July 14, 2021

Phadia AB
% Sheryl Skinner
Associate Director RA/QA
Phadia US Inc.
4169 Commercial Avenue
Portage, Michigan 49002

Re: K202067
Trade/Device Name: EliA SmD^{P}-S
Regulation Number: 21 CFR 866.5100
Regulation Name: Antinuclear antibody immunological test system
Regulatory Class: Class II
Product Code: LKP
Dated: November 30, 2020
Received: December 1, 2020

Dear Sheryl Skinner:

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 (Katelin) Mao, Ph.D.
Chief
Division of Immunology
and Hematology Devices
OHT7: Office of In Vitro Diagnostics
and Radiological Health
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)*
K202067

Device Name
EliA SmDP-S

Indications for Use *(Describe)*
EliA SmDP-S is intended for the in vitro semi-quantitative measurement of IgG antibodies directed to Sm in human serum and EDTA-plasma as an aid in the diagnosis of systemic lupus erythematosus (SLE) in conjunction with other laboratory and clinical findings. EliA SmDP-S uses the EliA IgG method.

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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510(k) Decision Summary

This 510(k) Summary is prepared in accordance with the requirements of 21 CFR Part 807.92.

Premarket Notification 510(k) No: K202067

Date of Summary Preparation: July 14, 2021

Manufacturer:
Phadia AB
Rapsgatan 7P
P.O. Box 6460
751 37 Uppsala, Sweden

Distributor:
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Portage, MI 49002

Company Contact Person:
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Proprietary and Established Device Name:

EliA SmD^{P}-S

Regulatory Information:

Product Code:	LKP
Classification:	Class II
Regulation:	21 CFR 866.5100 – Antinuclear Antibody Immunological Test System
Panel:	Immunology

Purpose of Submission:

New Device

Measurand:

IgG autoantibodies specific to Sm protein (Sm) D component

Type of Test:

Automated semi-quantitative solid phase fluoroimmunoassay

Intended Use:

EliA SmD^{P}-S is intended for the in vitro semi-quantitative measurement of IgG antibodies directed to Sm in human serum and EDTA-plasma as an aid in the diagnosis of systemic lupus erythematosus (SLE) in conjunction with other laboratory and clinical findings. EliASmD^{P}-S uses the EliA IgG method.

Indication(s) for Use:

Same as intended use

Special Conditions for Use:

Rx – For Prescription Use Only

Special Instrument Requirements:

For use on the Phadia 250 instrument and the E-module of the Phadia 2500 and Phadia 5000 series of instruments.

Device Description:

The EliA SmD^{P}-S is a semi-quantitative solid-phase fluoroimmunoassay, for the determination of autoantibodies against Sm. The EliA SmD^{P}-S test System is fully integrated and automated system which comprises of assay-specific reagents, EliA method-specific reagents, and general reagents.

Assay-Specific Reagents include:
- EliA SmD^{P}-S Wells: coated with a synthetic SmD_3 peptide – 4 carriers (16 wells each), ready to use;
- EliA ANA Positive Controls: Human blood preparation containing IgG antibodies to dsDNA, RNP, Sm, Ro, La, Scl-70, CENP and Jo-1 in PBS containing BSA, detergent and 0.095% sodium azide – 6 single use vials, 0.3 mL each, ready to use;
- EliA IgG/IgM/IgA Negative Control 250 or 2500/5000: Human blood preparation from healthy donors in PBS containing BSA, detergent and 0.095% sodium azide – 6 single-use vials, 0.3 mL each, ready to use;

