

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY**

A. 510(k) Number:

k052143

B. Purpose for Submission:

Device modification: The capture antigen was changed from a purified native gliadin protein to a synthetic gliadin peptide.

C. Measurand:

Anti-gliadin IgA antibodies

D. Type of Test:

Semi-quantitative ELISA

E. Applicant:

INOVA Diagnostics, Inc.

F. Proprietary and Established Names:

QUANTA Lite™ Gliadin IgA II

G. Regulatory Information:

1. Regulation section:

21 CFR 866.5750 Radioallergosorbent (RAST) immunological test system

2. Classification:

Class II

3. Product code:

MST, Antibodies, Gliadin

4. Panel:

Immunology 82

H. Intended Use:

1. Intended use(s):

QUANTA Lite™ Gliadin IgA II is an enzyme-linked immunosorbent assay (ELISA) for the semi-quantitative detection of gliadin IgA antibodies in human serum. The presence of gliadin antibodies can be used in conjunction with clinical findings and other laboratory tests to aid in the diagnosis of celiac disease.

2. Indication(s) for use:

Same as Intended Use

3. Special conditions for use statement(s):

For prescription use only

4. Special instrument requirements:

Microplate reader capable of measuring OD 450 nm.

I. Device Description:

Each device contains the following: microwell plate with breakaway microwells coated with a synthetic, deamidated peptide (Gliadin) antigen, plate holder, assay controls (high positive, low positive and negative), HRP sample diluent, HRP wash concentrate, HRP IgA conjugated goat anti-human IgA, TMB chromogen and HRP Stop solution.

J. Substantial Equivalence Information:

1. Predicate device name(s):

QUANTA Lite™ Gliadin IgA

2. Predicate 510(k) number(s):
k964986
3. Comparison with predicate:

Similarities		
Item	Device	Predicate
Intended use	QUANTA Lite™ Gliadin IgA II is an enzyme-linked immunosorbent assay (ELISA) for the semi-quantitative detection of gliadin IgA antibodies in human serum. The presence of gliadin antibodies can be used in conjunction with clinical findings and other laboratory tests to aid in the diagnosis of celiac disease.	QUANTA Lite™ Gliadin IgA II is an enzyme-linked immunosorbent assay (ELISA) for the semi-quantitative detection of anti-Gliadin antibody of the IgA class in human serum. Detection of these antibodies is an aid in diagnosis of certain gluten sensitive enteropathies such as celiac disease and dermatitis herpetiformis.
Technology	ELISA	Same
Assay format	Semi-quantitative	Same
Positive & negative controls	Ready to use	Same
Assay Platform	96-well microtiter plates	Same
Sample type and dilution	Human serum at 1:101	Same
Enzyme-conjugate	Horseradish peroxidase conjugated to goat anti-human IgA	Same
Substrate	TMB chromogen	Same

Differences		
Item	Device	Predicate
Antigen	Synthetic, deamidated peptide	purified native gliadin protein

K. Standard/Guidance Document Referenced (if applicable):

None referenced.

L. Test Principle:

Synthetic gliadin antigen is bound to the wells of a polystyrene microwell plate. Pre-diluted controls and diluted patient sera are added to separate wells, allowing any anti-gliadin antibodies present to bind to the immobilized antigen. Unbound sample is washed away and an enzyme labeled anti-human IgA antibody is added to each well. A second incubation allows the enzyme label to bind to any patient antibodies which have become attached to the microwells. After washing away any unbound enzyme

conjugate, the remaining enzyme activity is measured by adding a chromogenic substrate and measuring the intensity of the color that develops. The assay is evaluated by comparing the color that develops in the patient wells with the color in the control wells.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. *Precision/Reproducibility:*

Intra-assay studies: Nine specimens (4 high, 2 near cut-off and 3 negative) were assayed for a total of five times each. The mean units ranged from 4.8 to 153.2 units, the standard deviations ranged from 0.3-5.0 and the percent CV ranged from 1.2-8.9.

