



Evaluation of Murex HCV Ag/Ab Combination

Laura Dean, Keith Perry
Microbiological Diagnostics Assessment Service
Evaluations and Standards Laboratory

Health Protection Agency - Centre for Infections
61 Colindale Avenue
London
NW9 5EQ

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Background and Description of the Assay

Murex HCV Ag/Ab Combination is a two-step enzyme immunoassay for the detection of Hepatitis C virus (HCV) infection in human serum and plasma. The assay simultaneously detects HCV core antigen and anti-HCV antibodies. It is based on a sandwich format for detection of both anti-HCV antibody and for HCV core antigen. Upon completion of the assay, the development of colour indicates the presence of HCV, while no colour development suggests the absence of HCV. The assay includes Sample and Reagent Addition Monitoring; thus the addition of samples and reagents can be measured colorimetrically. The assay was evaluated to determine its ability to detect HCV.

The assay carries a CE mark and therefore has undergone testing described in the Common Technical Specification for Annex IIa related products and according to the European Union In-vitro Diagnostic Medical Device Directive. This means that the kit has already been tested against 400 HCV positive specimens including a range of subtypes, 5300 negative specimens and 30 seroconversion panels. This evaluation builds on the work already done for CE marking by providing comparative performance information on a range of kits with a particular focus on seroconversion timing. The panel is moderately sized, recognising that a large number of specimens have already been tested as part of the CE Marking process.

This report specifically relates to the kit version and lot numbers supplied for this evaluation. We cannot guarantee that these will reflect the performance of other lot numbers or subsequent versions. Laboratories should always validate and monitor assay performance as part of an ongoing quality control program.

Further assay information is shown in Table 1.

Table 1: Assay Information

General	
Assay name	Murex HCV Ag/Ab Combination
Manufacturer / UK agent	Abbott-Murex
Product number	4J24-01/4J24-02
Number of tests in one pack	96 / 480
Specimen volume	50µL

Presentation	
Assay type	Two-Step Sandwich ELISA
Solid phase	12 x 8 microtitre plate wells
Coating	Anti-core monoclonal antibodies Recombinant antigen and peptides representing NS3 and core viral antigens
Conjugate	HCV NS3 and core antigens plus anti-core monoclonal antibodies labelled with horseradish peroxidase
Substrate	TMB
Controls per plate	4
Negative control	2
Antibody positive control [Pos1]	1
Antigen positive control [Pos2]	1
Reading wavelength	450 / 630
Cut-off computation	Mean [Neg Ctrl] + 0.2
Equivocal zone	n/a

Stages	
Preparation / sample well loading	30 minutes
Prewash of reaction plate	n/a
Incubation status	Static
Samples incubation	60 minutes 37°C
Conjugate incubation	60 minutes 18-25°C
Number of washes	5
Substrate incubation (time/temp)	30 minutes 37°C
Reading	5 minutes
Total incubation times	150 minutes
Approximate time to completion	180 minutes
Number of optional procedures	none

Additional equipment required	
Incubator, type not specified (*Dry incubator)	
Microplate spectrophotometer (* EL 808)	
Micropipettes: 40 - 200µL, 200 - 1000µL & 2 - 10mL	
Multichannel pipettes: 50 - 300µL	
Disposable tips	
Reagent troughs and bottles	
Measuring cylinder	
Distilled water	

Notes:	
* Equipment used in this evaluation.	

Evaluation Panel and Method

The evaluation panel consisted of 614 specimens (Table 2). Of these, 200 specimens were from HCV negative blood donors, 200 from HCV positive subjects, 211 from twenty-six commercial seroconversion panels and three quality control samples. 182 specimens were tested against a second kit lot (Table 3).

The method described in the kit insert was strictly followed. Briefly, 50µL of sample diluent followed by 50µL of specimens or controls was added to each of the microplate wells. The wells were incubated at 37°C for 60 minutes then washed five times. 120 µL of conjugate was added to all wells, which were then incubated for 60 minutes at room temperature (15 - 28°C). The plate was washed five times then 80µL of substrate was added to each of the wells. The microplate was incubated for 30 minutes at 37°C. Finally the stop solution was added and the plates were read at 450/630nm.

Table 2: Evaluation panel (Lot 061384AU)

Sample category	Number
1. Anti-HCV negative	200
2. Anti-HCV positive	200
3. HCV seroconversion panels	
BBI: PHV901	11
BBI: PHV904	7
BBI: PHV905	9
BBI: PHV906	7
BBI: PHV907	7
BBI: PHV908	13
BBI: PHV909	3
BBI: PHV910	5
BBI: PHV911	5
BBI: PHV913	4
BBI: PHV914	9
BBI: PHV915	4
BBI: PHV916	8
BBI: PHV917	10
BCP6211*	16
BCP6212	9
BCP6213	12
BCP6214	13
BCP6215	4
BCP6216	7
BCP6222	8
BCP6229	8
BCP9041	8
BCP9044	6
BCP9045	8
BCP9047	10
4. Quality control samples	
HPA: HCV-QC1	3x 1
NIBSC HCV BWS	3x 1
NIBSC HCV BWS 1 in 8	3x 1
TOTAL (number of specimens)	614

Notes:

BBI = Boston Biomedica Inc; BCP = BioClinical Partners Inc (Zeptometrix)
 HPA = Health Protection Agency
 NIBSC = National Institute for Biological Standards and Control.
 * BCP6211 has 40 members in the panel, but for this evaluation only the last 16 members (6211-25 - 6211-40) were tested because the first 24 members are known to be negative

Table 3: Batch 2 evaluation panel (Lot: 060554AU)

Sample category	Number
1. Anti-HCV negative	40
2. Anti-HCV positive	40
3. HCV seroconversion panels	
BBI: PHV904*	7
BBI: PHV905*	9
BBI: PHV908*	13
BBI: PHV914	9
BBI: PHV915*	4
BBI: PHV917	10
BCP: 6212	9
BCP: 6214*	13
BCP: 6216	7
BCP: 9045*	8
BCP: 9047*	10
4. Quality control samples	
HPA: HCV-QC1	3x 1
NIBSC HCV BWS	3x 1
NIBSC HCV BWS 1 in 8	3x 1
TOTAL (number of specimens)	182

Notes:

BBI = Boston Biomedica Inc; BCP = BioClinical Partners Inc (Zeptometrix)

HPA = Health Protection Agency

NIBSC = National Institute for Biological Standards and Control.

* Panels marked were not part of the original panel due to be tested on lot 2.

These were tested on lot 2 at the request of Murex

Specificity Findings

Of the 200 HCV negative blood donor specimens tested, four were initially reactive (Figure 1). These specimens were repeated in duplicate and were all negative. A repeat reactive rate of 0% (95% confidence interval, 0 – 1.8%) was therefore observed (Table 4).

Appendix 1 shows a table of false positive rates for 15 previously evaluated HCV screening kits.

Table 4: Specificity of Murex HCV Ag/Ab Combination

HCV negative blood donors	Number tested	Number reactive	Number reactive	Range OD/CO	Mean OD/CO	Median OD/CO	Specificity
Stored < 6 mths	200	Initial	4	0.24 - 1.59	0.37	0.34	98%
		Repeat	0	0.24 - 0.88	0.36	0.34	100%

Sensitivity Findings (routine positives)

All of the 200 randomly selected HCV positive specimens were detected by the assay. A sensitivity of 100% (95% confidence interval, 98.2 – 100%) was therefore observed (Table 5, Figure 1). The majority (95%) of specimens tested had OC/CO values of >9.0 however a small proportion showed weak reactivity (OD/CO less than 5.0) in this assay, further details of these eight specimens can be seen in Appendix 3.

