October 11, 2024

Permantis Public Health
Robert Darnell
President
PO Box 941
New York, NY 10021

Re: K240797
Trade/Device Name: PPH Saliva Collection Kit
Regulation Number: 21 CFR 866.2950
Regulation Name: Microbial Nucleic Acid Storage And Stabilization Device
Regulatory Class: Class II
Product Code: QBD
Dated: March 22, 2024
Received: March 22, 2024

Dear Robert Darnell:

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,

Bryan M. Grabias -S

Digitally signed by Bryan M. Grabias -S
Date: 2024.10.11 09:22:36 -04'00'

Bryan Grabias, Ph.D.
Acting Branch Chief
Bacterial Respiratory and Medical Countermeasures Branch
Division of Microbiology 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.

510(k) Number *(if known)*
K240797

Device Name
Permantis Public Health (PPH) Saliva Collection Kit

Indications for Use *(Describe)*
The PPH Saliva Collection Kit is designed for use in the non-invasive collection, inactivation, and stabilization of viral nucleic acids for in vitro diagnostic testing of saliva samples. The device is intended to inactivate and stabilize human clinical saliva samples from the collection site to the laboratory at room temperature. The device is intended to be used by a health care provider for the collection of saliva samples suspected of containing SARS-CoV-2. The saliva sample is stabilized and suitable for use with legally marketed molecular diagnostic devices.

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.

510(k) Summary

PPH Saliva Collection Kit For *In vitro* Diagnostic Use

Submitter's information:

Robert B. Darnell, MD, PhD
Permantis Public Health
P.O. Box 941
New York, NY 10021
Telephone: 917-946-1890
Date Summary Prepared: March 22, 2024

Name of Device:

Trade Name:	PPH Saliva Collection Kit
Common Name:	Saliva Collection Device
Classification Name:	Microbial nucleic acid storage and stabilization device
Classification Number:	Class II, 21 CFR 866.2950
Product Code:	QBD

Predicate Device:

Trade Name:	Spectrum Saliva Collection Device
Common name:	SDNA 1000
Classification Name:	Microbial nucleic acid storage and stabilization device
Classification Number:	Class II, 21 CFR 866.2950
Product Code:	QBD
Description:	A self-sample collection device designed for the collection of human saliva samples
Address:	Spectrum Solutions 12248 S. Lone Peak Parkway, #106 Draper, UT 64020 www.spectrumsolution.com

Description of the device:

The PPH Saliva Collection Device contains a plastic bulb pipette, paper cup, plastic tube with PPH Saliva collection buffer (0.3 ml). This collection device designed for the collection of human saliva samples. It is designed for use in the non-invasive collection, inactivation, and stabilization of viral nucleic acids for in vitro diagnostic testing of saliva samples. The device is intended to inactivate and stabilize human clinical saliva samples from the collection site to the laboratory at room temperature.

Sample collection is conducted by first collecting saliva into the provided paper cup, uncapping the tube containing inactivating media, using the bulb pipet to transfer saliva into the tube, replacing the cap, and mixing the saliva with the PPH Saliva collection buffer by inverting the caped tube 5-10 times.

Performance of the device has been validated to support the claims of specimen stability for 7 days at ambient temperature (20-25°C) , see section limit of detection, stability, viral inactivation.

Intended Use:

The PPH Saliva Collection Kit is designed for use in the non-invasive collection, inactivation, and stabilization of viral nucleic acids for in vitro diagnostic testing of saliva samples. The device is intended to inactivate and stabilize human clinical saliva samples from the collection site to the laboratory at room temperature. The device is intended to be used by a health care provider for the collection of saliva samples suspected of containing SARS-CoV-2. The saliva sample is stabilized and suitable for use with legally marketed molecular diagnostic devices.

Technologic characteristics:

The proposed device shares the same technological characteristics found in the predicate device and other cleared saliva collection devices on the market.

Feature	Device K240797	Predicate: K223497
Device Trade Name	PPH Saliva Collection Device	Spectrum Solutions Saliva Collection Device
General Device Characteristic Similarities		
Intended Use/ Indications for Use	The PPH Saliva Collection Kit is designed for use in the non-invasive collection, inactivation, and stabilization of viral nucleic acids for in vitro diagnostic testing of saliva samples. The device is intended to inactivate and stabilize human clinical saliva samples from the collection site to the laboratory at room temperature. The device is intended to be used by a health care provider for the collection of saliva samples suspected of containing SARS-CoV-2.	The Spectrum Solutions Saliva Collection Device is designed for use in the non-invasive collection, inactivation, and stabilization of viral nucleic acids for in vitro diagnostic testing of saliva samples. The device is intended to inactivate and stabilize human clinical saliva samples from the collection site to the laboratory at room temperature. The saliva sample is stabilized and suitable for use with legally marketed molecular diagnostic devices. The device is intended to be used by a health care provider for samples suspected of containing SARS-CoV-2.
Analyte	RNA from SARS-CoV-2	Same
Transport Media	Disrupt/lyses lipid membranes, inactivates enzymes, and stabilizes nucleic acids	Same