EliA Method-Specific Reagents include:
- EliA Sample Diluent: PBS containing BSA, detergent and 0.095% sodium azide – 6 bottles, 48 mL each, ready to use; or 6 bottles, 400 mL each, ready to use;
- EliA IgG Conjugate 50 or 200: β-Galactosidase labeled anti-IgG (mouse monoclonal antibodies) in PBS containing BSA and 0.06% sodium azide – 6

wedge shaped bottles, 5 mL each, ready to use; or 6 wedge shaped bottles, 19 mL each, ready to use;
- EliA IgG Calibrator Strips: Human IgG (0, 4, 10, 20, 100, 600 µg/L) in PBS containing BSA, detergent and 0.095% sodium azide – 5 strips, 6 single-use vials per strip, 0.3 mL each, ready to use;
- EliA IgG Curve Control Strips: Human IgG (20 µg/L) in PBS containing BSA, detergent and 0.095% sodium azide – 5 strips, 6 single-use vials per strip, 0.3 mL each, ready to use;
- EliA IgG Calibrator Well: coated with mouse monoclonal antibodies – 4 carriers (16 wells each), ready to use;

General Reagents include:
- Development Solution: 0.01% 4-Methylumbelliferyl-β-D-galactoside, <0.0010% preservative – 6 bottles (11 mL, 17 mL, or 112 mL each), sufficient for 6x >110, 6x >170, or 6x >1165 determinations;
- Stop Solution: 4% Sodium Carbonate – 6 bottles (65 mL, 119 mL, or 2800 mL each), sufficient for 6x >292, 6x >560, or 6x >13100 determinations;
- Washing Solution Additive: detergent, preservative <0.13% – 6x 17.2 mL, 2x 86mL, or 4x 850 mL;
- Washing Solution Concentrate: phosphate buffer – 6x 80 mL, 2x 400 mL, or 1x 2800 mL.

Instrument System

The EliA SmD^P-S is run on the Phadia 250 instrument and the E-module of the Phadia 2500 and Phadia 5000 series of instruments. The instruments are automated platforms for EliA test procedures from sample and reagent handling to the processing of results.

Substantial Equivalence

EliA SmD^P, Phadia AB, K132631

Comparison with Predicate Device:

Similarities		
Feature	**Proposed Device** EliA SmD^P-S	**Predicate Device** EliA SmD^P
Intended Use	EliA SmD^P-S is intended for the in vitro semi-quantitative measurement of IgG antibodies directed to Sm in human serum and EDTA-plasma as an aid in the diagnosis of systemic lupus erythematosus (SLE) in conjunction with other laboratory and clinical findings.	EliA SmD^P is intended for the in vitro semi-quantitative measurement of IgG antibodies directed to Sm in human serum and EDTA-plasma to aid in the clinical diagnosis of systemic lupus erythematosus (SLE) in conjunction with other laboratory and clinical findings.
Internal Controls	Positive and negative Control provided with EliA ANA Positive Control 250 and 2500/5000 and EliA IgG/IgM/IgA	Positive and negative Control provided with EliA ANA Positive Control 250 and 2500/5000 and EliA IgG/IgM/IgA

	Negative Control 250 and 2500/5000, resp.	Negative Control 250 and 2500/5000, resp.
Calibration	6-point total IgG Calibration 6 vials of human IgG at concentrations of 0 – 4 – 10 – 20 – 100 – 600 µg/L	Same
Assay Type	Solid-phase fluoroimmunoassay	Same
Type of Test	Semi-Quantitative	Same
Reported Unit	EliA U/mL	Same
Antigen	synthetic SmD_3 peptide	Same
Cut-off	Negative <7 EliA U/mL Equivocal 7-10 EliA U/mL Positive >10 EliA U/mL	Same
Differences		
Feature	**Proposed Device** EliA SmD^P-S	**Predicate Device** EliA SmD^P
Instrument Platforms	Phadia 250, E-module of the Phadia 250 and Phadia 5000 series	Phadia 100, Phadia 250, E-module of the Phadia 250 and Phadia 5000 series
Sample type	Serum or EDTA-plasma	Serum, citrate- or EDTA-plasma
Sample Dilution	1:100	1:50
Coating Technology	adsorptive coating of a SmD_3 peptide-polymer conjugate	affinity-based coating of SmD_3 peptide

