alterations that narrower tests may miss. If your tumor's driver falls outside the test's scope, a potentially treatable finding can go undetected.

9% to 32%

Broad results keep working for you. In a study of more than 47,000 tumors, 9% of patients had a result that matched an approved targeted treatment in 2017. By 2022 it was 32%, from the same test results, because new treatments had been approved.

ASK YOUR ONCOLOGIST

- How many genes does this test look at, and does it include RNA?
- If this test finds nothing actionable, would broader testing be worth doing?

2

🔗 DNA isn't the whole story, RNA matters too

DNA is your cells' instruction manual. RNA is what happens when a cell actually reads and acts on those instructions, including mistakes where two genes get fused together in a way that can drive cancer growth. Without reading the RNA, these "gene fusions" can be missed entirely, because DNA alone often cannot reveal them, and a targeted therapy that could work better than standard treatment is never identified.

ALK, ROS1, RET, NTRK

Examples of gene fusions that have therapies built to target them. DNA-only testing can miss fusions that RNA testing detects.

ASK YOUR ONCOLOGIST

- Does my test analyze RNA, or only DNA?
- If my DNA results show no driver, should RNA testing be added?

3

💧 Not every mutation detected in your blood comes from the cancer

As people age, some of their normal blood cells naturally pick up small mutations that have nothing to do with cancer. This is called CHIP. It's common, especially in older adults. Without separating non-cancer mutations from cancer mutations, which many tests do not do, you risk an improper treatment pathway or an incorrect diagnosis.

~50%

In one study of patients with advanced cancer, about half of the mutations found in blood came from aging blood cells and not from the tumor.

ASK YOUR ONCOLOGIST

- Can this blood test tell the difference between CHIP mutations and cancer mutations?
- If it cannot, how will you know which mutations came from my cancer?
- Can both tissue and blood be tested in my case?

4

A simple test can tell if standard chemotherapy is unsafe for you

Some of the most widely used chemotherapy drugs are cleared from the body by enzymes that a small number of people are born with less of. If you were born with less of one of these enzymes, a standard dose can act like an overdose, and the reaction can be severe or fatal. A simple test before treatment shows whether this is a concern. If it is, your dose may need to be lowered or the drug changed.

DPYD, UGT1A1

The two inherited genes that matter most for chemotherapy safety in solid tumors. DPYD affects fluorouracil and capecitabine. UGT1A1 affects irinotecan.

ASK YOUR ONCOLOGIST

- For solid tumors, does my treatment plan include fluorouracil, capecitabine or irinotecan? If so, can DPYD and UGT1A1 be tested before my first dose?
- For blood cancers, does my treatment plan include mercaptopurine, azathioprine or rasburicase? If so, can TPMT, NUDT15 and G6PD be tested before my first dose?
- If a problem is identified, would you lower the dose or change the drug?

5

The right diagnosis can change the treatment

Most of the time, doctors can determine where a cancer began. Sometimes, however, its origin remains unknown. Most broad profiling tests now use AI to predict a tumor's likely origin when pathology alone cannot provide a clear answer. Small panels do not read enough of the tumor to do this. These tools can also flag cases where the tumor's profile does not match the original diagnosis. Because treatment options depend on the type of cancer, clarifying its origin can change which therapies a patient may qualify for.

Origin shapes options

Treatment options depend on the type of cancer, so clarifying where it started can change which therapies a patient may qualify for.

ASK YOUR ONCOLOGIST

- Is the origin of my cancer fully certain, or is there some doubt?
- Does the profiling test you're ordering include a tissue-of-origin prediction?

How to read the test pages

The next three pages compare tests feature by feature. Here is why each feature matters.

DNA Genes

How much of the tumor's DNA the test reads. More genes means fewer blind spots.

RNA Genes

Whether the test also reads RNA, which is how many gene fusions are found.

CHIP Correction

Blood tests only. Whether the test separates age-related blood cell mutations from tumor mutations.

Tissue Of Origin Detection

Whether the test can predict where the cancer started when that is unclear.

AI Signatures

Predictions the lab calculates from the tumor's overall pattern using a trained computer model.

Chemo Safety

Whether inherited genes that affect chemotherapy dosing, such as DPYD and UGT1A1, are reported. If not, a separate pharmacogenomic (PGx) test can check them.

