This package insert follows the Pharmaceuticals, Medical devices and Other Therapeutic Products Act of Japan.

In Vitro Diagnostics
Marketing Notification No.13A2X00197218079

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This package insert must be read carefully prior to use.

Creatine kinase assay kit
(Classification No.: 38503000)

QUALIGENT CK-L

General Precautions

1. This product is for in vitro diagnostic use, and must not be used for any other purposes.
2. Clinicians should make a comprehensive clinical decision based on assay results in conjunction with clinical symptoms and other examination results.
3. This product should be used only as directed in this package insert. Reliability of results cannot be guaranteed if there are any deviations from the instructions in this package insert.
4. If the reagent accidentally comes in contact with eyes and/or mouth, rinse immediately with ample water as first aid, and consult the doctor if required.
5. Carefully read the operating instructions for each type of automated analyzers prior to using this product. Parameters for each type of analyzers are available, and can be requested from SEKISUI MEDICAL CO., LTD. if required.
6. Perform a quality control test prior to assay to ensure accuracy.

Description (Kit Components) **

Component: Ingredients
CK-L Enzyme Solution 1:
Hexokinase (derived from yeast)
Glucose-6-dehydrogenase (derived from Leuconostoc)
Adenocin-5'-potassium diphosphate
Nicotinamide adenine dinucleotide potassium phosphate (oxidized)
D-Glucose
CK-L Substrate Solution 2:
Disodium creatine phosphate

Intended Use

Measurement of creatine kinase in serum or plasma

Creatine kinase (CK) is an enzyme that acts on creatine phosphate and ADP to produce creatine and ATP.
Because there is much CK in the skeletal muscle and myocardium, it is considered to be useful for the diagnosis of muscle disease and myocardial infarction.
Various recommended methods of measuring blood CK such as GSCC and JSCC have recently been published. They are expected to be useful for improving differences among laboratories.

Assay Principle **

1. Assay Principle

Creatine kinase (CK) acts on creatine phosphate and ADP to produce creatine and ATP. ATP reacts with glucose in the presence of hexokinase (HK) to produce glucose-6-phosphate.
Glucose-6-phosphate is converted to 6-phosphogluconic acid by the action of glucose-6-phosphate dehydrogenase (G-6-PDH). At the same time, NADP is converted to NADPH, and the absorbance at 340 nm increases. CK activity is determined by measuring the velocity of NADPH production.

$$\text{Creatine phosphate} + \text{ADP} \xrightarrow[Mg^{2+}]{CK} \text{Creatine} + \text{ATP}$$

$$\text{ATP} + \text{Glucose} \xrightarrow[Mg^{2+}]{HK} \text{ADP} + \text{Glucose-6-phosphate}$$

$$\text{Glucose-6-phosphate} + \text{NADP} \xrightarrow{\text{G-6-PD}} \text{6-Phosphogluconic acid} + \text{NADPH}$$

2. Features

1) Final concentration of the principal ingredient matches with the final concentration stipulated in the JSCC Recommendation for Enzyme Activities.
2) Because the double kinetic method is used, analytical results are not influenced by hemolysis.
3) Wide assay range.

Procedural Precautions **

1. Properties of Samples and Sampling Methods

1) Samples
Serum and plasma may be used.
2) Storage of samples[4)]
If the isolated serum or plasma sample cannot be tested on the same day, specimens should be stored as follows:
2–10°C: for tests within 1 week
≤ -20°C: for tests after more than 1 week
Bring samples to room temperature (15–30°C) before use.

2. Interfering substances

Assay results are not affected by free bilirubin (up to 20 mg/dL), conjugated bilirubin (up to 20 mg/dL), hemoglobin (up to 500 mg/dL), ascorbic acid (up to 50 mg/dL), or formazin turbidity (up to 3000 FTU)

3. Others

1) Always use Enzyme Calibrator Plus "Daiichi" for calibration.
2) Precautions for assay range
If the concentration of sample exceeds assay range, dilute the sample with saline and repeat the measurement.

Dosage/Administration (Assay Procedure) **

1. Preparation of reagents

Reagent (1): CK-L Enzyme Solution 1 is ready to use.
Reagent (2): CK-L Substrate Solution 2 is ready to use.

2. Assay Procedure

.This product is compatible with Hitachi 9000 series and LABOSPECT series automated analyzers. Assay procedure is indicated below.

Sample 3.3 μL	+ Reagent (1) 100 μL	37°C → 107–293 sec	Measurement (Absorbance I※)
	+ Reagent (2) 25 μL	37°C → 122–299 sec	Measurement (Absorbance II※)
		→	Calculation of activity

※ Absorbance I and II: The difference in absorbance between 415 nm and 340 nm.

