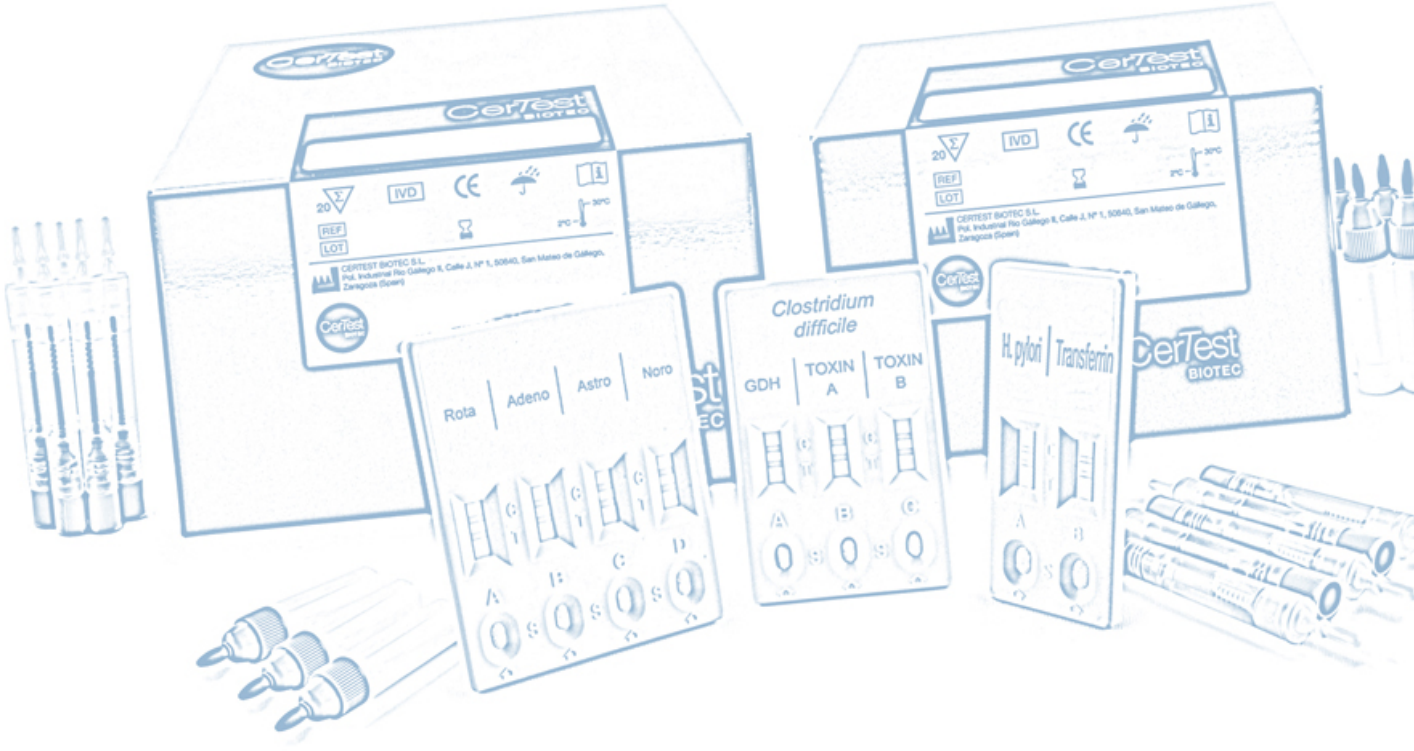
CerTest BIOTEC

EVALUATION OF
CERTEST *Clostridium difficile*
Toxin A+B TEST vs Evaluation criteria
(CerTest, Operon, qPCR)



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1. LOCATION

Evaluation made in our facilities (CerTest Biotec S.L., Pol. Industrial Río Gállego II, Calle J, nº1, 50840 San Mateo de Gállego, Zaragoza, (Spain)) from 17th April to 2nd June 2017 for *Clostridium difficile* Toxin A and Toxin B evaluation with fecal samples from Hospital.

