REF **901000 NeuMoDx™ HHV-6 External Controls** Rx Only

CAUTION: For US Export Only

IVD For *In Vitro* Diagnostic Use with the NeuMoDx™ HHV-6 Quant Test Strip on the NeuMoDx™ 288 and NeuMoDx™ 96 Molecular Systems

This package insert must be read carefully prior to product use. Package insert instructions must be followed accordingly. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert.
For detailed instructions, refer to the NeuMoDx™ 288 Molecular System Operator's Manual; P/N 40600108
For detailed instructions, refer to the NeuMoDx™ 96 Molecular System Operator's Manual; P/N 40600317
See also the NeuMoDx™ HHV-6 Quant Test Strip Instructions For Use (package insert)

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INTENDED USE

The NeuMoDx™ HHV-6 External Controls are intended for use with the NeuMoDx™ HHV-6 Quant Test Strip to establish a runtime validity on the NeuMoDx™ 288 Molecular System and NeuMoDx™ 96 Molecular System (NeuMoDx™ System(s)) to process a quantitative in vitro diagnostic test to quantify and differentiate Human betaherpesvirus 6A (HHV-6A) DNA and/or Human betaherpesvirus 6B (HHV-6B) DNA.

SUMMARY AND EXPLANATION

The NeuMoDx™ HHV-6 External Controls are provided in a kit comprised of 15 positive vials, two NeuMoDx™ HHV-6 External Control Buffer and 30 empty secondary labelled tubes. One external control set is composed of one dried positive control tube sealed in a single aluminum pouch with a small orange desiccant sachet and NeuMoDx™ HHV-6 External Control Buffer used as negative control. One set of external controls is processed every 24 hours to establish runtime validity of the NeuMoDx™ HHV-6 Quant Assay. The NeuMoDx™ HHV-6 positive control contains a dried pellet of synthetic HHV-6A and HHV-6B target nucleic acid at 4 $\log_{10}$ IU/mL. The NeuMoDx™ HHV-6 negative control consists of NeuMoDx™ HHV-6 External Control Buffer only.

The NeuMoDx™ HHV-6 Quant Assay combines automated DNA extraction, amplification, and detection by real-time PCR to enable the quantitative detection of HHV-6A and/or HHV-6B DNA in human plasma. The NeuMoDx™ HHV-6 Quant Assay includes an exogenous DNA Sample Process Control (SPC1) to help monitor for the presence of potential inhibitory substances as well as NeuMoDx™ System or reagent failures that may be encountered during the extraction and amplification processes.

However, clinical laboratories typically require that external controls be incorporated into routine testing protocols to assess test performance and ensure that the test procedures meet established quality control requirements. The NeuMoDx™ HHV-6 External Controls are intended to be used to establish such routine run validity of the NeuMoDx™ HHV-6 Quant Assay. Routine use of these controls enables the laboratories to monitor day-to-day variation, lot-to-lot performance of the NeuMoDx™ HHV-6 Quant Assay reagents and can assist the lab in identifying errors prior to reporting of test results.

PRINCIPLES OF THE PROCEDURE

The NeuMoDx™ HHV-6 External Controls allow for the verification of efficacious extraction workflow and nucleic acid amplification procedure. One set of controls – consisting of 1 positive and 1 negative control – should be processed every 24 hours. Such routine processing of the NeuMoDx™ HHV-6 External Controls - enables the laboratories to ensure efficacy of the test results for human clinical specimens processed within the 24-hour validity period. The external controls are processed in a manner identical to the processing of the human clinical specimens intended for quantitative HHV-6A and HHV-6B testing.
Expected results for both external controls are incorporated into the Control Validity algorithm included in the NeuMoDx™ System software. Upon successful processing of the external controls, the system software automatically records the validity for a period of 24 hours. The system software automatically alerts the user to process the external controls when control validity period has expired.