Appendix 2 shows a table of sensitivities for 15 previously evaluated HCV screening kits.

Table 5: Sensitivity of Murex HCV Ag/Ab Combination

	Number tested	Number initially negative	Number repeatedly negative	Range OD/CO	Mean OD/CO	Median OD/CO
Anti -HCV Positive Specimens	200	0	0	1.60 - 12.38	11.23	11.80

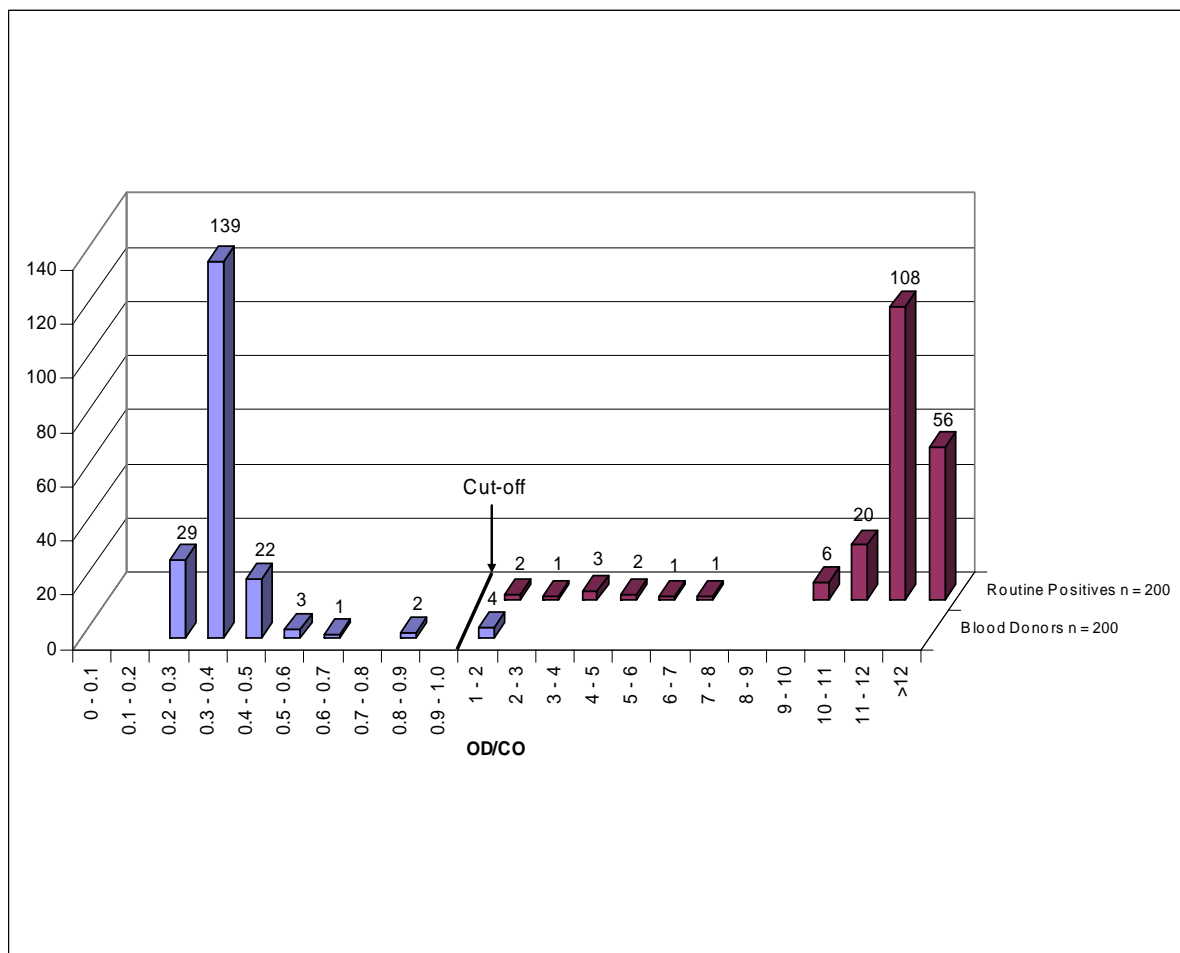


Figure 1: Distribution of initial reactivities. The graph shows four blood donor specimens that were initially reactive. When the specimens were repeated in duplicate they were all found to be negative.

Seroconversion Sensitivity: Aggregate scores

The ability of the Murex HCV Ag/Ab Combination assay to detect early antigen or antibody in 19 seroconversion panels was compared with previous evaluation results for nine other antibody-only HCV kits and one Ag/Ab kit. The kit gave a score of 110 out of 148 making it the most sensitive EIA. The next most sensitive kit was Monolisa HCV Ag-Ab ULTRA with a score of 108 followed by the most sensitive antibody-only EIA, Vitros *ECi* anti-HCV with a score of 72 (Table 6, Appendix 4).

It was also possible to compare results of 25 panels with five other HCV kits. In this case Murex HCV Ag/Ab Combination was still ranked as the most sensitive test (Table 7, Appendix 5). All scores have been calculated using the results from the first kit lot tested.

A number of the panels tested were repeated, at the request of Murex, on a second lot. The majority of these panels gave exactly the same results in both lots; however, PHV904 did not. On the first lot only member -05, which is in the middle of the panel, was reactive but when the panel was tested on the second lot members -05, -06 and -07 were all reactive. The results of PHV908 also differed slightly between the lots; for the first lot PHV908-06 was reactive first whereas in the second lot PHV908-05 was reactive first, although for both lots members -05 and -06 gave OD/CO values that were very close to the cut-off. A summary of seroconversion batch comparison results is shown in Table 9 and the full results are shown in Appendix 6.

Table 6: Combined Seroconversion Scores (19 panels), Lot 061384AU

Kit Name	Product Number	Lot Number	Aggregate score* (19 panels, n = 148)
PCR	NA	NA	130
Murex HCV Ag/Ab Combination	4J24-01	061384AU	110
Monolisa HCV AgAb ULTRA (cut-off = 1.0)	72558	5B1513	108
Ortho HCV Ag EIA	933255	AGK156	102
Vitros ECI anti-HCV	131 8450	0100	72
AxSYM HCV version 3.0	3B44-20	65113LU00	70
Ortho HCV 3.0 with Enh SAVe (Short inc.)	9307401	GECV028	66
Access HCV Ab PLUS	34330	194822	64
PRISM HCV	6A5248	10143 HP00	63
Monolisa anti-HCV Plus	72312	6C501.U	55
Adaltis EIAGEN HCV Ab	071064	060604	53
IMx	3A99-20	12220 HP00	47
Abbott anti-HCV 3rd gen EIA	7A16-23	12027 HP00	47
Notes:			
*The score was calculated by summing the correct positive reactions for each of the panels. A higher score suggests higher sensitivity.			

