Anti-MERS-CoV ELISA Camel (IgG)

Indications: Test system for the in vitro determination of antibodies against MERS coronavirus in camelid serum or plasma.

Clinical significance: "Middle East Respiratory Syndrome" (MERS) was first reported in humans in 2012 and is caused by a novel coronavirus (MERS-CoV). So far, all human MERS-CoV infections have originated in the Middle East, particularly in Saudi Arabia. About 40% of known cases of this disease were fatal. Confirmed host organisms for MERS-CoV alongside bats are dromedary camels, which frequently show high titers of neutralising antibodies and are currently discussed as a potential source of sporadic infections in humans.

Transmission between humans takes place via aerosols and smear infections. Respiratory secretions of the upper respiratory tract of infected persons play a particularly important role as they can be passed on by sneezing, coughing, and via contaminated hands. The highest viral load is detected in the lower respiratory tract of patients, smaller quantities are found in urine and stool.

Similar results were obtained for infected camels and seroprevalence in adult camels is up to 100% in endemic areas in Arabian and African countries. Newborn camels are supposed to multiply and shed the virus as they need time to generate neutralizing antibodies. During this time the calves might be a source of infection for humans. However, clinical disease associated with a MERS-CoV infection is rare and mild in camels.

Application of the Anti-MERS-CoV ELISA Camel (IgG): The most reliable laboratory diagnostic methods for confirmation of suspected MERS-CoV infections include the direct detection of MERS-CoV using polymerase chain reaction (PCR) and the detection of antibodies against MERS-CoV using indirect immunofluorescence (IIFT), ELISA, or neutralisation tests. The EUROIMMUN Anti-MERS-CoV ELISA Camel (IgG) contains purified S1 antigen of MERS coronavirus (MERS-CoV S1), which is known to be well suited for diagnostics as it combines high sensitivity and high specificity. IgG antibodies can be detected approximately 3 weeks after infection and persist for years. Cross reactions with other coronaviruses, especially bovine coronavirus, need to be taken into account in serological diagnostics, which, however, can be reduced using a recombinant spike protein as antigen. Nevertheless, positive results should be confirmed using a different test method, ideally a neutralization assay.

Test Characteristics
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Principle of the test: The ELISA test kit provides a semiquantitative in vitro assay for antibodies of class IgG against MERS coronavirus in serum or plasma of camels. The test kit contains microtiter strips each with 8 break-off reagent wells coated with purified S1 antigen of MERS coronavirus (MERS-CoV S1). In the first reaction step, diluted samples are incubated in the wells. In the case of positive samples, specific IgG antibodies (also IgA and IgM) will bind to the antigens. To detect the bound antibodies, a second incubation is carried out using an enzyme-labelled anti-camel IgG (enzyme conjugate) catalysing a colour reaction.

Sensitivity and specificity: To confirm assay sensitivity, 151 sera from camels collected in Dubai were analysed and results were compared to in-house assays of the Institute of Virology, University of Bonn, Germany. To assess assay specificity, 20 sera from camels collected in Germany with negative predictive value and, additionally, 13 camel sera from the UAE negative for MERS-CoV antibodies but positive for bovine coronavirus antibodies in a recombinant IFA were tested. Sensitivity and specificity of the EUROIMMUN Anti-MERS-CoV ELISA Camel (IgG) both amounted to 100 %.

n = 184		Precharacterization	
		positive	negative
EUROIMMUN Anti-MERS-CoV Camel ELISA (IgG)	positive	151	0
	borderl.	0	0
	negative	0	33

Technical Data:

Antigen	Purified S1 antigen of MERS coronavirus (MERS-CoV S1).
Evaluation	Semiquantitative evaluation using ratio values (extinction value of the control/sample over the extinction value of the calibrator).
Interpretation	EUROIMMUN recommends interpreting results as follows: Ratio < 0.8: negative Ratio ≥ 0.8 to < 1.1: boderline Ratio ≥ 1.1: positive
Sample dilution	Serum or plasma; 1 : 101 in sample buffer.
Reagents	Ready to use, with the exception of the wash buffer (10x). Colour-coded solutions.
Test procedure	30 min (37°C) / 30 min (37°C) / 15 min (room temperature). Fully automatable.
Measurement	450 nm. Reference wavelength between 620 nm and 650 nm.
Kit format	96 break-off wells. Kit includes all necessary reagents.
Order no.	EI 2604-9601 GK

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