April 23, 2025

Hycor Biomedical
Aashrey Kaul
Regulatory Affairs Manager
7272 Chapman Avenue
Garden Grove, California 92841

Re: K242531
Trade/Device Name: NOVEOS Specific IgE (sIgE) Assay
Capture Reagent G010, Johnson Grass (Sorghum halepense);
Capture Reagent T007, Oak (Quercus alba);
Capture Reagent G002, Bermuda Grass (Cynodon dactylon);
Capture Reagent W001, Common Ragweed (Ambrosia artemisiifolia);
Capture Reagent E005, Dog Dander (Canis familiaris);
Capture Reagent T003, Common Silver Birch (Betula verrucosa);
Capture Reagent F001, Egg White (Gallus gallus);
Capture Reagent F002, Cow's Milk (Bos taurus)
Regulation Number: 21 CFR 866.5750
Regulation Name: Radioallergosorbent (RAST) Immunological Test System
Regulatory Class: Class II
Product Code: DHB
Dated: March 21, 2025
Received: March 24, 2025

Dear Aashrey Kaul:

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,

Ying Mao -S

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: 07/31/2026
See PRA Statement below.

510(k) Number *(if known)*
K242531

Device Name

NOVEOS Specific IgE (sIgE) Assay
Capture Reagent G010, Johnson Grass (Sorghum halepense);
Capture Reagent T007, Oak (Quercus alba);
Capture Reagent G002, Bermuda Grass (Cynodon dactylon);
Capture Reagent W001, Common Ragweed (Ambrosia artemisiifolia);
Capture Reagent E005, Dog Dander (Canis familiaris);
Capture Reagent T003, Common Silver Birch (Betula verrucosa);
Capture Reagent F001, Egg White (Gallus gallus);
Capture Reagent F002, Cow's Milk (Bos taurus)

Indications for Use *(Describe)*

The NOVEOS Specific IgE Assay is an in vitro quantitative assay for the measurement of allergen specific IgE in human serum. NOVEOS Specific IgE Assay is to be used with the NOVEOS Immunoassay Analyzer. It is intended for use as an in vitro diagnostic aid in the clinical diagnosis of IgE mediated allergic disorders in conjunction with other clinical findings and is to be used in clinical laboratories.

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

NOVEOS Specific IgE

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

Date of Preparation: 21st April 2025

Manufacturer: Hycor Biomedical, LLC
7272 Chapman Avenue
Garden Grove, CA 92841

Contact Person: Aashrey Kaul
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Garden Grove, CA 92841
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Device Name:

NOVEOS™ Specific IgE (sIgE) Assay
Capture Reagent G010, Johnson Grass (*Sorghum halepense*);
Capture Reagent T007, Oak (*Quercus alba*);
Capture Reagent G002, Bermuda Grass (*Cynodon dactylon*);
Capture Reagent W001, Common Ragweed (*Ambrosia artemisiifolia);*
Capture Reagent E005, Dog Dander (*Canis familiaris*);
Capture Reagent T003, Common Silver Birch (*Betula verrucosa*);
Capture Reagent F001, Egg White (*Gallus gallus*);
Capture Reagent F002, Cow's Milk (*Bos taurus*);

Classification

NOVEOS™ Specific IgE (sIgE) Assay
Product Code: DHB
Class: II
CFR § 866.5750

Substantial Equivalence to: K051218

ImmunoCAP Specific IgE Assay

ImmunoCAP Allergens g10, t7, g2, w1, e5, t3, f1, and f2.

Indications for Use/ Intended Use

The NOVEOS™ Specific IgE Assay is an *in vitro* quantitative assay for the measurement of allergen specific IgE in human serum. NOVEOS Specific IgE Assay is to be used with the NOVEOS Immunoassay Analyzer. It is intended for use as an *in vitro* diagnostic aid in the clinical diagnosis of IgE mediated allergic disorders in conjunction with other clinical findings and is to be used in clinical laboratories.

General Description

Reagents

The IgE Common reagents includes: Diluent A, Conjugate IgE, Substrate A, Substrate B, Fluo Beads™. Other required and recommended reagents include the allergen specific Capture Reagent, IgE Calibrator Set (6 levels (kU/L) - Cal 0.07 IgE, Cal 0.35 IgE, Cal 0.70 IgE, Cal 3.5 IgE, Cal 17.5 IgE, Cal 100 IgE), Calibrator Antibody IgE, Probe Wash Pack, Wash Buffer Concentrate, Cuvette Wash Pack, IgE Negative Control Pack, and IgE Positive Control Pack.

Assay Principle

The NOVEOS Specific IgE Assay is an immunometric, chemiluminescent procedure for the quantitative determination of IgE of known specificity in human serum samples. It employs fluorescent labelled magnetic, streptavidin coated microparticles which are incubated with a biotinylated allergenic capture reagent, patient sample and monoclonal anti-human IgE antibody: horseradish peroxidase conjugate. If present in the sample, IgE binds to the biotinylated allergen captured to the streptavidin-coated microparticles to form a complex. After a final wash, the resulting complex is incubated with the enzyme substrate and a chemiluminescent signal is generated, the magnitude of which is proportional to the concentration of IgE in the patient sample.

The concentration of allergen-specific IgE is determined from a standard curve, which is traceable to the World Health Organization (WHO) reference reagent serum Immunoglobulin E (IgE) 11/234.

Device Comparison

NOVEOS Specific IgE Assay on the NOVEOS Immunoassay Analyzer is comparable to ImmunoCAP Specific IgE on the Phadia 100 or 250 Analyzer. Both are automated immunoassay systems that process all assay steps and automatically generate results. See the table on the next page.

Similarities and Differences		
General Device Characteristic	**NOVEOS sIgE Assay**	**ImmunoCAP Specific IgE**
Intended Use	The NOVEOS Specific IgE Assay is an *in vitro* quantitative assay for the measurement of allergen specific IgE in human serum. NOVEOS Specific IgE Assay is to be used with the NOVEOS Immunoassay Analyzer. It is intended for use as an *in vitro* diagnostic aid in the clinical diagnosis of IgE mediated allergic disorders in conjunction with other clinical findings and is to be used in clinical laboratories.	ImmunoCAP Specific IgE is an *in vitro* quantitative assay for the measurement of allergen specific IgE in human serum or plasma (EDTA or Na-Heparin). ImmunoCAP Specific IgE is to be used with instruments Phadia 100, Phadia 250, Phadia 1000, Phadia 2500 and Phadia 5000. It is intended for *in vitro* diagnostic use as an aid in the clinical diagnosis of IgE mediated allergic disorders in conjunction with other clinical findings, and is to be used in clinical laboratories.
Specimen Type	Serum	Serum or plasma (EDTA, Na Heparin)
Sample Volume	4 µL	40 µL
Assay Type	Quantitative	Same
Detection Antibody	Horseradish peroxidase conjugated mouse anti-human IgE monoclonal antibody	β-Galactosidase-anti-human IgE (mouse monoclonal antibody)
Detection Limit	G010, Johnson Grass: LoB: 0.03 kU/L LoD: 0.06 kU/L LoQ: 0.10 kU/L T007, Oak: LoB: 0.04 kU/L LoD: 0.05 kU/L LoQ: 0.10 kU/L G002, Bermuda Grass: LoB: 0.03 kU/L LoD: 0.05 kU/L LoQ: 0.010 kU/L	LoB: 0.001 kU/L LoD: 0.02 kU/L LoQ: 0.10 kU/L