Genomic Signatures

Tumor-wide markers the test reports, such as TMB and MSI. See Words you will see.

Add-On

Offered by the same lab but ordered in addition to the base test. It may need its own order and, in some cases, its own sample. Ask whether your oncologist plans to order it too.

THERAPY SELECTION TESTS

Tissue-based tests for solid tumors

Run on tumor tissue from a biopsy or surgery, to help guide the choice of treatment.

KEY FEATURES	① CARIS LIFE SCIENCES MI Cancer Seek	② TEMPUS xT + xR	③ GUARDANT HEALTH Guardant360 Tissue	④ FOUNDATION MEDICINE FoundationOne CDx
DNA Genes How much DNA is read	~21,000 (Whole Exome)	648	742	324
RNA Genes Finds gene fusions	✓ ~21,000 (Whole Transcriptome)	✓ ~21,000 (Whole Transcriptome, Add-On)	✓ 367	✓ 318 (Add-On)
Tissue Of Origin Detection Predicts where it started	✓ Caris GPSai	✓ Tempus TO	✓ Guardant MTT	✗ Not Available
AI Signatures Model-based predictions	✓ FOLFIRSTai (CRC Chemo Sequencing)	✓ IPS (Add-On) and PuriST Pancreatic (Add-On)	✗ Not Available	✗ Not Available
Chemo Safety Chemo dosing genes	✓ Add-On (Assure or PGx)	✓ Add-On (PGx)	✓ Add-On (PGx)	✓ Add-On (PGx)
Genomic Signatures Tumor-wide markers	TMB, MSI, HRD, gLOH, HLA Genotype	TMB, MSI, HLA Class I, HRD (Add-On)	TMB, MSI	TMB, MSI, LOH (Ovarian), HRDsig (Add-On)
Also Worth Knowing				Offers a separate pathologist-guided interpretation add-on for complex/CUP cases, distinct from an automated AI classifier.

✓ Included ✓ Add-On or partial. Read the cell. ✗ Not included or not available

Tests are ranked by the broadest total coverage available, DNA and RNA combined. No company pays to be listed or influences the ranking, and this guide does not recommend any specific test.

⌘ Tissue or blood?

Tissue is the gold standard in accuracy. Depending on where the tumor is located or how accessible it is, blood testing may be the only viable option. Many patients receive both. Ask your oncologist what best fits your case.

❓ Worth asking

- How many genes does this test look at, and does it include RNA?
- Does my test analyze RNA, or only DNA?
- Does the profiling test you're ordering include a tissue-of-origin prediction?

THERAPY SELECTION TESTS

Blood-based tests (liquid biopsy) for solid tumors

Run on a blood draw for patients with solid tumors, to help guide the choice of treatment.

KEY FEATURES	① CARIS LIFE SCIENCES Caris Assure	② GUARDANT HEALTH Guardant360	③ TEMPUS xF / xF+	④ FOUNDATION MEDICINE FoundationOne Liquid CDx	⑤ BILLIONTOONE Northstar Select
DNA Genes How much DNA is read	~21,000 (Whole Exome)	740	105 / 523	324	102
RNA Genes Finds gene fusions	✓ ~21,000 (Whole Transcriptome)	✗ Not Available	✗ Not Available	✗ Not Available	✗ Not Available
CHIP Correction Separates blood cell mutations	✓ Yes	✗ Inferred, Not Measured	✗ Inferred, Not Measured (xF+)	✗ Inferred, Not Measured	✓ Yes (Add-On)
Tissue Of Origin Detection Predicts where it started	✓ Caris GPSai	✓ Guardant MTT	✓ Tempus TO	✗ Not Available	✓ Northstar Origin (Add-On)
AI Signatures Model-based predictions	✓ FOLFIRSTai (CRC Chemo Sequencing)	✗ Not Available	✓ IPS (Add-On) and PuriST Pancreatic (Add-On)	✗ Not Available	✗ Not Available
Chemo Safety Chemo dosing genes	✓ Yes (DPYD, UGT1A1)	✓ Add-On (PGx)	✓ Add-On (PGx)	✓ Add-On (PGx)	✓ Add-On (PGx)
Genomic Signatures Tumor-wide markers	bTMB, MSI, HLA Genotyping	TMB, MSI, HRD (Add-On), HLA (Add-On)	bTMB, MSI, HLA Class I (xF+ only)	bTMB, MSI-H, ctDNA tumor fraction	MSI-H

✓ Included ✓ Add-On or partial. Read the cell. ✗ Not included or not available

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💧 Confirm your test filters out CHIP mutations

CHIP mutations come from aging blood cells, not from the cancer. Confirm that the blood test ordered filters them out, so that treatment is not chosen based on a misleading result.