Standard/Guidance Document Referenced

- CLSI EP25-A, Evaluation of Stability of In Vitro Diagnostic Reagents, September 2009
- CLSI EP05-A3, Evaluation of Precision of Quantitative Measurement Procedures, September 2014
- CLSI EP6-A, Evaluation of the Linearity of Quantitative Measurement Procedures: A Statistical Approach, April 2003
- CLSI EP07-ED3, Interference Testing in Clinical Chemistry, September 2018
- CLSI EP37-ED1, Supplemental Tables for Interference Testing, September 2018
- CLSI EP09c-ED3, Measurement Procedure Comparison and Bias Estimation Using Patient Samples, June 2018
- CLSI EP17-A2, Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures, June 2012
- CLSI EP28-A3c, Defining, Establishing, and Verifying Reference Intervals in the Clinical Laboratory, October 2010

Test Principle

The EliA tests are fluorescence immunoassays for the detection and measurement of human antibodies based on EliA solid-phase components, which contain specific antigens for the antibodies to be measured.

The specific antigen for the antibodies to be detected is bound to the EliA solid phase component (EliA Well). The EliA wells are molded cups comparable to excised wells from a microtiter plate. They are made of polystyrene and are coated with the respective antigen.

The wells are at the same time a holder of the coupled antigen for convenient automation and a reaction chamber with reaction/washing solution handling based on pipetting to add and aspiration to remove liquids.

If present in the patient's specimen, antibodies to these proteins bind to their specific antigen. After washing away non-bound antibodies, enzyme-labeled antibodies against human IgG antibodies (EliA IgG Conjugate) are added to form an antibody-conjugate complex. After incubation, non-bound conjugate is washed away, and the bound complex is incubated with a Development Solution. After stopping the reaction, the fluorescence in the reaction mixture is measured. The assay directly measures the amount of antibody of interest bound to the antigen coating the EliA well, therefore the higher the value of fluorescent signal detected by the instrument, the higher the amount of antibody bound and detected in the sample tested. To evaluate test results, the response for patient samples is compared directly to the response for calibrators.

Performance Characteristics

1. Analytical performance:
   a) Precision/Reproducibility:

Precision on Phadia 250

To determine the precision of the assay, the variability was assessed in a study with 21 runs by examining the samples in 252 replicates across 3 lots and 3 instruments over 7 days. The data was calculated against the calibration curve from Day 1. The statistical evaluation was performed by Analysis of Variance. The results are given in the table below.

Mean (EliA U/mL)	Within-Run		Between-Run		Between-Instrument		Lot-to-Lot		Total Imprecision	
	SD	%CV	SD	%CV	SD	%CV	SD	%CV	SD	%CV
5.2	0.2	3.1	0.3	5.0	0.1	1.3	0.7	14.1	0.8	15.4
9.4	0.3	2.7	0.3	3.5	0.3	3.7	0.8	9.0	1.0	10.7
11.1	0.2	2.2	0.2	1.6	0.3	2.4	0.2	1.7	0.4	4.1
105.0	2.5	2.4	2.0	1.9	1.0	0.9	0.6	0.5	3.4	3.2
273.0	12.5	4.6	3.2	1.2	16.6	6.1	14.9	5.5	25.8	9.4

Within-Lab Imprecision

To determine the within-lab precision of the assay, the variability was assessed in a study with 40 runs by examining the samples in 80 replicates on 1 instrument over 20 days. The data was calculated against the calibration curve from Day 1. The statistical evaluation was performed by Analysis of Variance. The results are given in the table below.

