GGT BR CE

CONTENTS			
REF	1126005 1126010	GGT BR GGT BR	2 x 50 mL 3 x 100 mL
For *in vitro* diagnostic use only			

γ-GT BR

IFCC

Enzymatic colorimetric method

KINETIC

PRINCIPLE

Gamma-glutamyltransferase (γ-GT) catalyzes the transfer of a γ-glutamyl group from γ-glutamyl-3-carboxy-4-nitroanilide to glycylglycine with the formation of L-γ-glutamyl-glycylglycine and 5 amino-2-nitro-benzoate.
The amount of 5-amino-2-nitro-benzoate formed, monitored kinetically at 405 nm, is proportional to the enzyme activity present in the sample.[1]

(L-γ-Glutamyl) -3-carboxy-4-nitroanilide $\xrightarrow{\text{γ-GT}}$ GLYCYLGLYCINE

(L-γ-Glutamyl) -glycylglycine + 5-amino-2- nitro-benzoate

REAGENT COMPOSITION

R1 **Buffer/Glycylglycine**. TRIS 133 mmol/L pH 8.2, glycylglycine 138 mmol/L.

R2 **Substrate/Glupa-C**. L-γ-Glutamyl-3-carboxy-4-nitroanilide 23 mmol/L.

STORAGE AND STABILITY

Store at 2-8ºC.
The Reagents are stable until the expiry date stated on the label.

REAGENT PREPARATION

Working reagent. Mix 4 mL of **R1** + 1 mL of **R2**. Stable for 3 weeks at 2-8ºC or for 5 days at 15-25ºC. Protect from light.
Discard the reagent if the blank presents an absorbance over 1.200 at 405 nm. against distilled water or if it fails to recover the declared values of control sera.

SAMPLES

Serum or EDTA plasma free of hemolysis. Fluoride, citrate and oxalate inhibit γ-GT activity[2].
The enzyme in the sample is stable for at least 1 week at 2-8ºC and for at least 2 months when frozen.

INTERFERENCES

- Lipemia (triglycerides >4 g/L), bilirubin (>10 mg/dL) and hemoglobin (>5 g/L) may affect the results.
- Some drugs (phenytoin, barbiturates, codeine) may result in falsely elevated values.[2]

MATERIALS REQUIRED

- Photometer or spectrophotometer with a thermostatted cell compartment set at 25/30/37ºC, capable to read at 405 nm.
- Stopwatch, strip-chart recorder or printer.
- Cuvettes with 1-cm pathlength.
- Pipettes to measure reagent and samples.

PROCEDURE

1. Preincubate working reagent, samples and controls to reaction temperature.
2. Set the photometer to 0 absorbance with distilled water.
3. Pipette into a cuvette:

Working reagent	1.0 mL
Sample	100 µL

4. Mix gently by inversion. Insert cuvette into the cell holder and start stopwatch.
5. Incubate for 1 minute and record initial absorbance reading.
6. Repeat the absorbance readings exactly after 1, 2 and 3 minutes.
7. Calculate the difference between absorbances.
8. Calculate the mean of the results to obtain the average change in absorbance per minute (ΔA/min).

CALCULATIONS

U/L = ΔA/min x 1111

Samples with ΔA/min exceeding 0.200 at 405 nm should be diluted 1:10 with saline and assayed again. Multiply the results by 10.

If results are to be expressed as SI units apply:
U/L x 16.67 = nkat/L

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REFERENCE VALUES[3]

Serum, plasma

Temperature	37ºC	30ºC	25ºC
Men	10-50 U/L (167-834 nKat/L)	7-35 U/L (117-538 nKat/L)	5-25 U/L (83-417 nKat/L)
Women	8-35 U/L (133-583 nKat/L)	6-25 U/L (100-417 nKat/L)	6-25 U/L (83-300 nKat/L)

It is recommended that each laboratory establishes its own reference range.

QUALITY CONTROL

To ensure adequate quality control (QC), each run should include a set of controls (normal and abnormal) with assayed values handled as unknowns.

REF **1980005** HUMAN MULTISERA NORMAL
Borderline level of γ-GT. Assayed.

REF **1985005** HUMAN MULTISERA ABNORMAL
Elevated level of γ-GT. Assayed.

CLINICAL SIGNIFICANCE

Gamma-glutamyl transferase is the most sensitive enzymatic indicator of hepatobiliary disease available. It is highest in cases of *intrahepatic* or *posthepatic biliary obstruction*, and is more sensitive than alkaline phosphatase in detecting *obstructive jaundice*, *colangitis*, and *cholecystitis*.

Elevated levels are noted in the sera of patients with *alcoholic cirrhosis* and from people who are heavy drinkers. The enzyme levels are important in detecting alcohol induced liver disease correlating well with the duration of the drug action.

ANALYTICAL PERFORMANCE

- ***Linearity.*** Up to 300 U/L
- ***Precision***

U/L	Within-run			Between-run		
Mean	45	83	280	45	80	287
SD	0.95	0.93	1.75	1.43	2.1	2.67
CV%	2.17	1.12	0.62	3.17	2.62	0.93
N	10	10	10	10	10	10

Replicates: 10 for each level. Replicates: 10 for each level
Instrument: CECIL CE 2021 for 8 days.

- ***Sensitivity.*** Using this reagent and method an ΔA/min of 0.001 read at 405 nm is equivalent to 1.15 U/L of γ-GT activity.
- ***Correlation.*** This assay (y) was compared with a similar commercial method (x). The results were:
N = 25 r = 0.998 y = 1x – 0.341

REFERENCES

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