- Hospital Lozano Blesa (Zaragoza, Zaragoza, SPAIN)

2. AIM

To determine the performance characteristics of a rapid immunocromatographic test, CerTest *Clostridium difficile* Toxin A+B (CerTest Biotec S.L, Spain) an evaluation, with fecal samples, was performed comparing the results obtained by an immunochromatographic test (CerTest *Clostridium difficile* Toxin A+B, CerTest) and another commercial available immunochromatographic test (Simple 2A-Bdiff, Operon) for *Clostridium difficile* Toxin A and B evaluation.

Discrepant samples have been evaluated by qPCR technology.

RESPONSABILITIES

Evaluation performed by CerTest laboratory technicians:

Marisa Sanchez	Laboratory technicians
Sandra García	

Final approval of the Immunochromatographic Product Manager: **Manuel Villacampa.**

3. SAMPLE

The stool samples were prepared from patients collected by Hospital:

Hospital Lozano Blesa.

These patients showed some symptoms that could be produced by *Clostridium difficile.*

The collected samples were stored at -20ºC (frozen samples) till tested following the kit instructions for use of every test.

The samples were analysed in parallel using the lateral flow tests.

The discrepant samples have been analysed by qPCR (Viasure *Clostridium difficile* Toxins A+B Real Time Detection Kit) in order to determine the result.

4. ABBREVIATIONS AND DEFINITIONS

Abbreviations:

++ & +++: very strong positive results	**LF:** Lateral Flow
+: positive result	**IFU:** instructions for use
±: for low intensity positive result	**CI:** confidence interval
-: for negative result	**PPV:** positive predictive value
Min: minute	**NPV:** negative predictive value
Not ev.: not evaluated	**Cq**: Threshold Cycle (Ct)
N/A: not applicable	

Definitions:

Sensitivity: It is the ability of a test to correctly classify an individual as “diseased”.

Specificity: It is the ability of a test to correctly classify an individual as *disease-free*

PPV: It is the percentage of patients with a positive test who actually have the disease.

NPV: It is the percentage of patients with a negative test who do not have the disease.

Kappa Value: the measure of concordance between reference assay and evaluated test was calculated using Cohen´s Kappa coefficient. The interpretation should be as follow:

Kappa values (IK)>0.4 → weak concordance

Kappa values (IK) between 0.4 to 0.6 → high concordance

Kappa values (IK) > 0.6 → excellent concordance

Confidence interval: is a type of interval estimate of a population parameter. It is an observed interval (i.e., it is calculated from the observations), in principle different from sample to sample, that potentially includes the unobservable true parameter of interest. How frequently the observed interval contains the true parameter if the experiment is repeated is called the confidence level.

Lateral Flow: Diagnostic Detection Immunological Technology based on the capture visible of colloidal conjugates on specific areas of a solid porous support.

5. METHOD. MEASURING PROTOCOL

The samples were processed following up the instructions for use related to each commercial kit.

- CerTest *Clostridium difficile* Toxin A+B (CerTest Biotec S.L, Spain).
- Simple 2A-Bdiff (Operon, Spain).

The samples were evaluated using the two Lateral Flow tests (CerTest *Clostridium difficile* Toxin A+B, Simple 2A-Bdiff) and the discrepant samples were evaluated by qPCR with Viasure *Clostridium difficile Toxins A+B* Real Time Detection Kit, CerTest. This is the evaluation criteria.

6. EQUIPMENTS

For the evaluation of **CerTest *Clostridium difficile* Toxin A+B, Simple 2A-Bdiff, Operon** for *Clostridium difficile* Toxin A and/or Toxin B detection which are qualitative tests it was not necessary the use of any equipment (visual interpretation), only follow the procedure of instructions for use. Anyway, if was required we have two equipments: Qiagen ESEquant LR3 Lateral Flow Strip readers for strip analysis.

The qPCR measurements were run at an Aria Mx Real Time PCR instrument, Model G8830-64001 with SN: MY165005276 (from Ag Plant Technologies/Agilent).

8. CALCULATIONS

The analysis has been performed by using Meta-DiSc 1.4, a freeware software to perform Meta-analysis of studies of evaluations of Diagnostic and Screening tests. The program has been developed by the Unit of Clinical Biostatistics team of the Ramón y Cajal Hospital in Madrid (Spain).