Results for within-laboratory study for Phadia 250:

Mean EliA U/mL	Within-Run		Between-Run		Between-Day		Total Within-Lab Imprecision	
	SD	CV%	SD	CV%	SD	CV%	SD	CV%
4.3	0.1	2.3	0.1	1.7	0.1	1.2	0.1	3.1
7.3	0.2	2.7	0.0	0.0	0.2	2.2	0.3	3.5
9.9	0.2	2.3	0.2	1.9	0.1	0.9	0.3	3.2
110	3.0	2.7	1.8	1.7	1.3	1.2	3.8	3.4

Lot reproducibility study

Three samples were tested in three different "Kits" in order to simulate three different customers using different combinations of EliA SmD^{P}-S Well lots and EliA assay reagent lots. The study was performed on one Phadia 250 instrument. Across 7 different days, one run per "Kit" was performed, i.e. a total of 7 runs per "Kit", and a total of 21 runs across three "Kits".
In each run, each of the three samples was tested in 4 replicates, giving a total of 84 replicates per sample over all three "Kits" (3 kits x 7 days x 4 replicates/run = 84 replicates per sample).

Results for additional lot reproducibility study for Phadia 250:

Mean (EliA U/mL)	Within-Run		Between-Run		Between-Lot		Total Imprecision	
	SD	CV%	SD	CV%	SD	CV%	SD	CV%
4.3	0.1	3.1	0.1	1.8	0.1	2.2	0.2	4.2
7.8	0.2	2.5	0.2	2.6	0.3	3.5	0.4	5.0
10.2	0.3	2.8	0.1	0.9	0.5	4.8	0.6	5.7

Precision on E-module of the Phadia 2500 and Phadia 5000 series:

To determine the precision of the assay on the E-module, which is a representative of the Phadia 2500 and Phadia 5000 series of instruments, the variability was assessed on 5 samples, using one lot of EliA SmD^{P}-S Well.

The variability was assessed in a study with 21 runs by examining the samples in 84 replicates on 3 Phadia 2500E instruments over 7 days. The data was calculated against the calibration curve from Day 1. The statistical evaluation was performed by Analysis of Variance. The results are given in the table below.

Mean EliA U/mL	n	Within-Run		Between-Run		Between-Instrument		Total Imprecision	
		SD	%CV	SD	%CV	SD	%CV	SD	%CV
4.8	84	0.3	6.1	0.1	2.6	0.4	8.4	0.5	10.7
8.7	84	0.4	4.2	0.6	7.2	0.0	0.0	0.7	8.3
9.6	84	0.5	5.3	0.3	2.8	0.6	6.6	0.9	8.9
102	84	3.7	3.6	3.7	3.6	3.4	3.4	6.2	6.1
256	82	13.0	5.1	8.3	3.2	12.0	4.7	20.0	7.6

b) Linearity/Assay Reportable Range:
3 serum samples were diluted in EliA Sample Diluent and tested on Phadia 250 and Phadia 2500E. The ratios of observed/expected values were calculated. The results are summarized below.

Phadia 250

Dilution Range (EliA U/mL)	Slope	Intercept	R^2
3.2 – 310.8	1.00	0.58	1.00
2.3 – 230.5	1.00	-0.31	1.00
0.5 – 9.9	1.00	-0.18	1.00

*Evaluation including 1st dilution step below LoD

Phadia 2500E

Dilution Range (EliA U/mL)	Slope	Intercept	R^2
3.0 – 329.3	1.01	-2.04	1.00
1.8 – 205.6	1.04	0.18	0.99
0.6 – 10.4	1.02	0.00	1.00

*Evaluation including 1st dilution step below LoD

The claimed linear range for EliA SmD^{P}-S is 0.8 (LoQ) – 310.8 EliA U/mL.

Hook Effect/Over the Range Results:
Not applicable. Results above the upper limit of the measuring range are reported as “>310”. No recommendations are made for dilution of samples outside measuring range in the Package Insert.

c) Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):
Traceability:
The IgG calibrators are traceable (via unbroken chain of calibrations) to the International Reference Preparation (IRP) 67/86 of Human Serum Immunoglobulins A, G and M from WHO. New batches of IgG calibrators are compared to a secondary standard (standardized with the IRP) or the IRP directly and adjusted accordingly to meet the correct concentration.

The instrument measures specific IgG concentrations in µg/L. By using a conversion factor given by the lot-specific code of the EliA™ test well, the results are automatically converted to EliA U/mL.