Table 7: Combined seroconversion scores (25 panels), Lot 061384AU

Kit Name	Product Number	Lot Number	Aggregate score* (25 panels, n = 197)
PCR	NA	NA	181
Murex HCV Ag/Ab Combination	4J24-01	061384AU	157
Monolisa HCV AgAb ULTRA (cut-off = 1.0)	72558	5B1513	152
Ortho HCV Ag EIA	933255	AGK156	144
Vitros ECI anti-HCV	131 8450	0100	99
AxSYM® HCV version 3.0	3B44-20	65113LU00	98
Access® HCV Ab PLUS	34330	194822	85
Adaltis EIAGEN HCV Ab	071064	060604	75
Notes:			
*The score was calculated by summing the correct positive reactions for each of the panels. A higher score suggests higher sensitivity.			

Seroconversion Sensitivity: Comparative timing of detection

Using a method that assigns the most sensitive test “time zero” and any less sensitive test a positive value we found that Murex HCV Ag/Ab Combination detected HCV infection on average 14.1 days earlier than any other anti-HCV kit and two days earlier than Monolisa HCV Ag-Ab ULTRA (Table 8, Figure 2).

The median detection time for Murex HCV Ag/Ab Combination was 0 days which was 20 days earlier than any other antibody-only HCV kit. The median delay is not affected in the same way as the mean delay which can be strongly influenced by outlying results from seroconversion panels for which the interval between the last negative and the first positive specimen is long. This can give rise to an artefact due to the timing of blood collection.

Table 8: Comparative timing of detection

Anti-HCV assay	Product number	Assay type	Overall delay in detecting seroconversion compared with the most sensitive assay		
			Range (days)	Mean (days)	Median (days)
PCR	N/A	PCR	0 - 9	0.5	0
Ortho HCV Ag EIA**	933255	Ag-only	0 - 23	2.5	0
Murex HCV Ag/Ab Combination	4J24-01	Ag-Ab	0 - 53	6.0	0
Monolisa HCV Ag-Ab (1.0 threshold)	72558	Ag-Ab	0 - 35	8.0	0
Vitros <i>ECi</i> anti-HCV	1318450	Ab-only	0 - 38	20.1	20
AxSYM HCV version 3.0	3B44-20	Ab-only	0 - 38	20.2	20
Ortho HCV 3.0 ELISA Enhanced SAve (short procedure)	9307401	Ab-only	0 - 41	21.3	20
PRISM anti-HCV	6A52-48	Ab-only	0 - 41	22.0	23
Access HCV Ab PLUS	34330	Ab-only	0 - 41	22.2	23
Monolisa anti-HCV Plus EIA	72312	Ab-only	3 - 41	23.7	25
Adaltis EIAgen HCV	071064	Ab-only	0 - 49	24.8	26
Abbott HCV EIA 3rd generation	7A16-23	Ab-only	0 - 53	26.7	28
IMx HCV	3A99-20	Ab-only	3 - 164	32.7	26

Notes:
 The upper limit of the range and the mean are, to some extent, influenced by the intervals between bleeds
 When any assay failed to detect seroconversion by the last sample available in a panel, an arbitrary extra
 ** It should be noted that a number of panels tested on Ortho HCV EIA began positive but then became negative. This is not taken into account when calculating the time taken to detect the first positive.

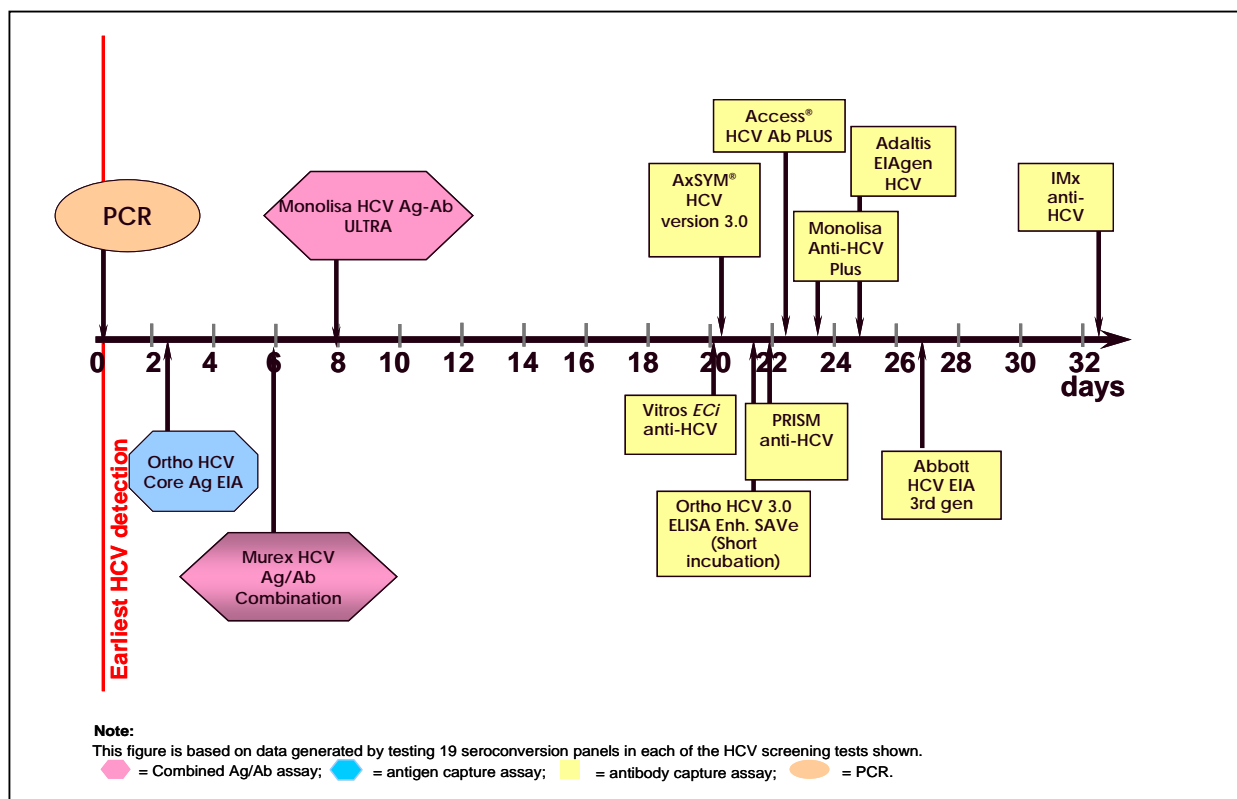


Figure 4: Mean Delay of HCV Detection. Murex HCV Ag/Ab Combination detected HCV infection on average 4.8 days later than PCR. There is a possibility that if earlier samples were available for some seroconversion panels PCR may detect infection earlier (this will also apply to Ag-Ab ELISAs).

Batch Comparison

Two batches of Murex HCV Ag/Ab combination were tested to examine variation. The comparison showed that with certain panels there was a difference in sensitivity between the two batches. Lot two (060554AU) detected more reactive specimens, but it should be noted that these specimens were only just below the cut-off when tested by lot one (061384AU).

Table 9: Batch Comparison

Specimen Category	Number of specimens	Number of reactive specimens	
		Batch Number	
		061384AU	060554AU
HCV positive	40	40	40
HCV negative blood donors	40	0	0
PHV904	7	1	3
PHV905	9	5	5
PHV908	13	8	9
PHV914	9	9	9
PHV915	4	0	0
PHV917	10	9	9
6212	9	2	2
6214	13	13	13
6216	7	0	0
9045	8	8	8
9047	10	10	10
HPA HCV QC1	3	3	3
NIBSC BWS	3	3	3
NIBSC BWS 1 in 5	3	0	0
Total	188	111	114

Quality control

Three quality control reagents were each tested in triplicate to identify a suitable control to run throughout the evaluation. Both HPA HCV QC1 and the NIBSC British Working Standard would be suitable to use as internal quality control reagents for this assay. A suitable control is one that has an OD reading that is approximately 2 to 3 times higher than the cut-off. For this evaluation, HPA HCV QC1 was included at the beginning, middle and end of each test plate.

