January 24, 2025

Roche Diagnostics
Leslie Patterson
Senior Regulatory Affairs Manager
9115 Hague Road
Indianapolis, Indiana 46250

Re: K241220
Trade/Device Name: Tina-quant Lipoprotein(a) Gen.2 Molarity
Regulation Number: 21 CFR 21 CFR 866.5600
Regulation Name: Low-density Lipoprotein Immunological Test System
Regulatory Class: Class II
Product Code: DFC
Dated: December 18, 2024
Received: December 18, 2024

Dear Leslie Patterson:

We have reviewed your section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (the Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing Device" (https://www.fda.gov/media/99812/download) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (https://www.fda.gov/media/99785/download).

Your device is also subject to, among other requirements, the Quality System (QS) regulation (21 CFR Part 820), which includes, but is not limited to, 21 CFR 820.30, Design controls; 21 CFR 820.90, Nonconforming product; and 21 CFR 820.100, Corrective and preventive action. Please note that regardless of whether a change requires premarket review, the QS regulation requires device manufacturers to review and approve changes to device design and production (21 CFR 820.30 and 21 CFR 820.70) and document changes and approvals in the device master record (21 CFR 820.181).

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801 and Part 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

All medical devices, including Class I and unclassified devices and combination product device constituent parts are required to be in compliance with the final Unique Device Identification System rule ("UDI Rule"). The UDI Rule requires, among other things, that a device bear a unique device identifier (UDI) on its label and package (21 CFR 801.20(a)) unless an exception or alternative applies (21 CFR 801.20(b)) and that the dates on the device label be formatted in accordance with 21 CFR 801.18. The UDI Rule (21 CFR 830.300(a) and 830.320(b)) also requires that certain information be submitted to the Global Unique Device Identification Database (GUDID) (21 CFR Part 830 Subpart E). For additional information on these requirements, please see the UDI System webpage at https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/unique-device-identification-system-udi-system.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-

assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Paula V. Caposino -S

Paula Caposino, Ph.D.
Deputy Director
Division of Chemistry and
Toxicology Devices
OHT7: Office of In Vitro Diagnostics
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: 07/31/2026
See PRA Statement below.

Submission Number *(if known)*

K241220

Device Name

Tina-quant Lipoprotein (a) Gen.2 Molarity

Indications for Use *(Describe)*

The Tina-quant Lipoprotein (a) Gen.2 Molarity assay is an in vitro test for the quantitative determination of lipoprotein (a) [Lp(a)] in human serum and plasma on cobas c systems. The measurement of Lp(a) is useful in evaluating lipid metabolism disorders and assessing atherosclerotic cardiovascular disease risk, when used in conjunction with clinical evaluation and other lipoprotein tests.

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

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Tina-quant Lipoprotein (a) Gen.2 Molarity
K241220 - 510(k) Summary

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of 21 CFR 807.92.

Submitter Name	Roche Diagnostics
Address	9115 Hague Road P.O. Box 50416 Indianapolis, IN 46250-0457
Contact	Leslie Patterson Phone: (317) 225-8563 Email: leslie.patterson@roche.com
Date Prepared	January 24, 2025
Proprietary Name	Tina-quant Lipoprotein (a) Gen.2 Molarity
Classification Name	Low-density lipoprotein immunological test system.
Product Codes, Regulation Numbers	DFC, 21 CFR 866.5600
Predicate Device	Tina-quant Lipoprotein (a) Gen.2 (K122722)
Establishment Registration	Roche Diagnostics GmbH Mannheim, Germany: 9610126 Roche Diagnostics GmbH Penzberg, Germany: 9610529 Roche Diagnostics Indianapolis, IN United States: 1823260

1. DEVICE DESCRIPTION

The Tina-quant Lipoprotein (a) Gen.2 Molarity assay is an in vitro test for the quantitative determination of lipoprotein (a) [Lp(a)] in human serum and plasma on **cobas** c systems. The measurement of Lp(a) is useful in evaluating lipid metabolism disorders and assessing atherosclerotic cardiovascular disease risk, when used in conjunction with clinical evaluation and other lipoprotein tests.

Tina-quant Lipoprotein (a) Gen.2 Molarity assay quantifies lipoprotein (a) in human serum and plasma and reports the values in nmol/L with calibrator values traceable to the WHO/IFCC SRM2B reference material.

