



Alanine Transaminase Microplate Assay Kit User Manual

Catalog # ASK1002

Detection and Quantification of Alanine Transaminase (ALT) Activity
in Urine, Serum, Plasma, Tissue extracts, Cell lysate, Cell culture
media and Other biological fluids Samples.

For research use only. Not for diagnostic or therapeutic procedures.

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I. INTRODUCTION

Alanine Transaminase (ALT), also known as serum alanine aminotransferase (ALAT) or pyruvic transaminase (GPT), facilitates the conversion of alanine and α -ketoglutarate to pyruvate and glutamate. ALT plays an important role in gluconeogenesis and amino acid metabolism. ALT is found mainly in the liver, and, to a lesser extent, in kidney, heart, muscle, and pancreas tissues. Normal serum levels of ALT are low, and increased serum ALT activity is widely used as a marker for liver damage.

The enzyme catalysed reaction product phenylhydrazone can be measured at a colorimetric readout at 520 nm.

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**II. KIT COMPONENTS**

Component	Volume	Storage
96-Well Microplate	1 plate	
Assay Buffer	30 ml x 4	4 °C
Substrate	Powder x 1	4 °C
Dye Reagent I	10 ml x 1	4 °C
Dye Reagent II	20 ml x 1	4 °C
Standard	Powder x 1	4 °C
Plate Adhesive Strips	3 Strips	
Technical Manual	1 Manual	

Note:

Substrate: add 10 ml Assay Buffer to dissolve before use.

Standard: add 1 ml Assay Buffer to dissolve before use, it will be 20 µmol/ml.

III. MATERIALS REQUIRED BUT NOT PROVIDED

1. Microplate reader to read absorbance at 520 nm
2. Distilled water
3. Pipettor
4. Pipette tips
5. Mortar
6. Ice
7. Centrifuge
8. Timer

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IV. SAMPLE PREPARATION

1. For cell and bacteria samples

Collect cell or bacteria into centrifuge tube, discard the supernatant after centrifugation, add 1 ml Assay buffer for 5×10^6 cell or bacteria, sonicate (with power 20%, sonication 3s, interval 10s, repeat 30 times); centrifuged at 8000g 4 °C for 10 minutes, take the supernatant into a new centrifuge tube and keep it on ice for detection.

2. For tissue samples

Weigh out 0.1g tissue, homogenize with 1 ml Assay buffer on ice, centrifuged at 8000g 4 °C for 10 minutes, take the supernatant into a new centrifuge tube and keep it on ice for detection.

3. For serum or plasma samples

Detect directly.

**V. ASSAY PROCEDURE**

Reagent	Sample	Control	Standard	Blank
Sample	10 μ l	--	--	--
Assay Buffer	--	--	10 μ l	10 μ l
Standard	--	--	10 μ l	--
Substrate	50 μ l	50 μ l	40 μ l	50 μ l
Mix, put it in the oven, 37 °C for 30 minutes.				
Dye Reagent I	50 μ l	50 μ l	50 μ l	50 μ l
Dye Reagent II	90 μ l	90 μ l	90 μ l	90 μ l
Sample	--	10 μ l	--	--
Mix, record absorbance measured at 520 nm.				

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VI. CALCULATION

Unit Definition: One Unit of ALT activity is defined as the enzyme produces 1 μmol of pyruvic acid per hour.

1. According to the volume of serum or plasma

$$\begin{aligned} \text{ALT (U/ml)} &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (OD_{\text{Sample}} - OD_{\text{Control}}) / (OD_{\text{Standard}} - OD_{\text{Blank}}) / V_{\text{Sample}} / T \\ &= 40 \times (OD_{\text{Sample}} - OD_{\text{Control}}) / (OD_{\text{Standard}} - OD_{\text{Blank}}) \end{aligned}$$

2. According to the weight of sample

$$\begin{aligned} \text{ALT (U/g)} &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (OD_{\text{Sample}} - OD_{\text{Control}}) / (OD_{\text{Standard}} - OD_{\text{Blank}}) / (W \times \\ & \quad V_{\text{Sample}} / V_{\text{Assay}}) / T \\ &= 40 \times (OD_{\text{Sample}} - OD_{\text{Control}}) / (OD_{\text{Standard}} - OD_{\text{Blank}}) / W \end{aligned}$$

3. According to the quantity of cell or bacteria

$$\begin{aligned} \text{ALT (U/10}^4\text{)} &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (OD_{\text{Sample}} - OD_{\text{Control}}) / (OD_{\text{Standard}} - OD_{\text{Blank}}) / (N \times \\ & \quad V_{\text{Sample}} / V_{\text{Assay}}) / T \\ &= 40 \times (OD_{\text{Sample}} - OD_{\text{Control}}) / (OD_{\text{Standard}} - OD_{\text{Blank}}) / N \end{aligned}$$

C_{Standard}: the concentration of Standard, 20 μmol/ml;

W: the weight of sample, g;

N: the quantity of cell or bacteria, N × 10⁴;

V_{Standard}: the volume of standard, 0.01 ml;

V_{Sample}: the volume of sample, 0.01 ml;

V_{Assay}: the volume of Assay buffer, 1 ml;

T: the reaction time, 0.5 hour.

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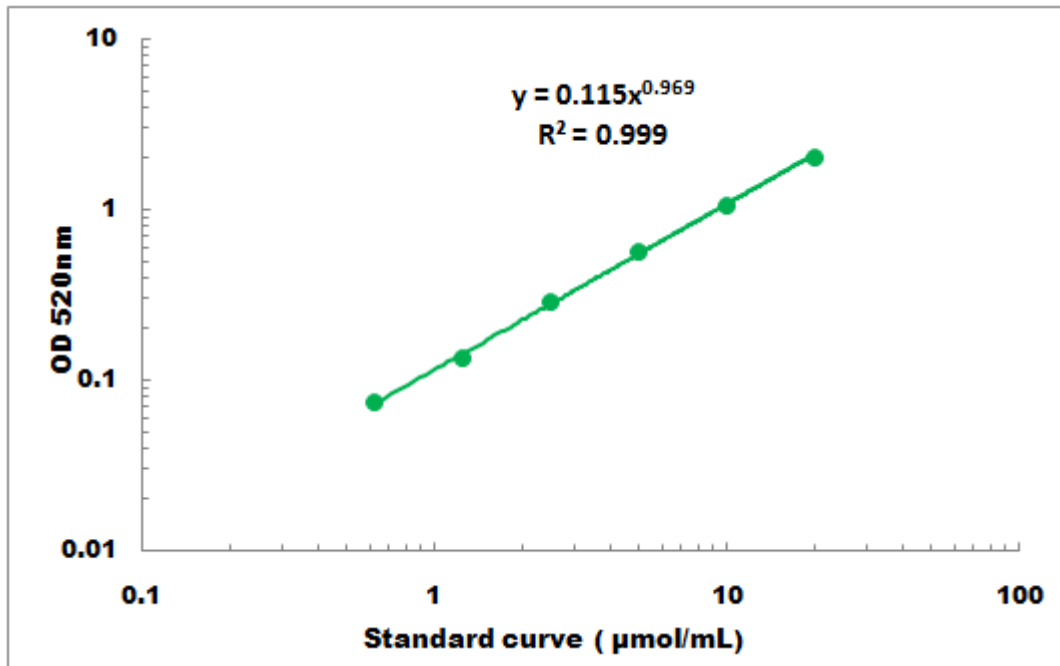
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VII. TYPICAL DATA

The standard curve is for demonstration only. A standard curve must be run with each assay.



Detection Range: 0.625 µmol/ml - 20 µmol/ml