🧐 Worth asking

- Can this blood test tell the difference between CHIP mutations and cancer mutations?
- If it cannot, how will you know which mutations came from my cancer?
- Can both tissue and blood be tested in my case?

THERAPY SELECTION TESTS

Hematologic tests for blood cancers

For leukemias, lymphomas and other cancers of the blood and bone marrow, to help guide the choice of treatment.

KEY FEATURES	① CARIS LIFE SCIENCES Caris ChromoSeq	② FOUNDATION MEDICINE FoundationOne Heme	③ NEOGENOMICS Neo Comprehensive - Heme Cancers	④ LABCORP Pan-Heme NGS
DNA Genes How much DNA is read	21,000+ (Whole Genome)	406	302	141
RNA Genes Finds gene fusions	✓ ~21,000 (Whole Transcriptome)	✓ 265	✓ 182	✗ Not Available
Chemo Safety Chemo dosing genes	✗ Not Available <i>Request a PGx test separately</i>	✗ Not Available <i>Request a PGx test separately</i>	✗ Not Available <i>Request a PGx test separately</i>	✗ Not Available <i>Request a PGx test separately</i>
Also Worth Knowing	Replaces separate karyotype, FISH, and panel testing with one report.		Plus 24 genes for copy number variants; 431 genes total across DNA and RNA.	

✓ Included ✓ Add-On or partial. Read the cell. ✗ Not included or not available

Tests are ranked by the broadest total coverage available, DNA and RNA combined. No company pays to be listed or influences the ranking, and this guide does not recommend any specific test.

⚠ Chemo safety is not on these panels

None of these panels report chemo safety genes. In blood cancers the genes that matter are TPMT and NUDT15, which affect thiopurines such as mercaptopurine, and G6PD, which affects rasburicase. A separate pharmacogenomic (PGx) test can check them before treatment starts.

❓ Worth asking

- Does my treatment plan include a thiopurine, such as mercaptopurine, or rasburicase?
- If so, can TPMT, NUDT15 and G6PD be tested before treatment starts?
- How many genes does this test look at, and does it include RNA?

BY CANCER TYPE

Specialized tests by cancer type

Some cancer types have specialized tests that are run near diagnosis. Ask your oncologist what applies to you.

BREAST**MI Clarity (Caris Life Sciences)**

A single test run on your tumor at diagnosis that answers two questions from one sample: whether chemotherapy is likely to help you now, and whether continuing hormone therapy past five years is likely to help you later.

Oncotype DX Breast (Exact Sciences)

Estimates recurrence risk and likely chemotherapy benefit at diagnosis for hormone-receptor-positive, HER2-negative early breast cancer.

Breast Cancer Index (Biotheranostics)

A gene-expression test that helps predict whether continuing hormone therapy beyond five years is likely to lower the risk of a later recurrence.

MammaPrint (Agendia)

A 70-gene tissue test run at diagnosis for early-stage breast cancer that sorts recurrence risk into High, Low, or Ultra Low to help decide whether chemotherapy is likely to help.

BluePrint (Agendia)

Run alongside MammaPrint on the same tissue sample to classify the subtype of the tumor (Luminal, HER2, or Basal), which helps guide which type of treatment is likely to work.

Prosigna (Veracyte)

A gene-expression test used at diagnosis to help decide whether chemotherapy can be safely avoided in certain hormone-receptor-positive breast cancers.

PreciseBreast / PDxBr (PreciseDx)

An AI-based digital pathology test that analyzes the tumor slide at diagnosis to help estimate recurrence risk alongside standard pathology.