1.1. Reagents - working solutions

R1: Glycine buffer: 170 mmol/L, pH 7.0; stabilizers; BSA; rabbit serum 0.1 %, preservative

R3: Latex particles coated with polyclonal anti-human lipoprotein (a) antibodies (rabbit): 0.5 %; glycine buffer: 170 mmol/L, pH 7.3, BSA; preservative

2. INDICATIONS FOR USE

The Tina-quant Lipoprotein (a) Gen.2 Molarity assay is an in vitro test for the quantitative determination of lipoprotein (a) [Lp(a)] in human serum and plasma on **cobas** c systems. The measurement of Lp(a) is useful in evaluating lipid metabolism disorders and assessing atherosclerotic cardiovascular disease risk, when used in conjunction with clinical evaluation and other lipoprotein tests.

3. TECHNOLOGICAL CHARACTERISTICS

The following table compares the Tina-quant Lipoprotein (a) Gen.2 Molarity assay with the predicate device, Tina-quant Lipoprotein (a) Gen.2 (K122722).

Table 1: Technical Characteristics Comparison Table between Tina-quant Lipoprotein (a) Gen.2 Molarity and Tina-quant Lipoprotein (a) Gen.2

	Candidate Device: Tina-quant Lipoprotein (a) Gen.2 Molarity	**Predicate Device: Tina-quant Lipoprotein (a) Gen.2 (k122722)**
Intended Use / Indications for Use	The Tina-quant Lipoprotein (a) Gen.2 Molarity assay is an in vitro test for the quantitative determination of lipoprotein (a) [Lp(a)] in human serum and plasma on **cobas** c systems. The measurement of Lp(a) is useful in evaluating lipid metabolism disorders and assessing atherosclerotic cardiovascular disease risk, when used in conjunction with clinical evaluation and other lipoprotein tests.	In vitro test for the quantitative determination of lipoprotein (a) in human serum and plasma on Roche/Hitachi **cobas** c systems. The measurement of Lp(a) is useful in evaluating lipid metabolism disorders and assessing atherosclerotic cardiovascular disease in specific populations, when used in conjunction with clinical evaluation and other lipoprotein tests.
Assay Method	Same	Particle enhanced immunoturbidimetric assay
Instrument Platform	Same	**cobas** c systems
Sample Type/Matrix	Same	Human serum and Li-heparin, K_2-EDTA, K_3-EDTA plasma
Calibrator	Same	Preciset Lp(a) Gen.2
Traceability/ Standardization	This method has been standardized against the IFCC reference material SRM2B for nmol/L.	This method has been standardized against an in-house reference material.
Calibration Method	Same	6-point, spline
Calibration Interval	Automatic full calibration - after reagent lot change Full calibration - as required following quality control procedures	Full calibration - after reagent lot change - as required following quality control procedures
Controls	Same	PreciControl Lp(a) Gen.2
Measuring Range	7-240 nmol/L	6.0-80 mg/dL
Lower Limits of Measurement	LoB (Limit of Blank): 6 nmol/L LoD (Limit of Detection): 7 nmol/L LoQ (Limit of Quantitation): 7 nmol/L	LoB (Limit of Blank): 3 mg/dL LoD (Limit of Detection): 4 mg/dL LoQ (Limit of Quantitation): 6 mg/dL

	Candidate Device: Tina-quant Lipoprotein (a) Gen.2 Molarity	Predicate Device: Tina-quant Lipoprotein (a) Gen.2 (k122722)
Method Comparison	Method comparison between the candidate method, Tina-quant Lipoprotein (a) Gen.2 Molarity assay and the Lp(a) ELISA reference method: Sample size (n) = 126 Deming regression y = 1.023x + 0.692 nmol/L r = 0.992 The sample concentrations were between 8.70 and 234 nmol/L.	

4. NON-CLINICAL PERFORMANCE EVALUATION

Performance characteristics were evaluated with Tina-quant Lipoprotein (a) Gen.2 Molarity on the **cobas** c 503 analyzer and are briefly summarized below.

All acceptance criteria were met.

4.1. Precision

4.1.1. Repeatability and Intermediate Precision

Precision was determined in accordance with the CLSI EP05-A3 requirements with repeatability (n = 84) and intermediate precision (2 aliquots per run, 2 runs per day, 21 days). Results for repeatability and intermediate precision were obtained on the **cobas** c 503 analyzer. The results are summarized below. All acceptance criteria were met.

