Canine parvovirus (CPV)

Canine parvovirus type 2 (CPV-2) causes severe and highly contagious disease in dogs. The symptoms include lethargy, loss of appetite, fever, vomiting, and severe (often bloody) diarrhea.

Parvoviral infection must be considered as a possible diagnosis in any young dog with vomiting and/or diarrhea. Puppies and dogs usually become infected when they ingest a virus that has been passed in the feces of an infected dog. Vomiting and diarrhea can cause rapid dehydration, and most deaths from parvovirus occur within 48 to 72 hours following onset of clinical signs.

The disease can be prevented by vaccination and CPV-2 vaccine is recommended as a core vaccine that should be given to all dogs.

Reagents for detecting CPV-2

We provide several monoclonal antibodies (MAbs) specific to CPV-2. Antibodies bind recombinant CPV-2 capsid protein VP2 as well as CPV from clinical samples. We also offer the recombinant CPV VP2 antigen that could be used as a calibrator in immunoassays.

MONOCLONAL ANTIBODIES SPECIFIC TO CPV

All MAbs were tested as capture and detection antibodies in sandwich immunoassays. Capture antibodies were absorbed to microtiter plate wells. Detection antibodies were labeled with a stable europium chelate. Recombinant CPV-2 capsid protein VP2 (Cat.# 8CP2) was used as an antigen in the concentration 50 ng/ml. A number of combinations demonstrated high signal in sandwich immunoassay at this VP2 concentration (see Table 1).

Noteworthy, MAb 3G3 performed well as a capture antibody but did not react with VP2 when used as a detection antibody labeled with europium chelate. It should be noted that detection antibody activity depends on a number of factors including the type of label and labeling protocol. Therefore, MAb 3G3 labeled with another label could demonstrate better performance in our customers' immunoassays.

MAb combinations demonstrated highest sensitivity in sandvich immunoassayas are listed in Table 2. Calibration curves for these combinations are provided in Figure 1.

Table 1.
Possible MAb combinations for a sandwich immunoassay.

		Detection (Eu^{3+})				
		2A10	**3G3**	**3H6**	**5G7**	**8H7**
Capture	**2A10**	–	–	+	+	–
	3G3	+	–	+	+	+
	3H6	+	–	n/a	+	+
	5G7	+	–	+	+	+
	8H7	+	–	+	+	+

Table 2.
MAb combinations demonstrating high sensitivity in sandwich immunoassays.

Capture	Detection
5G7	8H7
3G3	8H7
3H6	8H7
5G7	3H6
3G3	3H6
2A10	3H6
5G7	2A10
3G3	2A10

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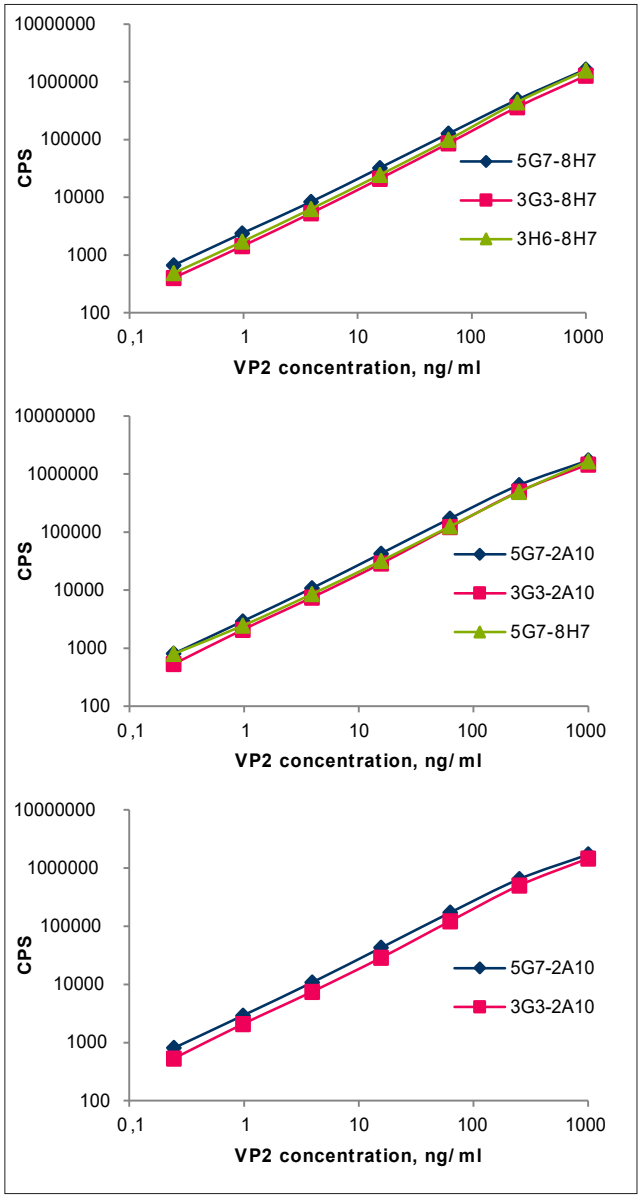

