OraQuick®
Rapid HIV-1 Antibody Test

Read this package insert completely before using the product. Follow the instructions carefully. Not doing so may result in inaccurate test results.

COMPLEXITY: MODERATE

NAME AND INTENDED USE

The OraQuick® Rapid HIV-1 Antibody Test is a single-use, qualitative immunoassay to detect antibodies to Human Immunodeficiency Virus Type 1 (HIV-1) in fingerstick whole blood specimens. The OraQuick® Rapid HIV-1 Antibody Test is intended for use as a point-of-care test to aid in the diagnosis of infection with HIV-1. This test is suitable for use in multi-test algorithms designed for statistical validation of rapid HIV test results. When multiple rapid HIV tests are available, this test should be used in appropriate multi-test algorithms.

RESTRICTIONS

- **Sale of the OraQuick® Rapid HIV-1 Antibody Test is restricted to clinical laboratories**
    - **that have an adequate quality assurance program, including pl anned systematic activities to provide adequate confidence that requirements for quality will be met; and**
    - **where there is assurance that operators will receive and use the instructional materials.**
- **The OraQuick® Rapid HIV-1 Antibody Test is approved for use only by an agent of a clinical laboratory.**
- **Test subjects must receive the "Subject Information" pamphlet prior to specimen collection and appropriate information when test results are provided.**
- **The OraQuick® Rapid HIV-1 Antibody Test is not approved for use to screen blood or tissue donors.**

SUMMARY AND EXPLANATION OF THE TEST

Acquired Immune Deficiency Syndrome (AIDS), AIDS related complex (ARC) and pre-AIDS are thought to be caused by the Human Immunodeficiency Virus (HIV). The first AIDS-related virus, HIV-1 (also known as HTLV-III, LAV-1 and ARV) has been isolated from patients with AIDS and from healthy persons at high risk for AIDS.[1,2] Genetic analysis of HIV-1 isolates has documented the existence of subtypes. To date, eight HIV-1 subtypes (A through H), designated as Group M, have been identified world-wide in addition to the highly divergent HIV-1 isolates from AIDS patients in Cameroon, designated as Group O.[3] A closely related but distinct second type of pathogenic human immunodeficiency retrovirus, designated HIV-2 (formerly LAV-2), has been isolated from West African patients with AIDS. HIV-2 has been shown to share a number of conserved sequences with HIV-1, but serological cross-reactivity between HIV-1 and HIV-2 has been shown to be highly variable from sample to sample.

HIV is known to be transmitted by sexual contact, by exposure to blood (including sharing contaminated needles and syringes) or by contaminated blood products, or it may be transmitted from an infected mother to her fetus during the prenatal period. Individuals infected with HIV produce antibodies against the HIV viral proteins. Testing for the presence of antibodies to HIV in bodily fluids (e.g., blood, oral fluid, and urine) is an accurate aid in the diagnosis of HIV infection. However, the implications of seropositivity must be considered in a clinical context. For example, in neonates, the presence of antibodies to HIV is indicative of exposure to HIV, but not necessarily of HIV infection, due to the acquisition of maternal antibodies that may persist for up to six months. Conversely, absence of antibody to HIV cannot be taken as absolute proof that an individual is free of HIV infection or incapable of transmitting the virus. An antibody response to a recent exposure may take several months to reach detectable levels. HIV has been isolated from asymptomatic, seronegative individuals presumably before seroconversion following exposure.

The standard laboratory HIV testing algorithm used in the United States consists of screening with an enzyme immunoassay (EIA) and confirmation of repeatedly reactive EIAs using a Western blot test. Results are typically reported within 48 hours to 2 weeks, making these standard screening and supplemental tests inadequate to meet the need for rapid HIV diagnosis. The OraQuick® Rapid HIV-1 Antibody Test is a point-of-care test to aid in the diagnosis of infection with HIV-1.

Using a rapid HIV test increases the number of HIV-infected persons who may be diagnosed. The Centers for Disease Control and Prevention (CDC) estimates that nearly one fourth of the estimated 900,000 HIV-infected persons in the United States do not know their HIV status. As a result, they cannot benefit from early intervention with effective antiviral therapy. Rapid HIV testing addresses this issue by providing results during the initial visit and enabling immediate counseling. Additionally, for pregnant women who do not know their HIV status at the time of delivery, rapid HIV testing permits therapy to be initiated for these mothers during labor, and to their infants post partum, substantially reducing the chance that the infants will become infected with HIV. Likewise, rapid HIV testing is instrumental in the decision to initiate treatment for health care workers after accidental exposures to body fluids from infected individuals. In the U.S., it is estimated that 600,000 to 1,000,000 "needlestick injuries" occur each year. Critical decisions about treatment depend on the availability of accurate, rapid HIV test results.

