

A1MG2

Tina-quant α 1-Microglobulin Gen.2
cobas[®]
Specific proteins

Order information

REF	CONTENT	Analyzer(s) on which cobas c pack(s) can be used
06750052 190	Tina-quant α 1-Microglobulin Gen.2 (100 tests)	System-ID 07 6791 3 COBAS INTEGRA 400 plus COBAS INTEGRA 800
03121305 122	C.f.a.s. PUC (5 x 1 mL)	System-ID 07 6755 7
03121313 122	Precinorm PUC (4 x 3 mL)	System-ID 07 6756 5
03121291 122	Precipath PUC (4 x 3 mL)	System-ID 07 6757 3
20756350 322	NaCl Diluent 9 % (6 x 22 mL)	System-ID 07 5635 0

English

System information

Test A1MG2, test ID 0-291.

Intended use

Immunoturbidimetric test for the quantitative in vitro determination of α 1-microglobulin in human urine on COBAS INTEGRA systems.

Summary^{1,2,3,4,5}

Alpha 1-microglobulin (α 1-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 re-absorption and catabolism taking place in the proximal tubules.

Increased excretion of α 1-microglobulin in tubular proteinuria is indicative of reduced tubular re-absorption 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 re-absorption capacity is exceeded (overflow proteinuria). α 1-Microglobulin can be used as a marker for the diagnosis of tubulo-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.

Test principle¹

Immunoturbidimetric assay

Anti- α 1-microglobulin antibodies react with antigen in the sample to form an antigen/antibody complex which, after agglutination, can be determined turbidimetrically.

Reagents - working solutions

- R1** Acetate buffer: 35 mmol/L, pH 5.3; PEG; detergent; stabilizer; preservatives
- SR** Polyclonal anti-human α 1-microglobulin antibody (sheep), dependent on titer; acetate buffer: 50 mmol/L, pH 5.3; stabilizer; preservatives

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

Precautions and warnings

Pay attention to all precautions and warnings listed in Section 1 / Introduction of this Method Manual.

Reagent handling

Ready for use

Storage and stability

Shelf life at 2-8 °C	See expiration date on cobas c pack label
COBAS INTEGRA 400 plus system	
On-board in use at 10-15 °C	12 weeks
COBAS INTEGRA 800 system	
On-board in use at 8 °C	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 for 10 min at 800 g before performing the assay.

Stability: ⁶	7 days at 15-25 °C
	1 month at 2-8 °C
	6 months at (-15)-(-20) °C

Materials provided

See "Reagents – working solutions" section for reagents.

Materials required (but not provided)

NaCl Diluent 9 %, Cat. No. 20756350 322, system-ID 07 5635 0 for automatic postdilution and standard serial dilutions. NaCl Diluent 9 % is placed in its predefined rack position and is stable for 4 weeks on-board COBAS INTEGRA 400 plus/800 analyzers.

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.

Application for urine

COBAS INTEGRA 400 plus test definition

Measuring mode	Absorbance
Abs. calculation mode	Endpoint
Reaction mode	R1-S-SR
Reaction direction	Increase
Wavelength A/B	340/659 nm
Calc. first/last	33/63
Typical prozone effect	> 1000 mg/L (> 33300 nmol/L)
Antigen excess check	No
Unit	mg/L

Pipetting parameters

		Diluent (H ₂ O)
R1	125 μ L	
Sample	7.5 μ L	5 μ L
SR	25 μ L	
Total volume	162.5 μ L	

COBAS INTEGRA 800 test definition

Measuring mode	Absorbance
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A1MG2

Tina-quant α 1-Microglobulin Gen.2

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Abs. calculation mode	Endpoint
Reaction mode	R1-S-SR
Reaction direction	Increase
Wavelength A/B	340/659 nm
Calc. first/last	44/97
Typical prozone effect	> 1000 mg/L (> 33300 nmol/L)
Antigen excess check	No
Unit	mg/L

Pipetting parameters

		Diluent (H ₂ O)
R1	125 μ L	
Sample	7.5 μ L	5 μ L
SR	25 μ L	
Total volume	162.5 μ L	

Calibration

Calibrator	C.f.a.s. PUC
Calibration mode	logit/log 4
Calibrator dilution ratio	1:1, 1:3, 1:5.5, 1:11.1, 1:16.7, 1:33.3, performed automatically by the instrument
Calibration replicate	Duplicate recommended
Calibration interval	Each lot and as required following quality control procedures

Enter the assigned lot-specific α 1-microglobulin value of the undiluted calibrator, indicated in the package insert of the calibrator C.f.a.s. PUC.

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

Quality control

Reference range	Precinorm PUC
Pathological range	Precipath PUC
Control interval	24 hours recommended
Control sequence	User defined
Control after calibration	Recommended

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 INTEGRA analyzers automatically calculate the analyte concentration of each sample. For more details, please refer to Data Analysis in the Online Help (COBAS INTEGRA 400 plus/800 analyzers).