Calibration material: Enzyme Calibrator Plus "Daiichi" (Manufacture's assigned value)

Reagent blank: Purified water or saline

Assessment of Assay Results **

1. Reference standard range[5)]

Male: 59–248 U/L

Female: 41–153 U/L

2. There may be reactions or interfering reactions with non-target substances. If assay results appear to be unreliable, repeat the measurement (if necessary, after dilution) or try another analytical methods.

Performance *

1. Sensitivity

1) Reagent blank: change in absorbance being equal to or lower than 0.005/min

2) Sensitivity: The change of absorbance is 0.194–0.290/min per 1000 U/L of creatine kinase activity.

2. Accuracy: 90–110% of the expected assay value

3. Within-run Reproducibility:

Coefficient of variation ≤ 5%

(Test methods used for 1. –3. are in-house methods.)

4. Measurement Range[7)]: (On a Hitachi 9000 series automated analyzer)

4–3000 U/L

5. Correlation[7)]:

1) Serum N=80 r=0.999 y=1.03+0.0

Control method: using an already approved in vitro diagnostic product with method in line with the JSCC Recommendation for Enzyme Activities

2) Plasma N=70 r=0.999 y=1.03x-0.8

Control method: using an already approved in vitro diagnostic product with method in line with the JSCC Recommendation for Enzyme Activities

6. Standard Material

Enzyme Calibrator Plus, the calibration material used for this product, is in line with the Japanese Standard for Certified Enzyme Reference Materials.

Precautions for Use or Handling **

1. Precautions for Handling (to Ensure Safety)

1) All samples used in the test should be handled as a material possibly infected with HIV, HBV, HCV, or other viruses. To prevent infection, use disposable gloves and avoid mouth pipetting during the test.

2) Sodium azide is added as an antiseptic agent in the reagent in this product contains. Therefore, if the reagent comes in accidentally contact with eyes, mouth or skin, rinse immediately with ample water as first aid, and consult the doctor if required.

2. Precautions for use

1) This product should be stored as directed, without freezing. Freezing can deteriorate the reagents, which can produce inaccurate results. Therefore, avoid using the reagents which have been previously frozen.

2) Do not use expired reagents. Use of such reagents cannot guarantee the reliability of measurement values.

3) Do not perform the assay under direct sunlight

3. Precautions for Disposal

1) Before disposal, used samples and their containers must be immersed in sodium hypochlorite solution at a concentration of greater than 0.1% for longer than 1 hour or autoclaved at 121ºC for 20 minutes.

2) To prevent infections from spilled samples or solutions containing samples, wipe the spilled area thoroughly with disinfectants such as sodium hypochlorite solution at a concentration of greater than 0.1%.

3) The reagents and treated samples should be discarded as medical waste or industrial waste according to the waste disposal regulations.

4) The reagents should be disposed of in accordance with the Water Pollution Control act or related regulations.

5) Sodium azide is added as an antiseptic agent in the reagent in this product contains. It can react with lead or copper pipes to produce the highly explosive metal azide. Therefore, the reagent should be flushed with large amounts of water when disposing.

4. Other precautions

1) Do not use the containers for other purposes.

2) Do not take apart the reagent cartridge before use.

Storage and Shelf Life **

1. Storage temperature: 2–10°C

2. Shelf life: 8 months from the date of manufacture (The expiration date is printed on the outer package.)

Packaging **

Name	Package contents		
QUALIGENT CK-L	Set (Cassette for Hitachi 9000 series)	CK-L Enzyme Solution 1 1 × 15.0 mL	× 2
		CK-L Substrate Solution 2 1 × 3.8 mL	
	L set (Set for Hitachi LABOSPECT series)	CK-L Enzyme Solution 1 1 × 46 mL	× 2
		CK-L Substrate Solution 2 1 × 12 mL	

References **

1) Japan Society of Clinical Chemistry: Jpn J Clin Chem, 19, 184, 1990.
2) Japan Society of Clinical Chemistry: Jpn J Clin Chem, 19, 189, 1990.
3) Osawa S.: Med Tech, 20, 1022, 1992.
4) Sasaki M. et al.: Sampling of constituents of the human body, 93, Kodansha, 1972.
5) Kanai M. (supervising editor): Kanai's manual of clinical laboratory medicine. 34th ed. 571, Kanehara Shuppan, 2015.
6) Japan Society of Clinical Chemistry: Jpn J Clin Chem, 25, 135, 1996.
7) In house data, SEKISUI MEDICAL CO., LTD.

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