Stability:
Data for open and closed real-time stability and on-board stability of EliA IgG reagents and general EliA reagents on Phadia 250 as well as on the E-module of the Phadia 2500 and Phadia 5000 series were cleared with other EliA tests, for example K141375 for the EliA M2 test on Phadia 250 or K151799 for the EliA anti-TG and EliA anti-TPO tests on Phadia 250 and the Phadia 2500 and Phadia 5000 instrument series (E-module).

Shelf-life:
The stability of EliA SmD^{P}-S Wells was evaluated with both, a real-time and accelerated/stress study. The real-time study results support stability of the test under the recommended storage of 2 – 8°C for up to 18 months.

On-board stability:
The on-board stability EliA SmD^{P}-S carriers (containing the antigen coated wells) was tested over 4 weeks using 4 positive and 2 negative samples only on the Phadia 250 instrument. As the storage conditions in the E-module of the Phadia 2500 and Phadia 5000 series are similar to the Phadia 250, the results can also be used for stability claims for these instruments. The on-board stability for the Phadia 250 was determined to be 28 days at 2-8°C.

Open Stability:
Stability after first opening of the foil bag containing the EliA SmD^{P}-S wells was tested and determined to be 9 months at 2-8°C.

d) Detection limit:

Four blank and four low level samples were measured with two different reagent sets (two lots of antigen wells and conjugate). The four blank samples were created from depleted IgG (IgM, IgA, IgD, IgE) sera, each diluted with EliA Sample Diluent. The blank samples and the low-level samples were assayed in six runs using two different sets of test- and method-specific reagents over six different days on each Phadia 250 and Phadia 2500E in 4-fold determination. For each instrument type, the total number of combined observations for blank and low-level samples is 96 (48 per reagent set, 12 per sample and reagent set).

The LoD for EliA SmD^{P}-S is 0.7 EliA U/mL, determined consistent with the guidelines in CLSI document EP17-A2 and with proportions of false positives (α) less than 5% and false negatives (β) less than 5%; based on 192 determinations with 96 blank and 96 low-level replicates per instrument type; and LoB of 0.4 EliA U/mL.

The results are summarized in the table below:

Instrument	LoB EliA U/mL	LoD EliA U/mL	LoQ EliA U/mL
Phadia 250	0.3	0.5	0.7
E-module of the Phadia 2500 and Phadia 5000 series	0.4	0.7	0.8

It was decided to use a harmonized LoB of 0.4 EliA U/mL, LoD of 0.7 EliA U/mL, and LoQ of 0.8 EliA U/mL for the immunoassay.

e) Analytical specificity:
Endogenous and Exogenous Interference:
A study was run to investigate whether high concentrations of potentially interfering substances in serum, like bilirubin, hemoglobin, lipemic factor, rheumatoid factor, Ibuprofen, Losartan, Hydroxychloroquine, Azathioprine, Prednisone, Rituximab and Infliximab adversely affect the results of the new device.

Three serum samples (one negative sample, one sample with a concentration within the equivocal range, and one high positive sample) were prediluted in EliA Sample Diluent and spiked with the different interfering substances or blank solution. The samples were tested in triplicates. A calibration curve was run in duplicate. The runs were repeated twice. One batch of EliA antigen wells and one batch of system reagents were used throughout the studies.

The ratio of blank/spiked sample ranged from 0.92 – 1.09 for EliA SmDP-S. No interference was observed up to the concentrations listed in the table below:

Potential Interfering Compound	Concentration in undiluted sample
Bilirubin F	19.2 mg/dL
Bilirubin C	20.1 mg/dL
Hemoglobin	501 mg/dL
Lipemic factor	1g/dL
Rheumatoid factor	505 IU/mL
Ibuprofen	21.9 mg/dL
Losartan	1.14 mg/dL
Hydroxychloroquine	0.23 mg/dL
Azathioprine	0.26 mg/dL
Prednisone	0.01 mg/dL
Rituximab	109 mg/dL
Infliximab	26.4 mg/dL

Reference Sera:
Externally defined sera should be measured according to their target values as mentioned by the institution CDC and AMLI.