REAGENTS/CONSUMABLES

Material Provided

REF	Contents	Tests per unit	Total Tests per kit
901000	**NeuMoDx™ HHV-6 External Controls** *Single use sets of HHV-6A and HHV-6B Positive and Negative Controls to establish daily validity of NeuMoDx™ HHV-6 Quant Assay (1 vial of positive control at 4 $\log_{10}$ copies/mL and NeuMoDx™* HHV-6 External Control *Buffer (negative control))*	1 set	15

Reagents and Consumables Required but Not Provided (Available Separately from NeuMoDx)

REF	Contents
202500	**NeuMoDx™ HHV-6 Quant Test Strip** *Freeze-Dried PCR reagents containing HHV-6A specific TaqMan® probes and primers, HHV-6B specific TaqMan® probes and primers in addition to SPC1-specific TaqMan® probe and primers.*
100200	**NeuMoDx™ Extraction Plate** *Dried paramagnetic particles, Lytic enzyme, and sample process controls*
801000	**NeuMoDx™ HHV-6 Calibrators** *Single use sets of HHV-6A High and Low Calibrators and HHV-6B High and Low Calibrators to establish standard curves.*
400400	**NeuMoDx™ Lysis Buffer 1**
400100	**NeuMoDx™ Wash Reagent**
400200	**NeuMoDx™ Release Reagent**
100100	**NeuMoDx™ Cartridge**
235903	**Hamilton CO-RE Tips (300 µL) with Filters**
235905	**Hamilton CO-RE Tips (1000 µL) with Filters**

For the reagents and consumables details please refers to the related insert

Instrumentation Required

NeuMoDx™ 288 Molecular System (REF 500100) or NeuMoDx™ 96 Molecular System (REF 500200).

WARNINGS & PRECAUTIONS

- The NeuMoDx™ HHV-6 External Controls are for *in vitro* diagnostic use only with the NeuMoDx™ HHV-6 Quant Test Strip as implemented on the NeuMoDx™ Systems.
- Do not use the NeuMoDx™ HHV-6 External Controls after the listed expiration date.
- Do not use the NeuMoDx™ HHV-6 External Controls if the safety seal is broken or if the packaging is damaged upon arrival.
- Do not use consumables or reagents if the protective pouch is open or broken upon arrival.
- Do not mix up reagents for amplification from other commercial kits.
- Do not reuse.
- Keep all the NeuMoDx™ HHV-6 External Controls protected from humidity in their aluminium envelopes with dedicated small orange desiccant sachet.
- Because the NeuMoDx™ HHV-6 positive controls contain HHV-6A and HHV-6B target material, they should be handled carefully as cross-contamination with test samples could produce a false-positive result.
- Always handle specimens as if they are infectious and in accordance with safe laboratory procedures such as those described in the OSHA Standard on Bloodborne Pathogens[1]. Biosafety Level 2[2] or other appropriate biosafety practices[3,4] should be used for materials that contain or are suspected of containing infectious agents.
- Do not pipette by mouth. Do not smoke, drink, or eat in areas where specimens or reagents are being handled.
- Dispose of unused reagents and waste in accordance with country, federal, provincial, state, and local regulations.
- Clean, powder-free, nitrile gloves should be worn when handling all NeuMoDx™ reagents and consumables.
- Safety Data Sheets (SDS) are provided for each reagent (as applicable) at www.neumodx.com/client-resources.
- A vertical bar in the text margin indicates changes in comparison to the previous insert version.
- Wash hands thoroughly after performing the test.

PRODUCT STORAGE, HANDLING & STABILITY

- The NeuMoDx™ HHV-6 External Controls are shipped at Room Temperature (+15 °C/+30 °C).
- The NeuMoDx™ HHV-6 External Controls Kit must be stored at +15 °C/+30 °C to ensure stability.
- External Control vials (negative control, reconstituted positive control and/or empty tubes) are intended for single use only. After use, discard the residual reconstituted NeuMoDx™ HHV-6 External Controls.
- Discard any unused material after use in biohazard waste as the material contains non-infectious target DNA and could cause a contamination risk.

INSTRUCTIONS FOR USE

1. One set of NeuMoDx™ HHV-6 External Controls (REF 901000) must be processed once every 24 hours. If a set of valid test controls does not exist, the NeuMoDx™ software will prompt for these controls to be processed before sample results can be reported.
2. If external controls are required, process the controls (1 positive control and 1 negative control per System):

NeuMoDx™ HHV-6 External Controls	Label Color Scheme	Barcode
Positive Control (PC)	Red	6ABPC
Negative Control (NC)	Black	6ABNC

