



Innovative Molecular Solutions

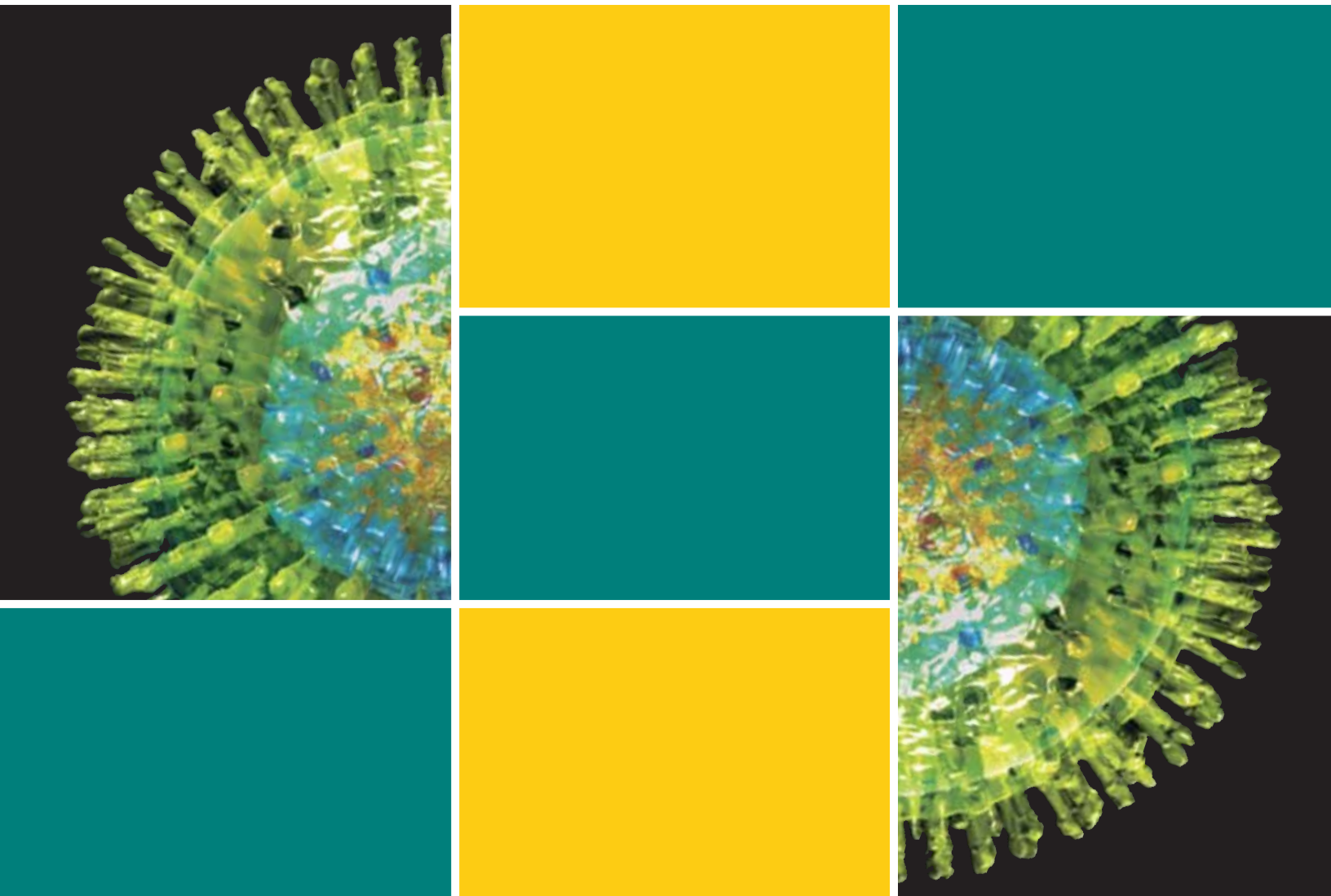
Exceptional Customer Support

First IVD Molecular HSV Test for Vaginal Lesion Swabs

MultiCode[®]-RTx HSV 1&2 Kit

For *In Vitro* Diagnostic Use

Real-Time PCR Qualitative Detection and Typing of HSV-1 or HSV-2



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} Most existing serologic methods for assessing HSV sero-status use viral lysate as antigens. Due to significant cross-reactivity between HSV-1 and HSV-2, the viral lysate assays are unable to differentiate HSV-1 infections from HSV-2 infections.³ Since most adults have had prior HSV-1 infection, often without primary or recurrent symptoms, HSV-2 serostatus is often impossible to determine with confidence using a viral lysate assay.³ Recent 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.⁴⁻⁶

