TEST

Histocompatibility antigen test

A histocompatibility antigen test identifies inherited HLA markers used in transplant matching and selected health assessments.

WHAT IT MEASURES
Inherited HLA markers that help the immune system identify cells

SAMPLE
Blood or cheek swab, occasionally tissue

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 5 to 10 minutes

RESULTS IN
Several days to weeks, based on laboratory and typing detail

USED FOR
Transplant matching, disease-risk assessment, and medicine safety testing

MAIN LIMITATION
HLA matching alone cannot predict rejection or disease

Overview

A histocompatibility antigen test identifies human leukocyte antigens, usually shortened to HLA . These are inherited proteins found on the surface of most cells. They help your immune system tell your own cells from cells that may be foreign.

"Histocompatibility" means how compatible one person's tissues are with another person's. HLA testing is therefore an important part of matching donors and recipients for kidney, heart, lung, liver, bone marrow, and stem-cell transplants.

The test is also called HLA typing or tissue typing. Despite the name "antigen test," most modern laboratories examine the genes that carry the instructions for HLA proteins. Commonly tested groups include HLA-A, HLA-B, HLA-C, HLA-DR, HLA-DQ, and HLA-DP.

HLA testing can also support the assessment of certain immune-related conditions or help determine whether a medicine carries an increased risk of a serious reaction. It does not diagnose most conditions by itself.

Why the test is ordered

The most common reason for HLA testing is transplant matching. A closer match can lower some immune risks, but the importance of individual HLA markers differs by organ, transplant type, and clinical situation.

The test may be ordered to:

HLA typing is often combined with other tests. An HLA antibody test looks for antibodies that could attack donor cells. A crossmatch directly checks whether the recipient's blood reacts against cells from a particular donor.

- Compare a potential organ or stem-cell donor with a recipient
- Search donor registries for a suitable unrelated donor
- Investigate why transplanted tissue is not working as expected
- Help select compatible platelets for someone with HLA antibodies
- Support assessment for selected immune-related conditions
- Check for an HLA type linked to reactions from certain medicines
- Confirm a biological relationship in specific clinical circumstances

Who should have the test

You may need HLA testing if you are being assessed for a transplant or have offered to become a donor. Close biological relatives are often tested because HLA types are inherited, but being related does not guarantee a suitable match.

Testing may also be appropriate if you need repeated platelet transfusions that have not produced the expected response. In this situation, HLA-matched platelets may sometimes be considered.

A clinician may request a specific HLA test when it could clarify the likelihood of a condition or guide medicine choice. HLA testing is not usually useful as general health screening. Many people carry HLA types associated with a condition but never develop it.

How to prepare

You do not normally need to fast. You can usually eat, drink, and take your usual medicines before a blood sample unless you have separate instructions for another test.

Tell the testing service if you have recently had:

These details help the laboratory choose the right sample and interpret related tests.

For a cheek swab, follow the kit instructions. You may be asked not to eat, drink, smoke, chew gum, or brush your teeth for a short period beforehand. This helps prevent contamination and ensures that enough cheek cells are collected.

Accurate identification is especially important because transplant decisions may rely on the result. Your name, date of birth, and sample labels will usually be checked carefully.

- A blood transfusion
- A bone marrow or stem-cell transplant
- An organ transplant
- A pregnancy, particularly if HLA antibody tests are also planned

What happens during the test

For a blood test, a healthcare professional places a needle into a vein, usually in your arm. A small amount of blood is collected into one or more tubes. The blood draw generally takes a few minutes.

For a cheek sample, a soft swab is rubbed firmly against the inside of your cheek. This collects cells containing your DNA. Some home donor-registration kits use this method.

The laboratory extracts DNA and examines selected HLA genes. The amount of detail reported is called the typing resolution . A lower-resolution test identifies broad HLA groups, while high-resolution typing identifies more specific genetic versions, called alleles.

Some transplant programmes require a second sample to confirm the result before treatment or donation proceeds.

Understanding your results

An HLA result usually lists letters and numbers, such as HLA-A, HLA-B, or HLA-DRB1 followed by specific allele codes. You inherit one set of HLA genes from each biological parent, so two results may be listed for each location.

There is no general "normal" or "abnormal" HLA type. Interpretation depends on why you were tested.

For transplant matching, your result is compared with a donor's result. A report may describe

the number of matched markers, but a simple match count does not tell the whole story. The transplant type, exact alleles, HLA antibodies, crossmatch results, urgency, and other health factors all matter.