BIOLOGICAL PRINCIPLES OF THE TEST

The OraQuick® Rapid HIV-1 Antibody Test is a manually performed, visually read, 20 minute immunoassay for the qualitative detection of antibodies to HIV-1 in human whole blood obtained from a finger puncture. The OraQuick® rapid test is comprised of a single-use test device and a single-use vial containing a pre-measured amount of a buffered developer solution. Each component is sealed in separate compartments of a single pouch to form the test. The OraQuick® rapid test utilizes a proprietary lateral flow immunoassay procedure. The device plastic housing holds an assay test strip comprised of several materials that provide the matrix for the immunochromatography of the specimen and the platform for indication of the test results.

The assay test strip, which can be viewed through the test device result window, contains synthetic peptides representing the HIV envelope region and a goat anti-human IgG procedural control immobilized onto a nitrocellulose membrane in the Test (T) zone and the Control (C) zone, respectively.

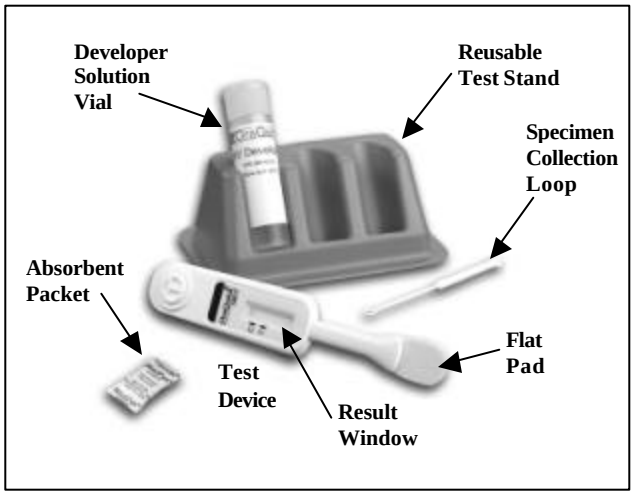
A fingerstick whole blood specimen is collected and transferred into the vial of developer solution, followed by the insertion of the test device. The developer solution facilitates the flow of the specimen into the device and onto the test strip. As the diluted specimen flows through the device, it rehydrates the protein-A gold colorimetric reagent contained in the device. As the specimen continues to migrate up the strip, it encounters the T zone. If the specimen contains antibodies that react with the antigens immobilized on the nitrocellulose membrane, a reddish-purple line will appear, qualitatively indicating the presence of antibodies to HIV-1 in the specimen. The intensity of the line color is not directly proportional to the amount of antibody present in the specimen.

Further up the assay strip, the sample will encounter the C zone. This built-in procedural control serves to demonstrate that a specimen was added to the vial and that the fluid has migrated adequately through the test device. A reddish-purple line will appear in the C zone during the performance of all valid tests, whether or not the sample is positive or negative for antibodies to HIV-1 (refer to the Interpretation *of Results* section below).

The test results are interpreted after 20 minutes but not more than 60 minutes after the introduction of the test device into the developer solution containing the test specimen. No precision pipeting, predilutions, or specialized instrumentation are required to perform the OraQuick® Rapid HIV-1 Antibody Test.

MATERIALS PROVIDED

OraQuick® Rapid HIV-1 Antibody Test Kits are available in the following packaging configurations:



Kit Size	100 count	25 count
Part Number	1001-0043	1001-0044
Divided pouches, each containing: Test Device (1) Absorbent Packet (1) Developer Solution Vial (1) (each vial contains 1 mL of a phosphate buffered saline solution containing polymers and an antimicrobial agent)	100	25
Reusable Test Stands	10	5
Specimen Collection Loops	100	25
Subject Information Pamphlets	100	25
Package Insert	1	1

MATERIALS REQUIRED AND AVAILABLE AS AN ACCESSORY TO THE KIT

OraQuick® Rapid HIV-1 Antibody Test Kit Controls
Part Number xxxx-xxxx
Package contains Positive Control (1 vial, black cap, 0.2 mL) and Negative Control (1 vial, white cap, 0.2 mL), and a Package Insert

MATERIALS REQUIRED BUT NOT PROVIDED

Timer or watch
Antiseptic wipe
Sterile lancet
Sterile gauze pads
Disposable gloves
Biohazard disposal container

WARNINGS

For *in vitro* Diagnostic Use

1. **Read the package insert completely before using the product. Follow the instructions carefully. Not doing so may result in inaccurate test results.**
2. **FDA has approved this kit for use with fingerstick whole blood specimens only. Use of this test kit with specimen types other than those specifically approved for use with this device may result in inaccurate test results.**
3. **This test should be performed at ambient temperature (15^{o}-27^{o}C).**