Repeatability			
Sample	**Mean (nmol/L)**	**SD (nmol/L)**	**CV (%)**
Lp(a) Control Level Low	35.2	0.412	1.2
Lp(a) Control Level High	97.7	0.435	0.4
Human Serum 1	19.7	0.414	2.1
Human Serum 2	49.3	0.516	1.0
Human Serum 3	80.5	0.434	0.5
Human Serum 4	120	0.546	0.5
Human Serum 5	203	0.794	0.4

Intermediate Precision			
Sample	**Mean (nmol/L)**	**SD (nmol/L)**	**CV (%)**
Lp(a) Control Level Low	35.1	0.562	1.6
Lp(a) Control Level High	99.0	1.14	1.2
Human Serum 1	19.7	0.508	2.6
Human Serum 2	49.3	0.676	1.4
Human Serum 3	80.5	0.831	1.0
Human Serum 4	119	1.14	1.0
Human Serum 5	203	1.33	0.7

4.2. Analytical Sensitivity

4.2.1. Limit of Blank (LoB)

For determination of LoB, one analyte-free sample was measured with three reagent lots in 6 runs, each run with 10-fold determination, distributed over >3 days, on the **cobas** c 503 analyzer. The LoB was determined according to CLSI EP17-A2. The LoB claim in the labeling will be set to LoB = 6 nmol/L.

4.2.2. Limit of Detection (LoD)

For determination of LoD, 5 serum samples with low analyte concentrations were measured each three reagent lots with 2-fold determination per run on one **cobas** c 503 analyzer. Six runs were distributed over 5 days. The LoD was determined according to CLSI EP17-A2. The LoD claim in the labeling will be set to LoD = 7 nmol/L

4.2.3. Limit of Quantitation (LoQ)

For determination of LoQ, 5 serum samples were measured with three reagent lots on one **cobas** c 503. Five runs were distributed over 5 days. The Limit of Quantitation (LoQ) was determined according to CLSI EP17-A2. The LoQ claim in the labeling will be set to 7 nmol/L.

4.3. Linearity/Assay Reportable Range

The linearity of the Tina-quant Lipoprotein (a) Gen.2 Molarity assay was assessed according to CLSI EP06-A-Ed2.

Linearity of the Tina-quant Lipoprotein (a) Gen.2 Molarity assay was assessed on one **cobas** c 503 analyzer in 1 run using 3 reagent lots and 5 replicates per sample. A dilution series was prepared from human serum (sample High) and NaCl 0.9% (sample Blank). The dilution series spanning the measuring range were prepared to obtain 16 levels.

Linearity was confirmed for the measuring range of 7 – 240 nmol/L.

4.4. Dilution

Post Dilution Check experiments were performed for samples above the measuring range and verify dilution of samples via the rerun function is a 1:3 dilution. Samples with concentrations above the measuring range were measured with the Tina-quant Lipoprotein (a) Gen.2 Molarity assay on the **cobas** c 503 via the automatic rerun function. The target values were determined with the ELISA reference method.

4.5. High Dose Hook Effect

High-dose hook effect study was performed using the Tina-quant Lipoprotein (a) Gen.2 Molarity assay and confirmed that no false result occurs up to a lipoprotein (a) concentration of 450 nmol/L.

4.6. Endogenous Interferences

Endogenous substances were evaluated for potential interference with the Tina-quant Lipoprotein (a) Gen.2 Molarity assay on the **cobas** c 503. All predefined acceptance criteria were met.

Endogenous Substance	Claim No significant interference up to
Icterus	I index of 60 for conjugated and unconjugated bilirubin (approximate conjugated and unconjugated bilirubin concentration: 1026 µmol/L or 60 mg/dL).
Hemolysis	H index of 1000 (approximate hemoglobin concentration: 621 µmol/L or 1000 mg/dL).
Lipemia (Intralipid)	L index of 2000 There is poor correlation between the L index (corresponds to turbidity) and triglycerides concentration.
Rheumatoid factors	1200 IU/mL

4.7. Analytical Specificity / Cross-Reactivity

Plasminogen and Apolipoprotein B were evaluated for cross-reactivity and the labeling claims for each substance can be found below:

Plasminogen: No significant cross-reactivity in the tested concentration range (up to 150 mg/dL).