	W001, Common Ragweed: LoB: 0.03 kU/L LoD: 0.05 kU/L LoQ: 0.10 kU/L E005, Dog Dander: LoB: 0.03 kU/L LoD: 0.06 kU/L LoQ: 0.16kU/L T003, Common Silver Birch: LoB: 0.04 kU/L LoD: 0.08 kU/L LoQ: 0.10 kU/L F001, Egg White: LoB: 0.02 kU/L LoD: 0.04 kU/L LoQ: 0.14 kU/L F002, Cow's Milk: LoB: 0.03 kU/L LoD: 0.05 kU/L LoQ: 0.10 kU/L	
Laboratory Setting	Clinical Laboratory	Same
Assay Principles	Fluorescence adjusted, immunometric, chemiluminescent assay	Fluoroenzyme-immunoassay
Solid Phase	Magnetic microparticles	Cellulose derivative
Calibrator Traceability	World Health Organization (WHO) reference reagent serum Immunoglobulin E (IgE) 11/234	Same
Calibration Method	Heterologous interpolation based on Total IgE calibration curve	Same
Stored Calibration Curve	Yes, up to 28 days	Same
Number of Calibrators	Six	Same
Calibrator Levels	0, 0.35, 0.7, 3.5, 17.5 and 100 kU/L	Same

Assay Range	G010, Johnson Grass: 0.10 – 100 kU/L T007, Oak: 0.10 – 100 kU/L G002, Bermuda Grass: 0.10- 100 kU/L W001, Common Ragweed: 0.10 – 100 kU/L E005, Dog Dander: 0.16 – 100 Ku/L T003, Common Silver Birch: 0.10 – 100 kU/L F001, Egg White: 0.14 – 100 kU/L F002, Cow's Milk: 0.10 – 100 kU/L	Same
Reaction Temperature	37°C	Same
Instrument(s)	NOVEOS Immunoassay Analyzer	Phadia 100, Phadia 250/1000/2500/5000
Time to First Result	1 hour 45 minutes	1 hour 45 minutes to 2 hour 30 minutes depending on model

Clinical Performance

In addition to the ImmunoCAP comparison study, a clinical study that compares NOVEOS sIgE allergen results to the allergic status of 102 to 228 patients was performed to support the diagnostic performance of the NOVEOS sIgE allergens G010 (Johnson Grass), T007 (Oak), G002 (Bermuda Grass), W001 (Common Ragweed), E005 (Dog Dander), T003 (Common Silver Birch), F001 (Egg White), and F002 (Cow's Milk). A total of 32 to 88 samples with allergic status (atopic) was confirmed by skin-prick testing or oral food challenge, and the other 53 to 146 samples were deemed negative (non-atopic) by ImmunoCAP testing (result <0.35 kU/L).
Results are expressed as positive when a sample has an sIgE value greater than or equal to 0.35 kU/L, and negative when a sample has an sIgE value is less than 0.35 kU/L.

Clinical sensitivity and specificity for each allergen under evaluation are summarized in the following table:

NOVEOS sIgE Allergens		Clinical Diagnosis		
		Atopic	Non-Atopic	Total
G010, Johnson Grass	Positive	62	1	63
	Negative	23	132	155
	Total	85	133	218
	Clinical sensitivity: 72.9% (62/85) 95% CI 62.7% to 81.2% Clinical specificity: 99.2% (132/133) 95% CI 95.9% to 99.9%			
T007, Oak	Positive	38	2	40
	Negative	15	91	106
	Total	53	93	146
	Clinical sensitivity: 71.7% (38/53) 95% CI 58.4% to 82.0% Clinical specificity: 97.8% (91/93) 95% CI 92.5% to 99.4%			
G002, Bermuda Grass	Positive	67	4	71
	Negative	21	136	157
	Total	88	140	228
	Clinical sensitivity: 76.1% (67/88) 95% CI 66.3% to 83.8% Clinical specificity: 97.1% (136/140) 95% CI 92.9% to 98.9%			
W001, Common Ragweed	Positive	44	6	50
	Negative	27	88	115
	Total	71	94	165
	Clinical sensitivity: 62.0% (44/71) 95% CI 50.3% to 72.4% Clinical specificity: 93.6% (88/94) 95% CI 86.8% to 97.0%			
E005, Dog Dander	Positive	23	0	23
	Negative	9	77	86
	Total	32	77	109
	Clinical sensitivity: 71.9% (23/32) 95% CI 54.6% to 84.4% Clinical specificity: 100.0% (77/77) 95% CI 95.2% to 100.0%			

NOVEOS sIgE Allergens		Clinical Diagnosis		
		Atopic	Non-Atopic	Total
T003, Common Silver Birch	Positive	27	0	27
	Negative	22	53	75
	Total	49	53	102
	Clinical sensitivity: 55.1% (27/49) 95% CI 41.3% to 68.1% Clinical specificity: 100.0% (53/53) 95% CI 93.2% to 100.0%			
F001, Egg White	Positive	19	0	19
	Negative	17	146	163
	Total	36	146	182
	Clinical sensitivity: 52.8% (19/36) 95% CI 37.0% to 68.0% Clinical specificity: 100.0% (146/146) 95% CI 97.4% to 100.0%			
F002, Cow's Milk	Positive	17	0	17
	Negative	17	132	149
	Total	34	132	166
	Clinical sensitivity: 50.0% (17/34) 95% CI 34.1% to 65.9% Clinical specificity: 100.0% (132/132) 95% CI 97.2% to 100.0%			

The following literature was published to support the observed low performance, especially sensitivity, from the NOVEOS sIgE Assay, T003, F001, and F002:

NOVEOS sIgE Assay	Literature Citation(s)	Prevalence	Reported Performance
T003, Oak Sensitivity: 55.1% Specificity: 100%	Knight, V., et al., (2018). Journal of Immunological Methods, 462, 9-12.	Not reported	53% (95 CI: 29% to 76%) - concordance of SPT vs. sIgE
	Salo, P. M., et al., (2014). The Journal of Allergy and Clinical Immunology, 134(2), 350-359.	~12% in subjects ≥6 years old in US	Not reported
F001, Egg White Sensitivity: 52.8% Specificity: 100%	Nacaroglu HT, et al. (2017) Allergol Immunopathol (Madr).	Not reported	Sensitivity: 41.3% Specificity: 86.67%
	Salo, P. M., et al., (2014). The Journal of Allergy and Clinical Immunology, 134(2), 350-359.	3.5% in subjects ≥6 years old in US	Not reported
	Min, T. K., et al. (2013). Allergy, Asthma & Immunology Research, 5(3), 138-142.	Not reported (study done in subjects <2 years old in Korea)	Sensitivity: 60.0% Specificity: 62.5% (with 2 kU_A/L as cut-off)
F002, Cow's Milk Sensitivity: 50.0% Specificity: 100%	Sampson H. A. (2001). The Journal of Allergy and Clinical Immunology, 107(5), 891-896.	Not reported	Sensitivity: 51% PPV: 95%
	Salo, P. M., et al., (2014). The Journal of Allergy and Clinical Immunology, 134(2), 350-359.	5.7% (in 8203 subjects between 1 to >60 years old in US)	Not reported
	Mehl, A., et al. (2012). Journal of the British Society for Allergy and Clinical Immunology, 42(8), 1266-1272.	Not reported	"low" between sIgE vs SPT on an individual basis

Method Comparison to ImmunoCAP

Method comparison studies to evaluate the performance of the NOVEOS sIgE allergens to ImmunoCAP were completed using 175 to 268 patient samples. Results for NOVEOS sIgE and ImmunoCAP allergens are expressed as positive when a sample has a value greater than or equal to 0.35 kU/L, and negative when a sample has an sIgE value is less than 0.35 kU/L. Percent positive and negative agreement for each allergen under evaluation are summarized in the following table:

NOVEOS sIgE Allergens		ImmunoCAP sIgE		
		Positive	**Negative**	**Total**
G010, Johnson Grass	**Positive**	100	1	101
	Negative	18	134	152
	Total	118	135	253
	Positive Agreement: 84.7% (100/118) 95% CI: 77.2% to 90.1% Negative Agreement: 99.3% (134/135) 95% CI: 95.9% to 99.9% Total Agreement: 92.5% (234/253) 95% CI: 88.6% to 95.1%			
T007, Oak	**Positive**	124	6	130
	Negative	24	106	130
	Total	148	112	260
	Positive Agreement: 83.8% (124/148) 95% CI: 77.0% to 88.9% Negative Agreement: 94.6% (106/112) 95% CI: 88.8% to 97.5% Total Agreement: 88.5% (230/260) 95% CI: 84.0% to 91.8%			
G002, Bermuda Grass	**Positive**	93	5	98
	Negative	11	150	161
	Total	104	155	259
	Positive Agreement: 89.4% (93/104) 95% CI: 82.0% to 94.0% Negative Agreement: 96.8% (150/155) 95% CI: 92.7% to 98.6% Total Agreement: 93.8% (243/259) 95% CI: 90.2% to 96.2%			
W001, Common Ragweed	**Positive**	99	5	104
	Negative	37	95	132
	Total	136	100	236
	Positive Agreement: 72.8% (99/136) 95% CI: 64.8% to 79.6% Negative Agreement: 95.0% (95/100) 95% CI: 88.8% to 97.8% Total Agreement: 82.2% (194/236) 95% CI: 76.8% to 86.6%			

NOVEOS sIgE Allergens		ImmunoCAP sIgE		
		Positive	Negative	Total
E005, Dog Dander	Positive	88	3	91
	Negative	8	88	96
	Total	96	91	187
	Positive Agreement: 91.7% (88/96) 95% CI 84.4% to 95.7% Negative Agreement: 96.7% (88/91) 95% CI 90.8% to 98.9% Total Agreement: 94.1% (176/187) 95% CI: 89.8% to 96.7%			
T003, Common Silver Birch	Positive	95	3	98
	Negative	4	73	77
	Total	99	76	175
	Positive Agreement: 96.0% (95/99) 95% CI: 90.1% to 98.4% Negative Agreement: 96.1% (73/76) 95% CI: 89.0% to 98.6% Total Agreement: 96.0% (168/175) 95% CI: 92% to 98%			
F001, Egg White	Positive	69	7	76
	Negative	8	179	187
	Total	77	186	263
	Positive Agreement: 89.6% (69/77) 95% CI: 80.8% to 94.6% Negative Agreement: 96.2% (179/186) 95% CI: 92.4% to 98.2% Total Agreement: 94.3% (248/263) 95% CI: 90.8% to 96.5%			
F002, Cow's Milk	Positive	60	2	62
	Negative	33	173	206
	Total	93	175	268
	Positive Agreement: 64.5% (60/93) 95% CI: 54.5% to 73.5% Negative Agreement: 98.9% (173/175) 95% CI: 95.9% to 99.7% Total Agreement: 86.9 % (233/268) 95% CI: 82.4% to 90.5%			

Precision/Reproducibility

Repeatability and within-laboratory precision of NOVEOS sIgE allergens were determined in accordance with CLSI guideline EP05-A3: *Evaluation of Precision of Quantitative Measurement Procedures – 3rd Edition* and CLSI guideline EP15-A3: *User Verification of Precision and Estimation of Bias – 3rdEdition.* A panel of four to five samples (two negative and two to three positive patient samples) was assayed in duplicate for two runs per day, over at least 20 days, on one NOVEOS Immunoassay Analyzer for a total of at least 80 replicates per sample. One lot of NOVEOS sIgE allergens were used for testing of each sample. The SD and % CV of the within-run, between-run, between-day, and total imprecision were calculated for each sample and results are summarized in the following table:

Sample	N	Mean (kU/L)	Within-Run (Repeatability)		Between-Run		Between-Day		Total	
			SD	CV	SD	CV	SD	CV	SD	CV
NOVEOS G010, Johnson Grass										
1	80	0.20	0.02	8.9%	0.01	6.9%	0.04	19.0%	0.05	22.1%
2	80	0.36	0.01	4.0%	0.02	6.0%	0.03	9.4%	0.04	11.8%
3	80	7.76	0.35	4.6%	0.16	2.0%	0.61	7.8%	0.72	9.3%
4	80	34.56	1.19	3.5%	1.07	3.1%	3.09	8.9%	3.48	10.1%
5	84*	43.17	2.07	4.8%	0.67	1.6%	1.46	3.4%	2.62	6.1%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with exclusion of 2 outliers for Day 21 and only 1 run at Day 22										
NOVEOS T007, Oak										
1	80	0.20	0.01	5.8%	0.01	4.7%	0.01	6.3%	0.02	9.8%
2	80	0.25	0.01	4.5%	0.02	8.2%	0.00	0.0%	0.02	9.4%
3	80	1.72	0.07	4.2%	0.13	7.8%	0.12	6.9%	0.19	11.2%
4	80	11.80	0.46	3.9%	0.70	6.0%	0.84	7.1%	1.19	10.1%
5	84*	96.20	4.74	4.9%	4.35	4.5%	4.40	4.6%	7.79	8.1%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with exclusion of 2 outliers for Day 21 and only 1 run at Day 22										
NOVEOS G002, Bermuda Grass										
1	80	0.14	0.01	7.5%	0.01	4.0%	0.01	7.4%	0.02	11.3%
2	80	0.22	0.01	6.0%	0.01	5.6%	0.02	8.0%	0.02	11.4%
3	80	9.14	0.38	4.1%	0.53	5.8%	0.64	7.0%	0.91	10.0%
4	80	51.34	2.14	4.2%	4.07	7.9%	4.70	9.2%	6.58	12.8%
NOVEOS W001, Common Ragweed										
1	80	0.17	0.01	8.1%	0.01	8.2%	0.02	10.7%	0.03	15.7%
2	80	0.29	0.02	7.4%	0.01	3.8%	0.02	6.5%	0.03	10.6%
3	80	1.28	0.07	5.5%	0.06	4.4%	0.08	6.7%	0.12	9.7%
4	80	6.28	0.22	3.5%	0.22	3.5%	0.37	5.9%	0.48	7.7%
5	86*	70.33	4.15	5.9%	2.90	4.1%	1.36	1.9%	5.25	7.5%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with only 1 run at Day 22										
NOVEOS E005, Dog Dander										
1	80	0.16	0.01	6.7%	0.00	3.0%	0.01	5.5%	0.01	9.2%
2	80	0.34	0.01	3.9%	0.02	6.0%	0.01	4.2%	0.03	8.3%
3	80	0.86	0.04	4.4%	0.05	5.8%	0.03	3.8%	0.07	8.2%
4	80	9.14	0.40	4.4%	0.69	7.5%	0.31	3.4%	0.85	9.3%
5	86*	81.48	4.68	5.7%	2.62	3.2%	2.60	3.2%	5.96	7.3%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with only 1 run at Day 22										

Sample	N	Mean (kU/L)	Within-Run (Repeatability)		Between-Run		Between-Day		Total	
			SD	CV	SD	CV	SD	CV	SD	CV
NOVEOS T003, Common Silver Birch										
1	80	0.21	0.02	10.6%	0.00	0.0%	0.02	9.9%	0.03	14.5%
2	80	0.29	0.01	4.2%	0.01	5.0%	0.03	8.7%	0.03	10.9%
3	80	1.31	0.10	7.7%	0.02	1.5%	0.06	4.6%	0.12	9.1%
4	80	10.37	0.38	3.7%	0.61	5.9%	0.38	3.6%	0.81	7.8%
5	86*	92.31	7.05	7.6%	5.01	5.4%	1.70	1.8%	8.82	9.6%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with only 1 run at Day 22										
NOVEOS F001, Egg White										
1	80	0.14	0.01	4.2%	0.01	4.8%	0.00	0.0%	0.01	6.4%
2	80	0.31	0.01	2.9%	0.01	3.1%	0.00	1.5%	0.01	4.5%
3	80	1.21	0.03	2.4%	0.04	3.6%	0.02	1.8%	0.06	4.7%
4	80	1.49	0.05	3.4%	0.04	2.4%	0.03	2.0%	0.07	4.7%
5	83*	78.75	4.30	5.5%	1.95	2.5%	3.33	4.2%	5.77	7.3%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with exclusion of 1dropped test on Day 20 and only 1 run at Day 22										
NOVEOS F002 (Cow's Milk)										
1	80	0.18	0.02	9.7%	0.00	2.6%	0.01	3.4%	0.02	10.6%
2	80	0.33	0.01	3.4%	0.01	3.1%	0.01	4.1%	0.02	6.2%
3	80	3.91	0.11	2.9%	0.14	3.6%	0.10	2.6%	0.21	5.3%
4	80	22.51	0.72	3.2%	0.73	3.2%	0.23	1.0%	1.05	4.7%
5	86*	59.43	3.34	5.6%	2.02	3.4%	4.93	8.3%	6.29	10.6%
* Sample 5 was done with 2 replicates/run x 2 runs/day x 22 days with 1 run at Day 22										

Lot-to-lot imprecision

Lot-to-lot imprecision was evaluated using a panel of four serum samples tested with two to three different lots of each NOVEOS sIgE allergen. For NOVEOS sIgE allergens G002 (Bermuda Grass), F001 (Egg White), and F002 (Cow's Milk), the samples were tested in duplicate for two runs per day, over 20 days, for a total of 240 replicates per sample. For NOVEOS sIgE allergens T007 (Oak), W001 (Common Ragweed), E005 (Dog Dander), and T003 (Common Silver Birch), the samples were tested in replicates of five for one run per day, over at least 5 days, for a total of at least 50 replicates per sample. For NOVEOS sIgE allergen G010 (Johnson Grass), the samples were tested in duplicate for two runs per day, over 5 days, for a total of 60 replicates per sample. The results are summarized in the following table:

