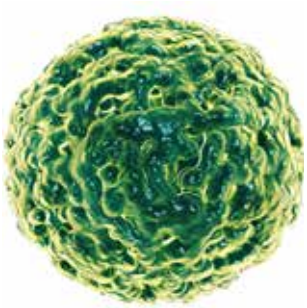
Caliciviridae (norovirus)



Noroviruses are highly contagious viruses that cause vomiting and diarrhea. In fact, most non-bacterial gastroenteritis infections are caused by noroviruses. These viruses are transmitted by the fecal-oral route and the source of infection is often contaminated food or water; for example, eating fresh or frozen berries without heating them first has been identified as a typical way of catching the disease. The virus also spreads easily when one comes into contact with infected individuals and from surfaces that they have touched. This means that the virus easily spreads among groups of people, for example in schools, in hospitals or even at home.

The Norovirus genus belongs to the Caliciviridae family of positive-sense single stranded RNA viruses. Other genera in this family are Vesivirus, Lagovirus, Sapovirus and Nebovirus. In addition to humans, different caliciviruses infect vertebrates such as cats, pigs, rabbits and cattle.

Diagnosing human norovirus

Laboratory detection methods for noroviruses mainly include electron microscopy and RT-qPCR. Different tests based on enzyme immunoassays are also available, although their sensitivity is not very good. Indeed, it has proven to be extremely difficult to develop sensitive antibodies that can enable the detection of antigenically divergent noroviruses. Immunodiagnostics methods would allow a fast and convenient detection of noroviruses, however, there is currently only one FDA approved test based on an enzyme immunoassay that is commercially available.

Feline calicivirus

Approximately half of the upper respiratory infections found in cats are caused by feline calicivirus (FCV). Infecting virus strains differ in their virulence and pathogenicity, and the symptoms also vary from mild to severe. An infected cat can continue to shed the virus even after the symptoms of the acute disease disappear. Despite vaccines having been available for decades and a systematic vaccination program, the virus remains a common cause of infection. The prevalence of FCV is higher in facilities that house several cats, such as catteries and shelters, although the virus can also be found in approximately 10% of cats that are kept as pets.

Reagents for immunoassay development

We provide five different monoclonal antibodies that detect caliciviruses. The antibodies were developed using the FCV and rabbit hemorrhagic disease virus (RHDV) as immunogens in order to obtain antibodies that would detect the most common epitopes of different caliciviruses. All MAbs detect human norovirus, feline calicivirus and the rabbit hemorrahgic disease virus.

Monoclonal antibodies

Immunological activity of monoclonal antibodies

The antibodies were tested for their ability to detect a field strain of human norovirus in a sandwich ELISA (see Figure 1).

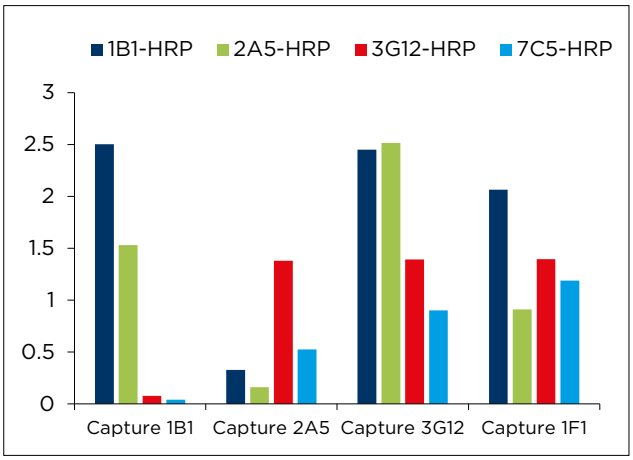


Figure 1. Immunological activity of several antibody pairs (capture-detection) in a sandwich immunoassay. A native human norovirus was used as the antigen.

Pair recommendations

Pair recommendations are outlined in Table 1. Please note that these recommendations are based on our internal testing and customer feedback. The performance of the antibodies is dependent on the platform and assay conditions, and we recommend testing several pair alternatives in order to find the best performing combinations.

Table 1. Pair recommendations for calicivirus detection

Capture	Detection
Human norovirus – lateral flow	
1B1	2A5
2A5	7C5
Human norovirus – sandwich immunoassay	
1B1	2A5
3G12	3G12
Feline calicivirus – sandwich immunoassay	
1F1	7C5
1B1	7C5
1B1	2A5

Ordering information

MONOCLONAL ANTIBODIES

Product name	Cat. #	MAb	Subclass	Remarks
Caliciviridae (norovirus)	3CNV1	1F1	IgG2a	EIA
		2A5	IgG2b	EIA, WB, HIT
		1B1	IgG2b	EIA, WB, HIT
		7C5	IgG2b	EIA, WB, HIT
		3G12	IgG2a	EIA, WB, HIT

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