

GOT/ALT

Alanine aminotransferase NADH. Kinetic UV. IFCC. Liquid



Product information

24ALT01-UN	Meditest GPT/ALT	4x40 mL 2x20 mL
24ALT01-AU	Meditest GPT/ALT	4x40 mL 2x20 mL
24ALT01-AB	Meditest GPT/ALT	4x40 mL 2x20 mL
24ALT01-ER	Meditest GPT/ALT	3x30 mL 3x10 mL
24ALT01-AR	Meditest GPT/ALT	3x30 mL 3x10 mL

Purpose

In vitro assay for the quantitative determination of alanine aminotransferase (ALT) in human serum, plasma and urine.

Summary

ALT is a cellular enzyme found in the highest concentration in the liver and kidney. High levels are observed in liver diseases such as hepatitis, muscle diseases and traumas, the better application of which is the diagnosis of liver diseases. When used with AST, it helps in the diagnosis of myocardial infarctions, since in the presence of high levels of AST, the ALT value remains within normal limits^{1,4,5}. Clinical diagnosis should not be based on a single test result; integrate clinical and other laboratory data.

Test principle

Alanine aminotransferase (ALT) or Glutamate pyruvate transaminase (GPT) catalyzes the reversible transfer of an amino group from alanine to α -ketoglutarate, forming glutamate and pyruvate. The pyruvate produced is reduced to lactate by lactate dehydrogenase (LDH) and NADH:

ALT

L-Alanine + α -Ketoglutarate $\longrightarrow$ Glutamate + Pyruvate

Pyruvate + NADH + H⁺ $\longrightarrow$ Lactate + NAD⁺

The rate of decrease in NADH concentration, measured photometrically, is proportional to the catalytic concentration of ALT present in the sample¹

Reagents - working solutions

R 1 Buffer	TRIS pH 7.8	<100 mmol/L
	Lactate dehydrogenase (LDH)	<1200 U/L
	L-Alanine	<500 mmol/L
R 2 Substrate	NADH	<0.18 mmol/L
	α -Ketoglutarate	<15 mmol/L

Precautions warnings

It is intended for in vitro diagnostic use by healthcare professionals. Follow the normal precautions necessary in handling all laboratory reagents.

Infectious or microbial waste:

Warning: handle waste as potentially biohazardous. Dispose of waste according to accepted laboratory instructions and procedures.

Environmental hazards: Follow all relevant local disposal regulations to determine that it has been disposed of safely. If requested, a safety data sheet can be provided to professional users.

Inhibit foam formation in all reagents and sample types (sample, calibrator and control).

If there is any damage on the package, do not use it. Read the user manual carefully before use, do not use the expired assay kit. Do not mix different lot reagents.

All samples should be considered epidemic material, please dispose of them in accordance with the laboratory working standard of infectious diseases.

Take the necessary protective measures to prevent users from becoming infected during operation.

Use of reagents

Ready to use.

Storage and stability

All components of the kit are stable until the expiration date on the label when stored tightly closed at 2-8°C, protected from light and contamination is avoided during their use.

Do not use reagents after the expiration date. Signs of reactive decay: Presence of particles and turbidity- empty absorbance (A) at 340 nm <1.00.

Sample collection and preparation

Use only suitable tubes and collection containers to collect and prepare specimens. Only the samples listed below have been tested and found acceptable.

Serum. Plasma: Liheparin and K₂EDTA plasma

Centrifuge samples containing precipitate before performing the test. For detailed information on possible sample interactions, see the limitations and interactions section. Sample stability claims were determined by the manufacturer based on experimental data or reference literature and only for the temperatures/time frames specified in the method sheet. It is the responsibility of each laboratory to use all available references and/or their own work to determine specific stability criteria for their laboratory.

Stability: 4 days at 2025 °C

7 days at 48 °C

3 months at -20°C

Required Materials (not included in the kit)

1. Cat# 24BIO01-DC Meditest Diachem Calibrator
2. Cat# 24BIO01-DQ Meditest Diachem Control L1
3. Cat# 24BIO02-DQ Meditest Diachem Control L2
4. General laboratory equipment
5. Distilled or deionized water

Working Procedure

If you are using a spectrophotometer to perform this test, work with the following procedure. Ask your representative for the application data for fully automatic devices.

