September 15, 2022

Roche Diagnostics
Jamie Ferguson
Regulatory Affairs Principal
9115 Hague Road
Indianapolis, Indiana 46250

Re: K220176
Trade/Device Name: Elecsys AFP
Regulation Number: 21 CFR 866.6010
Regulation Name: Tumor-Associated Antigen Immunological Test System
Regulatory Class: Class II
Product Code: LOJ
Dated: January 20, 2022
Received: January 21, 2022

Dear Jamie Ferguson:

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 (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 located 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.

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 803) for devices or postmarketing safety reporting (21 CFR 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 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 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,

Ying Mao, Ph.D.
Branch Chief
Division of Immunology
and Hematology 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: 06/30/2023
See PRA Statement below.

510(k) Number *(if known)*
K220176

Device Name
Elecsys AFP

Indications for Use *(Describe)*
Immunoassay for the in vitro quantitative determination of α1-fetoprotein in human serum and plasma to aid in the management of patients with non-seminomatous germ cell tumors.
The electrochemiluminescence immunoassay "ECLIA" is intended for use on the cobas e immunoassay analyzers.

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.

This section applies only to requirements of the Paperwork Reduction Act of 1995.

DO NOT SEND YOUR COMPLETED FORM TO THE PRA STAFF EMAIL ADDRESS BELOW.

The burden time for this collection of information is estimated to average 79 hours per response, including the time to review instructions, search existing data sources, gather and maintain the data needed and complete and review the collection of information. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden, to:

Department of Health and Human Services
Food and Drug Administration
Office of Chief Information Officer
Paperwork Reduction Act (PRA) Staff
PRAStaff@fda.hhs.gov

"An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB number."

Elecsys AFP
510(k) Summary

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

In accordance with 21 CFR 807.87, Roche Diagnostics hereby submits official notification as required by Section 510(k) of the Federal Food, Drug and Cosmetics Act of our intention to market the device described in this Premarket Notification 510(k).

The purpose of this Traditional 510(k) Premarket Notification is to obtain FDA review and clearance for the Elecsys AFP.

Submitter Name	Roche Diagnostics
Address	9115 Hague Road P.O. Box 50416 Indianapolis, IN 46250-0457
Contact	Contact: Jamie Ferguson Phone: (317) 270-7402 Email: Jamie.ferguson@roche.com
Date Prepared	September 15, 2022
Proprietary Name	Elecsys AFP
Common Name	Tumor-associated antigen immunological test system
Classification Name	Kit, Test, Alpha-Fetoprotein for Testicular Cancer
Product Codes, Regulation Numbers	LOJ, 21 CFR 866.6010
Predicate Devices	K981282, Elecsys AFP

1. DEVICE DESCRIPTION SUMMARY

Immunoassay for the in vitro quantitative determination of α_1-fetoprotein in human serum and plasma to aid in the management of patients with non-seminomatous germ cell tumors.

The **e**lectro**c**hemi**l**uminescence **i**mmuno**a**ssay "ECLIA" is intended for use on **cobas e** immunoassay analyzers.

Elecsys AFP utilizes a sandwich test principle and has a total test duration of 18 minutes.

- 1st incubation: 10 µL of sample, a biotinylated monoclonal AFP specific antibody, and a monoclonal AFP specific antibody labeled with a ruthenium complex[a)] react to form a sandwich complex.
- 2nd incubation: After addition of streptavidin-coated microparticles, the complex becomes bound to the solid phase via interaction of biotin and streptavidin.
- The reaction mixture is aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode. Unbound substances are then removed with ProCell/ProCell M. Application of a voltage to the electrode then induces chemiluminescent emission which is measured by a photomultiplier.
- Results are determined via a calibration curve which is instrument-specifically generated by 2 point calibration and a master curve provided via the reagent barcode or e barcode.

a) Tris(2,2'-bipyridyl)ruthenium(II)-complex (Ru(bpy))

The reagent rackpack (M, R1, R2) is labeled as AFP:

- M: Streptavidin-coated microparticles (transparent cap), 1 bottle, 12 mL: Streptavidin-coated microparticles 0.72 mg/mL; preservative.
- R1: Anti-AFP-Ab~biotin (gray cap), 1 bottle, 17 mL: Biotinylated monoclonal anti-AFP antibodies (mouse) 4.5 mg/L; phosphate buffer 100 mmol/L, pH 6.0; preservative.

- R2: Anti-AFP-Ab~Ru(bpy) (black cap), 1 bottle, 17 mL: Monoclonal anti-AFP antibodies (mouse) labeled with ruthenium complex 12.0 mg/L; phosphate buffer 100 mmol/L, pH 6.0; preservative.

2. INTENDED USE/INDICATIONS FOR USE

Immunoassay for the in vitro quantitative determination of α1-fetoprotein in human serum and plasma to aid in the management of patients with non-seminomatous germ cell tumors.