Meta-analysis is a two-stage process. In the first stage, a summary statistic is calculated for each study. Unlike controlled trials, in evaluation of diagnostic tests, each study is summarized by a pair of statistics that measures the test's accuracy. The pair is usually either sensitivity and specificity or positive and negative likelihood ratios. In the second stage, the overall test accuracy indexes are calculated as the weighted average of these summary statistics.

For more information: "Zamora J, Abraira V, Muriel A, Khan KS, Coomarasamy A. Meta-DiSc: a software for meta-analysis of test accuracy data. BMC Medical Research Methodology 2006, 6:31".

9. METHOD AND COMMERCIAL KIT USED FOR COMPARISON

CerTest *Clostridium difficile* Toxin A+B Card Test (CerTest). Cat. number: CD882001V.

Lot number used:

General lot	**TA031TB030**	**Expiry date**	**2019-03**
Strips lot	**TA031TB030**	**Expiry date**	**2019-03**
Diluent lot	**TA031TB030**	**Expiry date**	**2019-03**

Simple 2A-Bdiff (Operon).

Cat. number: 9.038.020.00.000.

Lot number used:

General lot	**AW.13.06**	**Expiry date**	**2018-11**
Strips lot	**AW.13**	**Expiry date**	**2018-11**
Diluent lot	**06**	**Expiry date**	**2018-11**

Viasure *Clostridium difficile Toxins A+B* Real Time Detection Kit (CerTest).

Cat. number: VS-CDA113L

Lot number used:

General lot	**CDA113L-005**	**Expiry date**	**2018-11**
Plate lot	**CDA1PL-005**	**Expiry date**	**2021-04**
Buffer lot	**RB02-011**	**Expiry date**	**2021-04**
Negative CTRL lot	**NC1-009**	**Expiry date**	**2021-04**
Positive CTRL lot	**CDA1C-001**	**Expiry date**	**2020-05**
Water lot	**H2O-009**	**Expiry date**	**2021-04**

Samples were tested following the kit instructions for use:

Product Name	**IFU draft version**
CerTest *Clostridium difficile* Toxin A+B test, CerTest	IU-CD88V rev 00
Simple 2A-Bdiff, Operon	Do-0905117 Rev. 6 (2015.06.30)
Viasure *Clostridium difficile Toxins A+B* Real Time Detection Ki, CerTest	VS-CDA12enes1516

All the products used are CE marked.

The evaluation was made following internal protocol: **CerTest *Clostridium difficile* Toxin A+B evaluation protocol 050417.**

10.RESULTS AND DISCUSSION

Raw Data. Results Evaluation. Date: 17th April to 2nd June 2017 (*Clostridium difficile* Toxin A+B)

Product name: CerTest *Clostridium difficile* Toxin A+B,

Lot number: TA031TB030, expiry date: 2019-03.

This product is a combo card format, cat. reference: CD882001V and lot number TA031TB030. Different formats (card or combo card) do not affect to sensitivity and specificity of the product.

The different rapid tests have been compared, when the two LF test results were the same, we will consider it as a positive or negative (depending of the obtained result). In those cases where the LF tests show discrepancies, the discrimination between positive and negative samples has been performed by qPCR analysis, this is the **evaluation criteria**.

126 frozen stool samples have been included in the study; following this criterion: 29 samples were positive ones for Toxin A; 36 samples were positive ones for Toxin B; meanwhile 97 were negative for Toxin A and 90 were negative for Toxin B.

The next table shows the results for the analyzed LF tests (from the different providers) as well as the results for qPCR (only discrepant samples). Results interpretation has been done following the instructions from the providers.