MultiCode[®]-RTx HSV 1&2 Kit

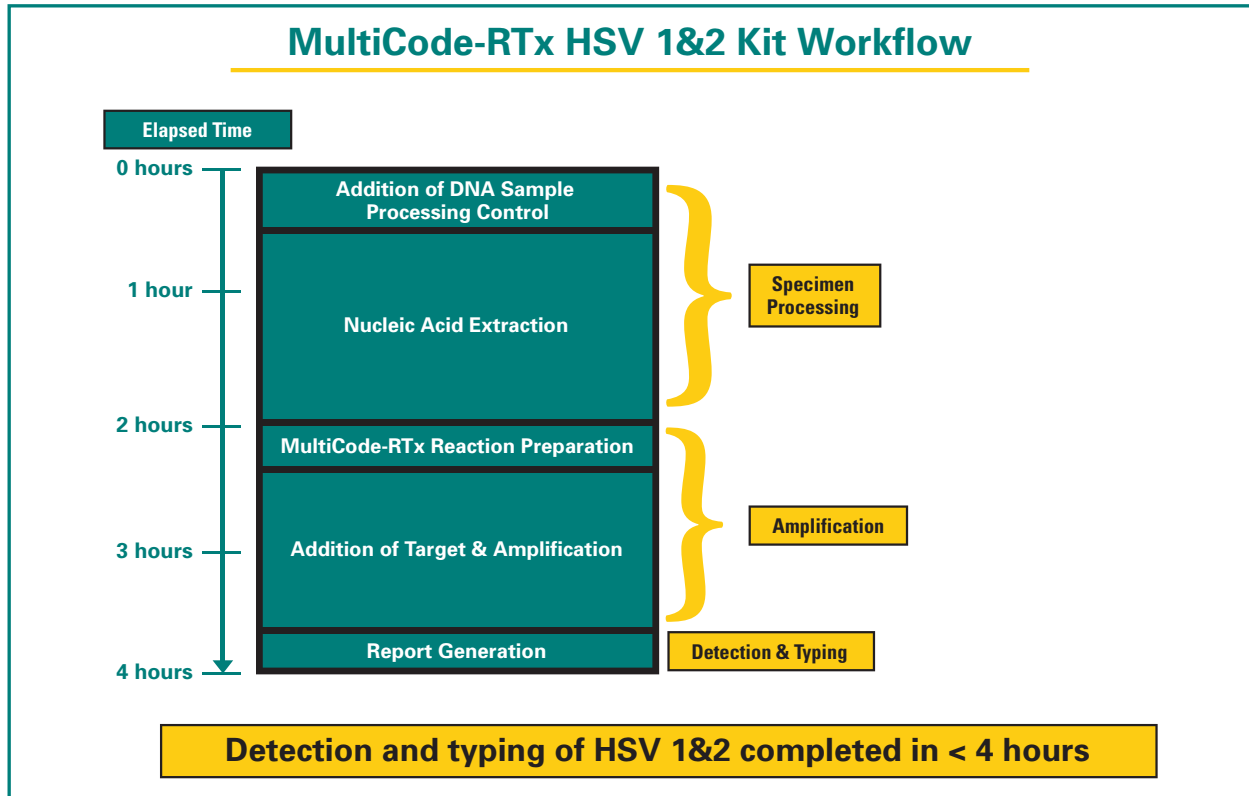
- For *In Vitro* Diagnostic Use
- Real-time PCR qualitative detection and typing of HSV DNA from vaginal lesion swabs
- MultiCode-RTx probe-free, real-time PCR technology powered by EraGen's patented MultiCode base pair: isoC:isoG
- Same day results for rapid turnaround time
- Streamlined workflow simplifies implementation for both large and small laboratories
- Utilizes a commonly available nucleic acid extraction system and real-time PCR instrument
- Established sensitivity and specificity⁷
- Reproducibility: overall agreement of 99.7%⁷
- Includes Sample Processing Control for monitoring extraction and amplification
- MultiCode-RTx HSV 1&2 Analysis 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.

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.

HSV 1&2

MultiCode-RTx HSV 1&2 Kit Workflow



Clinical Performance: Results from Prospective Clinical Study⁷

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/Reproducibility⁷

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%

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;51 (No. RR-6).
3. Arvin, A. C. Prober. Herpes Simplex Viruses. 876-883. In Murray, P., E. Baron, M. Pfaller, F. Tenover, and R. Tenover (eds.). Manual of Clinical Microbiology. 6th Ed. ASM, Washington, D.C. (1995).
4. Slomka M. J. 2000. Current diagnostic techniques in genital herpes: their role in controlling the epidemic. *Clin. Lab.* 46:591-607.
5. 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.
6. 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.
7. MultiCode®-RTx HSV 1&2 Kit Package Insert (PI-3711).

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, contact EraGen Customer Support Center at 866-327-3290 or sales@eragen.com.



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