Table 10: Quality Control Reagents

QC sample ID	Batch number	Murex HCV Ag/Ab Combination							
		Batch number: 061384AU				Batch number: 060554AU			
		OD/CO 1	OD/CO 2	OD/CO 3	Mean	OD/CO 1	OD/CO 2	OD/CO 3	Mean
HPA HCV 1-QC1	05/B438-01	3.38	3.25	3.33	3.32	1.29	2.35	2.13	1.92
NIBSC Anti-HCV (BWS)	02/238-003-WIL	3.91	3.52	3.47	3.64	3.17	3.41	2.89	3.16
NIBSC Anti-HCV 1 in 8	02/240-003-WIL	0.67	0.65	0.70	0.67	1.88	1.63	1.94	1.82

Conclusion

The Murex HCV Ag/Ab Combination kit showed good sensitivity and specificity when tested against a small number of routine positive and negative specimens.

The seroconversion sensitivity of the kit was excellent, detecting early HCV infection a mean of 14 days (median 20 days) earlier than antibody-only HCV assays and slightly earlier than the one other combined Ag/Ab that we have evaluated, Monolisa HCV Ag/Ab (BioRad Laboratories). The assay detected infection on average 5.5 later than PCR, and 3.5 days later than an antigen-only assay, though it should be noted though that PCR/Ag assays may have detected infection earlier if earlier seroconversion samples were available and that the Ag-only assay does not generally detect the later members of seroconversion panels because of its inability to detect antibody, a factor not taken into account when calculating time to detection of first positive.

The test was very easy to use and did not require a great deal of hands on time. This kit is suitable for any laboratory wishing to use a kit that has improved sensitivity when compared to an antibody-only EIA. It would also make a suitable alternative to PCR in laboratories where this technology is unavailable.

Appendix 1: False positive rates for 15 previously evaluated HCV screening kits

Assay	Product code	Number tested	Number initially reactive (IR)	Initial reactive rates (95% confidence intervals)	Number repeatedly reactive (RR)	Repeat reactive rates (95% confidence intervals)
Monolisa [®] anti-HCV Plus v2 Lot 9M512T	72317/18	1232*	0	0.00% (0 – 0.3%)	0	0.00% (0 – 0.3%)
Monolisa [®] anti-HCV Plus v2 Lot 9M513U	72317/18	1056*	0	0.00% (0 – 0.3%)	0	0.00% (0 – 0.3%)
Access [®] HCV Ab PLUS	34330	373	2	0.54% (0.1 - 1.9%)	0	0.00% (0 - 1.0%)
AxSYM [®] HCV version 3.0	3B44-20	377	3	0.80% (0.2 – 2.3%)	0	0.00% (0 – 1.0%)
Ortho [®] HCV 3.0 ELISA enh. SAve (standard incubation - MiDAS data)	9307401	262	0	0.00% (0 – 1.4%)	0	0.00% (0 – 1.4%)
Monolisa HCV Ag-Ab ULTRA	72558	200	0	0.00% (0 - 1.8%)	0	0.00% (0 - 1.8%)
Adaltis EIAgen HCV	071064	200	3	1.50% (0.3 - 4.3%)	0	0.00% (0 - 1.8%)
Murex HCV Ag/Ab Combination	4J24-01	200	4	2.0% (0.5 - 5.0%)	0	0.00% (0 - 1.8%)
Abbott HCV EIA 3rd generation	7A16-23	199	0	0.00% (0 – 1.8%)	0	0.00% (0 – 1.8%)
Access [®] HCV	34310	181	2	1.10% (0.1 – 3.9%)	0	0.00% (0 – 2.0%)
Ortho [®] HCV 3.0 ELISA enh. SAve (short incubation)	9307401	1993*	2	0.10% (0 – 0.4%)	1	0.10% (0 – 0.3%)
PRISM [™] anti-HCV	6A52-48	9743*	20	0.20% (0.1 – 0.3%)	17	0.20% (0.1 – 0.3%)
Monolisa [®] anti-HCV Plus EIA (version 1)	72312	2090*	10	0.48% (0.20 – 0.90%)	6	0.29% (0.10 – 0.60%)
IMx [®] HCV	3A99-20	176	4	2.27% (0.6 – 5.7%)	1	0.57% (0 – 3.1%)
Vitros <i>ECi</i> anti-HCV	1318450	310	2	0.65% (0.08 – 2.31%)	2	0.65% (0.08 – 2.31%)
Note:						
* = data from blood centre specificity evaluations						

Appendix 2: Sensitivity for 15 previously evaluated HCV screening assays

Assay	Product code	Number tested	Number positive (Sensitivity)	95% confidence interval %	Range S/CO	Mean S/CO	Median S/CO
AxSYM [®] HCV version 3.0	3B44-20	500	500 (100%)	99.3 – 100	1.92 – 138.32	79.76	86.94
Access [®] HCV Ab PLUS	34330	499	499 (100%)	99.3 - 100	1.09 - 11.32	9.28	9.85
Vitros <i>Eci</i> anti-HCV	1318450	433	433 (100%)	99.2 – 100	4.17 – 38.2	27.07	26.00
Ortho [®] HCV 3.0 ELISA enhanced SAve (standard incubation)	9307401	215	215 (100%)	98.3 – 100	1.34 – 5.03	4.88	4.99
Ortho [®] HCV 3.0 ELISA enhanced SAve (short incubation)	9307401	215	215 (100%)	98.3 – 100	1.06 – 9.12	8.71	9.09
Adaltis EIAgen HCV	071064	200	200 (100%)	98.2 - 100	1.69 - 10.16	9.41	9.71
Monolisa HCV Ag-Ab ULTRA	72558	200	200 (100%)	98.2 - 100	2.00 - 7.73	6.61	6.88
Murex HCV Ag/Ab Combination	4J24-01	200	200 (100%)	98.2 - 100	1.60 - 12.38	11.23	11.80
PRISM [™] anti-HCV	6A52-48	114	114 (100%)	96.8 – 100	1.22 – 6.47	4.59	4.75
IMx [®] HCV	3A99-20	103	103 (100%)	96.5 – 100	1.84 – 54.22	31.15	30.26
Monolisa [®] anti-HCV Plus version 1	72312	101	101 (100%)	96.4 – 100	1.21 – 10.65	8.50	8.73
Monolisa [®] anti-HCV Plus version 2 lot 9M512T	72317/18	40	40 (100%)	91.2 - 100	7.09 - 12.43	9.95	10.01
Monolisa [®] anti-HCV Plus version 2 lot 9M513U	72317/18	40	40 (100%)	91.2 - 100	8.00 - 13.10	11.06	11.35
Abbott HCV EIA 3rd generation	7A16-23	230	228 (99.1%)	96.9 – 99.9	0.19 – 6.49	4.68	4.62
Access [®] HCV	34310	177	175 (98.9%)	96.0 – 99.9	0.32 – 447.73	132.67	129.78

Appendix 3: Further test results for five weakly reactive specimens in Murex HCV Ag/Ab Combination