Material	Medical-grade polypropylene	Same
Sterility	Non-Sterile	Same
General Device Characteristic Differences		
Physical container	Plastic polypropylene collection tube	Tube – Polypropylene Funnel Cap – Polypropylene & HDPE
Buffer	PPH Saliva Collection Kit buffer	Spectrum's Nucleic Acid Stabilization Solution
Specimen Stability	7 days at ambient temperature (20-25°C)	SARS-CoV-2 for 28 days at 20-25oC
Shelf life	9 months at room temperature (15-30 °C)	24 months at room temperature (15-30°C)

The PPH Saliva Collection Kit is substantially equivalent to the legally marketed predicate device. The PPH Saliva Collection Kit has the same intended use and similar indications for use, technological characteristics, and principles of operation as its predicate device. Performance data demonstrates that the PPH Saliva Collection Kit is as safe and effective.

Performance Data: Non-Clinical

Shelf life: The shelf life for the PPH Saliva Collection Kit is nine (9) months at room temperature (15-30°C) after the date of manufacture. The shelf-life stability of the PPH Saliva Collection Kit was established in a real-time stability study that evaluated several time points (T = 0, 1, 3, 6, 9, and 12 months) for both temperature extremes. In this study, shelf-life stability also included evaluation of physical stability (appearance), color, volume loss, and pH stability during the period of storage. At each time point, the appearance of the product was inspected visually as a clear liquid without precipitation and with no observed volume loss, change in buffer pH, or color change when stored under the specified storage conditions.

Detection Limit

A limit of detection (LoD) study was conducted to determine the lowest concentration that contains measurable nucleic acids that can be repeatedly detected in samples collected in the PPH Saliva Collection Kit with greater than 95% accuracy. RNA extraction was performed using magnetic bead purification on a Thermo Fisher Kingfisher Apex Purification system. Viral RNA was subsequently amplified using Triplex CII-SARS-CoV-2 rRT-PCR for SARS-CoV-2 detection assay (RUCGL.SCV2.2 assay). The primers and probes used in this assay allow simultaneous measurements of SARS-CoV-2 nucleocapsid RNA (N1 and/or N2), and human Ribonuclease P (RP) transcripts. RT-qPCR was performed with RP primers as positive control to detect the human RNase P gene.

A preliminary LoD was established by evaluating three replicates of several serial dilutions of saliva spiked with SARS-CoV-2 and collected in the PPH Saliva Collection device. These samples were evaluated on the RUCGL.SCV2.2 assay for SARS-CoV-2 detection.
Ct values <40 were considered positive for SARS-CoV-2.
Results from the preliminary LoD study are summarized in Table 1 below.

Table 1. Preliminary LoD Estimation Results

Copies/µL	N1 Detection Rate	N1 Mean Ct	N2 Detection Rate	N2 Mean Ct
8	**3/3**	**31.03**	**3/3**	**30.92**
4	**3/3**	**32.13**	**3/3**	**31.97**
2	**3/3**	**33.06**	**3/3**	**32.62**
1	**3/3**	**34.37**	**3/3**	**33.90**
0.5	**3/3**	**35.23**	**3/3**	**35.20**
0.25	**3/3**	**37.85**	**2/3**	**-**
0.125	**3/3**	**39.53**	**2/3**	**-**
0.06125	**2/3**	**-**	**1/3**	**-**
0	**0/3**	**-**	**0/3**	**-**

The estimated LoD based on the preliminary results was identified as 0.125 copies/µl.