Conversion factor: mg/L \times 33.3 = nmol/L

Limitations - interference

Criterion: Recovery within \pm 10 % of initial value.

Icterus: No significant interference up to a conjugated bilirubin concentration of 257 μ mol/L or 15 mg/dL.

Hemolysis: No significant interference up to a hemoglobin concentration of 155 μ mol/L or 250 mg/dL.

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

High dose hook-effect: No false result occurs up to a α 1-microglobulin concentration of 1000 mg/L.

In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.⁸

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 INTEGRA analyzers. Refer to the CLEAN Method Sheet for further instructions and for the latest version of the Extra wash cycle list.

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 (167-6660 nmol/L) (typical measuring range)

The upper and lower limits of the measuring range depend on the actual calibrator value.

Determine samples having higher concentrations via the rerun function. Dilution of samples via the rerun function is a 1:5 dilution. Results from samples diluted using the rerun function are automatically multiplied by a factor of 5.

Lower limits of measurement

Lower detection limit of the test:

5.0 mg/L (167 nmol/L)

The lower detection limit represents the lowest measurable analyte level that can be distinguished from zero. It is calculated as the value lying 3 standard deviations above that of a zero sample (zero sample + 3 SD, repeatability, n = 21).

Expected values

2nd morning urine ⁹	< 14 mg/g creatinine or < 1.58 g/mol creatinine (< 52.6 mmol/mol creatinine)
24-hour urine ¹⁰	< 12 mg/L (< 400 nmol/L) < 20 mg/24 h (< 666 nmol/24 h)

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 COBAS INTEGRA analyzers are given below. Results obtained in individual laboratories may differ.

Precision

Precision was determined using human samples and controls in an internal protocol with repeatability (n = 21) and intermediate precision (1 aliquot per run, 1 run per day, 21 days). The following results were obtained:

Repeatability	Mean mg/L (nmol/L)	SD mg/L (nmol/L)	CV %
Precinorm PUC	18.0 (599)	0.2 (7)	0.9
Precipath PUC	54.8 (1825)	0.3 (10)	0.5
Human urine	10.0 (333)	0.2 (7)	1.6

Intermediate precision	Mean mg/L (nmol/L)	SD mg/L (nmol/L)	CV %
Precinorm PUC	14.8 (493)	0.5 (17)	3.1
Precipath PUC	48.5 (1615)	1.6 (53)	3.4
Human urine	49.5 (1648)	1.0 (33)	2.1

Method comparison

α 1-Microglobulin values for human urine samples obtained on a COBAS INTEGRA 700 analyzer with the application A1MG2 (y) were compared with those determined using the same reagent on a

A1MG2

Tina-quant α 1-Microglobulin Gen.2

Roche/Hitachi 917 analyzer (x) and with a nephelometric α 1-microglobulin test (x).



Roche Diagnostics GmbH, Sandhofer Strasse 116, D-68305 Mannheim
www.roche.com



Roche/Hitachi 917 analyzer

Sample size (n) = 79

Passing/Bablok¹¹

Linear regression

$y = 0.997x + 0.43 \text{ mg/L}$

$y = 0.97x + 1.57 \text{ mg/L}$

$r = 0.973$

$r = 0.996$

The sample concentrations were between 5 and 384 mg/L (167 and 12787 nmol/L).

Nephelometric test

Sample size (n) = 46

Passing/Bablok¹¹

Linear regression

$y = 0.97x - 1.44 \text{ mg/L}$

$y = 0.98x - 1.3 \text{ mg/L}$

$r = 0.917$

$r = 0.991$

The sample concentrations were between 6 and 61.7 mg/L (200 and 2055 nmol/L).

References

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- 3 Colombo JP, ed. Klinisch-chemische Urindiagnostik. Rotkreuz: LABOLIFE-Verlagsgemeinschaft 1994:180.
- 4 Guder W, Zawta B. Basiswissen Labordiagnostik Niere (Boehringer Mannheim 1994) 1994.
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- 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 Bakker AJ, Mücke M. Gammopathy interference in clinical chemistry assays: mechanisms, detection and prevention. Clin Chem Lab Med 2007;45(9):1240-1243.
- 9 Greiling H, Gressner AM, eds. Lehrbuch der Klinischen Chemie und Pathobiochemie, 3rd ed. Stuttgart/New York: Schattauer Verlag 1995:749-750.
- 10 Heil W, Koberstein R, Zawta B. Reference Ranges for Adults and Children, Pre-Analytical Considerations. 6th ed. (Published by Roche Diagnostics).
- 11 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



Volume after reconstitution or mixing

COBAS, COBAS C, COBAS INTEGRA, TINA-QUANT, PRECINORM and PRECIPATH are trademarks of Roche.

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Significant additions or changes are indicated by a change bar in the margin.

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