Sample ID	SOURCE	Murex HCV AgAb Combination OD/CO	Adaltis EIAgen HCV OD/CO	Monolisa HCV AgAb ULTRA OD/CO	Vitros Eci anti-HCV S/CO	Access HCV Ab Plus S/CO
00-10314	BBI	3.22	1.69	6.05	13.40	6.49
00-10339	BBI	3.26	5.93	Not tested	21.50	5.08
00-10401	BBI	4.09	9.26	Not tested	28.60	7.40
00-10413	BBI	1.86	3.11	5.30	16.90	4.96
00-10434	BBI	2.15	5.47	6.57	15.80	8.04
00-10488	BBI	3.76	2.98	3.79	Not tested	2.76
00-10495	BBI	1.60	3.12	2.68	7.64	2.16
98-41817	LEEDS BTS	4.54	9.35	Not tested	23.70	9.41

Appendix 4: Combined seroconversion scores (19 panels)

Panel	Number of specimens in panel	PCR	Murex HCV Ag/Ab Combination	Monolisa HCV AgAb ULTRA (cut off = 1.0)	Ortho HCV Ag EIA	Vitros ECI anti-HCV	AxSYM® HCV version 3.0	Ortho HCV 3.0 with Enh SAVe (Short Inc.)	Access® HCV Ab PLUS	PRISM™ HCV	Monolisa anti-HCV Plus	Adaitis EIAGEN HCV Ab	IMx	Abbott anti-HCV 3rd gen EIA
PHV901	11	10 (65)	10 (65)	9 (97)	2 (65)***	9 (97)	9 (97)	9 (97)	9 (97)	9 (97)	9 (97)	9 (97)	9 (97)	9 (97)
PHV904	7	6 (0)	1 (14)	4 (9)	4 (0)***	4 (9)	4 (9)	4 (9)	3 (14)	4 (9)	4 (9)	3 (14)	3 (14)	3 (14)
PHV907	7	7 (0)	7 (0)	7 (0)	6 (0)***	4 (13)	3 (18)	3 (18)	4 (13)	2 (21)*	2 (21)	4 (13)	1 (164)	2 (21)
PHV908	13	13 (0)	8 (19)	9 (13)	4 (11)***	9 (13)	10 (11)	8 (19)	8 (19)	8 (19)*	7 (25)	7 (25)	3 (41)	5 (32)
PHV909	3	3 (0)	3 (0)	3 (0)	3 (0)	2 (28)	0 (>30)	2 (28)	2 (28)	2 (28)*	2 (28)	2 (28)	0 (>30)	2 (28)
PHV910	5	5 (0)	5 (0)	5 (0)	5 (0)	3 (8)	3 (8)	3 (8)	3 (8)	3 (8)*	2 (11)	3 (8)	2 (11)	3 (8)
PHV913	4	4 (0)	4 (0)	4 (0)	4 (0)	3 (2)	0 (>9)	4 (0)	2 (7)	0 (>9)*	2 (7)	3 (2)	0 (>9)	2 (7)
PHV914	9	9 (0)	9 (0)	9 (0)	9 (0)	5 (16)	5 (16)	5 (16)	5 (16)	3 (24)*	4 (19)	5 (16)	3 (24)	4 (19)
PHV915	4	4 (0)	0 (>14)	2 (12)	0 (>14)	2 (12)	3 (5)	1 (14)	0 (>14)	2 (12)*	1 (14)	0 (>14)	2 (12)	0 (>14)
6212	9	9 (0)	2 (53)	6 (23)	1 (23)***	8 (12)	8 (12)	8 (12)	6 (23)	8 (12)*	4 (32)	3 (37)	8 (12)	2 (53)
6213	12	9 (11)	7 (18)	3 (37)	11 (2)	3 (37)	3 (37)	2 (43)	2 (43)	2 (43)*	2 (43)	2 (43)	2 (43)	2 (43)
6214	13	13 (0)	13 (0)	6 (25)	12 (0)***	5 (30)	6 (25)	5 (30)	5 (30)	5 (30)*	4 (32)	3 (49)	3 (49)	3 (49)
6215	4	4 (0)	4 (0)	4 (0)	4 (0)	1 (20)	1 (20)	1 (20)	1 (20)	1 (20)*	1 (20)	0 (>20)	1 (20)	1 (20)
6216	7	1 (23)	0 (>23)	1 (23)	0 (>23)	1 (23)	1 (23)	1 (23)	1 (23)	1 (23)*	0 (>23)	1 (23)	0 (>23)	1 (23)
6222	8	2 (17)	6 (17)	6 (17)	6 (17)	1 (40)	1 (40)	1 (40)	1 (40)	1 (40)	1 (40)	0 (>40)	0 (>40)	0 (>40)
9041	8	7 (24)	7 (24)	6 (27)	7 (24)	4 (62)	4 (62)	4 (62)	4 (62)	4 (62)*	4 (62)	4 (62)	4 (62)	4 (62)
9044	6	6 (0)	6 (0)	6 (0)	6 (0)	2 (25)	3 (21)	2 (25)	2 (25)	2 (25)*	2 (25)	1 (29)	2 (25)	1 (29)
9045	8	8 (0)	8 (0)	8 (0)***	8 (0)	2 (37)	2 (37)	2 (37)	2 (37)	2 (37)*	1 (41)	0 (>41)	2 (37)	0 (>41)
9047	10	10 (0)	10 (0)	10 (0)	10 (0)	4 (28)	4 (28)	4 (28)	4 (28)	4 (28)*	3 (30)	3 (30)	4 (28)	3 (30)
Total**	148	130	110	108	102	72	70	66	64	63	55	53	47	47
PHV905	9	9 (0)	5 (14)	6 (11)	6 (4)***	5 (14)	5 (14)	5 (14)	3 (21)	NT	4 (18)	3 (21)	2 (25)	2 (25)
PHV906	7	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	NT	7 (0)	7 (0)	5 (7)	4 (10)
PHV911	5	5 (0)	5 (0)	5 (0)	5 (0)	3 (14)	3 (14)	3 (14)	3 (14)	NT	3 (14)	3 (14)	2 (21)	3 (14)
PHV916	8	8 (0)	8 (0)	7 (2)	8 (0)	3 (19)	4 (16)	2 (23)	2 (23)	NT	2 (23)	2 (23)	NT	NT
PHV917	10	9 (13)	9 (13)	9 (13)	3 (13)	6 (85)	6 (85)	NT	6 (85)	NT	NT	6 (85)	NT	NT
6211***	16	13 (140)	13 (140)	10 (150)	13 (140)	3 (182)	3 (182)	3 (182)	2 (186)	NT	2 (186)	1 (189)	0 (>189)	2 (186)
Product Number	NA	NA	4J24-01	72558	933255	131 8450	3B44-20	9307401	34330	6A5248	72312	071064	3A99-20	7A16-23
Lot Number	NA	NA	061384AU	5B1513	AGK156	0100	65113LU00	GEV028	194822	10143 HP00	6C501.U	060604	12220 HP00	12027 HP00

Notes:

NT = not tested. NS = not scored, all panels had not been tested by the assay.

* PRISM results were extracted from BBI/BCP data sheets

**The total for each assay was calculated by summing the correct positive reactions for each of the panels. A higher score suggests higher sensitivity.