PRECAUTIONS

Safety Precautions

1. Handle specimens and materials contacting specimens as if capable of transmitting infectious agents.
2. Do not drink, eat, or smoke in areas where specimens are being handled.
3. Wear a lab coat, eye protection and disposable gloves while handling specimens. Wash hands thoroughly after performing each test. Dispose of gloves in a biohazard waste container after use.
4. Dispose of all test specimens and materials used in the test procedure in a biohazard waste container. Lancets should be placed in a puncture-resistant container prior to disposal. The recommended method of disposal of biohazard waste is autoclaving for a minimum of 1 hour at 121ºC. Disposable materials may be incinerated. Liquid wastes may be mixed with appropriate chemical disinfectants. A solution of 10% bleach (0.5% solution of sodium hypochlorite) is recommended. Allow 60 minutes for effective decontamination. **NOTE: Do not autoclave solutions that contain bleach.** For additional information on biosafety, refer to "Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and other Blood-borne Pathogens in Health-Care Settings".[5]
5. Wipe all spills thoroughly with a solution of 10% bleach or other appropriate disinfectant[4].

Handling Precautions

1. Use all Specimen Collection Loops, Test Devices, and Developer Solution Vials only once and dispose of properly (see *Safety Precautions*). **Do not reuse any of these test components**.
2. Do not use the test beyond the expiration date printed on the Divided Pouch. Always check expiration date prior to testing.
3. Do not interchange Test Devices and Developer Solution Vials from kits with different lot numbers.
4. Avoid microbial contamination and exercise care in handling the kit components.
5. Adequate lighting is required to read a test result.

STORAGE INSTRUCTIONS

Store unused OraQuick® Rapid HIV-1 Antibody Tests unopened at 2°-27°C (35-80°F). Do not open the Divided Pouch until you are ready to perform a test. If stored refrigerated, ensure that the Divided Pouch is brought to ambient temperature (15°-27°C) before opening.

DIRECTIONS FOR USE

GENERAL TEST PREPARATION

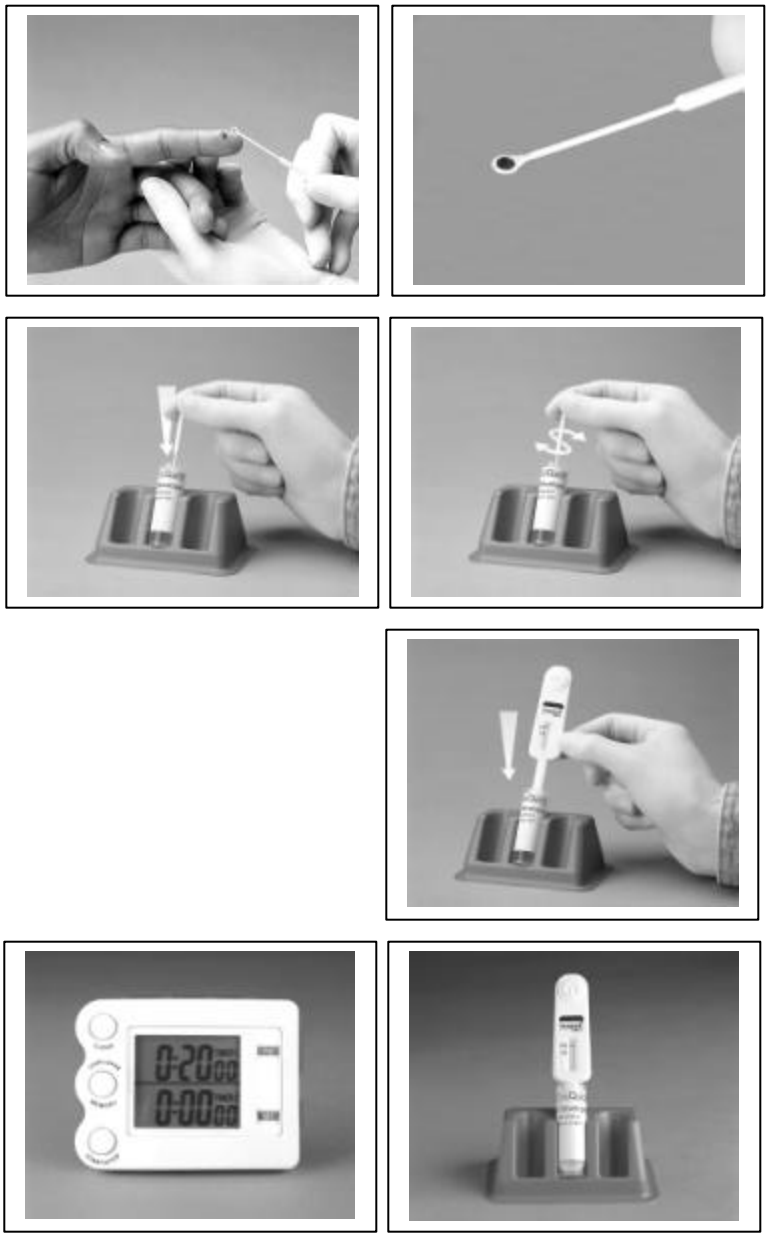
1. Place the Reusable Test Stand on a flat, level surface. Use only the stand provided.
2. Using the notched corners, tear the top of each end of the Divided Pouch containing the Test Device and Developer Solution Vial.
3. To prevent contamination, leave the Test Device in the Divided Pouch until needed. DO NOT touch the flat pad.
4. Check to see if an Absorbent Packet is present. If no Absorbent Packet is present, discard the Test Device and obtain a new Divided Pouch for testing.
5. Remove the Developer Solution Vial from the Divided Pouch.
6. Firmly holding the Developer Solution Vial, carefully uncap the vial by gently rocking the cap back and forth.
7. Slide the uncapped Developer Solution Vial into the top of the slot in the angled Reusable Test Stand, making sure the vial is completely seated in the stand. DO NOT force the vial into the stand from the front of the slot, as splashing may occur.