1. Test Conditions:

Wavelength: . 340 nm

Cuvette: 1 cm light path

Temperature: . 37°C / 15 25°C 2. Set the appliance to zero with distilled water.

3. Place the pipettes in a cuvette.

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meditest

WR (mL)	1,0
Sample (μL)	100

4. Mix, incubate for 1 minute.

5. Read the initial absorbance (A) of the sample, start the stopwatch, and read the absorbances at 1-minute intervals for 3 min.

6. Calculate the difference between absorbances and the average absorbance differences per minute ($\Delta A/\mu\text{v}$).

Calculation

$$\Delta A/\mu\text{v} \times 1750 = \text{U/L of ALT}$$

One international unit (IU) is the amount of enzyme that converts 1 μmol substrate per minute under standard conditions. The concentration is expressed in units per liter of sample (U/L).
Conversion factor: $\text{U/L} \times 0.0167 = \mu\text{kat/L}$

Expected values

Male 0-41 U/L (0.68 μkat/L)
Woman 0-33 U/L (0.55 μkat/L)

To convert from 25 °C to 37 °C, 1.85 is used as the factor.

These values are for orientation purposes; Each laboratory should establish its own reference range

Limitations

Criterion: Recovery within 10% of baseline at 30 U/L (0.5 μfold/L)
ALT activity within ± of baseline.

Icterus: No apparent interaction until the I index is 60 (approximate conjugated and unconjugated bilirubin concentration: 1026 μmol/L or 60 mg/dL).

Hemolysis: No apparent interaction until the H index is 90 (approximate hemoglobin concentration: 56 μmol/L or 90 mg/dL).
Since the analyte level in erythrocytes is higher than in normal serum, contamination with erythrocytes will increase the results.
The level of interaction may vary depending on the analyte content in fragmented erythrocytes.

Lipemia (Intralipid): No obvious interaction until the L index is 150. There is a weak correlation between the L index (which corresponds to turbidity) and the concentration of triglycerides. Lipemic specimens may cause > Abs stimulation to be issued.

Drugs: No interactions were found at therapeutic concentrations when common drug panels were used.

Exception: Calcium dobesilate at therapeutic concentrations can cause artificially low ALT results. Cyanokit (Hydroxocobalamin) may cause interference in results. Physiologic plasma concentrations of Sulfasalazine or Sulfapyridine may lead to false results. In very rare cases, gammopathy, especially type IgM (Waldenström macroglobulinemia), can cause unreliable results. When making a diagnosis, the results must be evaluated together with the patient's medical history, clinical examination and other findings.

Performance characteristics

Measuring range: 0-400 U/L

If the results obtained are greater than the linearity limit, dilute the sample by 1/10 with 9 g/L NaCl and multiply the result by 10.

Precision

	Intra-assay (n=20)		Inter-assay (n=20)	
Mean (U/L)	42,0	116	41,1	115
SD	0,47	0,42	0,76	1,61
CV (%)	1,11	0,36	1,85	1,40

Sensitivity: 1 U/L = 0.00052 ΔA/min

Accuracy: Results obtained using Meditest reagents (y) showed no systematic differences when compared to other commercial reagents (x). The results obtained using 50 samples are as follows:

Correlation coefficient (r)²: 0.99597

Regression equation $y = 1.1209x - 1.390$

The results of the performance characteristics depend on the analyzer used.

References

1. Murray R. Aspartate aminotransferase. Kaplan A et al. Clin Chem The C.V. Mosby Co. St Louis. Toronto. Princeton 1984; 1112-1116.
2. Young DS. Effects of drugs on Clinical Lab. Tests, 4th ed AACC Press, 1995.
3. Young DS. Effects of disease on Clinical Lab. Tests, 4th ed AACC 2001.
4. Burtis A et al. Tietz Textbook of Clinical Chemistry, 3rd ed AACC 1999.
5. Tietz N W et al. Clinical Guide to Laboratory Tests, 3rd ed AACC 1995.



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