Using EliA SmD^{P}-S, the results of 22 reference samples (12 CDC, and 10 AMLI) were found in good agreement to the results described by the supplier: All CDC samples were found according to their target. Three AMLI samples which did not contain antibodies to SmD_3 but are known to contain SmB,B', SmE and/or SmF could not be detected by the EliA SmD^{P}-S assay.

Carry-Over:
A study was carried out on a Phadia 250 instrument using the test EliA Ro, cleared under k082759. The instruments of the Phadia 2500 and Phadia 5000 series use disposable tips for pipetting samples and a separate pipette for the conjugate, therefore carry-over from samples to conjugate is impossible.

f) Assay Cut-Off:
To define the cut-off, a study was performed using a cohort consisting of 200 clinically defined disease control samples. The samples were measured on a Phadia 250 instrument.

The cut-off was set as follows for EliA SmD^{P}-S:

<7 EliA U/mL	Negative
7-10 EliA U/mL	Equivocal
>10 EliA U/mL	Positive

In case of equivocal results, it is recommended to retest the patient after 8-12 weeks.

2. Comparison Studies:
   a) Method Comparison with Predicate Device:

A total of 628 patient samples with concentrations covering the measuring range were tested.

The samples were analyzed with the EliA SmD^P-S and EliA SmD^P assay. The test was run in single determination, and values outside the measuring range (n=168) were excluded from statistical analyses. The results are summarized in the tables below:

EliA SmD^P-S: equivocal results considered negative

N = 460	EliA SmD^P positive: > 10 EliA U/mL	EliA SmD^P negative: < 7 EliA U/mL	Total
EliA SmD^P-S positive: > 10 EliA U/mL	169	9	178
EliA SmD^P-S negative: < 7 EliA U/mL	15	267	282
Total	184	276	460

	Calculation	Agreement (%)	95% CI
Positive Percent Agreement	100% x 169/184	91.8	86.9 – 95.4
Negative Percent Agreement	100% x 267/276	96.7	93.9 – 98.5
Total Agreement	100% x (169+267)/460	94.8	92.3 – 96.6

EliA SmD^P-S: equivocal results considered positive

N = 460	EliA SmD^P positive: > 10 EliA U/mL	EliA SmD^P negative: < 7 EliA U/mL	Total
EliA SmD^P-S positive: > 10 EliA U/mL	201	7	208
EliA SmD^P-S negative: < 7 EliA U/mL	16	236	252
Total	217	243	460

	Calculation	Agreement (%)	95% CI
Positive Percent Agreement	100% x 201/217	92.6	88.3 – 95.7
Negative Percent Agreement	100% x 236/243	97.1	94.2 – 98.8
Total Agreement	100% x (201+236)/460	95.0	94.2 – 98.8

Matrix Comparison:
Serum, Li-heparin plasma and EDTA-plasma samples were collected from the same patients (n = 93) to evaluate if the plasma results deviate from the corresponding serum results and are within the pre-defined specifications. The 25 positive samples were spiked with a serum sample of high antibody titer to cover the measuring range. Samples were tested in single determination. Passing-Bablok regression plots were generated by plotting the concentration observed from the control tube (serum) versus the concentration for each test collection tube. The corresponding slopes of regression and coefficient determination are summarized in the tables below:

	Range tested (EliA U/mL)	Slope (95% CI)	Intercept (95% CI)	R^2
Serum vs. Li-heparin plasma	0.7 – 254.3	0.88 (0.84 to 0.92)	-0.31 (-0.53 to -0.15)	1.00
Serum vs. EDTA plasma	1.2 – 278.7	0.99 (0.96 – 1.02)	0.13 (-0.12 to 0.38)	1.00

Based on the results, only serum and EDTA plasma are appropriate sample matrices for the EliA SmD^{P}-S; the following statement is included in the package insert sections below:

SPECIMEN COLLECTION, HANDLING AND PREPARATION:
“However, the use of plasma preparations with heparin is not recommended because heparin interferes with the measurement of Sm antibodies.”