The number in parenthesis is the number of days from the initial bleed to the first positive sample

*** Panels marked began positive but had one or more negative results later on in the panel

**** BCP6211 has 40 members in the panel, but for this evaluation only the last 16 members (6211-25 - 6211-40) were tested because the first 24 members are known to be negative

Appendix 5: Combined seroconversion scores (25 panels)

Panel	Number of specimens in panel	PCR	Murex HCV Ag/Ab Combination	Monolisa HCV AgAb ULTRA (cut-off = 1.0)	Ortho HCV Ag EIA	Vitros ECI anti-HCV	AxSYM® HCV version 3.0	Access® HCV Ab PLUS	Adaltis EIAGEN HCV Ab
PHV901	11	10 (65)	10 (65)	9 (97)	2 (65)***	9 (97)	9 (97)	9 (97)	9 (97)
PHV904	7	6 (0)	1 (14)	4 (9)	4 (0)***	4 (9)	4 (9)	3 (14)	3 (14)
PHV905	9	9 (0)	5 (14)	6 (11)	6 (4)***	5 (14)	5 (14)	2 (21)	3 (21)
PHV906	7	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)	7 (0)
PHV907	7	7 (0)	7 (0)	7 (0)	6 (0)***	4 (13)	3 (18)	4 (13)	4 (13)
PHV908	13	13 (0)	8 (19)	9 (13)	4 (11)***	9 (13)	10 (11)	7 (19)	7 (25)
PHV909	3	3 (0)	3 (0)	3 (0)	3 (0)	2 (28)	0 (33)	2 (28)	2 (28)
PHV910	5	5 (0)	5 (0)	5 (0)	5 (0)	3 (8)	3 (8)	3 (8)	3 (8)
PHV911	5	5 (0)	5 (0)	5 (0)	5 (0)	3 (14)	3 (14)	3 (14)	3 (14)
PHV913	4	4 (0)	4 (0)	4 (0)	4 (0)	3 (2)	0 (12)	2 (7)	3 (2)
PHV914	9	9 (0)	9 (0)	9 (0)	9 (0)	5 (16)	5 (16)	5 (16)	5 (16)
PHV915	4	4 (0)	0 (>14)	2 (12)	0 (>14)	2 (12)	3 (5)	0 (>14)	0 (>14)
PHV916	8	8 (0)	8 (0)	7 (2)	8 (0)	3 (19)	4 (16)	2 (23)	2 (23)
PHV917	10	9 (13)	9 (13)	9 (13)	3 (13)	6 (85)	6 (85)	6 (85)	6 (85)
6211***	16	13 (140)	13 (140)	10 (150)	13 (140)	3 (182)	3 (182)	2 (186)	1 (189)
6212	9	9 (0)	2 (53)	6 (23)	1 (23)***	8 (12)	8 (12)	6 (23)	3 (37)
6213	12	9 (11)	7 (18)	3 (37)	11 (2)	3 (37)	3 (37)	2 (43)	2 (43)
6214	13	13 (0)	13 (0)	6 (25)	12 (0)***	5 (30)	6 (25)	5 (30)	3 (49)
6215	4	4 (0)	4 (0)	4 (0)	4 (0)	1 (20)	1 (20)	1 (20)	0 (>20)
6216	7	1 (23)	0 (>23)	1 (23)	0 (>23)	1 (23)	1 (23)	1 (23)	1 (23)
6222	8	2 (17)	6 (17)	6 (17)	6 (17)	1 (40)	1 (40)	1 (40)	0 (>40)
9041	8	7 (24)	7 (24)	6 (27)	7 (24)	4 (62)	4 (62)	4 (62)	4 (62)
9044	6	6 (0)	6 (0)	6 (0)	6 (0)	2 (25)	3 (21)	2 (25)	1 (29)
9045	8	8 (0)	8 (0)	8 (0)**	8 (0)	2 (37)	2 (37)	2 (37)	0 (>41)
9047	10	10 (0)	10 (0)	10 (0)	10 (0)	4 (28)	4 (28)	4 (28)	3 (30)
Score*	203	181	157	152	144	99	98	85	75
Product Number	NA	NA	4J24-01	72558	933255	131 8450	3B44-20	34330	071064
Lot Number	NA	NA	061384AU	5B1513	AGK156	0100	65113LU00	194822	060604

Notes:
 *The score was calculated by summing the correct positive reactions for each of the panels. A higher score suggests higher sensitivity.
 The number in parenthesis is the number of days from the initial bleed to the first positive sample.
 ** Panels marked began positive but had one or more negative results later on in the panel
 *** BCP6211 has 40 members in the panel, but for this evaluation only the last 16 members (6211-25 - 6211-40) were tested because the first 24 members are known to be negative

Appendix 6a: Seroconversion data PHV901 – PHV909

Batch 1: 061384AU

All Aliquots fresh from -60

Batch 2: 060554AU

Aliquots from -60. 1 freeze thaw cycle

Sample ID	OD	CO	OD/CO	Sample ID	OD	CO	OD/CO
PHV901-01	0.125	0.304	0.412	PHV901-01	NOT TESTED		
PHV901-02	0.343	0.304	1.130	PHV901-02			
PHV901-03	0.927	0.304	3.054	PHV901-03			
PHV901-04	0.863	0.304	2.844	PHV901-04			
PHV901-05	1.047	0.304	3.450	PHV901-05			
PHV901-06	1.171	0.304	3.858	PHV901-06			
PHV901-07	3.134	0.304	10.326	PHV901-07			
PHV901-08	3.097	0.304	10.204	PHV901-08			
PHV901-09	3.490	0.304	11.499	PHV901-09			
PHV901-10	3.565	0.304	11.746	PHV901-10			
PHV901-11	3.397	0.304	11.193	PHV901-11			
PHV904-01	0.241	0.304	0.794	PHV904-01	0.210	0.306	0.687
PHV904-02	0.235	0.304	0.774	PHV904-02	0.191	0.306	0.625
PHV904-03	0.148	0.304	0.488	PHV904-03	0.171	0.306	0.560
PHV904-04	0.228	0.304	0.751	PHV904-04	0.250	0.306	0.818
PHV904-05	0.349	0.304	1.150	PHV904-05	0.417	0.306	1.365
PHV904-06	0.223	0.304	0.735	PHV904-06	0.309	0.306	1.012
PHV904-07	0.267	0.304	0.880	PHV904-07	0.354	0.306	1.159
PHV905-01	0.121	0.304	0.399	PHV905-01	0.109	0.306	0.357
PHV905-02	0.164	0.304	0.540	PHV905-02	0.199	0.306	0.651
PHV905-03	0.208	0.304	0.685	PHV905-03	0.201	0.306	0.658
PHV905-04	0.240	0.304	0.791	PHV905-04	0.244	0.306	0.799
PHV905-05	0.361	0.304	1.190	PHV905-05	0.317	0.306	1.038
PHV905-06	0.431	0.304	1.420	PHV905-06	0.456	0.306	1.493
PHV905-07	0.404	0.304	1.331	PHV905-07	0.573	0.306	1.876
PHV905-08	1.482	0.304	4.883	PHV905-08	1.886	0.306	6.174
PHV905-09	3.151	0.304	10.382	PHV905-09	3.511	0.306	11.493
PHV906-01	1.548	0.304	5.101	PHV906-01	NOT TESTED		
PHV906-02	1.544	0.304	5.087	PHV906-02			
PHV906-03	2.635	0.304	8.682	PHV906-03			
PHV906-04	3.358	0.304	11.064	PHV906-04			
PHV906-05	3.385	0.304	11.153	PHV906-05			
PHV906-06	3.513	0.304	11.575	PHV906-06			
PHV906-07	3.399	0.304	11.199	PHV906-07			
PHV907-01	3.146	0.304	10.366	PHV907-01	NOT TESTED		
PHV907-02	2.237	0.304	7.371	PHV907-02			
PHV907-03	2.025	0.304	6.672	PHV907-03			
PHV907-04	2.596	0.304	8.554	PHV907-04			
PHV907-05	1.901	0.304	6.264	PHV907-05			
PHV907-06	1.649	0.304	5.433	PHV907-06			
PHV907-07	3.666	0.304	12.079	PHV907-07			
PHV908-01	0.148	0.304	0.488	PHV908-01	0.158	0.306	0.517
PHV908-02	0.169	0.304	0.557	PHV908-02	0.160	0.306	0.524
PHV908-03	0.155	0.304	0.511	PHV908-03	0.167	0.306	0.547
PHV908-04	0.225	0.304	0.741	PHV908-04	0.237	0.306	0.776
PHV908-05	0.295	0.304	0.972	PHV908-05	0.310	0.306	1.015
PHV908-06	0.327	0.304	1.077	PHV908-06	0.340	0.306	1.113
PHV908-07	0.649	0.304	2.138	PHV908-07	0.690	0.306	2.259
PHV908-08	0.989	0.304	3.259	PHV908-08	1.012	0.306	3.313
PHV908-09	2.598	0.304	8.560	PHV908-09	2.481	0.306	8.121
PHV908-10	3.073	0.304	10.125	PHV908-10	3.339	0.306	10.930
PHV908-11	3.055	0.304	10.066	PHV908-11	3.313	0.306	10.845
PHV908-12	3.283	0.304	10.817	PHV908-12	3.580	0.306	11.718
PHV908-13	3.367	0.304	11.094	PHV908-13	3.544	0.306	11.601
PHV909-01	0.590	0.342	1.728*	PHV909-01	NOT TESTED		
PHV909-02	1.114	0.342	3.262*	PHV909-02			
PHV909-03	0.437	0.342	1.280*	PHV909-03			