NOTE: DO NOT cover the two holes in the back of the Test Device after placing it into the developer solution. Doing so may cause an invalid result.

SPECIMEN COLLECTION AND TESTING PROCEDURE

1. Provide the "Subject Information" pamphlet to the test subject.
2. Using an antiseptic wipe, clean the finger of the person being tested. Allow the finger to dry thoroughly or wipe dry with a sterile gauze pad. Using a sterile lancet, puncture the skin just off the center of the finger pad. Squeeze the finger gently to obtain a drop of blood. Wipe away this first drop of blood with a sterile gauze pad. Holding the finger downward, apply gentle pressure beside the point of the puncture to obtain a rounded drop of blood. Avoid squeezing or milking the finger to accelerate bleeding, as this may dilute the blood with excess tissue fluid.

3. Touch the round end of an unused Specimen Collection Loop to the drop of blood. Visually inspect the loop to make sure that it is completely filled with blood.
4. Immediately immerse the blood-filled Specimen Collection Loop in the developer solution inside the Developer Solution Vial. Use the Specimen Collection Loop to stir the specimen in the developer solution. Remove the Specimen Collection Loop from the Developer Solution Vial and discard the used loop in a biohazard waste container.
5. Examine the solution in the Developer Solution Vial to ensure that it appears pink, indicating that the blood specimen was properly introduced. If the developer solution is not pink after adding the specimen, discard the Developer Solution Vial as infectious waste, open a new Divided Pouch, and collect a new specimen.
6. Remove the Test Device from the Divided Pouch without touching the flat pad. Insert the Test Device, flat pad first, into the Developer Solution Vial containing the specimen. **Be sure that the result window faces forward and the flat pad touches the bottom of the Developer Solution Vial**.
7. Leave the Test Device in the Developer Solution Vial and start a timer. **Do not remove the Test Device from the vial until you have read the results.** Read the results after at least 20 minutes but not more than 60 minutes in a well-lighted area. Read the results as indicated in the *Test Results and Interpretation of Results* section in this package insert.
8. After recording the results, dispose of the used Developer Solution Vial and the Test Device in a biohazard waste container.
9. Follow CDC guidelines to inform the test subject of the test result and its interpretation.[6]



QUALITY CONTROL

The OraQuick® Rapid HIV-1 Antibody Test has a built-in procedural control that demonstrates assay validity. A reddish-purple line in the Control (C) zone of the result window indicates that a specimen was added and that the fluid migrated appropriately through the Test Device. The control line will appear on all valid tests, whether or not the sample is positive or negative for antibodies to HIV-1. (Refer to *Test Results and Interpretation of Results* section below.)

OraQuick® Rapid HIV-1 Antibody Test Kit Controls are available separately for use only with the OraQuick® Rapid HIV-1 Antibody Test. The Kit Controls are used to verify your ability to properly perform the test and interpret the results. **Kit Controls should be run under the following circumstances:**

- **by each new operator prior to performing testing on patient specimens,**
- **whenever a new lot of the OraQuick® Rapid HIV-1 Antibody Test is used for the first time,**
- **if there is a change in the conditions of testing (e.g., new location, lighting, temperature, etc.), and**
- **at periodic intervals specified in your quality assurance program.**

Refer to the OraQuick® Rapid HIV-1 Antibody Test Kit Controls package insert for instructions on the use of these reagents. It is the responsibility of each laboratory using the OraQuick® Rapid HIV-1 Antibody Test to establish an adequate quality assurance program to ensure the performance of the device under their specific locations and conditions of use.