No	Sample	TOXIN A				TOXIN B			
		qPCR Lot: CDA113L-005	LF (Toxin A result)		Evaluation Criteria	qPCR Lot: CDA113L-005	LF (Toxin B result)		Evaluation Criteria
		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06	
1	12937	N/A	+	+	+	N/A	+	+	+
2	12497	N/A	+	+	+	N/A	+	+	+
3	12094	N/A	+	+	+	N/A	+	+	+
4	16452	N/A	+	+	+	N/A	+	+	+
5	12428	N/A	+	+	+	N/A	+	+	+
6	12675	N/A	+	+	+	N/A	+	+	+
7	6438	N/A	+	+	+	N/A	+	+	+
8	8930	N/A	+	+	+	N/A	+	+	+
9	11108	N/A	+	+	+	N/A	+	+	+
10	4988	N/A	+	+	+	N/A	+	+	+
11	9423	N/A	+	+	+	N/A	+	+	+
12	7896	N/A	+	+	+	N/A	+	+	+
13	11107	N/A	+	+	+	N/A	+	+	+

No	Sample	TOXIN A				TOXIN B			
		qPCR Lot: CDA113L-005	LF (Toxin A result)		Evaluation Criteria	qPCR Lot: CDA113L-005	LF (Toxin B result)		Evaluation Criteria
		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06	
14	15931	N/A	+	+	+	N/A	+	±	+
15	6758	N/A	+	±	+	N/A	+	±	+
16	15931	N/A	+	±	+	N/A	+	±	+
17	12431	33.89	+	-	+	N/A	+	+	+
18	12499	36.30	+	-	+	N/A	+	+	+
19	7603	32.28	+	-	+	N/A	+	±	+
20	13029	23.75	±	+	+	26.70	+	+	+
21	15702	29.80	±	-	+	N/A	+	+	+
22	13876	26.78	±	-	+	N/A	+	+	+
23	13277	33.77	-	+	+	N/A	+	+	+
24	13873	N/A	-	-	-	N/A	+	±	+
25	9285	N/A	-	-	-	N/A	+	±	+
26	9285	N/A	-	-	-	N/A	+	±	+
27	13874	N/A	+	+	+	17.82	+	-	+
28	7751	N/A	+	+	+	24.39	±	-	+
29	11741	N/A	+	±	+	35.30	+	-	+
30	10493	31.02	+	-	+	28.22	±	-	+
31	10875	NEG	-	+	-	36.23	+	+	+
32	5556	N/A	-	-	-	37.24	+	-	+
33	9163	N/A	-	-	-	30.22	+	-	+
34	7756	N/A	-	-	-	37.77	±	-	+
35	9217	N/A	-	-	-	33.49	±	-	+
36	7751	N/A	+	+	+	N/A	-	-	-
37	6457	30.05	±	-	+	29.06	+	-	+
38	14703	N/A	-	-	-	N/A	-	-	-
39	10918	N/A	-	-	-	N/A	-	-	-
40	8615	N/A	-	-	-	N/A	-	-	-
41	16312	N/A	-	-	-	N/A	-	-	-
42	16364	N/A	-	-	-	N/A	-	-	-
43	15651	N/A	-	-	-	N/A	-	-	-
44	14184	N/A	-	-	-	N/A	-	-	-
45	14585	N/A	-	-	-	N/A	-	-	-
46	14701	N/A	-	-	-	N/A	-	-	-
47	9284	N/A	-	-	-	N/A	-	-	-
48	5307	N/A	-	-	-	N/A	-	-	-
49	7646	N/A	-	-	-	N/A	-	-	-
50	5587	N/A	-	-	-	N/A	-	-	-

