A1MGU

Denka

α1-Microglobulin

Order information

REF	CONTENT		Analyzer(s) on which **cobas c** pack(s) can be used
08944539190	α1-Microglobulin (100 tests)	System-ID 07 7627 0	**cobas c** 311, **cobas c** 501/502
08944474190	α1-Microglobulin Calibrator Set (5 × 1 mL)	Code 620-625	
03121313122	Precinorm PUC (4 × 3 mL)	Code 240	
03121291122	Precipath PUC (4 × 3 mL)	Code 241	
04489357190	Diluent NaCl 9 % (50 mL)	System-ID 07 6869 3	

English

Roche does not hold the product registration for Partner Channels. The legal manufacturer indicated on the kit is solely responsible for all of the design, legal, and regulatory aspects of the product.

System information

For **cobas c** 311/501 analyzer:

A1MGU: ACN 696

For **cobas c** 502 analyzer:

A1MGU: ACN 8696

Intended use

Reagent to measure A1M Levels in human urine samples.

Summary

α1-Microglobulin (α1-M) is a low molecular weight, pH stable glycoprotein. It has a molar mass of 30000 daltons and is synthesized by the hepatocytes and lymphocytes. It is almost entirely filtered in the glomeruli with approximately 99.8 % of the reabsorption and catabolism taking place in the proximal tubules.

Increased excretion of α1-microglobulin in tubular proteinuria is indicative of reduced tubular reabsorption under normal glomerular filtration conditions. This form of proteinuria is typical for chronic interstitial nephropathy and for acute and chronic tubular damage caused by endogenous and exogenous tubular toxins. In renal failure, the plasma levels of this microprotein increase from an early stage. The resultant protein hyperfiltration in the residual nephron causes increased renal excretion as reabsorption capacity is exceeded (overflow proteinuria). α1-Microglobulin can be used as a marker for the diagnosis of tubule-interstitial nephropathy, for example, at an early stage or rule it out with a high degree of certainty; the detection limit is approximately 10-20 mg/L (333-666 nmol/L). Acute and chronic forms of tubular insufficiency (all forms of primary and secondary Fanconi syndrome), heavy metal intoxication, nephrotoxic side-effects of pharmaceuticals, and rejection reactions following kidney transplantation can also be excluded.[1,2,3,4,5]

Test principle

Immunoturbidimetric assay

Anti-α1-microglobulin antibodies sensitized to latex particles react with antigen in the sample to form an antigen/antibody complex which, after agglutination, can be determined turbidimetrically. This agglutination is detected as an absorbance change, with the magnitude of the change being proportional to the quantity of A1M in the sample. The actual concentration is determined by interpolation from a calibration curve prepared from calibrators of known concentration.

Reagents - working solutions

R1 Glycine buffer: 170 mmol/L, pH 7.0; NaCl: 1.1 mol/L; preservative

R3 Latex particles coated with anti-human α1-microglobulin antibodies (rabbit): 0.2-0.3 %; glycine buffer: 150 mmol/L, pH 7.3; NaCl: 90 mmol/L; preservative

R1 is in position B and R3 is in position C.

Precautions and warnings

For professional in vitro diagnostic use.
Exercise the normal precautions required for handling all laboratory reagents.
Disposal of all waste material should be in accordance with local guidelines.
Safety data sheet available for professional user on request.

Reagent handling

Ready for use

Storage and stability

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Shelf life at 2-8 °C:	See expiration date on **cobas c** pack label.
On-board in use and refrigerated on the analyzer:	12 weeks

Diluent NaCl 9 %

Shelf life at 2-8 °C:	See expiration date on **cobas c** pack label.
On-board in use and refrigerated on the analyzer:	12 weeks

Specimen collection and preparation

For specimen collection and preparation only use suitable tubes or collection containers.

Only the specimens listed below were tested and found acceptable.
Urine

The sample types listed were tested with a selection of sample collection tubes that were commercially available at the time of testing, i.e. not all available tubes of all manufacturers were tested. Sample collection systems from various manufacturers may contain differing materials which could affect the test results in some cases. When processing samples in primary tubes (sample collection systems), follow the instructions of the tube manufacturer.