TEST RESULTS AND INTERPRETATION OF RESULTS–

Refer to the result window on the Test Device.

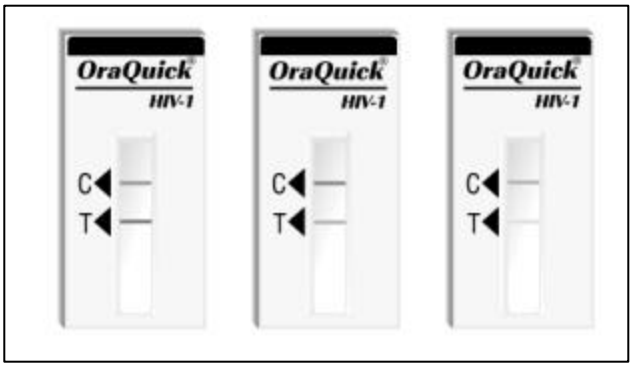
NON-REACTIVE

The diagram at the right shows an example of a **Non-Reactive** test result.

If a line appears in the result window in the area adjacent to the triangle labeled "C", and **no line** appears in the area adjacent to the triangle labeled "T", the result is **Non-Reactive**.

A **Non-Reactive** test result means that anti-HIV-1 antibodies were not detected in the specimen. The test result is interpreted as **NEGATIVE for HIV-1 antibodies**.

REACTIVE

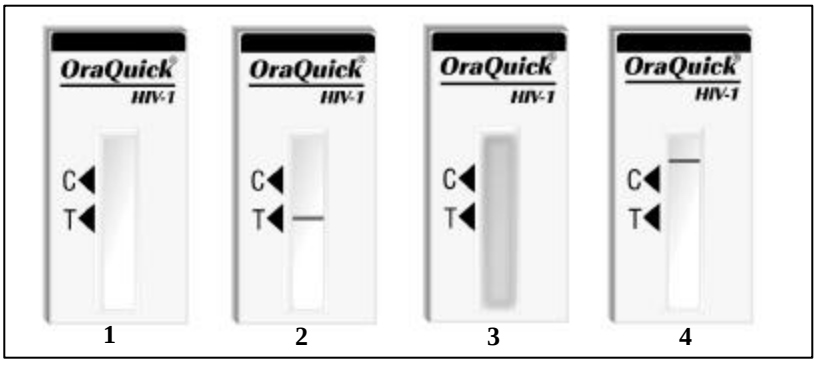


The diagrams at the right show examples of a **Reactive** test result.

If a line appears in the result window in the area adjacent to the triangle labeled "C" **and** a line appears in the area adjacent to the triangle labeled "T", the result is considered **Reactive**.
One of these lines may be darker than the other.
The presence of **any** reddish-purple line in the area adjacent to the "T" triangle **and** in the area adjacent to the "C" triangle, no matter how faint these lines are, is considered to be a **Reactive** result.

A **Reactive** test result means that anti-HIV-1 antibodies have been detected in the specimen. The test result is interpreted as **PRELIMINARY POSITIVE for HIV-1 antibodies**.

INVALID



The diagrams at the right show examples of an invalid test result.

A test is **Invalid** if any of the following occurs:

- no line is present in the area adjacent to the "C" triangle (see Diagram 1 and 2)
- a red background in the result window makes it difficult to read the results after 20 minutes (see Diagram 3)
- any of the lines appear outside of the areas adjacent to the "C" or "T" triangles (see Diagram 4)

An **Invalid** test result means that there was a problem running the test, either related to the specimen or to the Test Device. An **Invalid** result cannot be interpreted.

An Invalid test should be repeated with a new Test Device, Developer Solution Vial, and fingerstick blood specimen.

LIMITATIONS OF THE TEST

1. The OraQuick® Rapid HIV-1 Antibody Test must be used in accordance with the instructions in this package insert to obtain an accurate result.
2. Reading test results earlier than 20 minutes or later than 60 minutes may yield erroneous results.

3. This test is approved by FDA for use with fingerstick blood specimens only. Use of other types of specimens may not yield accurate results.
4. A Reactive result using the OraQuick® Rapid HIV-1 Antibody Test suggests the presence of anti-HIV-1 antibodies in the specimen. The OraQuick® Rapid HIV-1 Antibody Test is intended as an aid in the diagnosis of infection with HIV-1. AIDS and AIDS-related conditions are clinical syndromes and their diagnosis can only be established clinically.
5. For a Reactive result, the intensity of the test line does not necessarily correlate with the titer of antibody in the specimen.
6. A Non-Reactive result does not preclude the possibility of exposure to HIV or infection with HIV. An antibody response to recent exposure may take several months to reach detectable levels.