DCISionRT (PreludeDx)

For ductal carcinoma in situ (DCIS), not invasive breast cancer. Run on the biopsy or surgical tissue to estimate recurrence risk and help decide whether radiation after surgery is likely to help.

COLORECTAL**Oncotype DX Colon (Exact Sciences)**

Used after surgery in Stage II colon cancer to help estimate recurrence risk and inform the chemotherapy decision.

LUNG (NSCLC)**LungOI (Imagene)**

An AI test that reads the existing pathology slide to give a fast read on common actionable biomarkers, as a bridge while full NGS results are still pending.

PROSTATE**Decipher Prostate (Veracyte)**

A genomic risk score used around diagnosis or after prostate surgery to help guide how intensive treatment should be.

Genomic Prostate Score (MDxHealth)

Run on biopsy tissue at diagnosis to help predict how aggressive the cancer is likely to be.

ArteraAI Prostate (Artera)

An AI test that combines the biopsy pathology image with clinical details to help predict how the cancer is likely to behave and whether adding hormone therapy to radiation is likely to help.

MELANOMA**DecisionDx-Melanoma (Castle Biosciences)**

A genomic test at diagnosis that helps guide staging decisions and surveillance intensity for cutaneous melanoma.

MyPath Melanoma (Castle Biosciences)

Helps classify an ambiguous mole or lesion as benign or melanoma when a visual diagnosis alone is unclear.

BLADDER

Decipher Bladder (Veracyte)

A genomic risk score used at diagnosis to help guide treatment intensity for muscle-invasive bladder cancer.

THYROID NODULES

Afirma (Veracyte)

Run on an indeterminate thyroid nodule biopsy to help determine whether it's benign or cancerous, before deciding on surgery.

SQUAMOUS CELL CARCINOMA (SKIN)

DecisionDx-SCC (Castle Biosciences)

Estimates metastasis risk at diagnosis for squamous cell carcinoma with one or more risk factors.

UVEAL MELANOMA

DecisionDx-UM (Castle Biosciences)

A prognostic test at diagnosis that helps estimate metastatic risk for this eye cancer.

PANCREATIC

PurIST (Tempus)

Classifies pancreatic tumor subtype at diagnosis, which can inform chemotherapy selection.

HEAD AND NECK

OncoPrism-HNSCC (Cofactor Genomics)

An RNA-based test for recurrent or metastatic head and neck squamous cell carcinoma that helps predict whether immunotherapy is likely to control the disease.

CANCER OF UNKNOWN PRIMARY (CUP)

GPSai (Caris Life Sciences)

Developed specifically to identify the likely tissue of origin in cancer of unknown primary (CUP), by comparing the tumor's genomic and gene-expression profile against a large library of known cancers. It can also help confirm or clarify the diagnosis for other tumors when the origin or subtype is uncertain. Automatically included, at no extra cost and with no separate sample, whenever Caris MI Cancer Seek and/or Caris Assure is ordered.

CancerTYPE ID (Biotheranostics)

A separate, standalone test run on the biopsy tissue that compares its gene-expression pattern to known tumor types, to help identify the likely site of origin when it is not otherwise clear.

? Cancer type not listed here?

Broad genomic profiling is the main question to raise with your oncologist.

Read more from the test makers

Only your oncologist can order these tests.

Caris
carislifesciences.com

Tempus
tempus.com

Guardant
guardanthealth.com

Foundation
foundationmedicine.com

TAKE THIS PAGE WITH YOU

Questions to bring to your appointment

Tick the questions that apply to you and write down what you hear. There are no wrong questions.

CANCER TYPE

STAGE

DATE

ONCOLOGIST

⌘ HOW MUCH DOES MY TEST READ?

☐ How many genes does this test look at, and does it include RNA?

☐ If this test finds nothing actionable, would broader testing be worth doing?

🔗 IS RNA INCLUDED?

☐ Does my test analyze RNA, or only DNA?

☐ If my DNA results show no driver, should RNA testing be added?

💧 IF A BLOOD TEST IS USED

☐ Can this blood test tell the difference between CHIP mutations and cancer mutations?

☐ If it cannot, how will you know which mutations came from my cancer?

☐ Can both tissue and blood be tested in my case?

