

Order information

REF	CONTENT	Analyzer(s) on which cobas c pack(s) can be used
03005771 322	Tina-quant α 1-Antitrypsin ver.2 (100 tests)	System-ID 07 9008 7 COBAS INTEGRA 400 plus COBAS INTEGRA 800
11355279 216	C.f.a.s. Proteins (5 x 1 mL)	System-ID 07 6557 0
11355279 160	C.f.a.s. Proteins (5 x 1 mL, for USA)	System-ID 07 6557 0
10557897 122	Precinorm Protein (3 x 1 mL)	System-ID 07 9105 9
10557897 160	Precinorm Protein (3 x 1 mL, for USA)	System-ID 07 9105 9
11333127 122	Precipath Protein (3 x 1 mL)	System-ID 07 9106 7
11333127 160	Precipath Protein (3 x 1 mL, for USA)	System-ID 07 9106 7
05117003 190	PreciControl ClinChem Multi 1 (20 x 5 mL)	System-ID 07 7469 3
05947626 190	PreciControl ClinChem Multi 1 (4 x 5 mL)	System-ID 07 7469 3
05947626 160	PreciControl ClinChem Multi 1 (4 x 5 mL, for USA)	System-ID 07 7469 3
05117216 190	PreciControl ClinChem Multi 2 (20 x 5 mL)	System-ID 07 7470 7
05947774 190	PreciControl ClinChem Multi 2 (4 x 5 mL)	System-ID 07 7470 7
05947774 160	PreciControl ClinChem Multi 2 (4 x 5 mL, for USA)	System-ID 07 7470 7
20756350 322	NaCl Diluent 9 % (6 x 22 mL)	System-ID 07 5635 0

English

System information

Test AAT2, test ID 0-008.

Intended use

In vitro test for the quantitative immunological determination of human α 1-antitrypsin in human serum and plasma on COBAS INTEGRA systems.

Summary^{1,2,3,4,5,6}

α 1-Antitrypsin is a glycoprotein consisting of a polypeptide chain to which 3 oligosaccharide chains are bonded (54000 daltons). It is synthesized in hepatocytes. α 1-Antitrypsin is quantitatively the most important proteinase inhibitor (Pi) in serum and plasma. It specifically inactivates serine proteases (e.g. trypsin, chymotrypsin, collagenase, leukocyte elastase, plasmin and thrombin), with which it reversibly forms an enzyme-inhibitor complex. α 1-Antitrypsin constitutes the major fraction of the electrophoretic α 1-globulin fraction. Because it is a small molecule, α 1-antitrypsin diffuses rapidly into other body fluids including bronchial secretions.

α 1-Antitrypsin is an important, positive acute phase reactant found in elevated concentrations in inflammatory processes (e.g. infectious and rheumatoid diseases), tissue necrosis, malignancy and traumas. Inflammation of the liver parenchymal cells is often accompanied by elevated α 1-antitrypsin levels, although levels of other acute phase reactants are not affected.

Acute hereditary α 1-antitrypsin deficiency is suspected in cases of neonatal hepatitis accompanied by progressive liver cirrhosis in early childhood. It is also suspected when severe pulmonary emphysema occurs in adults due to the prevalence of leukocyte elastase, which can lead to unrestrained proteolytic degradation of the pulmonary parenchymal cells.

Various methods are available for assaying α 1-antitrypsin, such as kinetic nephelometry or radial immunodiffusion. Roche's automated α 1-antitrypsin assay is based upon the immunological agglutination test principle.

Test principle

Immunoturbidimetric assay

Human α 1-antitrypsin forms a precipitate with a specific antiserum which is determined turbidimetrically at 340 nm.

Reagents - working solutions

R1 Phosphate buffer: 12.7 mmol/L, pH 7.2; NaCl: 130 mmol/L; PEG: 40 g/L; preservative

SR Anti-human α 1-antitrypsin antibody (rabbit) > 2 g/L; NaCl: 100 mmol/L; preservative

R1 is in position B and SR is 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.

Serum

Plasma: heparin (Li-, Na-, NH₄⁺) or EDTA (K₂-, K₃-) plasma

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.

Samples and controls are automatically prediluted 1:21 (1+20) with NaCl solution by the instrument.

Centrifuge samples containing precipitates before performing the assay.

Stability:⁷

7 days at 15-25 °C

3 months at 2-8 °C

3 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 sample dilution 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 serum and plasma**COBAS INTEGRA 400 plus test definition**

Measuring mode	Absorbance
Abs. calculation mode	Endpoint
Reaction mode	D-R1-S-SR
Reaction direction	Increase
Wavelength A/B	340 nm
Calc. first/last	33/55
Typical prozone effect	> 13.0 g/L (> 239 μ mol/L or > 1300 mg/dL)
Antigen excess check	No
Predilution factor	21
Unit	g/L

Pipetting parameters

		Diluent (H ₂ O)
R1	100 μ L	
Sample	6 μ L	14 μ L
SR	45 μ L	
Total volume	165 μ L	

COBAS INTEGRA 800 test definition

Measuring mode	Absorbance
Abs. calculation mode	Endpoint
Reaction mode	D-R1-S-SR
Reaction direction	Increase
Wavelength A/B	340 nm
Calc. first/last	44/82
Typical prozone effect	> 13.0 g/L (> 239 μ mol/L or > 1300 mg/dL)
Antigen excess check	No
Predilution factor	21
Unit	g/L

