

LIQUIZYME

CREATINE KINASE

(Optimized IFCC Method)



BEACON

Code	Product Name	Pack Size
LS014A	Liquizyme Creatine kinase	15 T
LS014B	Liquizyme Creatine kinase	25 ml
LS014D	Liquizyme Creatine kinase	100 ml

Intended Use

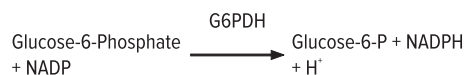
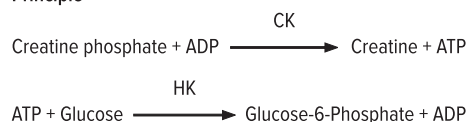
Diagnostic reagent for quantitative *in vitro* determination of Creatine Kinase in human serum and plasma.

Clinical Significance

Creatine Kinase (CK) is a dimetric enzyme occurring in four different forms: amitochondrial isoenzyme and the cytosolic isoenzymes CK-MM (muscle type), CK-BB (brain type) and CK-MB (myocardial type). The determination of CK and CK-isoenzyme activities is utilized in the diagnosis and monitoring of myocardial infarction and myopathies such as the progressive Duchenne muscular dystrophy. Following injury to the myocardium, as occurs with acute myocardial infarction, CK is released from the damaged myocardial cells. In early cases a rise in the CK activity can be found just 4 hours after an infarction, the CK-activities reaches a maximum after 12-24 hours and then falls back to the normal range after 3-4 days. Myocardial damage is very likely when the total CK activity is above 190 U/l, the CK-MB activity is above 24 U/l (37°C) and the CK-MB activity fraction exceeds 6% of total.

The assay method using creatine phosphate and ADP was first described by Oliver, modified by Rosalki and further improved for optimal test conditions by Szasz. CK is rapidly inactivated by oxidation of the sulfhydryl groups in the active center. The enzyme can be reactivated by addition of N-acetyl cysteine (NAC). Interference by adenylate kinase is prevented by the addition of diadenosine pentaphosphate and AMP. Standardized methods for the determination for CK using the "reference reaction" and activation by NAC were recommended by the German society for Clinical chemistry (DGKC) and the International Federation of Clinical Chemistry (IFCC) in 1977 and 1990 respectively. This assay meets the recommendations of the IFCC and DGKC.

Principle



The rate of absorbance change at 340 nm is directly proportional to Creatine kinase activity.

Reagent Composition

Reagent 1 : Enzyme Reagent

Imidazole buffer	:	125 mmol/L
Glucose	:	25 mmol/L
Magnesium acetate	:	12.5 mmol/l
EDTA	:	2 mmol/l
N-acetylcysteine	:	25 mmol/l
NADP	:	2.4 mmol/l
Hexokinase	:	>6.8 U/ml

Reagent 2 : Starter Reagent

ADP	:	15.2 mmol/L
D-glucose-6-phosphate	:	>8.8 U/ml
-dehydrogenase	:	
AMP	:	250 mmol/l
Diadenosine pentaphosphate	:	103 µmol/l

Reagent Preparation

Reagent is liquid, ready to use.

Stability And Storage

The unopened reagents are stable till the expiry date stated on the bottle and kit label when stored at 2–8°C.

Working Reagent Preparation

Mix 4 portion of reagent R1 with 1 portion of reagent R2.

Stability:

2 days	:	at 20 – 25°C
14 days	:	at 2 – 8°C

Specimen Collection And Handling

Use unhemolytic serum or plasma (heparin, EDTA)

It is recommended to follow NCCLS procedures (or similar standardized conditions).

Loss of activity:

1 week	:	at 2 – 8°C	< 10%
1 day	:	at 15 – 25°C	< 10%

Stability :

4 weeks	:	at -20°C (in the dark)
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Discard contaminated specimens.

Quality Control

It's recommended to run normal and abnormal control sera to validate reagent performance.

Unit Conversion

U/L x 0.017 = μ kat/l

Expected Values

At 37°C

Male : 24-195 U/L

Female : 24-180 U/L

It is recommended that each laboratory verify this range or derives reference interval for the population it serves.

Performance Data

Data contained within this section is representative of performance on Beacon system. Data obtained in your laboratory may differ from these values.

Limit of quantification : 10.4 U/L

Linearity : 2000 U/L

Measuring range : 10.4 – 2000 U/L

Intra-assay precision Within run (n=20)	Mean (U/L)	SD (U/L)	CV (%)
Sample 1	133	1.29	0.96
Sample 2	448	1.57	0.35
Inter-assay precision Run to run (n=20)	Mean (U/L)	SD (U/L)	CV (%)
Sample 1	129	1.62	1.26

Comparison

A comparison between Beacon CK (NAC act.) (y) and a commercially available test (x) using 20 samples gave following results:

y = 0.997x - 0.598 U/L

r = 0.999

Interferences

Following substances do not interfere:

haemoglobin interferes, bilirubin up to 15 mg/dl, triglycerides up to 600 mg/dl.

Waste Management

Please refer to local legal requirements.

Assay Procedure

Wavelength : 340 nm

Cuvette : 1 cm

Addition Sequence	Volume
Working Reagent	1000 μ l
Sample	20 μ l

Mix and read the initial absorbance A after 1 minute and repeat the absorbance reading after every 1, 2 and 3 minutes. Calculate the mean absorbance change per minute. (ΔA /min).

Calculation

Using factor:

CK activity (U/L) = ΔA /min x 8095

Applications for automatic analysers are available on request.

Assay Parameters For Photometers

Mode	Kinetic
Wavelength 1 (nm)	340
Sample Volume (μ l)	20
Working Reagent Volume (μ l)	1000
Lag time (sec.)	60
Kinetic Interval (sec.)	60
No. of Interval	3
Kinetic Factor	8095
Reaction temp. (°C)	37
Reaction Direction	Increasing
Normal Low (U/L)	24
Normal High (U/L)	195
Linearity Low (U/L)	10.4
Linearity High (U/L)	2000
Blank with	Water
Unit	U/L

References

1. Henderson, A.R., Donald W.M., Enzymes, Tietz Fundamentals of Clinical Chemistry, 5th Ed., Burtis, C. & Ashwood, E.R. (W.B. Saunders eds. Philadelphia USA), (2001), 352.

Symbols Used On Labels



Catalogue
Number



Manufacturer



See Instruction
for Use



Lot Number



Content



Storage Temperature



Expiry Date



In Vitro Diagnostics



BEA/24/CKN/LS/IFU-02 22/04/2022