The **e**lectro**c**hemi**l**uminescence **i**mmuno**a**ssay "ECLIA" is intended for use on **cobas e** immunoassay analyzers.

3. INDICATIONS FOR USE COMPARISON

Elecsys AFP (updated assay, Mat. No. 09015086160) is substantially equivalent to Elecsys AFP, cleared under K981282.

The intended use of Elecsys AFP was updated to remove analyzers that are no longer supported for use with Roche assays. The indications for use of Elecsys AFP did not change from the predicate device.

4. TECHNOLOGICAL COMPARISON

Roche Diagnostics has updated the current Elecsys AFP assay in order to improve the biotin tolerance from ≤ 60 ng/mL to ≤ 1200 ng/mL and to reduce streptavidin interference. A technical solution was implemented by adding an anti-biotin antibody to one of the reagents, which allows depletion of biotin in patient samples by binding free biotin, and by adding a streptavidin interference reducing agent to enhance the streptavidin tolerance. No other technological characteristics were changed. The information submitted in this Premarket Notification supports a substantial equivalent decision.

5. NON-CLINICAL AND/OR CLINICAL TESTS SUMMARY & CONCLUSIONS

Precision measurements were conducted for both 21 days and 5 days with the Elecsys AFP assay to evaluate repeatability (within-run precision) and intermediate precision (within-laboratory

precision) according the CLSI guideline EP05-A3. All predefined acceptance criteria was met for the precision experiments.

Lot-to-lot reproducibility was performed for the Elecsys AFP assay using three reagent lots. All predefined acceptance criteria was met for the lot-to-lot reproducibility experiment.

The Limit of Blank (LoB) was determined according to CLSI EP17-A2. The LoB claim in the labeling will be set to 0.75 IU/mL.

The Limit of Detection (LoD) was determined according to CLSI EP17-A2. The LoD claim in the labeling will be set to 1.5 IU/mL.

The Limit of Quantitation (LoQ) was determined according to CLSI EP17-A2. The LoQ claim in the labeling will be set to 1.5 IU/mL.

Linearity was evaluated according to CLSI EP06-A with the Elecsys AFP assay on one **cobas e** 601 analyzer. Linearity was confirmed in the range of 0.58 IU/mL – 1129 IU/mL, and a measuring range of 1.50-1000 IU/mL will be claimed in the labeling.

The high-dose hook effect (HDHE) of the Elecsys AFP assay was assessed on one **cobas e** 601 analyzer in two-fold determination. No hook effect was seen up to 1,000,000 for both samples.

Seven endogenous substances were evaluated for potential interference with the Elecsys AFP assay on the **cobas e** 601 analyzer. All predefined acceptance criteria was met, and the proposed labeling claims for each endogenous substance can be found below:

Biotin ≤ 1200 ng/mL

Lipemia (Intralipid) ≤ 1500 mg/dL

Hemoglobin ≤ 2200 mg/dL

Bilirubin ≤ 65 mg/dL

Rheumatoid Factor ≤ 1500 IU/mL

Serum Albumin ≤ 7 g/dL

IgG ≤ 7 g/dL

An exogenous interference study was conducted to evaluate 17 commonly used and ten specially used pharmaceutical compounds for potential interference with the Elecsys AFP assay on the **cobas e** 601 analyzer. The predefined acceptance criteria was met for all drugs tested, and no interference was observed.

A method comparison was performed with the current Elecsys AFP assay (material number 04481798190) and the candidate Elecsys AFP assay (material number 09015060160), using a total of 181 serum samples. The sample concentrations were between 1.58 and 966 IU/mL. The results can be found below:

Linear regression

$y = -0.148 + 0.969x$

$r = 0.999$

Passing/Bablok

$y = 0.101 + 0.965x$

tau = 0.985

The effect on quantitation of analyte in the presence of anticoagulants with Elecsys AFP was determined by comparing values obtained from native, single-donor samples drawn into serum, Li-Heparin, K_2-EDTA, and K_3-EDTA plasma primary tubes. All predefined acceptance criteria was met, supporting the labeling claim that serum, Li-Heparin, K_2-EDTA and K_3-EDTA plasma primary tubes are acceptable sample types.

On-board reagent stability for the Elecsys AFP assay was tested on one **cobas e** 601 analyzer. Elecsys AFP reagent kits can be stored on-board the analyzers for up to 28 days (4 weeks). A new calibration of the kit kept on-board is recommended every 7 days.

Lot calibration frequency for the Elecsys AFP assay was tested on one **cobas e** 601 analyzer. Calibrations of an Elecsys AFP reagent lot is recommended every 4 weeks (1 month). During that time period, fresh reagent kits of the same lot can be used without calibration using the calibration curve of the day 0 reagent kit.

The information provided in this 510(k) Premarket Notification supports the determination that the updated Elecsys AFP is substantially equivalent to the predicate device, Elecsys AFP (K981282).