PERFORMANCE CHARACTERISTICS

SENSITIVITY

A sensitivity study was performed at eight dinical trial sites using freshly obtained fingerstick whole blood samples from 481individuals known to be infected with HIV-1 and 40 AIDS patients. Of the 521 specimens that were repeatedly reactive using a licensed EIA and positive by Western blot, 519 gave a Reactive result on the OraQuick® Rapid HIV-1 Antibody Test. The results of this study are shown in Table 1.

A separate study was performed at seven clinical trial sites using 625 freshly obtained fingerstick whole blood samples from previously unscreened individuals from high-risk populations. The results of this study are also shown in Table 1. Of the 625 specimens tested, 20 were repeatedly reactive using a licensed EIA, of which 17 were positive by Western blot. These same 17 specimens gave a Reactive result using the OraQuick® Rapid HIV-1 Antibody Test.

TABLE 1
Detection of Antibody to HIV-1 in Fingerstick Whole Blood Samples from Patients with AIDS and from HIV-1 Seropositive Individuals

Test Group	Total Samples	OraQuick® Reactive	Licensed EIA Repeatedly Reactive	Western Blot Positive
AIDS	40	40	40	40
Known HIV-1 Positive	481	479	481	481
High-Risk	625	17	20 [1]	17
TOTAL	1146	536	541	538

[1] Two specimens were negative and one was indeterminate on Western blot.

Combining the number of OraQuick® Reactive results obtained from the study of confirmed positives with the number of OraQuick® Reactive results obtained from the study of high-risk populations, the sensitivity of the OraQuick® Rapid HIV-1 Antibody Test in these studies was calculated to be 536/538 = 99.6% (95% C.I. = 98.5% - 99.9%).

To assess the sensitivity of the OraQuick® Rapid HIV-1 Antibody Test for HIV-1 variants from various geographic regions, 215 confirmed HIV-1 antibody-positive specimens were obtained from various parts of the world. Of these 215 specimens, 214 were Reactive using the OraQuick® Rapid HIV-1 Antibody Test. One confirmed HIV-1 antibody-positive specimen from China was Non-Reactive using the OraQuick® test.

Eleven HIV-1 seroconversion panels were tested in comparison with licensed anti-HIV EIA tests. Each panel consisted of sequential specimens obtained from a single individual during seroconversion. The eleven seroconversion panels consisted of 69 specimens. The results of this study are shown in Table 2. In this study, the OraQuick® Rapid HIV-1 Antibody Test was demonstrated to be capable of detecting seroconversion similar to currently available FDA licensed EIAs.

TABLE 2

Comparison of the OraQuick® Rapid HIV-1 Antibody Test and Licensed Anti-HIV EIA Tests Using Seroconversion Panels

Specimen Information			Licensed Anti-HIV EIA Tests				
Panel	Relative Day of Bleed	**OraQuick® Test**	EIA #1	EIA #2	EIA #3	EIA #4	EIA #5
K	1	NR	NR	NR	NR	NR	NR
	7	NR	NR	NR	NR	NR	NR
	9	NR	NR	NR	NR	NR	NR
	14	**R**	NR	**RR**	NR	NR	NR
	16	**R**	NR	**RR**	NR	NR	NR
	21	**R**	NR	**RR**	NR	**RR**	**RR**
	23	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	30	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	34	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	37	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
N	1	**R**	**RR**	**RR**	NR	NR	NR
	5	**R**	**RR**	**RR**	NR	**RR**	NR
	8	**R**	**RR**	**RR**	NR	**RR**	NR
	26	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	32	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
Q	1	NR	NR	NR	NR	NR	NR
	54	NR	NR	NR	NR	NR	NR
	58	NR	NR	NR	NR	NR	NR
	61	NR	NR	**RR**	NR	NR	NR
	66	**R**	NR	**RR**	NR	NR	NR
	68	**R**	**RR**	**RR**	NR	NR	NR
	73	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
R (M)	3	NR	NR	**RR**	NR	NR	NR
	8	NR	NR	**RR**	NR	NR	NR
	14	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	16	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	22	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
S	1	NR	NR	NR	NR	NR	NR
	10	**R**	**RR**	**RR**	NR	NR	NR
	12	**R**	**RR**	**RR**	NR	**RR**	NR
W	1	NR	NR	NR	NR	NR	NR
	8	NR	NR	NR	NR	NR	NR
	13	NR	NR	NR	NR	NR	NR
	15	NR	NR	NR	NR	NR	NR
	29	NR	NR	NR	NR	NR	NR
	31	NR	NR	NR	NR	NR	NR
	36	NR	NR	NR	NR	NR	NR
	38	NR	NR	NR	NR	NR	NR
	48	NR	NR	**RR**	NR	NR	NR
	85	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	87	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	146	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	162	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
AB	1	NR	NR	NR	NR	NR	NR
	29	NR	NR	**RR**	NR	NR	NR
	34	**R**	**RR**	**RR**	NR	NR	NR
	36	**R**	**RR**	**RR**	NR	NR	**RR**
	41	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
AC	1	NR	NR	NR	NR	NR	NR