Figure 1.
Calibration curves for CPV sandwich immunoassays.
Capture MAb: 1 µg/well
Detection MAb: 200 ng/well, labeled with europium chelate
Antigen: canine recombinant CPV-2 capsid protein VP2 (Cat.# 8CP2)
Sample volume: 100 µl

RECOMBINANT CPV VP2 PROTEIN

CPV-2 has a non-enveloped spherical capsid assembled from three proteins (VP1, VP2 and VP3). VP1 and VP2 are products of the same gene that are generated by alternative splicing of viral mRNA.

Capsid contains 60 copies of a combination of VP1 (5-6 copies) and VP2 (54-55 copies). VP1 has an additional 143 aar in its N-terminus compared to VP2. VP3 is present only in full virions. It is formed as the result of proteolytic cleavage of 19 aar from the N-terminus of VP2. Empty capsids could be assembled from VP2 alone.

Our recombinant CPV-2 capsid protein VP2 can be used as a calibrator in immunoassays for detection of CPV or as an antigen in CPV antibody titer analyses.

The recombinant VP2 is expressed in a eukaryotic cell line. It consists of 584 amino acid residues and it does not contain any affinity tags. The protein is able to assemble into virus-like particles (VLPs, see Figure 2). VP2 is highly purified with purity exceeding 90% according to an SDS-PAGE (see Figure 3).

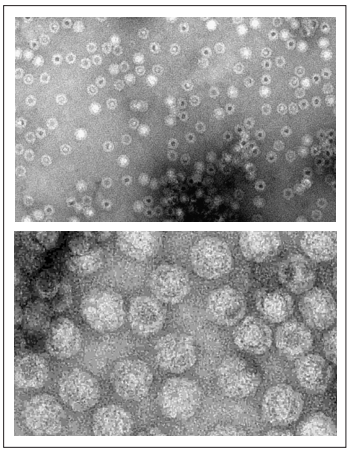

Figure 2.
Electron micrographs of CPV virus like particles produced by expression of the recombinant VP2 protein.

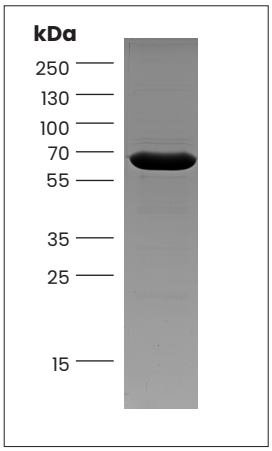

Figure 3.
SDS-PAGE of recombinant VP2.

ORDERING INFORMATION

MONOCLONAL ANTIBODIES

Product name	Cat. #	MAb	Subclass	Remarks
Canine parvovirus (CPV)	3PV16	5G7	IgG2a	EIA, WB. ID, HIT
		8H7	IgG2a	EIA, WB. ID, HIT
		2A10	IgG2a	EIA
		3G3	IgG2a	EIA
		3H6	IgG3	EIA

ANTIGEN

Product name	Cat. #	Purity	Source
Canine parvovirus (CPV) VP2, recombinant	8CP2	>90%	Recombinant

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HYTEST LTD
Intelligate 1, 6th floor, Joukahaisenkatu 6 • FI-20520 Turku, FINLAND
Tel. +358 2 512 0900 • E-mail: hytest@hytest.fi • HYTEST.FI