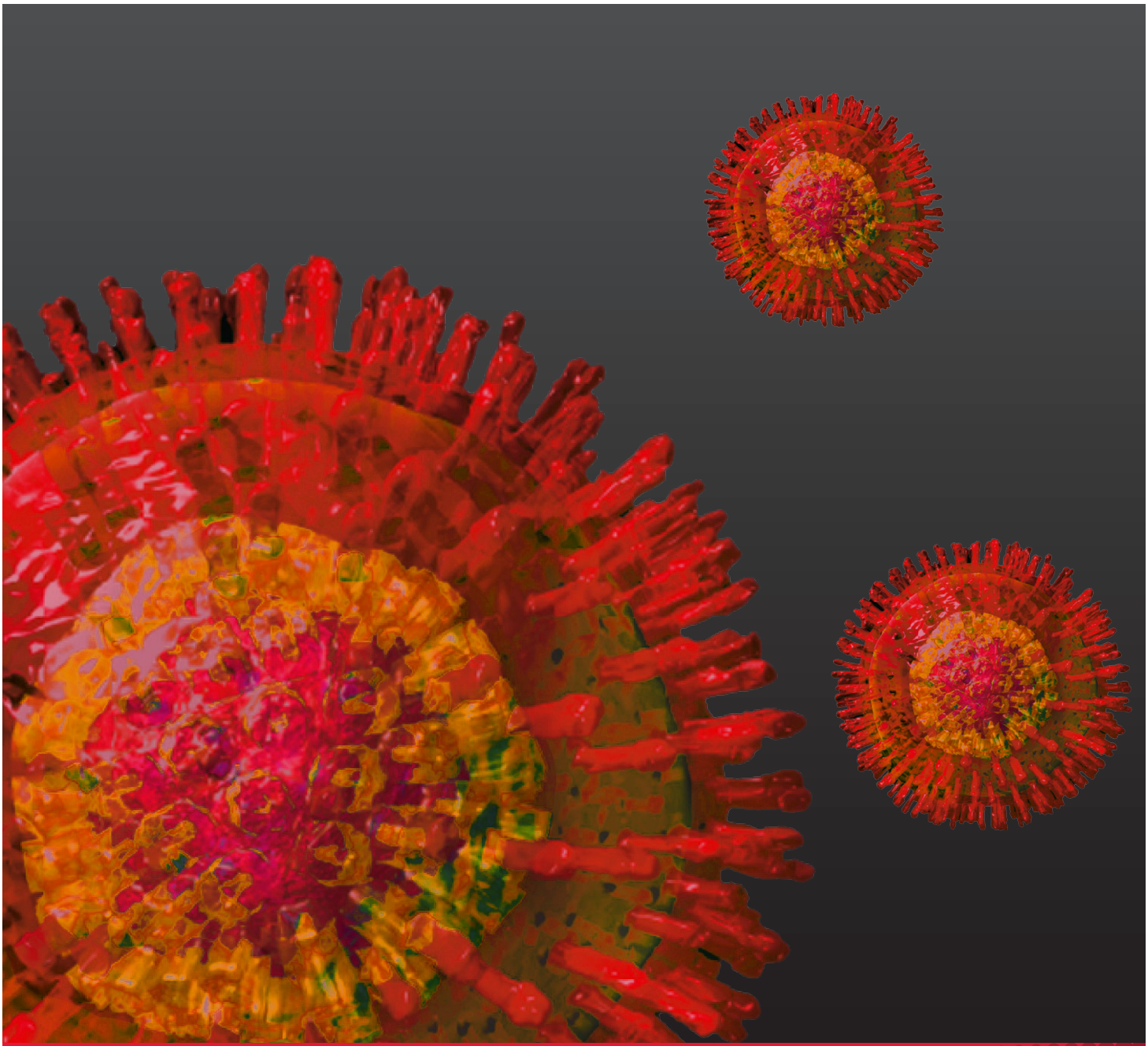
Luminex® MultiCode® Technology



MultiCode®-RTx HSV 1&2 Kit

For *In Vitro* Diagnostic Use
Real-Time PCR Qualitative Detection and Typing of HSV-1 or HSV-2