Sample	N	Mean (kU/L)	Within-Run (Repeatability)		Between-Day		Between-Lot		Total	
			SD	CV	SD	CV	SD	CV	SD	CV
NOVEOS G010, Johnson Grass										
1	60	0.18	0.02	11.6%	0.03	14.9%	0.01	6.3%	0.04	19.9%
2	60	0.37	0.02	6.6%	0.01	1.7%	0.01	3.2%	0.03	7.5%
3	60	8.15	0.46	5.7%	0.14	1.7%	0.00	0.0%	0.48	5.9%
4	60	38.12	1.86	4.9%	0.57	1.5%	0.00	0.0%	1.95	5.1%
NOVEOS T007, Oak										
1	75	0.20	0.02	8.2%	0.03	14.5%	0.00	0.0%	0.03	16.7%
2	75	0.44	0.02	5.6%	0.04	8.2%	0.00	0.0%	0.04	9.9%
3	75	1.46	0.06	4.4%	0.14	9.5%	0.08	5.2%	0.17	11.7%
4	75	10.07	0.37	3.7%	0.51	5.1%	0.38	3.7%	0.73	7.3%
NOVEOS G002, Bermuda Grass										
1	240	0.14	0.02	13.9%	0.01	6.9%	0.01	6.9%	0.02	17.1%
2	240	0.23	0.03	11.8%	0.02	9.0%	0.02	7.4%	0.04	16.8%
3	240	9.14	0.38	4.2%	0.64	7.0%	0.00	0.0%	0.88	9.6%
4	240	51.00	2.46	4.8%	4.67	9.1%	0.00	0.0%	6.43	12.6%
NOVEOS W001, Common Ragweed										
1	75	0.18	0.01	8.0%	0.01	5.7%	0.01	7.9%	0.02	12.6%
2	75	0.48	0.03	5.7%	0.02	4.5%	0.02	4.0%	0.04	8.3%
3	75	1.27	0.05	4.3%	0.06	4.8%	0.00	0.0%	0.08	6.5%
4	75	6.16	0.29	4.7%	0.02	3.7%	0.00	0.0%	0.37	6.0%
NOVEOS E005, Dog Dander										
1	75	0.14	0.01	8.2%	0.01	9.0%	0.01	4.2%	0.02	12.9%
2	75	0.43	0.02	5.4%	0.02	4.2%	0.03	5.9%	0.04	9.0%
3	75	0.79	0.04	5.1%	0.04	4.7%	0.03	3.6%	0.06	7.8%
4	75	8.25	0.30	3.6%	0.45	5.5%	0.00	0.0%	0.54	6.6%
NOVEOS T003, Common Silver Birch										
1	50	0.11	0.01	8.6%	0.01	10.6%	0.00	0.0%	0.01	13.6%
2	50	0.55	0.02	3.6%	0.05	9.2%	0.00	0.0%	0.05	9.9%
3	50	1.54	0.06	3.7%	0.05	3.2%	0.00	0.0%	0.08	4.9%
4	50	8.89	0.38	4.3%	0.1	1.1%	0.00	0.0%	0.39	4.4%
NOVEOS F001, Egg White										
1	240	0.15	0.02	15.0%	0.00	0.0%	0.01	4.5%	0.02	16.0%
2	240	0.31	0.01	3.1%	0.00	0.9%	0.00	0.0%	0.02	5.1%
3	240	1.20	0.03	2.8%	0.02	1.5%	0.01	1.2%	0.06	4.8%
4	240	1.47	0.05	3.3%	0.02	1.1%	0.01	0.7%	0.08	5.2%

Sample	N	Mean (kU/L)	Within-Run (Repeatability)		Between-Day		Between-Lot		Total	
			SD	CV	SD	CV	SD	CV	SD	CV
NOVEOS F002, Cow's Milk										
1	240	0.18	0.01	6.4%	0.00	1.6%	0.00	0.3%	0.01	7.5%
2	240	0.35	0.01	3.1%	0.01	2.7%	0.01	4.2%	0.02	6.4%
3	240	4.05	0.10	2.4%	0.16	4.0%	0.11	2.8%	0.24	5.9%
4	240	22.35	0.62	2.8%	0.76	3.4%	0.04	0.2%	1.04	4.7%

Linearity

Linearity of NOVEOS sIgE allergens was evaluated in accordance with CLSI guideline I/LA20-3rd Edition*, Analytical Performance Characteristics, Quality Assurance, and Clinical Utility of Immunological Assays for Human Immunoglobulin E Antibodies of Defined Allergen Specificities*. Three sets of linearity dilution panels consisting of three neat positive human serum samples (low, mid, and high) were used for testing. One negative sample below the assay detection limit was used as the diluent. Each sample was serially diluted in a two-fold scheme (1/2, 1/4, 1/8, 1/16, and 1/32) to create the full dilution panel. Testing was performed using one lot of each NOVEOS sIgE allergen. The linear regression statistics calculated using the weighted least squares with intercept analysis per CLSI guideline EP06-2nd Edition, *Evaluation of Linearity of Quantitative Measurement Procedures*, are shown in the following tables:

NOVEOS Specific IgE Assay, G010, Johnson Grass				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.10 – 3.26	0.99 (0.92 to 1.07)	-0.00 (-0.03 to 0.02)	0.997
2	1.94 - 56.15	0.91 (0.85 to 0.97)	0.23 (-0.00 to 0.46)	0.998
3	3.16 - 111.01	0.90 (0.81 to 0.97)	-0.10 (-0.67 to 0.97)	0.997
All	0.10 - 111.01	0.95 (0.92 to 0.97)	0.01 (-0.01 to 0.02)	0.997

NOVEOS Specific IgE Assay, T007, Oak				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.05 - 1.99	1.00 (0.86 to 1.13)	-0.01 (-0.02 to -0.00)	0.987
2	0.63 - 42.05	0.95 (0.91 to 0.99)	-0.07 (-0.13 to 0.00)	0.999
3	1.41 - 113.95	0.86 (0.80 to 0.91)	-0.19 (-0.48 to 0.10)	0.997
All	0.05 - 113.95	0.90 (0.86 to 0.94)	-0.01 (-0.01 to -0.00)	0.991

NOVEOS Specific IgE Assay, G002, Bermuda Grass				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.06 - 2.94	0.96 (0.89 to 1.03)	-0.03 (-0.04 to -0.01)	0.996
2	1.50 - 51.58	0.96 (0.90 to 1.01)	-0.25 (-0.53 to 0.03)	0.998
3	2.90 - 111.89	1.00 (0.92 to 1.07)	-0.70 (-1.28 to -0.12)	0.997
All	0.06 - 111.89	0.93 (0.91 to 0.96)	-0.02 (-0.04 to -0.01)	0.997

NOVEOS Specific IgE Assay, W001, Common Ragweed				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.09 - 1.60	0.96 (0.92 to 1.00)	-0.01 (-0.02 to 0.01)	0.999
2	0.74 - 49.27	0.96 (0.94 to 0.99)	-0.01 (-0.02 to 0.01)	0.998
3	1.44 - 94.04	0.91 (0.85 to 0.97)	0.06 (-0.10 to 0.22)	0.997
All	0.09 - 94.04	0.95 (0.93 to 0.97)	0.00 (-0.02 to 0.01)	0.998

NOVEOS Specific IgE Assay, E005, Dog Dander				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.16 - 3.31	1.12 (1.00 to 1.24)	-0.00 (-0.03 to 0.06)	0.994
2	0.37 - 19.3	1.06 (0.97 to 1.14)	0.03 (-0.03 to 0.09)	0.995
3	1.47 - 102.41	0.99 (0.97 to 1.01)	-0.15 (-0.22 to -0.08)	1.000
All	0.16 - 102.41	1.06 (1.01 to 1.11)	0.03 (0.01 to 0.05)	0.990