Inter-assay studies: Five samples (2 high, 1 near cut-off and 2 negative) plus a High positive kit control were tested in duplicate, twice daily, for three days. The mean units ranged from 7.0 to 164.1, the standard deviations ranged from 0.6-5.1 and percent CV ranged from 1.2-16.4.

b. *Linearity/assay reportable range:*

Not applicable.

c. *Traceability, Stability, Expected values (controls, calibrators, or methods):*

No recognized material for gliadin. The results are reported in arbitrary units.

d. *Detection limit:*

Not applicable.

e. *Analytical specificity:*

Interference by endogenous substances: No data provided. The package insert states that addition of azide or other preservatives to the sample may adversely affect the results. Microbially contaminated, heat-treated, or specimens containing visible particulate should not be used. Using grossly hemolyzed or lipemic serum or specimens should be avoided.

Cross-reactivity with other autoantibodies: The QUANTA Lite™ Gliadin IgA II was tested with 45 sera containing other autoantibodies specific for Actin (5), PCNA (1), AMA (1), Fibrillerin (1), Chromatin (1), Histone (4), LKM (4), SS-B (4), Scl-70 (4), RNP (4), RF IgM (4), Centromere (4), β 2 IgG (2), β 2 IgM (1), β 2 IgA (1) and GBM (4). The mean value of these 45 samples was 5.0 units. The highest sample, an Actin sample, was 51 units. The mean value is four standard deviations below the 20-unit cutoff.

f. *Assay cut-off:*

To validate the cut-off from the predicate device with the new assay, a panel of 500 asymptomatic, healthy individuals, residing in the US was tested. Results are summarized below:

	Predicate device	New Device
Number males/Age (y)	150/24y-78y	150/24y-78y
Number female/Age (y)	150/14y-76y	150/14y-76y
Number w/ no data	200	200
Number Positive (%)	16 (3.2%)	11 (2.2%)
Mean (SD) units	7.225 (7.502)	5.53 (10.837)
Mean + SD (units)	14.727	16.367

The assay cut-off of 20 U/ml from the predicate device was maintained in the new device.

2. Comparison studies:

a. *Method comparison with predicate device:*

A comparison between the two devices was performed in two separate studies. A panel of 500 asymptomatic and healthy individuals, residing in the US, was tested (*See Expected Values, above*). A second set of studies involved 113 blood samples from patients from three celiac disease laboratories consisting of Celiac Positive (32), Celiac Positive, Gluten-Free Diet (30), Celiac Positive Gluten-Free Diet, EMA Positive (5), 1st degree relatives (20), Celiac IgA Deficient (5), and Healthy Normal (521). The comparison showed the following:

		Gliadin IgA		
		(+)	(-)	Total
Gliadin IgA II	(+)	21	21**	42
	(-)	21*	550	571
	Total	42	571	613

Positive percent agreement: 50.0% (21/42)
 Negative percent agreement: 96.3% (550/571)
 Overall agreement: 93.1% (571/613)

For the Gliadin IgA(+)/Gliadin IgA II(-) samples(*), 15 of 21 were from the normal, healthy population and demonstrated a “false positive” result on the predicate device. For the Gliadin IgA(-)/Gliadin IgA II(+) samples(**), 11 of 21 were considered true positives since they were from diagnosed celiac patients.

b. *Matrix comparison:*

Both assays use serum as the matrix.

3. Clinical studies:

a. *Clinical Sensitivity:*

The study consisted of the following: Celiac Positive (32), Celiac Positive, Gluten-Free Diet (30), Celiac Positive Gluten-Free Diet, EMA Positive (5), 1st degree relatives (20), Celiac IgA Deficient (5), and Healthy Normal (521) for a total of 613 samples. In the target population, the clinical sensitivity of the new device was 41.7% (30/72) (table 1) and 31.9% (23/72) for the predicate device (table 2).

Table 1

		Disease		
		(+)	(-)	Total
Gliadin IgA II	(+)	30	12	42
	(-)	42	529	571
	Total	72	541	613

Table 2

		Disease		
		(+)	(-)	Total
Gliadin IgA	(+)	23	19	42
	(-)	49	522	571
	Total	72	541	613

- b. Clinical specificity:*
Of the 613 subjects referenced above, the clinical specificities of the new device and the predicate device were 97.8% (529/541) and 96.5% (522/541) respectively in the non-target populations (see tables 1 and 2 above).
- c. Other clinical supportive data (when a. and b. are not applicable):*
Not applicable.
4. Clinical cut-off:
See assay cut-off.
5. Expected values/Reference range:
The expected value in the normal population is negative; however the sponsor states that other gastrointestinal disorders are known to induce circulating gliadin antibodies.

N. Proposed Labeling:

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

O. Conclusion:

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