



Lactate Assay Kit

Catalog # EA-7016

(For Research Use Only)

Introduction

The Lactate Assay Kit utilizes an enzyme oxidation reaction to measure lactate levels in samples. First, lactate is oxidized by lactate oxidase into pyruvate and hydrogen peroxide. Then, the lactate concentration in the sample is determined by quantifying the hydrogen peroxide generated by the enzyme reaction with a fluorogenic probe that can be measured with a spectrophotometer.

Materials Required but Not Provided

- PBS
- 96-well clear microplate for absorbance reading or 96-well black microplate with clear bottom for fluorescence reading
- Microplate reader capable of measuring absorbance at 560 nm or fluorescence at 530nm/590nm

Materials Provided

- 10mM FMN (-80°C)
- Probe Reagent (-20°C)
- HRP Reagent (4°C)
- 1mM Lactate Standard (-20°C)
- LOX Enzyme Stock (-80°C)

****Spin down small tubes before starting experiment. ****

Plasma Sample Preparation

1. Centrifuge citrated or EDTA-collected blood at 4°C (1,000 x g for 10 minutes) to separate plasma from erythrocytes. Alternatively, blood collected without anticoagulant can be centrifuged to collect serum.
2. Transfer the plasma layer to a new tube without disturbing the buffy layer.
3. The plasma may be assayed directly or stored away at -80°C.

Cell Sample Preparation

1. Wash the cells once with PBS before lysing the cells.
2. For a 96-well culture plate, add 40 µL of lysis buffer to each well and incubate at room temperature for 10 minutes.
3. Pipette the lysis buffer up and down to detach the cells and transfer the cell lysates into a new tube.
4. If necessary, homogenize the cell lysates with a sonicator.
5. The cell lysates may be assayed directly or stored at -80°C.
6. Use PBS to dilute the cell sample to the appropriate concentration, if necessary.

Tissue Sample Preparation

1. Weigh tissue sample and add 1 mL of lysis buffer per 100mg of tissue.
2. Homogenize the tissue samples with a tissue grinder.
3. If necessary, further homogenize the tissue samples with a sonicator.
4. Centrifuge the sample at 10,000 RPM for 5 minutes to pellet the tissue debris.
5. Collect the supernatant and measure the protein concentration of the supernatant. The tissue sample can be assayed directly or stored at -80°C.
6. Use PBS to dilute the tissue sample to the appropriate concentration, if necessary.

Lactate Measurement

1. **Standard curve preparation:** First, take eight new tubes and label them 1-8. In tube 1, prepare a 2000 μ M lactate standard by mixing 40 μ L of the provided 5mM lactate standard with 60 μ L of PBS. Then, for tubes 2-8, add 50 μ L of PBS to each tube. Transfer 50 μ L of the 2000 μ M lactate standard from tube 1 to the PBS in tube 2 and mix to make a 1000 μ M lactate standard. Then, transfer 50 μ L of the 1000 μ M lactate standard from tube 2 to the PBS in tube 3 and mix to make an 500 μ M lactate standard. Continue the serial dilutions until tube 7 is done. Leave tube 8 untouched as the PBS negative control.
8. Add 50 μ L of detection mix to each reaction well in the plate. **Be sure to add the detection mix quickly, since the signal begins to develop when the reagents are added. Use a multichannel pipette if possible.**
9. Cover the plate and incubate at room temperature away from light for 10-20 minutes. **Exposure to light will produce background signal in wells**
10. For a stronger signal, the plate can be incubated for an additional 30-60 minutes away from light.
11. Measure the absorbance of the plate at 560 nm using a plate reader. Alternatively, measure the fluorescence of the plate in a fluorescence plate reader Ex/Em 530nm/590nm.

Standard#	Lactate Concentration (μ M)
1	2000
2	1000
3	500
4	250
5	125
6	62.5
7	31.25
8	0

2. **Reaction mix preparation:** calculate the amount of each reagent needed to make the reaction mix according to the table below.

Component	Reaction Mix (per well/sample)
10mM FMN	0.05 μ L
LOX Enzyme	0.4 μ L
PBS	49.55 μ L
Total	50 μ L

3. Any unused enzyme stock can be stored at -80°C for future use.
4. Add 50 μ L of reaction mix to each well of the plate.
5. Add 5 μ L of sample or standard to each well with reaction mix and mix thoroughly.
6. Cover the plate and incubate at room temperature for 30 minutes.
7. **Detection mix preparation:** calculate the amount of each reagent needed to make the detection mix according to the table below.

Component	Detection Mix (per well/sample)
Probe Reagent	0.5 μ L
HRP Reagent	1 μ L
PBS	48.5 μ L
Total	50 μ L