	112	NR	NR	**RR**	NR	NR	NR
	121	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	126	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	131	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
AE	1	NR	NR	NR	NR	NR	NR
	4	NR	NR	NR	NR	NR	NR
	8	NR	NR	**RR**	NR	NR	NR
	11	NR	**RR**	**RR**	NR	**RR**	NR
AF	1	NR	NR	NR	NR	NR	NR
	3	NR	NR	NR	NR	NR	NR
	8	NR	NR	NR	NR	NR	NR
	10	NR	NR	NR	NR	NR	NR
	16	NR	NR	NR	NR	NR	NR
	29	**R**	NR	**RR**	NR	NR	NR
	34	**R**	**RR**	**RR**	NR	**RR**	**RR**
	36	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	43	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
AI	1	NR	NR	NR	NR	NR	NR
	8	**R**	**RR**	**RR**	NR	NR	**RR**
	12	**R**	**RR**	**RR**	NR	**RR**	**RR**

NR = Non-Reactive; R = Reactive; RR = Repeatedly Reactive

Two low titer HIV-1 antibody panels were tested in comparison with licensed anti-HIV EIA tests. The low titer antibody panels consisted of 30 specimens. The results of this study are shown in Table 3. In this study, the OraQuick® Rapid HIV-1 Antibody Test was demonstrated to be capable of detecting antibodies to HIV-1 similar to currently available FDA licensed EIAs.

TABLE 3
Comparison of the OraQuick® Rapid HIV-1 Antibody Test and Licensed Anti-HIV EIA Tests Using Low Titer HIV-1 Antibody Panels

Specimen Information			Licensed Anti-HIV EIA Tests				
Panel	Member	**OraQuick® Test**	EIA #1	EIA #2	EIA #3	EIA #4	EIA #5
LT106	1	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	2	NR	NR	**RR**	NR	NR	NR
	3	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	4	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	5	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	6	NR	NR	NR	NR	NR	NR
	7	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	8	NR	**RR**	**RR**	NR	NR	NR
	9	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	10	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	11	**R**	**RR**	**RR**	NR	NR	**RR**
	12	**R**	**RR**	**RR**	NR	NR	**RR**
	13	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	14	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	15	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
LT107	1	NR	NR	**RR**	**RR**	NR	NR
	2	**R**	NR	**RR**	**RR**	**RR**	NR
	3	**R**	NR	**RR**	NR	NR	NR

	4	**R**	**RR**	**RR**	**RR**	**RR**	NR
	5	NR	NR	NR	NR	NR	NR
	6	**R**	**RR**	**RR**	**RR**	**RR**	NR
	7	NR	NR	**RR**	**RR**	NR	NR
	8	NR	NR	**RR**	NR	**RR**	NR
	9	NR	NR	**RR**	NR	NR	NR
	10	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	11	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	12	NR	NR	**RR**	NR	NR	NR
	13	NR	NR	**RR**	**RR**	NR	NR
	14	**R**	**RR**	**RR**	**RR**	**RR**	**RR**
	15	**R**	**RR**	**RR**	**RR**	**RR**	**RR**

NR = Non-Reactive; R = Reactive; RR = Repeatedly Reactive

To assess the impact of unrelated medical conditions or interfering substances on the sensitivity of the OraQuick® Rapid HIV-1 Antibody Test, 200 specimens from a variety of medical conditions unrelated to HIV-1 infection and 125 specimens with interfering substances were spiked with an HIV-1 positive specimen to give a level of reactivity in the low positive range (see list of medical conditions and interfering substances in Table 5 below). All spiked specimens gave Reactive results.

SPECIFICITY

A specificity study was performed at eight clinical trial sites using freshly obtained fingerstick whole blood samples from 1250 previously unscreened individuals at low risk for HIV-1 infection. In the course of this study, two specimens were confirmed to have antibodies to HIV-1 and were removed from the specificity calculation. All of the remaining specimens gave Non-Reactive results using the OraQuick® Rapid HIV-1 Antibody Test. In addition, all of the 608 HIV-1 antibody-negative specimens from the high-risk study also gave Non-Reactive results using the OraQuick® test. The results of this study are shown in Table 4.