For condition-related testing, a positive HLA type usually means an association or increased likelihood-not that you have the condition. A negative result may make some conditions less likely, but whether it can help rule one out depends on the specific HLA marker and condition.

For medicine safety testing, the report states whether the relevant HLA variant was found. The result must be interpreted for that particular medicine and clinical situation.

Laboratory methods and reporting formats differ. Interpretation may also vary with age, sex, pregnancy status, medicines, transplant history, and the wider clinical context, although these factors do not normally change your inherited HLA genes.

What affects the results

Your HLA genes remain largely unchanged throughout life. Meals, coffee, exercise, kidney function, time of day, common medicines, age, sex, and pregnancy do not alter your inherited HLA type.

However, several factors can make a sample misleading or unsuitable:

Pregnancy, transfusion, and previous transplantation can lead to HLA antibodies. These antibodies do not change your HLA type, but they can strongly affect transplant compatibility and results from separate antibody or crossmatch tests. Immunosuppressive medicines may also influence antibody measurements without changing your inherited type.

- Stem-cell or bone marrow transplant: Blood cells may carry the donor's DNA, so a blood sample can show the donor's HLA type rather than your original type. A cheek or other tissue sample may be needed.
- Recent blood transfusion: Donor white blood cells can occasionally complicate DNA testing, particularly after large or non-leukocyte-reduced transfusions.
- Poor cheek sample: Too few cells, food residue, smoking, or another person's DNA can prevent a clear result.
- Sample contamination or mislabelling: These can produce conflicting results and require repeat testing.
- Testing resolution: A broad test may group together alleles that a higher-resolution test can separate.

- Rare genetic patterns: Closely related HLA variants can sometimes be difficult to distinguish with a particular method.

Accuracy and limitations

Modern DNA-based HLA typing is generally reliable when the sample is correctly identified and contains the expected person's cells. Confirmatory testing helps detect rare sample errors before major transplant decisions.

The chance of an incorrect result depends on the method and level of detail. Lower-resolution testing can correctly identify a broad HLA group while missing the exact allele. Some genetic combinations are ambiguous, meaning more than one detailed HLA type could fit the initial result. Additional testing may resolve this.

False positive or false negative disease conclusions can occur if HLA typing is treated as a diagnostic test. Many HLA markers are common among healthy people, while some people with a condition may not have the marker usually associated with it. Symptoms, examination, and condition-specific tests are often more informative.

HLA typing alone cannot predict whether a transplant will succeed or be rejected. HLA antibody testing and a donor crossmatch are better for checking whether your immune system is likely to react against a particular donor. Organ quality, infections, medicines, and many other factors also affect transplant outcomes.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light-headedness. A cheek swab is low risk but may briefly feel uncomfortable or trigger gagging.

What happens next

Routine follow-up depends on the reason for testing. A transplant team may compare your HLA type with relatives, registry donors, HLA antibody results, and crossmatches. Additional samples may be requested to confirm a possible match or obtain higher-resolution typing.

If testing was related to a condition or medicine, the result will be considered alongside your history and other test results. Do not start, stop, or change a prescribed medicine based only on an HLA report.

HLA results do not usually require emergency action. After a blood draw, seek urgent medical help if bleeding does not stop after firm pressure or if a rapidly enlarging, painful swelling develops at the needle site. Mild bruising can usually be followed routinely.

Common questions

Can I drink coffee before the test?

Yes. Coffee does not alter your HLA type. Follow any separate fasting instructions if other blood tests are being collected at the same appointment.

Does the time of day matter?

No. HLA genes do not change during the day, so the sample can usually be collected at any convenient time.

Can I exercise beforehand?

Yes. Exercise does not affect HLA typing. If you tend to feel faint during blood tests, arrive rested and tell the person taking the sample.

Will my medicines affect the result?

Usual medicines do not change your inherited HLA type. Immunosuppressive medicines can affect separate HLA antibody tests, so make sure the testing service has an up-to-date medicine list.

Can a cheek swab replace a blood test?

Often, but not always. A cheek swab can provide DNA for typing, while blood may be needed for antibody testing, crossmatching, confirmation, or a laboratory's required procedure.

Will I ever need the test repeated?

Your inherited type does not normally change. Repeating the test may be needed to confirm identity, improve typing detail, replace an unsuitable sample, or account for donor-derived blood cells after a stem-cell transplant.

Sources

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