TEST

ELISA blood test

An ELISA blood test uses an enzyme-based method to detect specific antibodies, antigens, hormones, or proteins.

WHAT IT MEASURES
Specific antibodies, antigens, hormones, or proteins chosen for the assay

SAMPLE
Blood

FASTING NEEDED?
Usually no, unless another ordered test requires fasting

HOW LONG IT TAKES
Usually less than ten minutes

RESULTS IN
One to several days, varying by laboratory

USED FOR
Screening, diagnosis, and monitoring, depending on the substance measured

MAIN LIMITATION
Cross-reactions and testing too early can produce misleading results

Overview

ELISA stands for enzyme-linked immunosorbent assay . It is a laboratory method used to detect or measure a chosen substance in blood, such as:

In the laboratory, a plate is coated with material designed to capture the target. An enzyme-linked reaction produces a colour change when the target is present. The reaction may show whether the result is positive or negative or estimate how much of the substance is present.

Some laboratories use related automated immunoassays. These use similar antibody-binding principles but are not technically identical to ELISA.

- Antibodies made by the immune system
- Antigens from viruses, bacteria, or other substances
- Hormones or other proteins
- Markers used to monitor conditions or treatments

Why the test is ordered

The reason for testing depends on what the assay measures. "ELISA" describes the laboratory method, not a particular condition.

An ELISA may be ordered to:

An antibody ELISA may show that your immune system has encountered a substance. It does not always prove that an infection is active because antibodies can take time to appear and may remain after recovery.

An antigen ELISA looks for part of the target itself. This may help identify a current infection, but timing and antigen levels still affect the result.

- Screen for evidence of an infection or immune response
- Investigate symptoms alongside an examination and other tests
- Measure a hormone, protein, or treatment-related marker
- Monitor changes over time
- Check an initial result before further testing

Who should have the test

You may be offered an ELISA when measuring a specific substance could help answer a clinical question. This may follow symptoms, possible exposure to infection, an unusual result from another test, or the need to monitor a known condition.

ELISA is not automatically useful as a broad health screen. Its benefits and limitations depend on the exact assay. Testing may also be required for blood donation, employment, immigration, pregnancy care, or public health programmes.

If you have difficulty breathing, fainting, new confusion, intense chest pain, or other severe symptoms, seek urgent medical help rather than waiting for a test result.

How to prepare

Most ELISA blood tests do not require fasting. However, you may need to fast if other tests, such as certain glucose or lipid tests, are being collected at the same appointment.

Ask whether you need to change the timing of medicines or supplements. Do not stop prescribed medicine unless specifically told to do so.

Tell the person arranging the test about:

Drinking water beforehand may make blood collection easier. Wear clothing that allows access to your upper arm.

- Prescription and non-prescription medicines
- Vitamins or supplements, especially high-dose biotin
- Recent vaccination, infection, blood transfusion, or antibody treatment
- Pregnancy or possible pregnancy
- Previous problems with blood tests, including fainting

What happens during the test

A healthcare professional places a band around your upper arm and cleans the skin. A needle is inserted into a vein, usually inside the elbow, and blood is collected into one or more tubes.

You may feel a brief scratch or sting. The blood draw usually takes less than ten minutes.

The sample is sent to a laboratory and added to materials designed to bind the target. Reagents create a measurable colour reaction, and controls confirm that the assay worked as expected.

Understanding your results

Your report should name the substance tested. The result may be positive , negative , reactive , non-reactive , equivocal , or numerical.

A positive or reactive result means the assay detected a signal above its threshold. It does not always confirm a diagnosis, and some positive screening results require a different confirmatory test.

A negative or non-reactive result means the target was not detected above the threshold. It may not rule out the condition if testing occurred too early, target levels were low, or your immune response was reduced.

An equivocal or borderline result is close to the assay's cutoff. It may need to be repeated after a suitable interval or checked using another method.

Numerical results must be interpreted using the units and reference range on your report. Interpretation can vary by assay, laboratory, age, sex, pregnancy status, medicines, and clinical context. Results from different laboratories may not be directly comparable.

What affects the results

Timing is especially important. After infection or exposure, antibodies may take days or weeks to become detectable. Antigen levels can also rise and fall. Testing outside the useful period may miss the target.

Cross-reactivity can cause a positive signal. A similar antibody or protein may bind to the test materials even when the condition being investigated is absent.

Other influences include:

Age, pregnancy, kidney or liver function, medicines, exercise, and time of day can affect some hormones and proteins. Their importance depends on what is being measured.

- Recent vaccination
- Immune-suppressing conditions or medicines
- Recent blood transfusion or immune globulin treatment
- Plasma exchange
- Interfering antibodies
- High-dose biotin in assays using biotin-based technology
- A damaged, contaminated, incorrectly stored, or very fatty sample

Accuracy and limitations

Accuracy is specific to each ELISA assay. There is no single accuracy figure for all ELISA blood tests.

A false-negative result can occur when target levels are too low, testing is too early or late, or the immune system has not produced the expected antibodies. A false-positive result can result from cross-reactivity, interfering antibodies, or the assay's cutoff.

The meaning of a positive result also depends on how likely the condition was before testing. Screening people at low risk can produce positive results that are not confirmed later.

Another method may better answer a particular question. For example, a molecular test may detect genetic material from an active infection, while a culture may identify a living organism. Confirmatory antibody testing may use different antigens or methods.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light bleeding. Some people feel faint, but serious complications are uncommon.

What happens next

The next step depends on the target, result, and reason for testing. A clear negative result taken at the correct time may require no further action. A positive screening result may need confirmation using another method.

A borderline result may be repeated. If testing occurred soon after a possible exposure, another sample may be recommended after enough time has passed for the target to become detectable.

Arrange routine follow-up if you have questions about your result. Seek urgent medical care for severe or rapidly worsening symptoms rather than waiting for repeat testing or a routine appointment.

Common questions

Can I drink coffee before an ELISA blood test?

Usually, yes. Avoid it if you were told to fast for other tests or if milk, sugar, or caffeine could affect another substance being measured.

Does the time of day matter?

Usually not for antibody testing. It can matter for hormones or proteins that change throughout the day. Follow the instructions for your specific test.

Can I exercise beforehand?

Ordinary activity is unlikely to affect most antibody ELISAs. Strenuous exercise can temporarily alter some hormones, inflammatory markers, and other proteins.

How long after exposure should I be tested?

The useful testing window differs by infection and by whether the assay measures antibodies or antigens. Follow guidance for the specific condition because testing too early can produce a negative result.

Can medicines affect the result?

Yes. Immune-suppressing medicines may reduce antibody production, and antibody treatments can affect some results. High-dose biotin may also interfere with certain assays.

Does a positive ELISA mean I definitely have the condition?

Not always. Cross-reactions can occur, and ELISA is often used for screening. The result may need to be considered alongside symptoms, exposure history, examination findings, and a confirmatory test.

Sources

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