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Antigen: **Feline/Canine/Porcine/Ferret/SARS-2003 & SARS-CoV-2 (COVID-19) Coronavirus Nucleoprotein.**
**BCV specific cross-reaction, see ref #75 Kalkanov et al 2018.**

*Monoclonal Designation:* **FIPV3-70** (Following information updated 02/29/20).
Ig Isotype/subclass plus light chain: **IgG2A kappa.**

**Specific reactivity and cross-reactivity**: Positive against nucleoprotein of FIPV (serotypes 1 and 2 equal positive); also CCV; TGEV, Ferret Coronavirus. FIPV3-70 also specifically recognizes SARS-2003* and SARS-CoV-2 (personal communication from investigators in South Korea).
Specific cross-reaction with Bovine Coronavirus is positive but possibly at a comaratively low level.

Negative against: Feline Leukemia Virus; Feline Immunodeficiency Virus; Feline Calicivirus; Feline Herpes Virus; Canine Adenovirus (type 2); Canine Distemper Virus; Canine Parvovirus; Canine Parinfluenza Virus.

Properties:
***Western blot***: gives a specific band in the 50 to 56 kDa region (consistent with nucleocapsid) in reducing gels using CCV. Using FIPV or COVID-19 patient material as antigen the nucleoprotein may be a tad smaller, blotting strongly in the 46 – 52 kDa range.

*ELISA*: Excellent ELISA probe. ***FIPV3-70 does NOT work well as a capture MAb immobilized on a plastic plate or other solid surface*** – the possible reason is that the FIPV3-70 binding site is situated in a "crypt-like" or coiled structure, and the Fab region is simply too short when fixed in place to reach in and bind to the amino-acid binding sequence.

V*irus neutralization*: not known but unlikely.
*Affinity Chromatography*: not known.
*Immunofluoresence*: Positive against CCV and FIPV (serotypes 1 and 2); not known against TGEV. Versus FIPV, MAb shows bright cytoplasmic staining with some cytoplasmic inclusions; zero nuclear staining or membrane activity. [Results provided by Dr. John Black (American BioResearch) using isolate TN-406 FIPV serotype 1 and HABER strain of FIPV serotype 2, both grown in CrFK cells].
*Immunohistochemistry*: Effective in paraffin embedded tissue to detect CCV; TGEV, and FIPV; conditions recommended are 10mM citrate pH6.0 and microwave antigen retrieval. The Mab will detect FIP in neural tissue and in the eye; Dr. Luc Poncelot (University Libre de Bruxelles). For further information on antigen retreival see ref #5 below (Ramos-Vera and Beissenherz).
*FACS Analysis*: Superb, as recently communicated by Dr. A. Moritz (Universitaet Giessen).

**Preparation and supply**: SpA purified from tissue culture supernatant and supplied in PBS pH 7.2 with 0.05% sodium azide as preservative. Biotin conjugated MAb also usually available. Pricing: $(US)745.00 per mg SpA purified; $(US)845.00 per mg SpA purified and biotin conjugated. Minimum order 1.0 mg.

**FIPV3-70** is also supplied under retail license to **Serotec (UK)**, and distributed by them under their catalogue number **MCA2194**, and also to **Santa Cruz Biotechnology** and distributed by them under the catalogue number **sc-65653**, for the convenience of customers who require small quantities on an irregular basis and are prepared to pay a substantial price mark-up for that convenience.

*FIPV/FCoV in Cats: Recent evidence has been obtained that anti-coronavirus specific MAb CCV2-2 detects more cases of FIP than does FIPV3-70. The result may be because the two MAbs bind different epitopes and the CCV2-2 detects an epitope that is*

*expressed earlier in symptomatic disease (12 positives in 70 samples with FIPV3-70, and 17 positives in 70 samples with CCV2-2 in one study, and 7 positives with FIPV3-70 and 14 positives with CCV2-2 in a second study). All FIPV3-70 positives were also positive with CCV2-2. In some tissue samples macrophages were detected carrying only the CCV2-2 or the FIPV3-70 virus epitope, in other samples macrophages carried both epitopes. It is suggested the two MAbs are directly compared. The binding sites of FIPV3-70 and CCV2-2 are both on the N-protein, but they are separate and distinct; these MAbs show NO competition for binding.*

***Recognition of SARS related Coronaviruses.** According to an on-line report by Suderman, NT, McCarthy M, Mossell E, Watts DM. Peters CJ, Shope R, and Goodwin TJ, 3-D human bronchial-tracheal epithelial tissue–like assemblies as hosts for Severe Acute Respiratory Syndrome-CoV Infection, (ref: NASA/TP-2006-213723) and FIPV3-70 was the MAb used in this study. Hence, FIPV3-70 specifically binds the SARS-associated nucleoprotein of coronavirus causing the 2003 epidemic. Very recently, investigators is South Korea have informed me that FIPV3-70 also specifically and avidly binds the nucleoprotein of the SARS-CoV-19 strain as detected in seriously sick patient sera. ***Clearly, FIPV3-70 will not provide a specific confirmation of COVID-19 disease, but the MAb will differentiate sera or other material from Coronvirus infected patients from patients with similar symptoms caused by any other class of viral agent.***

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Other related FIPV3-70 MAbs available: MAb CCV2-2-biotin works effectively as a probe with FIPV3-70 as a capture to provide a sensitive MAb/MAb ELISA for coronavirus in canine and feline biological fluids.