Analytical and Clinical Performance of the VITROS® Immunodiagnostic Products Anti-HTLV I/II Assay

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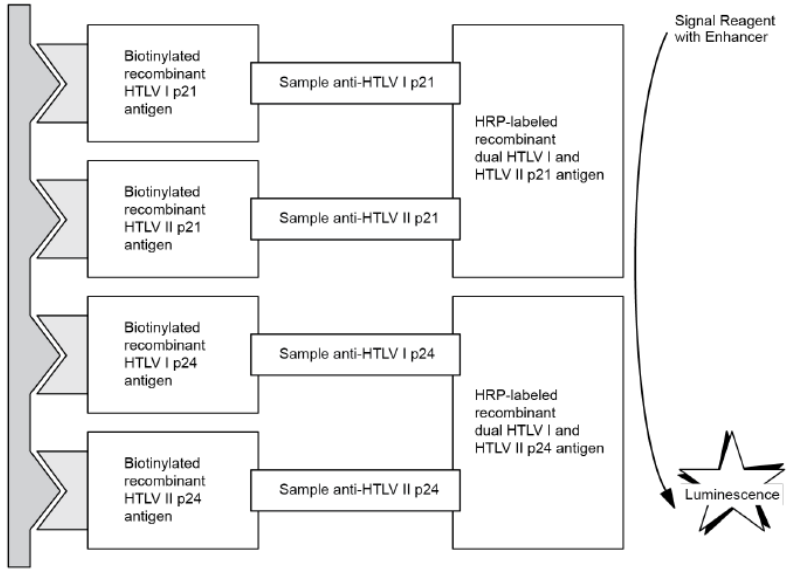
Introduction

This study was designed to assess the clinical and analytical performance of the VITROS Immunodiagnostic Products Anti-HTLV I/II assay (VITROS Anti-HTLV) on the VITROS ECi/ECiQ/3600 Immunodiagnostic Systems and the VITROS 5600/ XT 7600 Integrated Systems. In addition, assay performance for VITROS Anti-HTLV I/II was compared to the Abbott ARCHITECT rHTLV-I/II assay (ARCHITECT rHTLV-I/II). The assay detects antibodies to HTLV Types I and II.

Method

Clinical testing was performed at two external sites and analytical testing was performed internally using two reagent lots.

Assay Architecture



Potentially Cross-reacting Subgroups and Substances that don't Interfere

The VITROS Anti-HTLV I/II test was evaluated for potential cross-reactivity in HTLV negative samples from medical conditions unrelated to HTLV infection. All samples were Non-reactive in the VITROS assay. The VITROS Anti-HTLV I/II test was evaluated for interference consistent with CLSI document EP7. Of the compounds tested, none was found to interfere with the clinical interpretation of the test in negative and weakly reactive samples.

Clinical Specificity

Clinical specificity was evaluated using fresh samples from 5096 HTLV negative blood donors and frozen samples from 204 HTLV negative hospitalized patients. Samples were tested on the VITROS assay as well as the ARCHITECT rHTLV-I/II assay. Discordant results were resolved by performing confirmatory testing with independent reference methods. Observed specificity in the blood donor population for VITROS Anti-HTLV was 99.94% (5093/5096, 95% CI: 99.83-99.99%) compared to 99.84% (5088/5096, 95% CI: 99.69-99.93%) for ARCHITECT rHTLV-I/II. Overall specificity for VITROS Anti-HTLV was 99.92% (5296/5300, 95% CI: 99.81-99.98%) compared to 99.83% (5291/5300, 95% CI: 99.68-99.92%) for ARCHITECT rHTLV-I/II.

Sample Description	N	CE Marked HTLV I/II Test				VITROS Anti-HTLV I/II Test			
		NR	IR	RR	Confirmed Positive*	NR	IR	RR	Confirmed Positive*
Blood Donor Samples	5096	5088	8	8	0	5093	4	3	0
Hospitalized Samples	207	203	4	4	3	203	4	4	3

* INNO-LIA HTLV I/II Score confirmatory test

N = Number of samples, NR = Non-reactive, IR = Initially Reactive, RR = Repeatedly Reactive

Precision

Precision was evaluated consistent with CLSI document EP05. Two replicates each of 1 negative patient sample pool, 4 diluted reactive patient sample pools, 1 negative control and 1 positive control sample were tested on 2 separate occasions per day on at least 20 different days. The experiment was performed using 2 reagent lots on one VITROS ECi/ECiQ Immunodiagnostic System, one VITROS 3600 Immunodiagnostic System, and one VITROS 5600 Integrated System. The data presented are a representation of the product performance on this system.

VITROS System	Mean (S/C)	Within-run*		Within-cal**		Within-lab***		No. Observations	No. Days
		SD	%CV	SD	%CV	SD	%CV		
VITROS ECi/ECiQ	0.01	0.00	NA	0.01	NA	0.01	NA	80	20
	0.96	0.00	0.18	0.03	3.50	0.05	4.63	80	20
	1.35	0.02	1.81	0.05	4.05	0.07	4.76	80	20
	3.31	0.07	2.14	0.10	3.13	0.14	4.07	80	20
	4.63	0.06	1.31	0.11	2.42	0.16	3.41	80	20
	0.01	0.00	NA	0.00	NA	0.00	NA	80	20
	4.08	0.09	2.37	0.14	3.62	0.16	3.71	80	20

* Within-run (repeatability). Between duplicate precision averaged over all runs.
** Within-calibration. Total precision with weighted components of within-run, between-run, and between-day variation.
*** Within-lab. A measure of the effect of recalibration on total precision, calculated within reagent lot, using data from at least 5 calibrations.

Clinical Sensitivity

Clinical sensitivity was evaluated using 434 HTLV positive samples tested on both VITROS Anti-HTLV and ARCHITECET rHTLV-I/II. The sensitivity of VITROS Anti-HTLV was 100.0% (434/434, 95% CI: 99.2-100.0%) compared to 99.8% for ARCHITECT rHTLV-I/II (433/434, 95% CI: 98.7-100.0%).

Sample Description	N	CE Marked HTLV I/II Test		VITROS HTLV I/II Test	
		Nonreactive	Reactive	Non-reactive	Reactive
Resolved HTLV Seropositive	434	1	433	0	434

Analytical Sensitivity

Analytical sensitivity was evaluated using 2 commercially available performance panels. Commercial panel results were concordant with the package insert. Results from one of the commercial panels are shown below.

Qualification Panel (QRP713)					
Panel Member	Panel Classification*	VITROS 5600 Master Lot 1 (S/C)	VITROS 3600 Master Lot 2 (S/C)	VITROS ECi/ECiQ Master Lot 1 (S/C)	VITROS XT7600 Master Lot 2 (S/C)
QRP713-01	HTLV I Reactive	45.9	36.3	45.7	38.5
QRP713-02	Nonreactive	0.01	0.01	0.01	0.01
QRP713-03	HTLV I Reactive	62.4	49.9	63.2	53.5
QRP713-04	HTLV II Reactive	27.1	22.2	25.7	24.7
QRP713-05	HTLV I Reactive	28.2	22.2	27.4	24.5
QRP713-06	HTLV II Reactive	20.2	16.4	19.1	17.6

* Data from SeraCare Anti-HTLV I/II AccuTrak™ Qualification Panel Data Sheet

Conclusion

The VITROS Anti-HTLV I/II assay demonstrates excellent clinical sensitivity and specificity. VITROS Anti-HTLV I/II is intended to be used as an aid in diagnosis of HTLV infection and to screen donors of blood, blood components, cells, tissue and organs for the presence of HTLV infection.

Ortho Clinical Diagnostics