Detection and typing of HSV 1&2 completed in < 4 hours

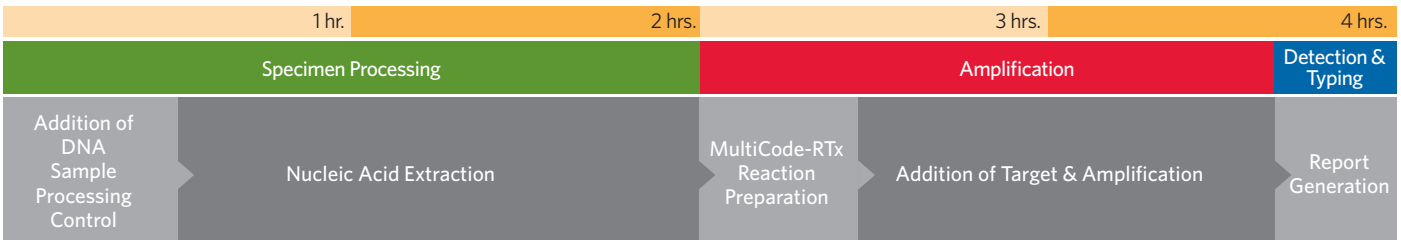


Figure 1. MultiCode-RTx HSV 1&2 Kit Workflow.

Background

Herpes Simplex Virus (HSV) is a common human pathogen found worldwide which produces a wide variety of diseases. HSV infects neonates, children and adults, and, by the fourth decade, more than 90% of the adult population demonstrates antibodies to HSV.[1] HSV transmission can result from direct contact with infected secretions from either a symptomatic or an asymptomatic host.

Herpes simplex virus has been characterized into 2 distinct serotypes: HSV-1 and HSV-2. HSV-1 is generally associated with infection in the tongue, mouth, lips, pharynx and eyes, whereas HSV-2 is primarily associated with genital and neonate infection.

Viral isolation (culture), direct fluorescent antibody (DFA) testing, and serology can be used to diagnose HSV infections. Positive culture and DFA are the most definitive and viral isolation allows typing of the viral isolate. However, length of culture time, specimen collection and transport difficulties, procedural complexity, and other variables are associated with DFA and culture.[1, 2]

Studies have shown that nucleic acid amplification tests such as PCR are more sensitive than viral isolation and antigen detection methods for the detection of HSV from a variety of sites.[3-5]

The MultiCode-RTx HSV 1&2 Kit utilizes real-time PCR molecular detection. MultiCode-RTx technology site-specifically incorporates an isoG triphosphate, covalently attached to a DABCYL quencher, opposite an isoC base that is adjacent to a 5′ fluorescent label in one of the primers. MultiCode-RTx technology does not require probes because specific amplification during PCR can be measured by a decrease in fluorescence.

Features

- **Probe-free, MultiCode-RTx technology for real-time PCR detection and typing of HSV DNA from vaginal lesion swabs**
- **Same day results for rapid turnaround time**
- **Streamlined workflow simplifies implementation for both large and small laboratories**
- **Utilizes commonly available instrumentation for extraction and PCR**
- **Established sensitivity and specificity[6]**
- **Reproducibility: overall agreement of 99.7%[6]**
- **Includes Sample Processing Control for monitoring extraction and amplification**
- **MultiCode-RTx HSV 1&2 Kit Software for automatic analysis and result reporting**

It is indicated for use in the detection and typing of HSV-1 or HSV-2 in vaginal lesion swab specimens from symptomatic female patients over 18 years of age as an aid in the diagnosis of genital herpes infection.

REFERENCES:

1. Aurelian, L. *Herpes Simplex Viruses*. 473-497. In Specter, S & G Lancz (eds.). *Clinical Virology Manual*. 2nd Ed. Elsevier, New York. (1992).
2. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines 2002. MMWR 2002:5 1 (No. RR-6).
3. Arvin, A. C. Prober. *Herpes Simplex Viruses*. 876-883. In Murray, P., E. Baron, M. Pfaller, F. Tenover, and R. Yolkenet (eds.). *Manual of Clinical Microbiology*. 6th Ed. ASM, Washington, D.C. (1995).
4. Koenig M, K. S. Reynolds, W. Aldous, and M. *Hickman*. 2001. Comparison of Light-Cycler PCR, enzyme immunoassay, and tissue culture for detection of herpes simplex virus. Diagn. Microbiol. Infect. *Dis*. 40(3):107-10.
5. Filén F., A. Strand, A. Allard, J. Blomberg, and B. *Herrmann*. 2004. Duplex real-time polymerase chain reaction assay for detection and quantification of herpes simplex virus type 1 and herpes simplex virus type 2 in genital and cutaneous lesions. Sex. Transm. *Dis*. 31(6):331-6.
6. MultiCode-RTx HSV 1&2 Kit Package Insert, Version 6, August 2011.

Warning: The device is not FDA-cleared for use with cerebral spinal fluid (CSF) or any lesions other than vaginal.
This assay is not intended to be used for male penile specimens, for prenatal screening or for females under the age of 18 years.

