

Tina-quant Lipoprotein (a) (Latex)

Order information

REF	CONTENT	Analyzer(s) on which cobas c pack(s) can be used
03001881 322	Tina-quant Lipoprotein (a) (Latex) (100 tests)	System-ID 07 6629 1 COBAS INTEGRA 400 plus COBAS INTEGRA 800
03001318 122	C.f.a.s. Lp(a) (3 × 1 mL)	System-ID 07 6641 0
11660993 216	Lp(a) Control Set Level I (2 × 1 mL) Level II (2 × 1 mL)	System-ID 07 9100 8 System-ID 07 9101 6
20756350 322	NaCl Diluent 9 % (6 × 22 mL)	System-ID 07 5635 0

English

System information

Test LPALX, test-ID 0-229

Intended use

In vitro test for the quantitative immunological determination of lipoprotein (a) in human serum and plasma on COBAS INTEGRA systems.

Summary^{1,2,3,4,5,6,7,8,9,10}

Lipoprotein (a) is composed of an LDL-like particle to which the lipoprotein (a)-specific apolipoprotein (a) is bonded by a disulfide bridge. Apolipoprotein (a) is highly homologous to plasminogen. Lipoprotein (a) is a cholesterol-rich lipoprotein which is synthesized in the liver independently of triglycerides and is not subject to the influence of age or diet.

Lipoprotein (a) can act atherogenically and has been found in artery walls. Because of its structural similarity to plasminogen, it can also inhibit fibrinolysis and hence acts thrombogenically. High lipoprotein (a) concentrations in serum correlate with premature manifestation of atherosclerosis and strokes. When lipoprotein (a) concentrations exceed 0.30 g/L, the coronary risk is approximately doubled. In combination with elevated LDL-cholesterol concentrations, the risk increases approximately six-fold. An elevated lipoprotein (a) level is considered to be the most sensitive parameter for the development of coronary heart disease, irrespective of other plasma lipoproteins. Lipoprotein (a) should be determined together with total cholesterol, HDL-cholesterol and LDL-cholesterol as well as triglycerides when assessing the total arteriosclerotic risk. Lipoprotein (a) levels should be determined in patients suffering from dyslipoproteinemia, diabetes mellitus, renal failure, and cardiovascular or cerebrovascular disorders, as well as in premature onset of arteriosclerosis. Determination of lipoprotein (a) is performed using immunoassays (RIA, ELISA), electroimmunodiffusion (EID), radial immunodiffusion, nephelometry or turbidimetry.

Test principle⁹

Particle enhanced immunoturbidimetric assay.

Human lipoprotein (a) agglutinates with latex particles coated with anti-Lp(a) antibodies. The precipitate is determined turbidimetrically at 552 nm.

Reagents - working solutions

- R1** Phosphate buffer: 60 mmol/L, pH 7.5; NaCl: 100 mmol/L; polyethylene glycol (PEG): 30 g/L; preservative
- R2** Latex particles coated with polyclonal anti-human Lp(a) antibodies (rabbit); glycine buffer: 25 mmol/L, pH 9.6; preservative
- R1 is in position A, R2 is in position B and position C is empty.

Precautions and warnings

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

For USA: For prescription use only.

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 systems

On-board in use at 10-15 °C 12 weeks

COBAS INTEGRA 800 systems

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: collect serum using standard sampling tubes.

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.

Centrifuge samples containing precipitates before performing the assay.

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

Stability:¹¹ 6 weeks at 4-8 °C
6 months at -20 °C

Materials provided

See "Reagents – working solutions" section for reagents.