* Initial results (OD/CO's of 1.361, 1.275 and 0.959 respectively) indicated that PHV909-03 was negative by this kit. The panel was repeated in triplicate (1 set of results shown) from a fresh aliquot and although the last member was positive in all cases, it still gave the lowest OD/CO of all three panel members.

Appendix 6b: Seroconversion data PHV910 – PHV917, BCP6211

Batch 1: 061384AU

Batch 2: 060554AU

All Aliquots fresh from -60

Aliquots from -60. 1 freeze thaw cycle

Sample ID	OD	CO	OD/CO	Sample ID	OD	CO	OD/CO
PHV910-01	2.198	0.304	7.242	PHV910-01	NOT TESTED		
PHV910-02	1.217	0.304	4.010	PHV910-02			
PHV910-03	2.222	0.304	7.321	PHV910-03			
PHV910-04	2.945	0.304	9.704	PHV910-04			
PHV910-05	2.934	0.304	9.667	PHV910-05			
PHV911-01	3.345	0.304	11.021	PHV911-01	NOT TESTED		
PHV911-02	3.005	0.304	9.901	PHV911-02			
PHV911-03	2.626	0.304	8.652	PHV911-03			
PHV911-04	3.018	0.304	9.944	PHV911-04			
PHV911-05	3.407	0.304	11.226	PHV911-05			
PHV913-01	1.022	0.304	3.367	PHV913-01	NOT TESTED		
PHV913-02	1.276	0.304	4.204	PHV913-02			
PHV913-03	1.539	0.304	5.071	PHV913-03			
PHV913-04	NOT TESTED			PHV913-04			
PHV914-01	1.780	0.304	5.865	PHV914-01	1.641	0.309	5.319
PHV914-02	1.547	0.304	5.097	PHV914-02	1.186	0.309	3.844
PHV914-03	1.370	0.304	4.514	PHV914-03	1.349	0.309	4.373
PHV914-04	1.194	0.304	3.934	PHV914-04	1.329	0.309	4.308
PHV914-05	0.814	0.304	2.682	PHV914-05	1.414	0.309	4.584
PHV914-06	1.531	0.304	5.045	PHV914-06	1.952	0.309	6.327
PHV914-07	1.389	0.304	4.577	PHV914-07	0.869	0.309	2.817
PHV914-08	0.920	0.304	3.031	PHV914-08	1.466	0.309	4.752
PHV914-09	1.091	0.304	3.595	PHV914-09	1.736	0.309	5.627
PHV915-01	0.141	0.304	0.465	PHV915-01	0.121	0.306	0.396
PHV915-02	0.154	0.304	0.507	PHV915-02	0.150	0.306	0.491
PHV915-03	0.153	0.304	0.504	PHV915-03	0.144	0.306	0.471
PHV915-04	0.199	0.304	0.656	PHV915-04	0.210	0.306	0.687
PHV916-01	1.319	0.305	4.332	PHV916-01	NOT TESTED		
PHV916-02	1.876	0.305	6.161	PHV916-02			
PHV916-03	2.027	0.305	6.657	PHV916-03			
PHV916-04	2.271	0.305	7.458	PHV916-04			
PHV916-05	1.487	0.305	4.883	PHV916-05			
PHV916-06	1.896	0.305	6.227	PHV916-06			
PHV916-07	1.204	0.305	3.954	PHV916-07			
PHV916-08	0.581	0.305	1.908	PHV916-08			
PHV917-01	0.111	0.305	0.365	PHV917-01	0.117	0.309	0.379
PHV917-02	3.234	0.305	10.621	PHV917-02	2.930	0.309	9.498
PHV917-03	1.419	0.305	4.660	PHV917-03	1.203	0.309	3.900
PHV917-04	2.050	0.305	6.732	PHV917-04	1.817	0.309	5.890
PHV917-05	1.628	0.305	5.347	PHV917-05	2.363	0.309	7.660
PHV917-06	1.269	0.305	4.168	PHV917-06	1.878	0.309	6.088
PHV917-07	1.750	0.305	5.747	PHV917-07	2.241	0.309	7.264
PHV917-08	2.122	0.305	6.969	PHV917-08	2.720	0.309	8.817
PHV917-09	3.562	0.305	11.698	PHV917-09	3.457	0.309	11.206
PHV917-10	3.645	0.305	11.970	PHV917-10	3.684	0.309	11.942
6211-25	0.117	0.305	0.384	6211-25	NOT TESTED		
6211-26	0.111	0.305	0.365	6211-26			
6211-27	0.110	0.305	0.361	6211-27			
6211-28	1.904	0.305	6.253	6211-28			
6211-29	0.671	0.305	2.204	6211-29			
6211-30	1.116	0.305	3.665	6211-30			
6211-31	3.000	0.305	9.852	6211-31			
6211-32	3.327	0.305	10.926	6211-32			
6211-33	3.566	0.305	11.711	6211-33			
6211-34	3.482	0.305	11.435	6211-34			
6211-35	3.401	0.305	11.169	6211-35			
6211-36	3.449	0.305	11.327	6211-36			
6211-37	3.679	0.305	12.082	6211-37			
6211-38	3.538	0.305	11.619	6211-38			
6211-39	3.617	0.305	11.878	6211-39			
6211-40	3.440	0.305	11.297	6211-40			

