



C4



Quantitative turbidimetric assay for the measurement of the component complement C4 in human serum or plasma

ORDER INFORMATION

REF	Kit size
GD8490 00	2x20 ml
KL8490 00	2x20 ml
BK8490 00	1x60 ml

CLINICAL SIGNIFICANCE

C4 is the complement component essential for classical pathway activation. Most individuals with C4 deficiency do not have problems with infection, suggesting that the alternative pathway can compensate for the lack in the classical pathway activation in removal of bacterial agents. Hepatic cells synthesize C4, although in less proportion may be synthesized by monocytes and other tissues.

Increased and decreased levels of C4 both have clinical significance. Increased levels are closely related with acute-phase response (trauma, inflammatory process).

Decreased levels are related with genetic deficiency (autoimmune or collagen vascular disease, particularly Systemic Lupus Erythematosus), or acquired deficiency as a consequence of the consumption in immunocomplexes formation, autoimmune hemolytic anemia and autoimmune nephritis.

METHOD PRINCIPLE

C4 is a quantitative turbidimetric assay for the measurement of the component complement C4 in human serum or plasma.

Anti-human C4 antibodies form insoluble complexes when mixed with samples containing C4. The scattering light of the immunocomplexes depends of the C4 concentration in the patient sample, and can be quantified by comparison from a calibrator of known C4 concentration.

COMPOSITION

Reagent A: Goat antibodies anti-human C4, Tris buffer 20 mmol/l, pH 8.2. Sodium azide 0.95 g/l.

PREPARATION OF THE REAGENTS

Reagent A is ready to use.

Calibration curve

Dilute the Plasmaprotein Multicalibrator L in NaCl 9 g/l as follows:

Dilution	1	2	3	4	5	6
Calibrator (µl)	--	10	25	50	75	100
NaCl 9 g/l (µl)	100	90	75	50	25	--
Factor	0	0.1	0.25	0.5	0.75	1.0

Multiply the concentration of the calibrator by the corresponding factor to obtain the C4 concentration of each dilution.

STORAGE AND STABILITY

Reagent A is stable up to the date stated on the label, if contamination and evaporation are avoided.

The above conditions are valid if the vial is opened just only for the time to take the reagent, closed immediately with its cap and stored at the indicated conservation temperature.

Do not use the reagent after the expiry date.

Presence of particles, turbidity and/or the absorbance of blank reagent > 0.300 at 340 nm are sign of deterioration.

ANCILLARY EQUIPMENT

- Automatic pipette to measure reagent and sample
- Thermostatic bath at 37 °C

- Spectrophotometer or photometer thermostatable at 37 °C capable to read 340 ± 20 nm
- Analysis cuvettes (optical path = 1 cm)
- NaCl (9 g/l) solution
- Plasmaprotein Multicalibrator L (Ref. GD8469 00)
- Plasmaprotein Normal Control L (Ref. GD8461 00)
- Plasmaprotein Pathological Control L (Ref. GD8464 00)
- Plasmaprotein Normal and Pathological Control L (Ref. GD8466 00)

SAMPLES

Fresh serum and EDTA or heparinized plasma.

C4 in serum or plasma is stable 7 days at 2-8 °C or 3 months at -20 °C.

Samples with presence of fibrin should be centrifuged before testing. Highly hemolyzed or lipemic samples are not suitable for testing.

PROCEDURE

1. Prewarm the reagent and the photometer (cuvette holder) to 37 °C.
2. Using distilled water zero the instrument at 340 nm.
3. Pipette into a cuvette:

Sample / Calibrator	25 µl
Reagent (RA)	1000 µl

4. Mix well and insert the cuvette into the photometer. Record the absorbance (A) after 2 minutes of the sample or calibrator addition.

CALCULATION

Plot the different absorbance values (A) against the C4 concentration of each calibrator dilution. C4 concentration in the sample is calculated by interpolation of its (A) value in the calibration curve.

REFERENCE VALUES^(3, 4)

Adults	10 – 40 mg/dl
Newborn	13 – 38 mg/dl

It is recommended that each laboratory establishes its own reference range according to the examined population.

QUALITY CONTROLS

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

Each laboratory should establish its own Quality Control scheme and corrective actions if controls do not meet the acceptable tolerances.

ANALYTICAL PERFORMANCE

Linearity

The method is linear up to 100 mg/dl, under the described assay conditions. Samples with higher concentrations should be diluted 1/5 in NaCl 9 g/l and retested again.

Detection limit

Values less than 0.5 mg/dl give non-reproducible results.

Analytical sensitivity

Using this reagent and method an ΔA of 9.34 mA at 340 nm is equivalent to 1 mg/dl of C4 at a concentration of 47.6 mg/dl.

Prozone effect

Prozone effect is not observed up to 200 mg/dl of C4.

Precision

mg/dl	Within-run		Between-run	
Mean	19.9	37.6	19.9	37.6
SD	0.6	0.9	0.7	1.8
%CV	3.1	2.3	3.6	4.7
N	10	10	10	10

Accuracy

Results obtained with this reagent did not show systematic differences when compared with commercial reagents of similar characteristics. Details of comparison are available on request.

Interferences

Bilirubin (10 mg/dl), and rheumatoid factors (400 UI/ml) do not interfere. Hemoglobin (4 g/l), lipemia (2.5 g/l) may affect the results. Other substances may interfere⁽⁵⁾.

Note:

1. This method may be used with different instruments. Any application to an instrument should be validated to demonstrate that results meet the performance characteristics of the method. It is recommended to validate periodically the instrument. Contact to the distributor for any question on the application method.
2. The linearity limit depends on the sample/reagent ratio, as well as the analyzer used. It will be higher by decreasing the sample volume, although the sensitivity of the test will be proportionally decreased.
3. Clinical diagnosis should not be made on findings of a single test result, but should integrate both clinical and laboratory data.

PRECAUTIONS IN USE

The reagents contain inactive components such as preservatives (Sodium azide or others), surfactants etc. The total concentration of these components is lower than the limits reported by 67/548/ECC and 88/379/EEC directives about classification, packaging and labelling of dangerous substances. However, the reagents should be handled with caution, avoiding swallowing and contact with skin, eyes and mucous membranes.

The reagents from human donors have given negative results to anti-HIV 1/2, HBsAg and anti-HCV. It is recommended to handle with caution.

The use of the laboratory reagents according to good laboratory practice is recommended.⁽⁷⁾

Waste Management

Please refer to local legal requirement.

REFERENCES

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5. Young DS. Effects of drugs on clinical laboratory tests. 3th ed. AACC Press (1997).
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7. EU-Dir 1999/11 Commission Directive of 8 March 1999 adapting to technical progress the principles of good laboratory practice as specified in Council Directive 87/18/EEC.