No	Sample	TOXIN A				TOXIN B			
		qPCR Lot: CDA113L-005	LF (Toxin A result)		Evaluation Criteria	qPCR Lot: CDA113L-005	LF (Toxin B result)		Evaluation Criteria
		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06	
51	12500	Neg	-	-	-	Neg	±	-	-
52	4623	N/A	-	-	-	N/A	-	-	-
53	5557	N/A	-	-	-	N/A	-	-	-
54	4442	N/A	-	-	-	N/A	-	-	-
55	4619	N/A	-	-	-	N/A	-	-	-
56	6771	N/A	-	-	-	N/A	-	-	-
57	14187	N/A	-	-	-	N/A	-	-	-
58	14462	N/A	-	-	-	N/A	-	-	-
59	14568	N/A	-	-	-	N/A	-	-	-
60	14569	N/A	-	-	-	N/A	-	-	-
61	14571	N/A	-	-	-	N/A	-	-	-
62	14573	N/A	-	-	-	N/A	-	-	-
63	14574	N/A	-	-	-	N/A	-	-	-
64	14576	N/A	-	-	-	N/A	-	-	-
65	14577	N/A	-	-	-	N/A	-	-	-
66	14578	N/A	-	-	-	N/A	-	-	-
67	14580	N/A	-	-	-	N/A	-	-	-
68	14582	N/A	-	-	-	N/A	-	-	-
69	14591	N/A	-	-	-	N/A	-	-	-
70	14595	N/A	-	-	-	N/A	-	-	-
71	14596	N/A	-	-	-	N/A	-	-	-
72	14614	N/A	-	-	-	N/A	-	-	-
73	14676	N/A	-	-	-	N/A	-	-	-
74	14687	N/A	-	-	-	N/A	-	-	-
75	14692	N/A	-	-	-	N/A	-	-	-
76	15164	N/A	-	-	-	N/A	-	-	-
77	15620	N/A	-	-	-	N/A	-	-	-
78	15661	N/A	-	-	-	N/A	-	-	-
79	15677	N/A	-	-	-	N/A	-	-	-
80	15684	N/A	-	-	-	N/A	-	-	-
81	15706	N/A	-	-	-	N/A	-	-	-
82	16302	N/A	-	-	-	N/A	-	-	-
83	16351	N/A	-	-	-	N/A	-	-	-
84	16353	N/A	-	-	-	N/A	-	-	-
85	16363	N/A	-	-	-	N/A	-	-	-
86	16369	N/A	-	-	-	N/A	-	-	-
87	16373	N/A	-	-	-	N/A	-	-	-

No	Sample	TOXIN A				TOXIN B			
		qPCR Lot: CDA113L-005	LF (Toxin A result)		Evaluation Criteria	qPCR Lot: CDA113L-005	LF (Toxin B result)		Evaluation Criteria
		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06	
88	16411	N/A	-	-	-	N/A	-	-	-
89	16412	N/A	-	-	-	N/A	-	-	-
90	16413	N/A	-	-	-	N/A	-	-	-
91	16414	N/A	-	-	-	N/A	-	-	-
92	16416	N/A	-	-	-	N/A	-	-	-
93	16417	N/A	-	-	-	N/A	-	-	-
94	16418	N/A	-	-	-	N/A	-	-	-
95	16419	N/A	-	-	-	N/A	-	-	-
96	16420	N/A	-	-	-	N/A	-	-	-
97	16421	N/A	-	-	-	N/A	-	-	-
98	16422	N/A	-	-	-	N/A	-	-	-
99	16423	N/A	-	-	-	N/A	-	-	-
100	16424	N/A	-	-	-	N/A	-	-	-
101	16426	N/A	-	-	-	N/A	-	-	-
102	16427	N/A	-	-	-	N/A	-	-	-
103	16428	N/A	-	-	-	N/A	-	-	-
104	16429	N/A	-	-	-	N/A	-	-	-
105	16535	N/A	-	-	-	N/A	-	-	-
106	16536	N/A	-	-	-	N/A	-	-	-
107	16537	N/A	-	-	-	N/A	-	-	-
108	16538	N/A	-	-	-	N/A	-	-	-
109	16539	N/A	-	-	-	N/A	-	-	-
110	16540	N/A	-	-	-	N/A	-	-	-
111	16541	N/A	-	-	-	N/A	-	-	-
112	16542	N/A	-	-	-	N/A	-	-	-
113	16543	N/A	-	-	-	N/A	-	-	-
114	16545	N/A	-	-	-	N/A	-	-	-
115	16547	N/A	-	-	-	N/A	-	-	-
116	16548	N/A	-	-	-	N/A	-	-	-
117	16549	N/A	-	-	-	N/A	-	-	-
118	16552	N/A	-	-	-	N/A	-	-	-
119	16553	N/A	-	-	-	N/A	-	-	-
120	16554	N/A	-	-	-	N/A	-	-	-
121	16555	N/A	-	-	-	N/A	-	-	-
122	16556	N/A	-	-	-	N/A	-	-	-
123	16557	N/A	-	-	-	N/A	-	-	-
124	16558	N/A	-	-	-	N/A	-	-	-