🧪 BEFORE CHEMOTHERAPY STARTS

☐ For solid tumors, does my treatment plan include fluorouracil, capecitabine or irinotecan? If so, can DPYD and UGT1A1 be tested before my first dose?

☐ For blood cancers, does my treatment plan include mercaptopurine, azathioprine or rasburicase? If so, can TPMT, NUDT15 and G6PD be tested before my first dose?

☐ If a problem is identified, would you lower the dose or change the drug?

📍 IS THE ORIGIN CERTAIN?

☐ Is the origin of my cancer fully certain, or is there some doubt?

☐ Does the profiling test you're ordering include a tissue-of-origin prediction?

TEST OR TESTS DISCUSSED

SAMPLE

☐ Tissue☐ Blood☐ Both

OTHER NOTES



🔗 After your appointment, take the one-minute survey

It is anonymous. Your answers help map how oncologists across the country are using broad genomic testing, so that other patients know what to expect.

testmytumor.org/followup

PLAIN LANGUAGE

Words you will see

Short definitions for the terms used in this guide and on test reports.

Genomic profiling

A lab test that reads many genes in a tumor at once to look for changes that may guide treatment.

Therapy selection test

A test used to help choose treatment for a cancer that has already been diagnosed.

DNA

Your cells' instruction manual. Changes in a tumor's DNA can drive the cancer.

RNA

What a cell produces when it reads and acts on its DNA instructions. Reading RNA shows which genes are active and whether any have fused.

Gene fusion

Two genes joined together in a way that can drive cancer growth. Many fusions are found through RNA.

Whole exome

The part of the DNA that carries instructions for making proteins, roughly 21,000 genes.

Whole transcriptome

The RNA from roughly 21,000 genes.

Whole genome

All of the DNA, including the regions between genes.

Liquid biopsy

A blood test that reads tumor DNA circulating in the bloodstream.

CHIP

Age-related mutations in normal blood cells that have nothing to do with the cancer. A blood test needs to separate these from tumor mutations.

Tissue of origin

Where in the body a cancer started. Some tests predict it when it is not otherwise clear.

TMB (tumor mutational burden)

A count of how many mutations a tumor carries, used in decisions about immunotherapy. bTMB is the same marker measured from blood.

MSI (microsatellite instability)

A sign that a tumor's DNA repair system is not working properly. It can affect whether immunotherapy is an option.

HRD (homologous recombination deficiency)

A sign that a tumor has trouble repairing a certain kind of DNA damage. It can affect whether drugs called PARP inhibitors are an option.

LOH and gLOH (loss of heterozygosity)

A measure of how much of the tumor's DNA has lost one of its two copies. Used as one sign of HRD.

HLA genotype

Your version of the genes that help the immune system recognize cells. It can be relevant to some immune-based treatments.

AI signatures

Predictions a lab calculates from the tumor's overall genomic pattern using a trained computer model.

Chemo Safety (pharmacogenomics, PGx)

Testing inherited genes, such as DPYD and UGT1A1, that affect how your body clears certain chemotherapy drugs.

Add-On

Offered by the same lab but ordered in addition to the base test.

ABOUT THIS GUIDE

Made for patients

TestMyTumor.org is a free educational resource for recently diagnosed cancer patients. It exists so patients can see what genomic testing is available, understand what matters, and have impactful conversations with the people treating them.

WHERE THE FACTS COME FROM

Every claim in this guide traces to a reference listed at testmytumor.org/sources.

HOW THE TESTS ARE ORDERED

Tests are ranked by the broadest total coverage available, DNA and RNA combined. No company pays to be listed or influences the ranking, and this guide does not recommend any specific test.

WHO CAN ORDER THESE TESTS

Only your oncologist can order these tests. The patient page from each test maker explains its tests in more detail and can be useful to bring to your appointment.

TESTS KEEP CHANGING

Test specifications are drawn from publicly available company materials, published guidelines, and peer-reviewed literature. Tests continue to evolve, so please confirm current specifications with your care team or the respective company websites.

MEDICAL DISCLAIMER

Educational use only. This is general information, not medical advice, and this site has no knowledge of your personal medical history. Testing decisions are best made together with your oncologist, who can order and interpret these results for your case.



testmytumor.org

Scan to find the tests for your cancer type and stage

Sitio disponible en español: testmytumor.org/es

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