Materials required (but not provided)

NaCl Diluent 9 %, Cat. No. 20756350322, 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/R2-S
Reaction direction	Increase
Wavelength A/B	552 nm
Calc. first/last	T ₀ /64
Typical prozone effect	> 18.6 g/L (> 1860 mg/dL)
Antigen excess check	No
Predilution factor	21
Unit	g/L

Pipetting parameters

		Diluent (H ₂ O)
R1	102 µL	
R2	30 µL	5 µL
Sample	13 µL	5 µL
Total volume	155 µL	

COBAS INTEGRA 800 test definition

Measuring mode	Absorbance
Abs. calculation mode	Endpoint
Reaction mode	D-R1-R2-S
Reaction direction	Increase
Wavelength A/B	552 nm
Calc. first/last	T ₀ /98
Typical prozone effect	> 14 g/L (> 1400 mg/dL)
Antigen excess check	No
Predilution factor	21
Unit	g/L

Pipetting parameters

		Diluent (H ₂ O)
R1	102 µL	
R2	30 µL	5 µL
Sample	13 µL	5 µL
Total volume	155 µL	

Calibration

Calibrator	C.f.a.s. Lp(a)
Calibrator dilution ratio	1:4.4, 1:6, 1:10, 1:20, 1:53, 1:100 performed automatically by the instrument
Calibration mode	Logit/log 5
Calibration replicate	Duplicate recommended
Calibration interval	Each lot and 90 days, and as required following quality control procedures.

Enter the assigned lot specific lipoprotein (a) (latex) value of the undiluted calibrator, indicated in the package insert of the C.f.a.s. Lp(a).

Traceability: This method has been standardized against a highly purified Lp(a) preparation which is used as an in-house master calibrator.¹¹

Quality control

Reference range	Lp(a) Control Set
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:

g/L × 100 = mg/dL

Limitations - interference

Criterion: Recovery within ± 10 % of initial value.

Serum, plasma

Icterus:¹² No significant interference up to an I index of 60 for conjugated and unconjugated bilirubin (approximate conjugated and unconjugated bilirubin concentration: 1026 µmol/L or 60 mg/dL).

Hemolysis:¹² No significant interference up to an H index of 1000 (approximate hemoglobin concentration: 621 µmol/L or 1000 mg/dL).

Lipemia (Intralipid):¹² No significant interference up to an L index of 2000. There is poor correlation between the L index (corresponds to turbidity) and triglycerides concentration.

Rheumatoid factors: No significant interference up to a rheumatoid factors level of 90 IU/mL.

Plasminogen: No significant interference in the tested concentration range (up to 1.0 g/L).

Apolipoprotein B: No significant interference in the tested concentration range (up to 1.4 g/L).

Therapeutic drug interference was tested according to the recommendations of the VDGH^{a)}. No interferences were found.

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 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.

a) Verband der Diagnostica und Diagnostica Geräte Hersteller. Refer to "section 1 / Introduction" of this Method Manual for a list of drugs tested and their concentrations.

Limits and ranges

Measuring range

0.08-1.81 g/L (8-181 mg/dL)

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.

Lower limits of measurement

Lower detection limit of the test

0.03 g/L (3 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 2 standard deviations above that of a zero sample (zero sample + 2 SD, repeatability, n = 30).

Expected values

Lp(a) serum concentrations in healthy persons exhibit an asymmetrical distribution and may exceed 1.00 g/L (100 mg/dL).

In a reference value study utilizing sera from 341 apparently healthy Caucasian Europeans, the following median values were found:¹¹

Males (n = 154) 0.09 g/L (9 mg/dL)

Females (n = 187) 0.11 g/L (11 mg/dL)

Values above approximately 0.3 g/L (30 mg/dL) are associated with a higher risk of atherosclerosis.^{14,15}

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 (3 aliquots per run, 1 run per day, 10 days). The following results were obtained:

Repeatability	Mean	CV
Level 1	0.109 g/L (10.9 mg/dL)	2.3 %
Level 2	1.124 g/L (112.4 mg/dL)	0.7 %

Intermediate precision	Mean	CV
Level 1	0.260 g/L (26.0 mg/dL)	3.3 %
Level 2	1.075 g/L (107.5 mg/dL)	2.9 %

Method comparison

Lipoprotein (a) values for human serum samples obtained on a COBAS INTEGRA 400 analyzer with the COBAS INTEGRA Tina-quant Lipoprotein (a) (Latex) reagent were compared to the same reagent on a COBAS INTEGRA 700 analyzer and to those of an alternative manufacturer's automated system (nephelometric determination).

