



Pyruvate Decarboxylase Microplate Assay Kit User Manual

Catalog # ASK1085

Detection and Quantification of Pyruvate Decarboxylase (PDC)
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.....2

II. KIT COMPONENTS.....3

III. MATERIALS REQUIRED BUT NOT PROVIDED.....3

IV. SAMPLE PREPARATION.....4

V. ASSAY PROCEDURE.....5

VI. CALCULATION.....6

VII. TYPICAL DATA.....7



I. INTRODUCTION

Pyruvate decarboxylase catalyzes the oxidation of decarboxylation of pyruvate to acetaldehyde. This assay is an indirect method in which the conversion is linked to the activity of the subsequent enzyme alcohol dehydrogenase, which supplied in excess, converts the product acetaldehyde effectively into NAD and ethanol.

The reaction velocity is determined by the rate of absorbance at 340 nm resulting from reduction of NADH is measured.

**II. KIT COMPONENTS**

Component	Volume	Storage
96-Well Microplate	1 plate	
Assay Buffer	30 ml x 4	4 °C
Reaction Buffer	20 ml x 1	4 °C
Substrate	Powder x 1	4 °C
Enzyme	Powder x 1	-20 °C
Standard	Powder x 1	-20 °C
Technical Manual	1 Manual	

Note:

Substrate: add 18 ml Reaction Buffer to dissolve before use.

Enzyme: add 1 ml distilled water to dissolve before use.

Standard: add 1 ml distilled water to dissolve before use; then add 0.2 ml into 0.8 ml distilled water, the concentration will be 400 $\mu\text{mol/L}$.

III. MATERIALS REQUIRED BUT NOT PROVIDED

1. Microplate reader to read absorbance at 340 nm
2. Distilled water
3. Pipettor
4. Pipette tips
5. Mortar
6. Centrifuge
7. Timer
8. Ice



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 16,000g 4 °C for 20 minutes, take the supernatant into a new centrifuge tube and keep it on ice for detection.

2. For tissue samples

Weigh out 0.1 g tissue, homogenize with 1 ml Assay buffer on ice, centrifuged at 16,000g 4 °C for 20 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

Warm all reagents to room temperature before use.

Add following reagents into the microplate:

Reagent	Sample	Standard	Blank
Standard	--	200 μ l	--
Distilled water	--	--	200 μ l
Sample	10 μ l	--	--
Substrate	180 μ l	--	--
Enzyme	10 μ l	--	--
Mix, measured at 340 nm and record the absorbance of 10th second and 130th second.			

Note: if the enzyme activity is lower, please add more sample into the reaction system; or increase the reaction time.

VI. CALCULATION

Unit Definition: One unit of PDC activity is defined as the enzyme that decomposes 1 nmol of NADH per minute.

1. According to the protein concentration of sample

$$\begin{aligned} \text{PDC (U/mg)} &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) / \\ &\quad (V_{\text{Sample}} \times C_{\text{Protein}}) / T \\ &= 4000 \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) / C_{\text{Protein}} \end{aligned}$$

2. According to the weight of sample

$$\begin{aligned} \text{PDC (U/g)} &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) / \\ &\quad (V_{\text{Sample}} \times W / V_{\text{Assay}}) / T \\ &= 4000 \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) / W \end{aligned}$$

3. According to the quantity of cells or bacteria

$$\begin{aligned} \text{PDC (U/10}^4) &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) \\ &\quad / (V_{\text{Sample}} \times N / V_{\text{Assay}}) / T \\ &= 4000 \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) / N \end{aligned}$$

4. According to the volume of serum or plasma

$$\begin{aligned} \text{PDC (U/ml)} &= (C_{\text{Standard}} \times V_{\text{Standard}}) \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) / \\ &\quad V_{\text{Sample}} / T \\ &= 4000 \times (\text{OD}_{\text{Sample}(10\text{S})} - \text{OD}_{\text{Sample}(130\text{S})}) / (\text{OD}_{\text{Standard}} - \text{OD}_{\text{Blank}}) \end{aligned}$$

C_{Standard} : the standard concentration, 400 $\mu\text{mol/L}$ = 400 nmol/ml;

V_{Standard} : the volume of standard, 200 μl = 0.2 ml;

C_{Protein} : the protein concentration, mg/ml;

W: the weight of sample, g;

N: the quantity of cell or bacteria, $N \times 10^4$;

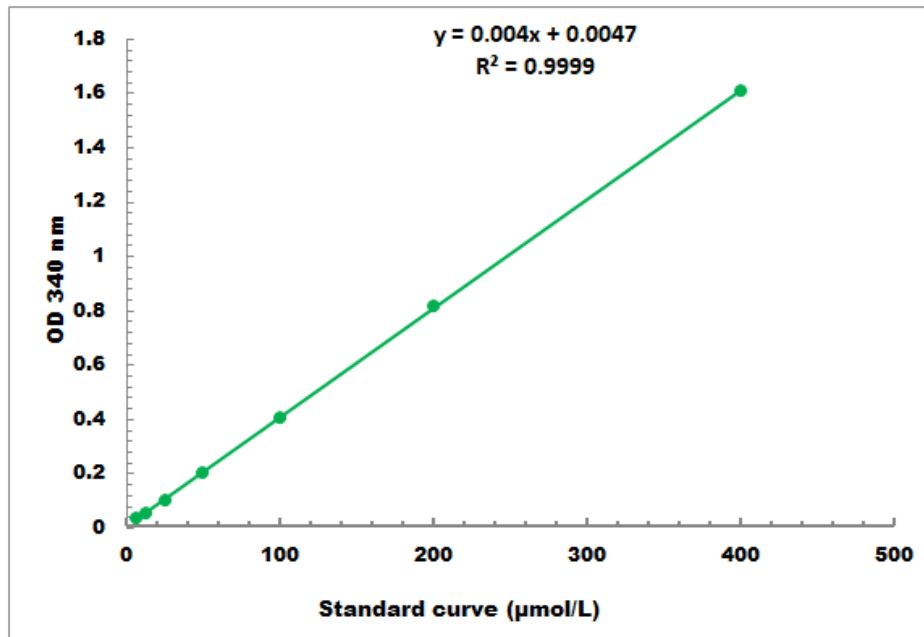
V_{Sample} : the volume of sample, 0.01 ml;

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

T: the reaction time, 2 minutes.

VII. TYPICAL DATA

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



Detection Range: 4 µmol/L - 400 µmol/L