3. If external controls are required, reconstitute the HHV-6 External Controls (1 positive control) and prepare negative control following the steps below.
4. Cut the aluminum pouch of positive control at the point indicated by the lateral notches.
5. Remove the HHV-6 positive control tube from the pouches immediately before use.
6. Before use, ensure that the pouches are well-sealed and that the desiccant sachets are still inside. Use only undamaged packages.
7. Discard the aluminum pouches and their contents if the desiccant sachets turn from orange to green.
8. Centrifuge the HHV-6 positive control tube prior to opening to ensure that DNA is at the bottom of the tube.
9. Vortex the NeuMoDx™ HHV-6 External Control Buffer and reconstitute the HHV-6 positive control tube with 800 µL of buffer. The reconstituted positive control tubes are intended for single use only.
10. Cap the reconstituted HHV-6 positive control tube and vortex it for 30 seconds until the dried DNA is resuspended.
11. Centrifuge the HHV-6 positive control tube for a few seconds at medium speed to remove any residue from the cap and eliminate bubbles/foam.
12. Incubate for at least 20 minutes at room temperature before use.
13. Vortex the HHV-6 positive control tube for few seconds at medium speed and centrifuge it for few seconds at medium speed.
14. Transfer all contents of the reconstituted HHV-6 positive control tube into a secondary empty labelled tube (NeuMoDx™ HHV-6 Positive Control (PC) tube included in the kit). It is advisable to transfer the positive control into the secondary empty tube immediately before use. Both reconstituted positive control and secondary tubes are intended for single use only.
15. Transfer 800 µL of NeuMoDx™ HHV-6 External Control Buffer into a secondary empty labelled tube (NeuMoDx™ HHV-6 Negative Control (NC) tube included in the kit). The filled secondary tubes are intended for single use only.
16. Load the control tubes into a standard 32-Tube Specimen Carrier.
17. Place the Specimen Tube Carrier on the Autoloader shelf and use the touchscreen to load carrier into the NeuMoDx™ System.
18. The NeuMoDx™ System will recognize the barcodes and start processing the specimen tubes unless reagents or consumables required for testing are not available.
19. Validity of the external controls will be assessed by the NeuMoDx™ System based on the expected results.

NeuMoDx™ HHV-6 External Controls	HHV-6A/HHV-6B Result	SPC1 Result
Positive Control (PC)	HHV-6A and HHV-6B Positive	N/A
Negative Control (NC)	HHV-6A and HHV-6B Negative	Valid

20. Discrepant result handling for external controls should be performed as follows:

a) A Positive test result reported for a negative control sample indicates a specimen contamination problem.

b) A Negative result reported for a positive control sample may indicate there is a reagent or instrument related problem.

c) In either of the above instances, repeat the failed control with new vial(s) of the control(s) failing the validity test.

d) If the Positive external control continues to report a Negative result, contact QIAGEN technical support.

e) If the Negative external control continues to report a Positive result, attempt to eliminate all sources of potential contamination, including replacing ALL reagents and repeat the run before contacting QIAGEN technical support.

LIMITATIONS

- The NeuMoDx™ HHV-6 External Controls can only be used in conjunction with NeuMoDx™ HHV-6 Quant Test Strip on the NeuMoDx™ Systems.
- A valid calibration of the NeuMoDx™ HHV-6 Quant Test Strip using NeuMoDx™ HHV-6 Calibrators (REF 801000) is required before the external controls can be processed.
- Erroneous results could occur from improper handling, storage, or other technical error.
- Operation of the NeuMoDx™ System is limited to use by personnel trained on the use of the NeuMoDx™ System.

REFERENCES

1. US Department of Labor, Occupational Safety and Health Administration. 29 CFR Part 1910.1030. Bloodborne Pathogens, https://www.osha.gov/lawsregs/regulations/standardnumber/1910/1910.1030.
2. US Department of Health and Human Services. Biosafety in Microbiological and Biomedical Laboratories, 5th Ed. Washington,DC: US Government Printing Office,December 2009.
3. World Health Organization. Laboratory Biosafety Manual, 3rd ed.Geneva: World Health Organization, 2004.
4. CLSI. Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline — Fourth Edition (M29-A4). Clinical and Laboratory Standards Institute, 2014.

TRADEMARKS

SYMBOLS

SYMBOL	MEANING
Rx Only	**Prescription use only**
	**Manufacturer**
	**Distributor**
IVD	***In vitro* diagnostic medical device**
REF	**Catalog number**
LOT	**Batch code**
	**Consult instruction for use**
	**Caution, consult accompanying documents**
	**Temperature limitation**
	**Keep dry**
	**Do not re-use**
	**Do not expose to the light**
	**Contains sufficient for *<n>* tests**
	**Use by**

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