Centrifuge samples containing precipitates before performing the assay.

See the limitations and interferences section for details about possible sample interferences.

Stability:	5 days at 15-25 °C
	4 weeks at 2-8 °C
	3 months at ~(-70) °C

Materials provided

See “Reagents – working solutions” section for reagents.

Materials required (but not provided)

See “Order information” section

General laboratory equipment

Assay

For optimum performance of the assay follow the directions given in this document for the analyzer concerned. Refer to the appropriate operator’s manual for analyzer-specific assay instructions.

The performance of applications not validated by Denka is not warranted and must be defined by the user.

Application for urine

cobas c 311 **test definition**

Assay type	2-Point End
Reaction time / Assay points	10 / 27-57
Wavelength (sub/main)	800/570 nm

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Reaction direction	Increase
Units	mg/L

Reagent pipetting		Diluent (H_2O)
R1	100 µL	–
R3	33 µL	–

Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	10 µL	10 µL	90 µL
Decreased	10 µL	10 µL	90 µL
Increased	10 µL	10 µL	90 µL

cobas c 501/502 **test definition**

Assay type	2-Point End
Reaction time / Assay points	10 / 40-70
Wavelength (sub/main)	800/570 nm
Reaction direction	Increase
Units	mg/L

Reagent pipetting		Diluent (H_2O)
R1	100 µL	–
R3	33 µL	–

Sample volumes	*Sample*	*Sample dilution*	
		Sample	*Diluent (NaCl)*
Normal	10 µL	10 µL	90 µL
Decreased	10 µL	10 µL	90 µL
Increased	10 µL	10 µL	90 µL

Calibration

Calibrators	S1: H_2O S2-S6: α1-Microglobulin Calibrator Set
Calibration mode	Spline
Calibration frequency	Full calibration • after reagent lot change • Every 84 days a new calibration for one lot. • as required following quality control

Calibration interval may be extended based on acceptable verification of calibration by the laboratory.

Traceability: This method has been standardized against an internal standard traceable to a nephelometric method.

Quality control

For quality control, use control materials as listed in the "Order information" section. In addition, other suitable control material can be used.

The control intervals and limits should be adapted to each laboratory's individual requirements. Values obtained should fall within the defined limits. Each laboratory should establish corrective measures to be taken if values fall outside the defined limits.

Follow the applicable government regulations and local guidelines for quality control.

Calculation

cobas c systems automatically calculate the analyte concentration of each sample.

Limitations – interference

Criterion: deviation from initial value: ≤ 20 mg/L: ≤ ± 2 mg/L, > 20 mg/L: ≤ ± 10 %

Hemolysis:[6] No significant interference up to an H index of 250 (approximate hemoglobin concentration: 250 mg/dL).

Urea: No significant interference from urea up to a concentration of 2700 mmol/L.

High dose hook-effect: No false result occurs up to an α1-microglobulin concentration of 500 mg/L.

Drugs:[7] No interference was found at therapeutic concentrations using common drug panels.

For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

ACTION REQUIRED

Special Wash Programming: The use of special wash steps is mandatory when certain test combinations are run together on **cobas c** systems. The latest version of the carry-over evasion list can be found with the NaOHD-SMS-SmpCln1+2-SCCS Method Sheets. For further instructions refer to the operator's manual. **cobas c** 502 analyzer: All special wash programming necessary for avoiding carry-over is available via the **cobas** link, manual input is required in certain cases.

Where required, special wash/carry-over evasion programming must be implemented prior to reporting results with this test.

Limits and ranges

Measuring range

5.0-200 mg/L

No automatic re-run defined. Samples exceeding the measuring range must be diluted manually with 0.9 % NaCl solution; e.g. 1:2.