To further confirm this preliminary LoD assessment, four concentrations of SARS-CoV-2 (0, 0.0625, 0.125, and 0.25 copies/µl) in saliva were evaluated in 20 replicates using the PPH Saliva Collection Kit. Results from the LoD confirmation study are summarized in Table 2 below**.**

Table 2. Confirmatory LoD Study Results

Copies/µL	N1 Detection Rate	N1 Mean Ct	N2 Detection Rate	N2 Mean Ct
0.25	**20/20**	**35.99**	**19/20**	**37.57**
0.125	**17/20**	**-**	**4/20**	**-**
0.06125	**18/20**	**-**	**5/20**	**-**
0	**0/20**	**-**	**-**	**-**

In summary, the results of the LoD study indicate an LoD of 0.25 copies/µl with observed detection of 100% (20/20) for the N1 target and 95% (19/20) for N2 replicate**.**

1. **<u>Sample Stability:</u>**
   A real-time sample stability study was conducted to evaluate the stability of samples containing SARS-CoV-2 when stored for up to 8 days at ambient temperature (20-25°C). Inactivated SARS-CoV-2 (Zeptometrix, Cat # NATSARS(COV2)-ST, 1.21x106 copies/ µl) was used to prepare contrived samples including 20 low positive samples (2X LoD) and 10 negative samples for each device lot. Briefly, saliva matrix and SARS-CoV-2 were combined at a ratio of 1:1 and then added to each collection tube containing 300 µl of PPH Saliva Collection Kit buffer.

   Sample stability was assessed at baseline (day 0), day 7, and day 8 after being placed in PPH Saliva Collection Kit buffer and stored at ambient temperature (20-25°C). The difference in Ct over this time course is less than 1. The largest change in Ct observed was 0.40 at 8 days.

These test results fall within the established acceptance criteria and indicate that samples are stable in the PPH Saliva Collection Kits inactivating media for up to 7 days. Results for sample stability testing is shown in Table 3 below.

Table 3. Sample Stability Study Results

Samples Evaluated	Mean Ct & SD	Day 0	Day 7	Day 8
Low positive (60 samples)	N1 Mean Ct	35.9	36.14	36.2 7
	SD	0.43	0.5	0.523
	N2 Mean Ct	35.49	35.63	35.7
	SD	0.4	0.47	0.4
Negative (30 samples)	-	-	-	-

Sterilization: The PPH Saliva Collection Kits are not sold as sterile nor are they intended to be sterilized by the user. These vials are single use devices that do not require cleaning or sterilization by the operator.

Inactivation

An inactivation study was conducted to verify that the PPH Saliva Collection device inactivates SARS-CoV-2 as efficiently as the predicate device.

Cytotoxicity: A cytotoxicity study was performed to determine at what dilution ratio the PPH Saliva Collection Kit buffer would not be toxic to a cell monolayer.

To determine the cytotoxic effect of the buffer on test cells, Vero E6 cells that were seeded at a concentration of 2500 cells/well in each well of a 96 well plate were exposed to serially diluted PPH Saliva Collection Kit buffer prepared in Vero E6 DMEM culture medium. Viability of the test cells was assessed using the CellTiterGlo assay (Promega #G7570) after 4 days of exposure and normalized to untreated cells. After the incubation period, concentration of 1:5,000 PPH Saliva Collection Kit buffer was determined not to have a cytopathic effect to the host cells. For the next step, the PPH Saliva Collection Kit buffer was diluted to 1:5,000 with DMEM media to perform the subsequent Inactivation Assay.

Inactivation Assay:

Viral inactivation was assessed using a stock of SARS-CoV-2 (USA WA1/2020) at $5.65x10^6$ PFU/ml. To determine the amount of contact time required for viral inactivation of SARS-CoV-2 with PPH Saliva Collection Kit buffer, the samples were prepared as follows:

1. Mixed virus stock with saliva at a 1:1 ratio.
2. Mixed virus and saliva with PPH Saliva Collection Kit buffer at a 1:1 ratio.
3. Incubated for 15, 30, 45, 60, 90, 120, 180, or 240 seconds.
4. Diluted virus, saliva and buffer to 1:5,000 PPH Saliva Collection Kit buffer with DMEM media, a concentration previously determined not to be cytotoxic.

100 µl of each sample containing ~ 113 PFU of SARS-CoV-2 was added to a 96-well plate confluent with Vero E6 cells after media was removed. Six replicates were plated for each time point. The controls included and plated in triplicates were media only, Saliva and PPH Saliva Collection Kit buffer (no virus), and Virus only. No PFUs were obtained after 60, 90, 120, 180 and 240 seconds of exposure of the cells to the media in the PPH Saliva Collection Kit buffer. Acceptance criteria were met for no detectable virus (zero positive plaques) after 4 days growth.

These study results support SARS-CoV-2 inactivation after 90 seconds of exposure to PPH Saliva Collection Kit buffer.

Overall Summary of Nonclinical and Clinical Studies

The non-clinical and clinical performance data demonstrate that PPH Saliva Collection Kit is as safe, as effective, and performs as well as or better than the predicate device.