Clinical Performance: Results from Prospective Clinical Study[6]

Herpes Simplex Virus Type 1 Comparison Results

		Reference Method[a]		
		Positive	Negative	Total
MultiCode®-RTx HSV 1 & 2 Kit	Positive	97	16[b]	113
	Negative	8[c]	920	928
	Total	105	936	1041

	Value	95% Confidence Interval
Sensitivity	92.4%	85.7-96.1%
Specificity	98.3%	97.2-98.9%

a. Cell culture based ELVIS® HSV ID/Typing Test System.

b. Sequence analysis detected HSV-1 in 12 of the 16 discordant samples identified as HSV-1 by MultiCode-RTx. Sequence analysis did not detect HSV-1 in 4 of the discordant samples.

c. Sequence analysis detected HSV-1 in 1 of the 8 discordant samples identified as HSV-1 negative by MultiCode-RTx. Sequence analysis did not detect HSV-1 in 7 of the discordant samples. Of these 7 discordant samples: 4 of the samples were identified as HSV-2 by both MultiCode-RTx and sequencing, 2 of the samples were negative by MultiCode-RTx and not detected by sequencing, and 1 sample was negative by MultiCode-RTx and HSV-2 positive by sequencing.

Herpes Simplex Virus Type 2 Comparison Results

		Reference Method[a]		
		Positive	Negative	Total
MultiCode®-RTx HSV 1 & 2 Kit	Positive	198	53[b]	251
	Negative	10[c]	780	790
	Total	208	833	1041

	Value	95% Confidence Interval
Sensitivity	95.2%	91.4-97.4%
Specificity	93.6%	91.8-95.1%

a. Cell culture based ELVIS® HSV ID/Typing Test System.

b. Sequence analysis detected HSV-2 in 43 of the 53 discordant samples identified as HSV-2 by MultiCode-RTx. Sequence analysis did not detect HSV-2 in 10 of the discordant samples.

c. Sequence analysis detected HSV-2 in 2 of the 10 discordant samples identified as HSV-2 negative by MultiCode-RTx. Sequence analysis did not detect HSV-2 in 8 of the discordant samples. These 8 samples were identified as HSV-1 by both MultiCode-RTx and sequencing.

A total of 69 specimens were reference method negative and MultiCode-RTx HSV 1&2 Kit positive for HSV-1 or HSV-2.
DNA sequencing analysis agreed in 55 of these 69 specimens with the MultiCode-RTx HSV 1&2 Kit results.

Precision/Reproducibility[6]

Panel Member ID	Site #1 Agreement with Expected Results	Site #2 Agreement with Expected Results	Site #3 Agreement with Expected Results	Total Agreement with Expected Results (%)	95% Confidence Interval
HSV-1 Positive Control	10/10	10/10	10/10	30/30 (100%)	88.4-100%
HSV-2 Positive Control	10/10	10/10	10/10	30/30 (100%)	88.4-100%
HSV-1/HSV-2 Negative Control	10/10	10/10	10/10	30/30 (100%)	88.4-100%
PN 1750 HSV-1 Positive External Control	30/30	29/30	30/30	89/90 (98.9%)	93.9-100%
PN 1751 HSV-2 Positive External Control	30/30	29/30	30/30	89/90 (98.9%)	93.9-100%
PN 1754 HSV-1/HSV-2 Negative External Control	30/30	30/30	30/30	90/90 (100%)	95.9-100%
HSV-1 High Negative	30/30	30/30	30/30	90/90 (100%)	95.9-100%
HSV-1 Low Positive	30/30	29/30	30/30	89/90 (98.9%)	93.9-100%
HSV-1 High Positive	30/30	30/30	30/30	90/90 (100%)	95.9-100%
HSV-2 High Negative	30/30	30/30	30/30	90/90 (100%)	95.9-100%
HSV-2 Low Positive	30/30	30/30	30/30	90/90 (100%)	95.9-100%
HSV-2 High Positive	30/30	30/30	30/30	90/90 (100%)	95.9-100%

ORDERING INFORMATION

Item	Part Number
MultiCode®-RTx HSV 1&2 Kit	3711
MultiCode®-RTx HSV 1&2 Kit Analysis Software and Package Insert	3712
• Analysis Software CD-ROM	3591
• Instructions for Use	4042

For more information about MultiCode Technology and products,
contact Luminex Madison Customer Support toll free at 866-327-3290 or visit: www.luminexcorp.com/MultiCode

Products are region specific.
Please contact us at **support-eragen@luminexcorp.com** to obtain the appropriate product information for your country of residence.

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