NOVEOS Specific IgE Assay, T003, Common Silver Birch				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.08 - 3.28	1.00 (0.96 to 1.04)	-0.01 (-0.02 to -0.00)	0.999
2	0.67 - 42.74	0.94 (0.87 to 1.02)	-0.06 (-0.26 to 0.13)	0.995
3	1.30 - 92.17	0.99 (0.89 to 1.10)	-0.38 (-0.80 to 0.03)	0.992
All	0.08 - 92.17	0.93 (0.90 to 0.96)	0.00 (-0.02 to 0.02)	0.995

NOVEOS Specific IgE Assay, F001, Egg White				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.14 - 3.73	1.05 (0.97 to 1.05)	-0.02 (-0.07 to 0.08)	0.999
2	0.92 - 33.82	1.01 (0.99 to 1.02)	-0.18 (-0.41 to 0.04)	1.000
3	3.40 - 105.97	1.01 (0.88 to 1.13)	2.47 (-3.79 to 8.73)	0.992
All	0.14 - 105.97	1.01 (0.98 to 1.05)	-0.01 (-0.02 to 0.01)	0.995

NOVEOS Specific IgE Assay, F002, Cow's Milk				
Dilution Series	**Dilution Range (kU/L)**	**Slope (95% CI)**	**Intercept (95% CI)**	**R^2**
1	0.05 - 1.78	0.94 (0.85 to 1.02)	-0.01 (-0.02 to 0.00)	0.993
2	0.78 - 45.83	1.08 (1.01 to 1.14)	-0.01 (-0.32 to 0.12)	0.997
3	1.37 - 96.86	0.98 (0.95 to 1.01)	-0.26 (-0.42 to -0.11)	0.999
All	0.05 - 96.86	0.98 (0.94 to 1.01)	-0.01 (-0.02 to -0.00)	0.995

Endogenous Substance Interference

Interference testing by endogenous substances of NOVEOS sIgE allergens was carried out in accordance with CLSI guideline EP07, *Interference Testing in Clinical Chemistry – Third Edition*. The effect of the presence of elevated levels of human serum albumin, hemoglobin, triglyceride, conjugated bilirubin, and unconjugated bilirubin in serum samples was evaluated by testing three serum sample pools (one negative, one near the cut-off, and one positive) spiked with varying levels of each interferent. To mimic the dilution effect caused by the spiked interferent, the same amount of respective solvent was spiked into each of the sample pools and tested as control samples.

For NOVEOS sIgE allergens G010 (Johnson Grass), G002 (Bermuda Grass), F001 (Egg White), and F002 (Cow's Milk), the samples were tested in replicates of 12 in one assay run with three different allergen lots. For NOVEOS sIgE allergens T007 (Oak), W001 (Common Ragweed), E005 (Dog Dander), and T003 (Common Silver Birch), the samples were tested in replicates of seven in one assay run with one lot of Capture Reagent.

The % recovery for each sample spiked with the potential interfering substance was calculated by comparing its result to that of the corresponding control sample. The substances listed in the table below show no significant interference at the indicated test concentrations for all allergens under evaluation.

Substance	**Concentration**
Hemoglobin	200 mg/dL
Conjugated Bilirubin	30 mg/dL
Unconjugated Bilirubin	20 mg/dL
Intralipid	3002 mg/dL
Human Serum Albumin	120 g/L

Interference testing with rheumatoid factor (RF) was previously performed for NOVEOS sIgE allergens and found no significant interference at 513 IU/mL. For RF interference testing, refer to cleared 510(k) submissions K200825.

Exogenous Substance Interference

Interference testing with potentially interfering exogenous substances biotin, diphenhydramine, methylprednisolone, ranitidine, and omalizumab was previously performed for NOVEOS sIgE allergens and found no significant interference at the concentrations listed in the table below. Refer to previously cleared 510(k) submission K200825.

Substance	Concentration
Biotin	3500 ng/mL
Diphenhydramine	19.5 µmol/L
Methylprednisolone	1000 ng/mL
Ranitidine	19.1 µmol/L
Omalizumab	0.12 mg/mL

Cross-Reactivity

Cross-reactivity testing with other human immunoglobulins (IgA, IgD, IgG, and IgM) was previously performed for NOVEOS sIgE allergens that utilize the same universal anti-IgE conjugate reagent as those currently under evaluation and found no significant interference at physiological concentrations of IgA, IgG, IgM (14.86 mg/mL), and IgG (0.173 mg/mL). Refer to previously cleared 510(k) submission K200825.

Competitive Inhibition (Analytical Specificity)

Immunological specificity of NOVEOS sIgE allergens was demonstrated through competitive inhibition in accordance with CLSI I/LA20-3rd Edition, *Analytical Performance Characteristics, Quality Assurance, and Clinical Utility of Immunological Assays for Human Immunoglobulin E Antibodies of Defined Allergen Specificities*.

For each NOVEOS sIgE allergen, a positive sample was tested with specific IgE concentrations shown in the table below:

NOVEOS sIgE Allergen	Concentration (kU/L)
G010, Johnson Grass	1.52
T007, Oak	12.12
G002, Bermuda Grass	2.79
W001, Common Ragweed	4.88
E005, Dog Dander	3.65
T003, Common Silver Birch	2.27
F001, Egg White	2.04
F002, Cow's Milk	8.51

The allergen solution (inhibitor) was diluted 1:1 into the positive sample and subsequently

serially diluted five times in two-fold increments. Each diluted sample was evaluated for dose-dependent inhibition in replicates of four using three lots of NOVEOS sIgE allergens G010 (Johnson Grass), G002 (Bermuda Grass), F001 (Egg White), and F002 (Cow's Milk), and one lot of NOVEOS sIgE allergens T007 (Oak), W001 (Common Ragweed), E005 (Dog Dander), and T003 (Common Silver Birch).

