510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY AND INSTRUMENT

I Background Information:

A 510(k) Number

K260047

B Applicant

Roche Molecular Systems, Inc.

C Proprietary and Established Names

cobas Strep A Nucleic acid test for use on the cobas Liat System (07341911190); cobas Strep A Quality Control Kit (07402678190)

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
PGX	Class II	21 CFR 866.2680 -Streptococcus spp. nucleic acid-based assay	MI - Microbiology
OOI	Class II	21 CFR 862.2570 – Instrumentation for clinical multiplex test systems	CH - Clinical Chemistry

II Submission/Device Overview:

A Purpose for Submission:

To demonstrate that the cobas Strep A Nucleic acid test run on a modified cobas Liat System with software version 4.0 is substantially equivalent to the previously cleared predicate device (i.e., K200065)

The updated cobas liat Analyzer Software (v4.0) incorporates the following changes:

(a) *Assay-related Changes*: (i) update of cobas Strep A assay-specific script from the legacy "SASA v1.29.0" to "SASA v1.4.0 *generic Liat Assay Specific Packages* (gLASP) assay script" and (ii) replacement of the legacy result calculation algorithm with a new Roche Kinetic Algorithm v2 ("KA2," incorporated in the updated cobas Strep A assay script).

(b) *Analyzer instrument-related Changes*:(i) OS upgrade and (ii) enablement of optional wireless network connectivity.

B Measurand:

Group A *Streptococcus* DNA

C Type of Test:

Real-time PCR assay for qualitative detection of Group A *Streptococcus* DNA in throat swab specimens.

III Intended Use/Indications for Use:

A Intended Use(s):
See Indications for Use below.

B Indication(s) for Use:

The cobas Strep A nucleic acid test for use on the cobas Liat System (cobas Strep A) is a qualitative *in vitro* diagnostic test for the detection of *Streptococcus pyogenes* (Group A β-hemolytic *Streptococcus*, Strep A) in throat swab specimens from patients with signs and symptoms of pharyngitis.

The cobas Strep A assay utilizes nucleic acid purification and polymerase chain reaction (PCR) technology to detect *Streptococcus pyogenes* by targeting a segment of the *Streptococcus pyogenes* genome.

C Special Conditions for Use Statement(s):
Rx – For Prescription Use Only

D Special Instrument Requirements:
cobas Liat Analyzer with software version 4.0

IV Device/System Characteristics:

A Device Description:
The cobas Strep A test is a rapid, automated *in vitro* diagnostic test for the qualitative detection of *Streptococcus pyogenes* (Group A β-hemolytic *Streptococcus*, Strep A) DNA in throat swab specimens in Amies medium. The test is performed on the cobas Liat System which automates and integrates sample purification, nucleic acid amplification, and detection of the target sequence in biological samples using TaqMan probe-based real-time PCR assays. The system consists of an instrument and preloaded software for running tests and viewing the results. The system requires the use of a single-use disposable cobas Strep A assay tube that holds all the sample purification and PCR reagents and hosts the sample preparation and PCR processes. The test targets a well-conserved region of the spy1258 gene of Strep A. An internal control (IC) is also included. The IC is present to control for adequate processing of the target bacteria and to monitor the presence of inhibitors in the sample preparation and PCR.

B Principle of Operation:

The cobas Strep A test is designed to identify and/or measure the presence of *Streptococcus pyogenes* by targeting a segment of the *Streptococcus pyogenes* genome. The test runs on the cobas Liat System, which consists of the cobas Liat Analyzer (hardware with integrated software) and single-use disposable assay tubes that contain all necessary sample preparation and PCR reagents in separate segments divided by frangible seals. The system fully automates all nucleic acid amplification test processes, including reagent preparation, target enrichment, inhibitor removal, nucleic acid extraction, amplification, real-time detection, and result interpretation in a rapid manner.

C nstrument Description Information:

1. Instrument Name:
   cobas Liat Analyzer with cobas Liat Software v4.0

2. Specimen Identification:
   The cobas Liat System maintains positive identification of each sample and assay tube during processing and analysis by means of barcode labels.