No	Sample	TOXIN A				TOXIN B			
		qPCR Lot: CDA113L-005	LF (Toxin A result)		Evaluation Criteria	qPCR Lot: CDA113L-005	LF (Toxin B result)		Evaluation Criteria
		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06		Cq	Certest Lot number: TA031TB030	Operon Lot number: AW.13.06	
125	16559	N/A	-	-	-	N/A	-	-	-
126	16686	N/A	-	-	-	N/A	-	-	-

Note: Results interpretation has been done at 10 minutes for Certest test, 10 minutes for Operon test, in all cases following the test instructions from the provider.

From the previous raw data it can be determined that:

Toxin A determination:

- 21 Samples were positive for both Lateral flow tests without discrepancy. They are considered all true *Clostridium difficile* Toxin A positive samples and true positives for both LF tests.
- 1 sample (No 23, sample:13277) was positive for Operon LF test, but negative for CerTest. The qPCR technique confirmed the sample as positive. It will be considered a positive sample and has been reported as a positive sample (qPCR and Operon), but as false negative for CerTest.
- 1 sample (No 31, sample: 10875) was negative for CerTest LF test, but positive for Operon. The qPCR technique confirmed the sample as negative. It will be considered a negative sample and has been reported as a negative sample (qPCR and CerTest), but as false positive for Operon.
- 7 samples (12431, 12499, 7603, 15702, 13876, 10493, 6457) were positive for CerTest LF test, but negative for Operon. The qPCR technique confirmed samples as positives. They will be considered positive samples and have been reported as positive samples (qPCR and CerTest), but as false negative for Operon.
- The rest of the samples were negative for both tests, showing no discrepancies and considered as negatives for *Clostridium difficile* Toxin A and true negative samples for both LF tests.

Toxin B determination:

- 27 Samples were positive for both Lateral flow tests without discrepancy. They are considered all true *Clostridium difficile* Toxin B positive samples and true positives for both LF tests.
- 1 sample (No 51, sample: 12500) was negative for Operon LF test, but positive for CerTest. The qPCR technique confirmed the samples as negative. It will be considered a negative sample and has been reported as a negative sample (qPCR and Operon), but as false positive for CerTest.
- 9 samples (13874, 7751, 11741, 10493, 5556, 9163, 7756, 9217 and 6457) were positive for CerTest LF tests, but negative for Operon. The qPCR technique confirmed the samples as positive. They will be considered as positive samples and has been reported as 9 positive samples (qPCR and CerTest), but as 9 false negatives for Operon.
- The rest of the samples were negative for both tests, showing no discrepancies and considered as negatives for *Clostridium difficile* Toxin B and true negative samples for both LF tests.

11.EVALUATION SUMMARY

Viasure *Clostridium difficile* Toxins A+B Real Time Detection Ki, CerTest has been considered the technique (qPCR) for evaluated the discrepancies in results for the determination of the analytical sensitivity and specificity.

For statistical analysis of the results, the free-software package Meta DiSc ver 1.4 has been used (see paragraph 8). The Confidence Intervals calculated for sensitivity, specificity, positive and negative prediction values (PPV and NPV) were at 95% confidence.

Results:

Toxin A results

CerTest *Clostridium difficile Toxin A+B* test vs Evaluation Criteria (Toxin A)

		Evaluation Criteria (Toxin A)		
		+	-	Total
IC test: CerTest *Clostridium difficile* Toxin A+B (Toxin A)	+	28	0	28
	-	1	97	98
	Total	29	97	126

CerTest *Clostridium difficile Toxin A+B* vs Evaluation Criteria (Toxin A)		
	Mean Value	**95% CI (confidence interval)**
Sensitivity	96.6%	92.2 – 99.9%
Specificity	100.0%	96.2 – 100.0%
PPV	100.0%	87.7 – 100.0%
NPV	99.0%	94.4 –100.0%