Related and unrelated allergen inhibitors were tested for each NOVEOS sIgE allergen in a single-dose competitive inhibition study. The related and unrelated allergen inhibitors were tested at a concentration at least 10 times the final concentration that achieved >50% inhibition for the allergen under evaluation. The related and unrelated allergens used for each NOVEOS sIgE allergen are shown in the table below:

NOVEOS sIgE Allergen	Related Inhibitor	Unrelated Inhibitors
G010, Johnson Grass	G006, Timothy Grass	• E085, Chicken Feathers • F203, Pistachio Nut • T008, Elm
T007, Oak	T006, Mountain Cedar	• E003, Horse Epithelia • F004, Whole Wheat • M003, Aspergillus fumigatus
G002, Bermuda Grass	G202, Maize, Corn	• F203, Pistachio Nut • T008, Elm • W001, Short Ragweed
W001, Common Ragweed	W014, Rough Redroot Pigweed	• E003, Horse Epithelia • F004, Whole Wheat • T003, White Birch
E005, Dog Dander	E003, Horse Epithelia	• M003, *Aspergillus fumigatus* • T006, Mountain Cedar • W006, Mugwort
T003, Common Silver Birch	T083, Mango Blossom	• E003, Horse Epithelia • F202, Cashew Nut • W006, Common Mugwort • W012, Goldenrod • W017, Firebush
F001, Egg White	F002, Cow's Milk	• G010, Johnson Grass • M006, *Alternaria alternata* • W006, Common Mugwort

F002, Cow's Milk	F001, Egg White	• E085, Chicken Feathers • G002, Bermuda Grass • T008, Elm

Inhibitor concentrations used for testing of the NOVEOS sIgE allergens are shown in the table below:

NOVEOS sIgE Allergen	Dose-Dependent Inhibition		Single-Dose Inhibition	
	Highest Tested Inhibitor Conc. (µg/mL)	Final Conc. at >50% Inhibition (µg/mL)	Final Conc. of Related Inhibitor (µg/mL)	Final Conc. of Unrelated Inhibitors (µg/mL)
G010, Johnson Grass	148.0	18.5	1480	1480
T007, Oak	100	3.125	31.25	31.25
G002, Bermuda Grass	285.5	17.8	2855	2855
W001, Common Ragweed	3.125	0.78	7.8	7.8
E005, Dog Dander	25	0.78	7.8	7.8
T003, Common Silver Birch	100	6.25	62.5	62.5
F001, Egg White	100	3.125	125	125
F002, Cow's Milk	100	6.25	62.5	62.5

Greater than 50% inhibition was achieved in the dose-dependent inhibition studies and no inhibition was observed for the related and unrelated inhibitors for all NOVEOS sIgE allergens. The inhibition studies indicate that the NOVEOS sIgE allergens contain their respective immunologically relevant allergens.

Detection Limit

Limit of Blank (LoB), Limit of Detection (LoD) and Limit of Quantitation (LoQ) of NOVEOS sIgE allergens were estimated in accordance with CLSI guideline EP17-A2, *Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures; Approved Guideline – Second Edition*.

Limit of Blank

For G010, Johnson Grass; G002, Bermuda Grass; F001, Egg White; F002, Cow's Milk, the study was done by using three lots of capture reagent on three NOVEOS Immunoassay Analyzers. Five analyte-free human serum samples were tested in replicates of two per run, over six runs, with no more than one run per instrument per day, for a total of 60 replicates per lot.

For T007, Oak; W001, Common Ragweed; E005, Dog Dander; T003, Common Silver Birch, the study was done using two lots of capture reagent and one NOVEOS Immunoassay Analyzer. Four analyte-free human serum samples were tested in replicates of five per run, over three runs, with no more than one run per day, for a total of 60 replicates per lot.

The value at the 95th percentile of the 60 measurements for each of the lots tested was estimated.

Limit of Detection

LoD for each assay was determined by testing multiple human serum samples with low IgE concentrations using 2-3 lots of capture reagents and on NOVEOS Immunoassay Analyzers. The study protocol is summarized in the table below:

NOVEOS sIgE Assay	No. of Sample	No. of Lot	No. of Analyzer	Testing Protocol
E005	5	2	1	5 samples x 5 replicates/run x 3 runs = 75/Lot
F001	4	3	2	4 samples x 10 replicates/run x 6 runs = 240/Lot
F002	4	3	2	4 samples x 10 replicates/run x 6 runs = 240/Lot
G002	5	3	3	5 samples x 10 replicates/run x 6 runs = 300/Lot
G010	5	3	3	5 samples x 10 replicates/run x 6 runs = 300/Lot
T003	5	2	2	5 samples x 5 replicates/run x 3 runs = 75/Lot
T007	4	2	2	4 samples x 5 replicates/run x 3 runs = 60/Lot
W010	4	2	1	4 samples x 5 replicates/run x 3 runs = 60/Lot

The LoD was calculated for each lot using a non-parametric analysis.

Limit of Quantitation

LoQ was evaluated as a functional sensitivity-based approach with no bias component to LoQ. Functional sensitivity for NOVEOS sIgE allergens G010 (Johnson Grass), T007 (Oak), G002 (Bermuda Grass), W001 (Common Ragweed), E005 (Dog Dander), T003 (Common Silver Birch), F001 (Egg White), and F002 (Cow's Milk), was determined using a set of at least four samples with low IgE concentrations and two lots of NOVEOS sIgE allergen. The samples were tested with replicates of three, over at least three testing days resulting in a total of at least 36 replicates. Data analysis was performed according to the precision profile method using within-lab precision results. The LoQ is defined as the mean value of the lowest sample which fulfills the specification for the total within-laboratory imprecision (<20%CV).

The claimed LoB, LoD, and LoQ are based on the highest value obtained from the lots tested and are summarized in the table below:

NOVEOS sIgE Allergen	LoB (kU/L)	LoD (kU/L)	LoQ (kU/L)
G010, Johnson Grass	0.03	0.06	0.10
T007, Oak	0.04	0.05	0.10
G002, Bermuda Grass	0.03	0.05	0.10
W001, Common Ragweed	0.03	0.05	0.10
E005, Dog Dander	0.03	0.06	0.16
T003, Common Silver Birch	0.04	0.08	0.10

NOVEOS sIgE Allergen	LoB (kU/L)	LoD (kU/L)	LoQ (kU/L)
F001, Egg White	0.02	0.04	0.14
F002, Cow's Milk	0.03	0.05	0.10

Reference Range

The expected value is negative (<0.35 kU/L) for a specific allergen in a non-atopic person. Each laboratory should establish its own expected value.

The expected value/reference range of NOVEOS sIgE assays for G010 (Johnson Grass), T007 (Oak), G002 (Bermuda Grass), W001 (Common Ragweed), E005 (Dog Dander), T003 (Common Silver Birch), F001 (Egg White), and F002 (Cow's Milk) in a normal population was verified in accordance with CLSI EP28-A3c, *Defining, Establishing, and Verifying Reference Intervals in the Clinical Laboratory – 3rd Edition*. The 95% reference range was calculated by ordering the dose recoveries from 121 to 137 non-atopic samples in ascending order of concentration and identifying the dose recovery that fell at the 95th percentile rank. The 95% reference range for each allergen under evaluation was below the established NOVEOS sIgE cutoff of 0.35 kU/L.