COBAS INTEGRA 700 analyzer

Sample size (n)	80
Corr. coefficient (r)	0.998
Lin. regression	$y = 0.96x + 0.007 \text{ g/L}$
Passing/Bablok ¹⁶	$y = 0.96x + 0.006 \text{ g/L}$

Alternative system

Sample size (n)	47
Corr. coefficient (r)	0.993
Lin. regression	$y = 1.44x - 0.032 \text{ g/L}$
Passing/Bablok ¹⁶	$y = 1.36x - 0.007 \text{ g/L}$

The sample concentrations were between 0.088 to 2.48 g/L (8.8 to 248 mg/dL).

References

- Greiling H, Gressner AM, eds. Lehrbuch der Klinischen Chemie und Pathobiochemie, 3rd ed. Stuttgart/New York: Schattauer Verlag 1995;227-228.
- Tietz NW, ed. Clinical Guide to Laboratory Tests, 3rd ed. Philadelphia, PA: WB Saunders Company 1995;400-401.
- Riesen WF. Lipoprotein (a) Bindeglied zwischen Fettstoffwechsel und Gerinnungssystem? Schweiz med Wschr 1991;121:1813-1818.
- Steinmetz A. (Universitätsklinik Marburg), personal communication.
- Armstrong VW, Cremer P, Eberle E, et al. The association between serum Lp(a) concentrations and angiographically assessed coronary atherosclerosis: dependence on serum LDL levels. Atherosclerosis 1986;62(3):249-257.
- Bostom AG, Gagnon DR, Cupples LA, et al. A prospective investigation of elevated lipoprotein(a) detected by electrophoresis and cardiovascular disease in women: The Framingham Heart Study. Circulation 1994;90:1688-1695.
- Schaefer EJ, Lamon-Fava S, Jenner JL, et al. Lipoprotein(a) levels and risk of coronary heart disease in men - The Lipid Research Clinics Coronary Primary Prevention Trial. JAMA 1994;271:999-1003.
- Assmann G, Schulte H, von Eckardstein A. Hypertriglyceridemia and elevated lipoprotein (a) are risk factors for major coronary events in middle-aged man. Am J Cardiol 1996;77(14):1179-1184.

- Siekmeier R, März W, Scharnagl H, et al. Bestimmung von Lipoprotein (a): Vergleich eines neuen latexverstärkten immunoturbidimetrischen Assay mit einem immunoradiometrischen Assay. J Lab Med 1996;20:294-298.
- Seed M, Hoppichler F, Reaveley D, et al. Relation of serum lipoprotein (a) concentration and apolipoprotein (a) phenotype to coronary heart disease in patients with familial hypercholesterolemia. New Engl J Med 1990;322:1494-1499.
- Data on file at Roche Diagnostics.
- Glick MR, Ryder KW, Jackson SA. Graphical Comparisons of Interferences in Clinical Chemistry Instrumentation. Clin Chem 1986;32:470-475.
- Bakker AJ, Mücke M. Gammopathy interference in clinical chemistry assays: mechanisms, detection and prevention. Clin Chem Lab Med 2007;45(9):1240-1243.
- Houlston R, Friedl W. Biochemistry and clinical significance of lipoprotein (a). Ann Clin Biochem 1988;25:499-503.
- Loscalzo J. Lipoprotein (a)/A Unique Risk Factor for Atherothrombotic Disease. Arteriosclerosis 1990;10:672-679.
- 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

GTIN

Global Trade Item Number

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