   Before starting a run, the user is required to scan the assay tube barcode and then scan the sample barcode. The user then transfers the sample into the assay tube and is required to scan the assay tube barcode again before inserting the assay tube into the analyzer and starting the run

3. Specimen Sampling and Handling:
   Throat swab specimens are collected using a Liquid Amies Collection and Transport System, which includes a sterile swab and a tube containing 1 mL of Amies liquid transport medium. With the patient seated and mouth fully open, the swab is rubbed along the back of the throat, tonsils, and any visible white patches, taking care to avoid contact with the tongue, cheeks, teeth, or gums. The swab is then inserted into the transport medium tube, swirled three times against the inner wall, broken off, and capped securely. Once collected, specimens should be added to the cobas Strep A assay tube and processed on the cobas Liat Analyzer as soon as possible. If immediate testing is not feasible, specimens are stable for up to 48 hours either refrigerated at 2–8°C (preferred) or at room temperature (20–25°C), with refrigeration also recommended during transport in accordance with applicable biological agent transport regulations.

4. Calibration:
   The Cobas Liat Analyzer hardware periodically performs automatic recalibration, and the Cobas Liat System does not run the assay until this auto-calibration step is performed.

5. Quality Control:
   The following controls are used to validate the assay run in the cobas Liat Analyzer.
   a. Internal Process control (IPC): Each Liat Tube contains a chemically-inactivated bacterium that is included to verify each step of Strep A sample processing before the PCR runs and to detect potential specimen-associated inhibition in the sample preparation or the PCR. The IPC should be positive in a negative sample and can be

negative or positive in a Strep A positive sample. The IPC is valid if it meets the acceptance criteria. An invalid result will be generated if the IPC fails to meet the acceptance criteria.

b. Positive Control: The Positive Control is a unit-dose of dried chemically-inactivated Strep A. The Report Result must be "*Strep A Detected*" for the positive control to pass. The positive control validates that the PCR reagents are working as expected.
c. Negative Control: A dilution Amies tube is used as the negative control sample. The Report Result must be "*Strep A Not Detected*" for the negative control to pass. The negative control is intended to monitor potential target contamination in the workflow or environment.

V Substantial Equivalence Information:

A Predicate Device Name(s):

cobas Strep A Nucleic Acid Test for use on the cobas Liat System

B Predicate 510(k) Number(s):

K200065

C Comparison with Predicate(s):

Device & Predicate Device(s):	Device: K260047	Predicate: K200065
Device Trade Name	cobas Strep A Nucleic Acid Test for use on the cobas Liat System	Same
General Device Characteristic Similarities		
Intended Use/Indications For Use	The cobas Strep A nucleic acid test for use on the cobas Liat System (cobas Strep A) is a qualitative in vitro diagnostic test for the detection of *Streptococcus pyogenes* (Group A β-hemolytic *Streptococcus*, Strep A) in throat swab specimens from patients with signs and symptoms of pharyngitis. The cobas Strep A assay	Same

	utilizes nucleic acid purification and polymerase chain reaction (PCR) technology to detect *Streptococcus pyogenes* by targeting a segment of the *Streptococcus pyogenes* genome.	
Regulation	21 CFR 866.2680	Same
Product code	PGX	Same
Analyte	Group A *Streptococcus pyogenes*	Same
Target	Conserved region of Group A *Streptococcus* genome	Same
Sample Type	throat swab	Same
Instrument	cobas Liat Analyzer	Same
General Device Characteristic Differences		
Software	cobas Liat Analyzer Software 4.0	cobas Liat Analyzer Software 3.3
Assay Script	Generic Liat Assay Specific Package (gLASP) SASA v1.40.0	legacy IQuum Command Language (ICL) assay script (SASA v1.29)
Internet connectivity	Optional wireless connectivity via an off-the-shelf (OTS) USB Wi-Fi adapter is available in addition to the existing wired Ethernet connection	Only wired Ethernet connection is available

VI Standards/Guidance Documents Referenced:

Not applicable

VII Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision/Reproducibility:
   Not applicable.

2. Linearity:
   Not applicable.

3. Analytical Cross-reactivity/Interference:
   Raw fluorescence data from the original Cross-reactivity/Interference studies (conducted to support K141338, the original clearance of the cobas Strep A Assay, which runs on ICL legacy script v.1.29) was recalculated using the updated Roche KA2 script (SASA v1.4.0 *generic Liat Assay Specific Packages* (gLASP) assay script). The re-analysis confirmed that the analytical cross-reactivity and interference remained consistent with the performance claims currently described in the Instructions for Use (IFU).