Lower limits of measurement

Limit of Blank, Limit of Detection, and Limit of Quantitation

Limit of Blank	= 1 mg/L
Limit of Detection	= 2.5 mg/L
Limit of Quantitation	= 5 mg/L

These data were generated on **cobas c** 501 at Denka, based on the Clinical and Laboratory Standards Institute (CLSI) Protocol EP17-A2. The precision goal for the Limit of Quantitation was a CV % of less than 16 %.

Expected values

2nd morning urine:[8] < 12 mg/L

Each laboratory should investigate the transferability of the expected values to its own patient population and if necessary determine its own reference ranges.

Specific performance data

Representative performance data on the analyzers are given below. Results obtained in individual laboratories may differ.

Precision

Precision was determined data using human samples and controls in an internal protocol with repeatability (n = 21) and intermediate precision (2 aliquots per run, 2 runs per day, 21 days). The following results were obtained.

Repeatability	*Mean* mg/L	*SD* mg/L	*CV* %
Precinorm PUC	43.7	0.360	0.8
Precipath PUC	181	1.66	0.9
Human urine 1	6.90	0.266	3.9
Human urine 2	15.4	0.252	1.6
Human urine 3	97.3	2.12	2.2
Intermediate precision	*Mean* mg/L	*SD* mg/L	*CV* %
Control Low	14.1	0.185	1.3

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Control High	109	1.37	1.3
Human urine 1	4.99	0.231	4.6
Human urine 2	15.0	0.357	2.4
Human urine 3	96.2	3.07	3.2

Method comparison

α1-Microglobulin values for urine samples obtained on a COBAS INTEGRA 400 plus analyzer (y) were compared with those determined using the corresponding reagent on a **cobas c** 501 analyzer (x).
Sample size (n) = 117

Passing/Bablok[9]	Linear regression
y = 1.018x – 0.832 mg/L	r = 0.999

The sample concentrations were between 5.60 mg/L and 194 mg/L.

References

1 Kurrle-Weittenhiller A, Engel W. AACC Poster Abstract. Clin Chem 1992;38:1090-1091.

2 Weber MH, Scholz P, Stibbe W, et al. α1-Mikroglobulin im Urin und Serum bei Proteinurie und Niereninsuffizienz. Klin Wschr 1985;63:711-713.

3 Colombo JP, ed. Klinisch-chemische Urindiagnostik. Rotkreuz: LABOLIFE-Verlagsgemeinschaft 1994:180.

4 Guder W, Zawta B. Basiswissen Labordiagnostik Niere (Boehringer Mannheim 1994) 1994.

5 Greiling H, Gressner AM, eds. Lehrbuch der Klinischen Chemie und Pathobiochemie, 3rd ed. Stuttgart/New York: Schattauer Verlag 1995.

6 Glick MR, Ryder KW, Jackson SA. Graphical Comparisons of Interferences in Clinical Chemistry Instrumentation. Clin Chem 1986;32:470-475.

7 Sonntag O, Scholer A. Drug interference in clinical chemistry: recommendation of drugs and their concentrations to be used in drug interference studies. Ann Clin Biochem 2001;38:376-385.

8 Hofmann W, Guder WG. Präanalytische und analytische Faktoren bei der Bestimmung von IgG, Albumin, a1-Mikroglobulin und Retinol-bindendem Protein im Urin mit dem Behring Nephelometer System (BNS) . Lab med 1989; 13: 470-8.

9 Bablok W, Passing H, Bender R, et al. A general regression procedure for method transformation. Application of linear regression procedures for method comparison studies in clinical chemistry, Part III. J Clin Chem Clin Biochem 1988 Nov;26(11):783-790.

A point (period/stop) is always used in this Method Sheet as the decimal separator to mark the border between the integral and the fractional parts of a decimal numeral. Separators for thousands are not used.

Symbols

Roche Diagnostics uses the following symbols and signs in addition to those listed in the ISO 15223-1 standard:

CONTENT	Contents of kit
GTIN	Global Trade Item Number
	Temperature limitation
IVD	In vitro diagnostic medical device
REF	Catalogue number
LOT	Batch code
	Use by date

CE

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