Appendix 6c: Seroconversion data BCP6212 – BCP6229

Batch 1: 061384AU

Batch 2: 060554AU

All Aliquots fresh from -60

Aliquots from -60. 1 freeze thaw cycle

Sample ID	OD	CO	OD/CO	Sample ID	OD	CO	OD/CO
6212-01	0.242	0.305	0.795	6212-01	0.222	0.306	0.727
6212-02	0.124	0.305	0.407	6212-02	0.177	0.306	0.579
6212-03	0.127	0.305	0.417	6212-03	0.159	0.306	0.521
6212-04	0.152	0.305	0.499	6212-04	0.170	0.306	0.557
6212-05	0.149	0.305	0.489	6212-05	0.231	0.306	0.756
6212-06	0.161	0.305	0.529	6212-06	0.165	0.306	0.540
6212-07	0.155	0.305	0.509	6212-07	0.212	0.306	0.694
6212-08	0.326	0.305	1.071	6212-08	0.400	0.306	1.309
6212-09	0.379	0.305	1.245	6212-09	0.465	0.306	1.522
6213-01	0.106	0.305	0.348	6213-01	NOT TESTED		
6213-02	0.113	0.305	0.371	6213-02			
6213-03	0.143	0.305	0.470	6213-03			
6213-04	0.162	0.305	0.532	6213-04			
6213-05	0.295	0.305	0.969	6213-05			
6213-06	0.338	0.305	1.110	6213-06			
6213-07	0.680	0.305	2.233	6213-07			
6213-08	1.708	0.305	5.609	6213-08			
6213-09	0.794	0.305	2.608	6213-09			
6213-10	1.367	0.305	4.489	6213-10			
6213-11	2.799	0.305	9.192	6213-11			
6213-12	2.089	0.305	6.860	6213-12			
6214-01	0.698	0.305	2.292	6214-01	0.640	0.309	2.075
6214-02	0.834	0.305	2.739	6214-02	0.731	0.309	2.370
6214-03	0.589	0.305	1.934	6214-03	0.571	0.309	1.851
6214-04	0.680	0.305	2.233	6214-04	0.632	0.309	2.049
6214-05	0.669	0.305	2.197	6214-05	0.647	0.309	2.097
6214-06	0.439	0.305	1.442	6214-06	0.448	0.309	1.452
6214-07	0.479	0.305	1.573	6214-07	0.458	0.309	1.485
6214-08	1.048	0.305	3.442	6214-08	0.947	0.309	3.070
6214-09	0.920	0.305	3.021	6214-09	0.805	0.309	2.609
6214-10	0.834	0.305	2.739	6214-10	0.786	0.309	2.548
6214-11	2.430	0.305	7.980	6214-11	2.334	0.309	7.566
6214-12	2.600	0.305	8.539	6214-12	2.599	0.309	8.425
6214-13	2.615	0.305	8.588	6214-13	2.785	0.309	9.028
6215-01	3.474	0.305	11.409	6215-01	NOT TESTED		
6215-02	3.430	0.305	11.264	6215-02			
6215-03	3.498	0.305	11.488	6215-03			
6215-04	3.286	0.305	10.791	6215-04			
6216-01	0.154	0.305	0.506	6216-01	0.166	0.306	0.543
6216-02	0.133	0.305	0.437	6216-02	0.192	0.306	0.629
6216-03	0.121	0.305	0.397	6216-03	0.167	0.306	0.547
6216-04	0.156	0.305	0.512	6216-04	0.175	0.306	0.573
6216-05	0.115	0.305	0.378	6216-05	0.174	0.306	0.570
6216-06	0.119	0.305	0.391	6216-06	0.183	0.306	0.599
6216-07	0.123	0.305	0.404	6216-07	0.220	0.306	0.720
6222-01	0.152	0.305	0.499	6222-01	NOT TESTED		
6222-02	0.189	0.305	0.621	6222-02			
6222-03	0.717	0.305	2.355	6222-03			
6222-04	1.582	0.305	5.195	6222-04			
6222-05	2.568	0.305	8.434	6222-05			
6222-06	1.937	0.305	6.361	6222-06			
6222-07	2.943	0.305	9.665	6222-07			
6222-08	2.022	0.305	6.640	6222-08			
6229-01	1.491	0.446	3.347	6229-01	NOT TESTED		
6229-02	3.187	0.446	7.154	6229-02			
6229-03	2.455	0.446	5.511	6229-03			
6229-04	2.954	0.446	6.631	6229-04			
6229-05	1.183	0.446	2.655	6229-05			
6229-06	2.849	0.446	6.395	6229-06			
6229-07	2.400	0.446	5.387	6229-07			
6229-08	2.822	0.446	6.335	6229-08			

Appendix 6d: Seroconversion data BCP9041 – BCP9047**Batch 1: 061384AU**

All Aliquots fresh from -60

Sample ID	OD	CO	OD/CO
9041-01	0.225	0.446	0.505
9041-02	0.882	0.446	1.980
9041-03	2.316	0.446	5.199
9041-04	3.112	0.446	6.985
9041-05	3.342	0.446	7.502
9041-06	3.424	0.446	7.686
9041-07	3.478	0.446	7.807
9041-08	3.491	0.446	7.836
9044-01	2.315	0.446	5.196
9044-02	1.620	0.446	3.636
9044-03	2.023	0.446	4.541
9044-04	1.927	0.446	4.326
9044-05	1.886	0.446	4.233
9044-06	1.409	0.446	3.163
9045-01	1.064	0.446	2.388
9045-02	0.918	0.446	2.061
9045-03	1.540	0.446	3.457
9045-04	1.543	0.446	3.464
9045-05	1.669	0.446	3.746
9045-06	0.989	0.446	2.220
9045-07	0.997	0.446	2.238
9045-08	0.564	0.446	1.266
9047-01	3.080	0.446	6.914
9047-02	3.084	0.446	6.923
9047-03	1.841	0.446	4.132
9047-04	1.814	0.446	4.072
9047-05	1.826	0.446	4.099
9047-06	1.701	0.446	3.818
9047-07	0.827	0.446	1.856
9047-08	1.942	0.446	4.359
9047-09	2.101	0.446	4.716
9047-10	1.702	0.446	3.820

Batch 2: 060554AU

Aliquots from -60. 1 freeze thaw cycle

Sample ID	OD	CO	OD/CO
9041-01	NOT TESTED		
9041-02			
9041-03			
9041-04			
9041-05			
9041-06			
9041-07			
9041-08			
9044-01	NOT TESTED		
9044-02			
9044-03			
9044-04			
9044-05			
9044-06			
9045-01	0.794	0.309	2.574
9045-02	0.895	0.309	2.901
9045-03	1.676	0.309	5.433
9045-04	1.479	0.309	4.794
9045-05	1.795	0.309	5.819
9045-06	0.817	0.309	2.648
9045-07	1.043	0.309	3.381
9045-08	1.117	0.309	3.621
9047-01	3.129	0.309	10.143
9047-02	2.317	0.309	7.511
9047-03	2.349	0.309	7.614
9047-04	2.540	0.309	8.233
9047-05	1.947	0.309	6.311
9047-06	1.514	0.309	4.908
9047-07	1.255	0.309	4.068
9047-08	2.460	0.309	7.974
9047-09	2.243	0.309	7.271
9047-10	1.629	0.309	5.280