Apolipoprotein B: No significant cross-reactivity in the tested concentration range (up to 200 mg/dL).

4.8. Exogenous Interferences

Common drug panels were evaluated for potential interference with the Tina-quant Lipoprotein (a) Gen.2 Molarity assay on the **cobas** c 503 analyzer. All predefined acceptance criteria were met.

Drug	Concentration Tested [mg/L]
N-Acetylcysteine	150
Acetylsalicylic acid	30
Ampicillin-Na	75
Ascorbic acid	52.5
Cefoxitin	6600
Doxycyclin	18
Heparin	3300 IU/L
Levodopa	7.5
Methyldopa	22.5
Metronidazole	123
Rifampicin	48
Acetaminophen	156
Cyclosporine	1.8
Ibuprofen	219
Theophylline	60
Phenylbutazone	321

4.9. Sample Matrix Comparison

The effect on quantitation of lipoprotein (a) values in the presence of anticoagulants with the Tina-quant Lipoprotein (a) Gen.2 Molarity assay was determined on the **cobas** c 503 analyzer by comparing values obtained from samples collected in serum, Li-Heparin, K2-EDTA and K3-EDTA plasma tubes. The study was performed using ≥ 50 samples measured on the **cobas** c 503 analyzer. All predefined acceptance criteria were met, supporting the labeling claim that serum, Li-Heparin, K_2-EDTA and K_3-EDTA plasma are acceptable sample types.

Anticoagulant	Slope	Intercept (nmol/L)	Correlation Coefficient (Pearson r)	Concentration of Samples (nmol/L, serum)
Serum vs. Serum with gel separation	1.000	0	1.000	7.51 - 239
Serum vs. Li-Heparin plasma	0.981	0.286	0.998	7.51 - 239
Serum vs. K_2-EDTA plasma	0.972	0.134	1.000	7.51 - 233
Serum vs. K_3-EDTA plasma	0.944	0.389	1.000	7.51 - 233

4.10. Method Comparison to Lp(a) ELISA reference method

A method comparison of the Tina-quant Lipoprotein (a) Gen.2 Molarity assay on the **cobas** c 503 analyzer compared to the Lp(a) ELISA reference method was completed. One hundred twenty-six native human serum samples were tested in singlicate using the **cobas** c 503 analyzer. The sample concentrations were between 8.70 and 234 nmol/L. The results can be found below:

Deming regression

$y = 1.023x + 0.692$ nmol/L

$r = 0.992$

4.11. Stability

The stability data supports Roche Diagnostic's claims as reported in the package labeling.

5. CLINICAL PERFORMANCE EVALUATION

5.1. Reference Range Study

Roche conducted a reference range study and measured Lp(a) levels among various sub-populations. The expected ranges were determined using samples from apparently healthy adults in the United States, with an equal representation of males and females.

Lp(a) by Race

	n	Median	2.5th percentile (90 %-CI)	97.5th percentile (90 %-CI)	Unit
Caucasian/White	425	17.8	< 7 (n.a.)	259 (229; 265)	nmol/L
African-American/Black	111	66.2	< 7 (n.a.)	267 (207; 313)	nmol/L
Asian	128	19.9	< 7 (n.a.)	210 (166; 330)	nmol/L

Lp(a) by Ethnicity (among Caucasian/White)

	n	Median	2.5th percentile (90 %-CI)	97.5th percentile (90 %-CI)	Unit
Hispanic/Latino	110	14.5	< 7 (n.a.)	260 (162; 267)	nmol/L
Non-Hispanic/Non-Latino	311	18.1	< 7 (n.a.)	259 (229; 287)	nmol/L

6. CLINICAL LITERATURE

Associations between Lp(a) and ASCVD risk were demonstrated in multiple published clinical studies in and outside of the US, including the Dallas Heart Study and the UK Biobank Study (PMID: 27831500, PMID: 33115266). The UK Biobank Study was also used to derive Lp(a) thresholds for ASCVD risk (PMID: 36036785, PMID: 38565461). Information was provided to bridge the results from the published studies to the candidate device.

7. CONCLUSIONS

The analytical performance data for Tina-quant Lipoprotein (a) Gen.2 Molarity assay met the acceptance criteria. The analytical performance data and clinical performance evaluation support the substantial equivalence of Tina-quant Lipoprotein (a) Gen.2 Molarity assay on the **cobas** c 503 analyzer to the predicate.