LIMITATIONS:
“Heparin can suppress SmD antibody reaction. Some EliA SmDP-S results in the equivocal/low positive range obtained from Li-heparin plasma samples may be underestimated.”

b) Instrument Comparison:
Performance of EliA SmD^{P}-S was evaluated on the Phadia 250 and Phadia 2500E instrument using 105 positive, 15 equivocal and 14 negative samples. The samples were analyzed in single determination on one Phadia 250 and one Phadia 2500E instrument each. The regression analysis results are summarized as follows:

	Intercept	Slope
Estimate	-0.73	1.01
95% CI	-1.20 - -0.36	0.98 - 1.03

3. Clinical Studies:
   a) Clinical Sensitivity and Specificity:

328 clinically defined samples with a diagnosis from patients with systemic lupus erythematosus (n = 104), mixed connective tissue disease (n = 22), Sjögren's syndrome (n = 28), scleroderma (n = 32), polymyositis/dermatomyositis (n=10), rheumatoid arthritis (n = 52), Graves' disease (n = 10), Hashimoto's disease (n = 10), bacterial infections (n = 30), and viral infections (n=30) were used to determine sensitivity and specificity of the assay. The results are summarized in the tables below.

EliA SmD^{P}-S – equivocal results evaluated as positive:

n=328	Diagnostic Group	Disease Controls	Total
Positive test ≥ 7 EliA U/mL	19	3	22
Negative test < 7 EliA U/mL	85	221	306
Total	104	224	328

Sensitivity (95% CI): 18.3% (11.4% - 27.1%)
Specificity (95% CI): 98.7% (96.1% - 99.7%)

EliA SmD^{P}-S – equivocal results evaluated as negative:

n=328	Diagnostic Group	Disease Controls	Total
Positive test > 10 EliA U/mL	19	1	20
Negative test ≤ 10 EliA U/mL	85	223	308
Total	104	224	328

Sensitivity (95% CI): 18.3% (11.4% - 27.1%)
Specificity (95% CI): 99.6% (97.5% - 100%)

The table below shows the results for each clinical subgroup if equivocal results evaluated as negative:

Diagnostic groups	n	No (%) Positive EliA SmD^{P}-S
Systemic lupus erythematosus	104	19 (18.3%)
Mixed connective tissue disease	22	0 (0%)
Sjögren's syndrome	28	0 (0%)
Scleroderma	32	0 (0.0%)
Polymyositis/Dermatomyositis	10	0 (0%)
Rheumatoid arthritis	52	1 (1.9%)
Graves' disease	10	0 (0%)
Hashimoto's disease	10	0 (0%)
Bacterial infections	30	0 (0%)
Viral infections	30	0 (0%)

b) Other Clinical Supportive Data:
Not applicable.

4. Clinical Cut-Off:
Same as assay cut-off.

5. Expected Values/Reference Range:
Antibody prevalence in autoimmune patients varies widely depending on disease area. The proportion of sera from a normal population found positive for the antinuclear antibodies covered by the EliA SmD^{P}-S test is below 1%. Expected values may vary depending on the population tested.

The frequency distribution for antinuclear antibodies was investigated in a group of apparently healthy subjects equally distributed by age and gender, using sera from Caucasian, African American, Hispanic and Asian population obtained from a blood bank.

The results are given in the table below:

Test	n	Median EliA U/mL	95th percentile EliA U/mL	99th percentile EliA U/mL
EliA SmD^{P}-S	632	1.8	3.6	5.0

Proposed Labeling
The labeling is sufficient, and it satisfies the requirements of 21 CFR Part 809.10.

Conclusion
All available data support that both immunoassays, the new device EliA SmD^{P}-S and its predicate device EliA SmD^{P} perform substantially equivalent.

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