Pipetting parameters

		Diluent (H ₂ O)
R1	100 μ L	
Sample	6 μ L	14 μ L
SR	45 μ L	
Total volume	165 μ L	

Calibration

Calibrator	Calibrator f.a.s. Proteins
Calibration dilution ratio	1:9.2, 1:13.5, 1:22, 1:45, 1:90, 1:200, performed automatically by the instrument
Calibration mode	Logit/log 5
Calibration replicate	Duplicate recommended
Calibration interval	Each lot and as required following quality control procedures

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

Traceability: This method has been standardized against an internal method traceable to the certified reference material in human serum of the

IRMM (Institute for Reference Materials and Measurements) ERM-DA470k/IFCC.

Quality control

Reference range	Precinorm Protein or PreciControl ClinChem Multi 1
Pathological range	Precipath Protein or PreciControl ClinChem Multi 2
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 factors: ⁸	g/L \times 18.4 = μ mol/L (where molecular weight = 54300) g/L \times 100 = mg/dL
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Limitations - interference

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

Serum, plasma

Icterus:⁹ No significant interference.

Hemolysis:⁹ No significant interference.

Lipemia:⁹ No significant interference up to an Intralipid level of 1200 mg/dL.

Rheumatoid factors: No significant interference.

Drugs: No interference was found at therapeutic concentrations using common drug panels.^{10,11}

Elevated estrogen levels (oral contraceptives; third trimester of pregnancy) give rise to increased values. CRP and haptoglobin should therefore also be determined.¹²

In very rare cases, gammopathy, in particular type IgM (Waldenström's macroglobulinemia), may cause unreliable results.¹³

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 Method Manual, Introduction, Extra Wash Cycles for further instructions.

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

Limits and ranges**Measuring range**

0.25-5.50 g/L (4.60-101 μ mol/L or 25-550 mg/dL) (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 1:3 dilution. Results from samples diluted using the rerun function are automatically multiplied by a factor of 3.

Determine samples having lower concentrations via the rerun function. For samples with lower concentrations, the rerun function reduces the sample predilution factor to 10.5. The results are automatically multiplied by the reduced predilution factor.

Lower limits of measurement

Lower detection limit of the test:
0.2 g/L (3.68 μ mol/L or 20.0 mg/dL)

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 values¹⁴

0.9-2.0 g/L (16.6-36.8 μ mol/L or 90.0-200 mg/dL)

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 using human samples and controls in an internal protocol with repeatability (n = 21) and intermediate precision (3 aliquots per run, 1 run per day, 10 days). The following results were obtained:

Repeatability	Mean g/L (μ mol/L, mg/dL)	SD g/L (μ mol/L, mg/dL)	CV %
Precinorm Protein	1.24 (22.8, 124)	0.01 (0.2, 1)	0.7
Precipath Protein	2.54 (46.8, 254)	0.02 (0.4, 2)	0.6
Human serum 1	1.20 (22.1, 120)	0.01 (0.2, 1)	0.8
Human serum 2	2.80 (51.6, 280)	0.02 (0.4, 2)	0.9

Intermediate precision	Mean g/L (μ mol/L, mg/dL)	SD g/L (μ mol/L, mg/dL)	CV %
Precinorm Protein	1.19 (21.9, 119)	0.01 (0.2, 1)	1.2
Precipath Protein	2.50 (46.0, 250)	0.05 (0.9, 5)	0.3
Human serum 1	1.03 (19.0, 103)	0.01 (0.2, 1)	3.3
Human serum 2	2.52 (46.4, 252)	0.02 (0.4, 2)	3.5

Method comparison

α 1-Antitrypsin values for human serum and plasma samples obtained on a COBAS INTEGRA 700 analyzer using the COBAS INTEGRA Tina-quant α 1-Antitrypsin ver.2 reagent (y) were compared with those determined using the same reagent on a COBAS INTEGRA 400 analyzer (x) and to those determined on a commercially available alternative automated system (nephelometric determination) (x).

COBAS INTEGRA 400 analyzer

Sample size (n)	75
Correlation coefficient (r)	0.999
Linear regression	$y = 0.99x + 0.01$ g/L
Passing/Bablok ¹⁵	$y = 0.99x + 0.01$ g/L

Alternative system

Sample size (n)	67
Correlation coefficient (r)	0.974
Linear regression	$y = 0.97x - 0.04$ g/L
Passing/Bablok ¹⁵	$y = 1.02x - 0.12$ g/L

The sample concentrations were between 0.19 and 3.52 g/L (3.50 and 64.8 μ mol/L or 19.0 and 352 mg/dL).

References

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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

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Roche Diagnostics warrants that this product will meet the specifications stated in the labeling when used in accordance with such labeling and will be free from defects in material and workmanship until the expiration date printed on the label. THIS LIMITED WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. IN NO EVENT SHALL ROCHE DIAGNOSTICS BE LIABLE FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES.

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

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AAT2

Tina-quant α 1-Antitrypsin ver.2



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