Liquick Cor-LACTATE

DIAGNOSTIC KIT FOR DETERMINATION OF LACTATE CONCENTRATION

Kit name	Cat. No
Liquick Cor-LACTATE 500	2-189
Liquick Cor-LACTATE „bulk"	2-190

INTRODUCTION

Lactate is produced in Cori cycle, by anaerobic conversion of glucose, mainly in skeletal muscle. Its determination, frequently done together with pyruvate, is useful in discovering lactic acidosis due to i.a. reduced tissue oxygenation, enzymatic deficiencies, diabetes mellitus, liver and kidneys diseases.

METHOD PRINCIPLE

Lactate is oxidized by lactate oxidase to pyruvate and hydrogen peroxide, which, in presence of peroxidase (POD), reacts with 4-aminoantipirine and phenol forming a compound, which colour intensity is proportional to the concentration of lactate in the examined sample.

REAGENTS

Package

	Liquick Cor-LACTATE 500	Liquick Cor-LACTATE "bulk"
1-LACTATE	3 x 300 ml	--*

*****reagent volume is printed on the label.

Unopened reagent is stable up to the kit expiry date printed on the package when stored at 2-8°C. The reagents are stable for 12 weeks on board the analyser at 2-10°C.

Concentrations in the test

Tris buffer (pH 7.5)	≥ 50 mmol/l
lactate oxidase	≥ 0.2 kU/l
peroxidase	≥ 2 kU/l
4-aminoantipyrine	≥ 0.4 mmol/l

Warnings and notes

- Product for in vitro diagnostic use only.
- The reagents must be used only for the purpose intended by suitably qualified laboratory personnel, under appropriate laboratory conditions.
- Do not freeze the reagent!
- Protect from light and contamination!
- Do not use after expiry date.
- The appearance of turbidity or control sera values outside the manufacturer's acceptable range may indicate of the reagents instability.
- Lactate concentration rapidly increases during physical activities. Normal levels are reached again after usually 30 minutes but it may vary according to individuals.
- Draw blood with lowest venous stasis as possible (max. 30 seconds) from fasting and completely resting patient and avoid using a tourniquet.

SPECIMEN

Plasma. Avoid haemolysis.

Collect samples in tubes containing sodium fluoride and potassium oxalate. Keep samples on ice. Centrifuge within 15 minutes after collection and separate from cells. Analyze promptly. Note whether sample is venous or arterial.

It is recommended to follow NCCLS procedures regarding specimen collecting and handling.

Lactate in plasma is stable up to 8 hours at room temperature or up to 14 days at 2-8ºC.

Nevertheless it is recommended to perform the assay with freshly collected samples!

ADDITIONAL EQUIPMENT

- automatic analyser or photometer (monochromatic or bichromatic) able to read main wavelength at 520 nm;
- thermostat at 37ºC;
- general laboratory equipment;

PROCEDURE

The reagent may be used both for manual assay and in several automatic analysers. Applications for them are available on request.

Manual procedure

wavelength	520 nm
temperature	37°C
cuvette	1 cm

Pipette into the cuvettes:

	test (T)	calibrator (C)
1-LACTATE	1000 µl	1000 µl

Bring up to the temperature of determination. Then add:

sample	10 µl	-
calibrator	-	10 µl

Mix well and exactly after 10 min. of incubation at 37ºC read the absorbance of calibrator A(C) and test samples A(T) against air.

Calculation

$$\text{lactate concentration} = \frac{\Delta A(T)}{\Delta A(C)} \times \text{calibrator concentration}$$

REFERENCE VALUES [2]

plasma (venous)	4.5 – 19.8 mg/dl	0.5 – 2.2 mmol/l
plasma (arterial)	4.5 – 14.4 mg/dl	0.5 – 1.6 mmol/l

It is recommended for each laboratory to establish its own reference ranges for local population.

QUALITY CONTROL

For interna quality control it is recommended to use the CORMAY SERUM HN (Cat. No 5-172) and CORMAY SERUM HP (Cat. No 5-173) with each batch of samples.

For the calibration the CORMAY MULTICALIBRATOR LEVEL 1 (Cat. No 5-174; 5-176) and LEVEL 2 (Cat. No 5-175; 5-177) are recommended.

The calibration curve should be prepared every 12 weeks, with change of reagent lot number or as required e.g. quality control findings outside the specified range.

PERFORMANCE CHARACTERISTICS

These metrological characteristics have been obtained using automatic analysers Biolis 24i Premium and Olympus AU600. Results may vary if a different instrument or a manual procedure is used.

- **Sensitivity:** 1.40 mg/dl (0.155 mmol/l).

- **Linearity:** up to 90 mg/dl (9.99 mmol/l).

For higher concentration dilute the sample 1:1 with 0.9% NaCl and repeat the assay. Multiply the result by dilution factor.

- **Specificity / Interferences**

a) In plasma samples containing approximately 12 mg lactate/dl, there is no interference up to: 0.23 g/dl haemoglobin, 8 mg/dl bilirubin, 330 mg/dl triglycerides, 15.5 mg/l ascorbic acid.

b) In plasma samples containing approximately 40 mg lactate/dl, there is no interference up to: 1.25 g/dl haemoglobin, 10 mg/dl bilirubin, 1000 mg/dl triglycerides, 62 mg/l ascorbic acid.

- **Precision**

Repeatability (run to run) n = 10	Mean [mg/dl]	SD [mg/dl]	CV [%]
level 1	8.65	0.18	2.07
level 2	42.13	0.31	0.74

Reproducibility (day to day) n = 10	Mean [mg/dl]	SD [mg/dl]	CV [%]
level 1	8.69	0.11	1.24
level 2	41.61	0.31	0.75

- **Method comparison**

A comparison between lactate values determined at Biolis 24i Premium (y) and at BS-400 (x) using 40 samples gave following results:
y = 0.9812 x – 0.0592 mg/dl;
R = 0.998 (R – correlation coefficient)

WASTE MANAGEMENT
Please refer to local legal requirements.

LITERATURE

1. Tietz Textbook of Clinical Chemistry (Edited by Burtis CA and Ashwood ER Eds): Third Edition WB Saunders Company 787-8, (1999).
2. Alan H. B. Wu, Tietz Clinical Guide to Laboratory Tests, W.B. Saunders Company, 4th edition, 650-652, (2006).

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MANUFACTURER

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