4. Detection Limit and Assay Reportable Range:
   Previously obtained raw fluorescence data from the original limit of detection (LoD) study (conducted to support K141338, the original clearance of the cobas Strep A Assay, which runs on ICL legacy script v.1.29) was recalculated using the updated Roche KA2 script (SASA v1.4.0 *generic Liat Assay Specific Packages* (gLASP) assay script). The re-analysis confirmed that the analytical sensitivity remained consistent with the performance claims currently described in the Instructions for Use (IFU).

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):
   Reanalysis of raw florescence data from the original shelf-life stability study was conducted with the updated script/algorithm, and no changes to the previous results (shelf-life of 24 months from the date of manufacture) were observed.

6. Assay Cut-Off:
   Reanalysis of raw florescence data from the original Cut-off study was conducted with the updated script/algorithm, and no changes to the previous results were observed.

B Comparison Studies:

1. Method Comparison with Predicate Device:
   To demonstrate performance equivalency of the cobas Strep A nucleic acid test following migration from the legacy IQuum Command Language (ICL) assay script (SASA v1.29, running on software v3.5.1) to the generic Liat Assay Specific Package (gLASP) architecture (SASA v1.40.0, running on software v4.0.0), an equivalency study was conducted using ten cobas liat Analyzers with contrived samples prepared at ~2x LOD, and ~5x LOD concentrations, and with positive and negative controls. A total of 160 runs were performed (**Table 1**), of which 158 yielded valid results; one aborted run and one invalid result (both with the ICL script, and gLASP script) were repeated per protocol and produced valid results. All negative controls and negative samples correctly returned "Not Detected" results (0% hit rate) for both script versions. At ~2x LOD, detection rates were 97.5% for ICL and 95.0% for gLASP, both meeting the ≥95% acceptance criterion, while at ~5x LOD, both versions achieved a 100% detection rate. No deviations from the study protocol were observed. The study concluded that the migration to gLASP SASA v1.40.0 had no impact on assay performance, confirming equivalency between the two script versions.

Table 1: Equivalency Study Results Summary

Test sample	ICL SASA Script v1.1.0 (legacy)				SASA Script v1.4.0 (gLASP)			
	Replicates	**Target detected**	**Target not detected**	**Hit rate**	**Replicates**	**Target detected**	**Target not detected**	**Hit rate**
Negative Control	10	0	10	0%	10	0	10	0%
Positive Control	10	10	0	100%	10	10	0	100%
Negative Sample	10	0	10	0%	10	0	10	0%
~2× LOD (positive) Sample	40	39	0	97.5 %	40	38	0	95%
~5× LOD (positive) Sample	10	10	0	100%	10	10	0	100%

Footnotes:

1. All 160 runs finally yielded valid results.
2. There were no deviations observed from the predetermined Equivalency Study Protocol.
3. All acceptance criteria outlined in Equivalency Study Protocol for cobas Liat assay's migration to gLASP Architecture were met.

2. Matrix Comparison:
   Not applicable.

C Clinical Studies:

1. Clinical Sensitivity:
   Raw fluorescence data from the previous clinical study (conducted to support the original clearance of Strep A Assay, K141338) was recalculated using SASA v1.40.0. The re-analysis confirmed that clinical sensitivity and specificity remained unchanged and the performance claims in the Instructions for Use (IFU) remained supported.

2. Clinical Specificity:
   Please refer to section C1 above.

3. Clinical Cut-Off
   Not applicable

4. Other Clinical Supportive Data (When 1. and 2. Are Not Applicable):
   Not applicable

D Expected Values/Reference Range:

Not applicable

E Other Supportive Instrument Performance Characteristics Data:

EMC: Electrical safety and electromagnetic compatibility (EMC) testing were performed; the information was reviewed and was found to be acceptable.

Software and Cybersecurity: Software and cybersecurity documentation was reviewed and found to be acceptable.

VIII Proposed Labeling:

The labeling supports the finding of substantial equivalence for this device.

IX Conclusion:

The submitted information in this premarket notification is complete and a substantial equivalence decision.