Kappa value: 0.98 Excellent concordance value

Simple 2A-Bdiff, Operon test vs Evaluation Criteria (Toxin A)

		Evaluation Criteria (Toxin A)		
		+	-	Total
IC test: Simple 2A-Bdiff (Toxin A)	+	22	1	23
	-	7	96	103
	Total	29	97	126

Simple 2A-Bdiff vs Evaluation Criteria (Toxin A)		
	Mean Value	**95% CI (confidence interval)**
Sensitivity	75.9%	56.5 – 89.7%
Specificity	99.0%	94.4 – 100.0%
PPV	95.7%	78.1 – 99.9%
NPV	93.2%	86.5 –97.2%

Kappa value: 0.81 Excellent concordance value

Toxin B results:

CerTest *Clostridium difficile Toxin A+B* test vs Evaluation Criteria (Toxin B)

		Evaluation Criteria (Toxin B)		
		+	-	Total
IC test: CerTest *Clostridium difficile* Toxin A+B (Toxin B)	+	36	1	37
	-	0	89	89
	Total	36	90	126

CerTest *Clostridium difficile Toxin A+B* vs Evaluation Criteria (Toxin B)		
	Mean Value	**95% CI (confidence interval)**
Sensitivity	100.0%	90.3 –100.0%
Specificity	98.9%	94.0 – 100.0%
PPV	97.3%	85.8 – 99.9%
NPV	100.0%	95.9 –100.0%

Kappa value: 0.98 Excellent concordance value

Simple 2A-Bdiff, Operon test vs Evaluation Criteria (Toxin B)

		Evaluation Criteria (Toxin B)		
		+	-	Total
IC test: Simple 2A-Bdiff (Toxin B)	+	27	0	27
	-	9	90	99
	Total	36	90	126

Simple 2A-Bdiff vs Evaluation Criteria (Toxin B)		
	Mean Value	**95% CI (confidence interval)**
Sensitivity	75.0%	57.8 –87.9%
Specificity	100.0%	96.0 – 100.0%
PPV	100.0%	87.2 – 100.0%
NPV	90.9%	83.4 –95.8%

Kappa value: 0.81 Excellent concordance value

12.CONCLUSION

Values for **CerTest *Clostridium difficile* Toxin A+B test** evaluation are good enough, as concluded after their comparison vs **Evaluation Criteria (for Toxin A and Toxin B).**

System	Sensitivity and CI	Specificity and CI	PVP and CI	NPV and CI
Certest *Clostridium difficile* Toxin A+B (Toxin A) vs Evaluation Criteria (Toxin A)	**96.6% 92.2 - 99.9%**	**100.0% 96.2 - 100.0%**	**100.0% 87.7 - 100.0%**	**99.0% 94.4 - 100.0%**
Simple 2A-Bdiff, Operon (Toxin A) vs Evaluation Criteria (Toxin A)	75.9% 56.5 – 89.7%	99.0% 94.4 – 100.0%	95.7% 78.1 – 99.9%	93.2% 86.5 – 97.2%
Certest *Clostridium difficile* Toxin A+B (Toxin B) vs Evaluation Criteria (Toxin B)	**100.0% 90.3 - 100.0%**	**98.9% 94.0 - 100.0%**	**97.3% 85.8 - 99.9%**	**100.0% 95.9 - 100.0%**
Simple 2A-Bdiff, Operon (Toxin B) vs Evaluation Criteria (Toxin B)	75.0 % 57.8 – 87.9%	100.0% 96.0 – 100.0%	100.0% 87.2 – 100.0%	90.9% 83.4 – 95.8%

Table: summary of results.

The obtained results of sensitivity and specificity conform to the expected ones.

The Certest *Clostridium difficile* Toxin A+B test performance shows high sensitivity and specificity to detect the presence of *Clostridium difficile* Toxin A and B *in stool samples.*

Name:	Made by:	Approved by:
	Marisa Sanchez & Sandra Garcia	Manuel Villacampa
Signed: Date:	 2nd June 2017	 2nd June 2017
Position:	Laboratory technicians	Immunochromatographic Manager

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