TABLE 4
Performance of the OraQuick® Rapid HIV-1 Antibody Test on Specimens from Individuals Presumed to be Negative for HIV Infection

Test Group	Total Samples	OraQuick® Non-Reactive	Licensed EIA Non-Reactive	True Negative [3]
Low-Risk	1250 [1]	1248	1247 [2]	1248
High-Risk	625	608	605	608
TOTAL	1875	1856	1853	1856

[1] Two specimens in the low-risk study that gave Reactive results using the OraQuick® test, repeatedly reactive results using a licensed EIA, and positive results using a licensed Western blot were removed from the calculation of specificity.
[2] One specimen was EIA repeatedly reactive, Western blot negative.
[3] True negative status based on negative or indeterminate test results using a licensed Western blot.

Combining the number of OraQuick® Non-Reactive results obtained from the study of the low-risk populations with the number of OraQuick® Non-Reactive results obtained from the study of the high-risk populations, the specificity of the OraQuick® Rapid HIV-1 Antibody Test in these studies was calculated to be 1856/1856 = 100% (95% C.I. = 99.7% - 100%).

To assess the impact of unrelated medical conditions or interfering substances on the specificity of the OraQuick® Rapid HIV-1 Antibody Test, 321 specimens from a variety of medical conditions unrelated to HIV-1 infection and 119 specimens with interfering substances were analyzed. The results of this study are shown in Table 5. One specimen from subjects known to be positive for EBV, for HBV, or for rheumatoid factor, one from a multiparous woman, and three specimens from known HAV infected subjects gave false positive results.

TABLE 5
OraQuick® Rapid HIV-1 Antibody Test Reactivity with Specimens from Individuals with Potentially Interfering Medical Conditions and Specimens with Interfering Substances

Medical Condition (n = 321)	OraQuick® Results	
	Reactive	Non-Reactive
Multiparous women	1 [2]	14
Anti-nuclear antibody (ANA)	0	17
Lupus	0	15
Rheumatoid factor	1 [2]	17
Cytomegalovirus (CMV)	0	15
Epstein Barr virus (EBV)	1 [2]	14
Hepatitis A virus (HAV)	3 [1]	17
Hepatitis B virus (HBV)	1 [2]	16
Hepatitis C virus (HCV)	0	15
Human T-cell Lymphotropic virus Type I (HTLV-I)	0	15
Human T-cell Lymphotropic virus Type II (HTLV-II)	0	15
Rubella	0	15
IgG gammopathies	0	13
IgM gammopathies	0	12
Syphilis	0	15
Toxoplasmosis	0	15
Tuberculosis	0	15
Influenza	0	10
Multiple transfusions	0	10
Hemophiliacs	0	10
Herpes Simplex virus	0	5
Cirrhosis	0	5
Dialysis patient	0	4
Colon cancer	0	4
HTLV I/II	0	2
Chlamydia	0	3
Anti-scl or anti-rnp antibody	0	3
Breast cancer	0	1
Anti-DNA antibody	0	1
Gonorrhea	0	1
Interfering Substances (n = 119)		
Elevated Bilirubin	0	20
Elevated Hemoglobin	0	20
Elevated Triglycerides	0	20
Elevated Protein	0	20
Bacterially Contaminated	0	25
Visual Hemolysis (hemolytic)	0	5
Icteric	0	5
Lipemic	0	4

[1] A total of 3 of the 20 HAV specimens were OraQuick® falsely Reactive. Two of the 3 specimens were OraQuick® Non-Reactive at the 20-25 minute read time and Reactive at the 55-60 minute read time. The remaining specimen was Reactive at both read times.
[2] One of the specimens was OraQuick® Non-Reactive at the 20-25 minute read time and Reactive at the 55-60 minute read time.

REPRODUCIBILITY

The reproducibility of the OraQuick® Rapid HIV-1 Antibody Test was tested at 3 sites using 3 lots of the device on 3 different days with 9 operators (3 per site). A blind-coded panel was tested that consisted of 5 contrived blood specimens (4 antibody-positive and 1 antibody-negative). Test results were recorded at 20-25 minutes and at 55-60 minutes. A total of 405 tests were performed (135/site), with a total of 81 tests per panel member. The overall reproducibility of the OraQuick® Rapid HIV-1 Antibody Test was 405/405 = 100%. Concordance between the specified assay read time limits was 99.8% (404/405); a single HIV-1 low positive panel member that was Non-Reactive at the 20-25 minute read time was Reactive at the 55-60 minute read time.

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