Stability

Shelf-Life Stability

Both an ongoing real-time stability study and an accelerated stability study were performed for NOVEOS sIgE assays for G010 (Johnson Grass), T007 (Oak), G002 (Bermuda Grass), W001 (Common Ragweed), E005 (Dog Dander), T003 (Common Silver Birch), F001 (Egg White), and F002 (Cow's Milk) in accordance with CLSI EP25-A2 *Evaluation of Stability of In Vitro Diagnostic Reagents – First Edition*. The accelerated stability study and ongoing real-time stability study were performed with two positive and one negative sample using three lots of NOVEOS Allergen (Capture Reagent).

The accelerated stability data supports the manufacturer's claim of up to 36-month unopened shelf-life stability for the capture reagents listed in the table below. Stability of common assay reagents (reagents except the Capture Reagent) has been established previously in prior submission K182479.

		Shelf-life Stability (2-8°C)
Specific IgE Capture Reagent G010*		36 months
Specific IgE Capture Reagent T007*		36 months
Specific IgE Capture Reagent G002*		36 months
Specific IgE Capture Reagent W001*		9 months
Specific IgE Capture Reagent E005*		36 months
Specific IgE Capture Reagent T003*		36 months
Specific IgE Capture Reagent F001*		36 months
Specific IgE Capture Reagent F002*		28 months
	Diluent A	48 months

		Shelf-life Stability (2-8°C)
IgE Common Kit	Conjugate IgE	18 months
	Substrate A and Substrate B	24 months
	Fluo Beads™	24 months
IgE Calibrator Set		24 months
Calibrator Antibody IgE		24 months
Others	Probe Wash Pack	24 months
	Wash Buffer Concentrate	48 months
	Cuvette Wash Pack	12 months
Controls	IgE Negative Control Pack	48 months
	IgE Positive Control Pack	24 months
*Based on accelerated stability data		

Real-time stability studies of the NOVEOS sIgE allergens are on-going to further support the manufacturer's claim of up to 36-months unopened shelf-life stability when stored at 2-8°C per the manufacturer's instructions for use.

On-Board Stability (OBS)

Real-time OBS stability studies using three lots (per previous protocol) of NOVEOS sIgE allergens G010 (Johnson Grass), G002 (Bermuda Grass), F001 (Egg White), and F002 (Cow's Milk), and one lot (per updated protocol) of NOVEOS sIgE allergens T007 (Oak), W001 (Common Ragweed), E005 (Dog Dander), and T003 (Common Silver Birch), support the on-board stability claim of 15 days for capture reagents as summarized in the table below. The real-time on-board stability study was performed with at least 3 samples, including at least two positive samples and one negative or low-level sample using one lot of NOVEOS Allergen (Capture Reagent) stored on-board the instrument. OBS of common assay reagents (reagents except the Capture Reagent) has been established previously in prior submission K182479.

	On-board Stability (2-8°C)
Specific IgE Capture Reagent G010	15 days
Specific IgE Capture Reagent T007	15 days
Specific IgE Capture Reagent G002	15 days
Specific IgE Capture Reagent W001	15 days
Specific IgE Capture Reagent E005	15 days
Specific IgE Capture Reagent T003	15 days
Specific IgE Capture Reagent F001	15 days

		On-board Stability (2-8°C)
Specific IgE Capture Reagent F002		15 days
IgE Common Kit	Diluent A	14 days
	Conjugate IgE	14 days
	Substrate A and Substrate B	14 days
	Fluo Beads™	14 days
IgE Calibrator Set		48 hours
Others	Probe Wash Pack	N/A
	Wash Buffer Concentrate	28 days
	Cuvette Wash Pack	28 days
Controls	IgE Negative Control Pack	48 hours
	IgE Positive Control Pack	48 hours

Open-Vial Stability (OVS)

Both an ongoing real-time stability study and an accelerated stability study were performed for the NOVEOS sIgE allergens in accordance with CLSI EP25-A *Evaluation of Stability of In Vitro Diagnostic Reagents – First Edition*. The accelerated stability data supports the manufacturer's claim of up to 365-day open-vial shelf-life stability for the individual assay components listed in the table below. OVS of common assay reagents (reagents except the Capture Reagent) has been established previously in prior submission K182479.

		Open-Vial Stability (2-8°C)
Specific IgE Capture Reagent G010*		365 days
Specific IgE Capture Reagent T007*		365 days
Specific IgE Capture Reagent G002*		365 days
Specific IgE Capture Reagent W001*		365 days
Specific IgE Capture Reagent E005*		365 days
Specific IgE Capture Reagent T003*		365 days
Specific IgE Capture Reagent F001*		365 days
Specific IgE Capture Reagent F002*		365 days
IgE Common Kit	Diluent A	28 days
	Conjugate IgE	28 days
	Substrate A and Substrate B	28 days
	Fluo Beads™	28 days

		Open-Vial Stability (2-8°C)
IgE Calibrator Set		N/A
Others	Probe Wash Pack	N/A
	Wash Buffer Concentrate	28 days (15 – 28°C)
	Cuvette Wash Pack	28 days (2 – 28°C)
Controls	IgE Negative Control Pack	N/A
	IgE Positive Control Pack	N/A
*Based on accelerated stability data		

Real-time stability studies of the NOVEOS sIgE allergens are on-going to further support the manufacturer's claim of up to 365-day open-vial shelf-life stability when stored per the manufacturer's instructions for use.

Stored Calibration Curve

The stored calibration curve interval was established by testing the six NOVEOS IgE calibrators and serum samples against previously cleared representative allergens. The testing met the acceptance criteria and established the use of stored curve for up to 28 days.

NOVEOS Software

Software testing up to version 1.1.0 was conducted, and documentation was provided per 2005 FDA Guidance- "Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices." The software for this device is considered as a "Moderate" level of concern. Software standard – "IEC 62304 Edition 1.1 2015-06 CONSOLIDATED VERSION Medical device software - Software life cycle processes" and risk management standard - "ISO 14971 Third Edition 2019-12, Medical devices - Application of risk management to medical devices" were also applied to the design.

NOVEOS Cybersecurity

Patient safety, security, and privacy risks have been addressed in this submission including a Security Risk Assessment, Threat model, and Cybersecurity testing. This includes system necessary cybersecurity controls which address the general principles and security capabilities outlined in the 2023 FDA guidance "Cybersecurity in Medical Devices: Quality System Considerations and Content of Premarket Submissions". Additionally, in accordance with the FDA's Policy, Cybersecurity in Medical Devices: Refuse to Accept Policy for Cyber Devices and Related Systems Under Section 524B of the FD&C Act ", a plan to monitor, identify and address, in a reasonable time, post market vulnerabilities and exploits, and an SBOM is provided.

Proposed Labeling:

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

Conclusion:

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