

Instructions for Use

IBL

TBEV IgG ELISA

Enzyme immunoassays (microtiter strips) for the qualitative and quantitative qualitative and determination of IgG antibodies against Tick-Borne Encephalitis Virus (TBEV) in human serum

REF

RE56301



12x8



2-8°C

EU:

IVD



U.S.:

*For research use only.
Not for use in diagnostic procedures.*

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1. INTENDED USE

Enzyme immunoassay for the the *in-vitro diagnostic* qualitative and quantitative determination of IgG class antibodies against Tick-Borne Encephalitis Virus (TBEV) in human serum.

2. SUMMARY AND EXPLANATION

The infection with TBEV occurs predominantly in early summer through the bite of a tick infected with TBEV. The incubation time ranges from 4 - 21 days. The viruses replicate in the organs of the tick, without causing symptoms of a disease or tissue damage.

Characteristic for the disease is an involvement of the bulbar or cervical sections of the spinal marrow as well as the development of ascending paralysis or hemiparesis. The occurrence of residual paraplegia after the infection is not uncommon. Typical infections show a two-stage course of the disease: the first phase comes along with an uncharacteristic feverish infect with strong headaches, the second phase with a meningo-encephalitis with or without pareses. If the CNS is involved, residual damage occurs in about 7% of the cases, lethality is around 1%.

The clinical picture of TBEV is uncharacteristic, thus, a serological laboratory diagnosis is required. The diagnosis of a fresh infection is done by the detection of specific IgM antibodies.

TBEV-specific IgG antibodies are determined for two reasons:

- a.) to monitor the course of the disease after infection with the TBEV (significant titer changes)
- b.) to determine the „immune status“ after an „active immunization“ (vaccination protection)

3. TEST PRINCIPLE

Solid phase enzyme-linked immunosorbent assay (ELISA) based on the sandwich principle. The wells are coated with antigen. Specific antibodies of the sample binding to the antigen coated wells are detected by a secondary enzyme conjugated antibody (E-Ab) specific for human IgG. After the substrate reaction the intensity of the color developed is proportional to the amount of IgG-specific antibodies detected. Results of samples can be determined directly using the standard curve.

4. WARNINGS AND PRECAUTIONS

1. For in-vitro diagnostic use only. For professional use only.
2. Before starting the assay, read the instructions completely and carefully. Use the valid version of the package insert provided with the kit. Be sure that everything is understood. For further information (clinical background, test performance, automation protocols, alternative applications, literature, etc.) please refer to the IBL-Homepage.
3. In case of severe damage of the kit package please contact IBL or your supplier in written form, latest one week after receiving the kit. Do not use damaged components in test runs, but keep safe for complaint related issues.
4. Obey lot number and expiry date. Do not mix reagents of different lots. Do not use expired reagents.
5. Follow good laboratory practice and safety guidelines. Wear lab coats, disposable latex gloves and protective glasses where necessary.
6. Reagents of this kit containing hazardous material may cause eye and skin irritations. See MATERIALS SUPPLIED and labels for details. Material Safety Data Sheets for this product are available on the IBL-Homepage or upon request directly from IBL.
7. Chemicals and prepared or used reagents have to be treated as hazardous waste according to national biohazard and safety guidelines or regulations.
8. Avoid contact with Stop solution. It may cause skin irritations and burns.
9. Some reagents contain sodium azide (NaN_3) as preservatives. In case of contact with eyes or skin, flush immediately with water. NaN_3 may react with lead and copper plumbing to form explosive metal azides. When disposing reagents, flush with a large volume of water to avoid azide build-up.
10. All reagents of this kit containing human serum or plasma have been tested and were found negative for HIV I/II, HBsAg and HCV. However, a presence of these or other infectious agents cannot be excluded absolutely and therefore reagents should be treated as potential biohazards in use and for disposal.

5. STORAGE AND STABILITY

The kit is shipped at ambient temperature and should be stored at 2-8°C. Keep away from heat or direct sun light. The storage and stability of specimen and prepared reagents is stated in the corresponding chapters.

The microtiter strips are stable up to the expiry date of the kit in the broken, but tightly closed bag when stored at 2–8°C.

6. SPECIMEN COLLECTION AND STORAGE

Serum, Plasma (EDTA, Heparin)

The usual precautions for venipuncture should be observed. It is important to preserve the chemical integrity of a blood specimen from the moment it is collected until it is assayed. Do not use grossly hemolytic, icteric or grossly lipemic specimens. Samples appearing turbid should be centrifuged before testing to remove any particulate material.

Storage:	2-8°C	-20°C	Keep away from heat or direct sun light. Avoid repeated freeze-thaw cycles.
Stability:	2 d	> 2 d	

7. MATERIALS SUPPLIED

5 x 2 mL	CAL A-E	Standard A-E 0; 10;100;300;1000 U/mL. Ready to use. Contains IgA antibodies against TBEV, PBS, stabilizers.
1 x 14 mL	ENZCONJ IgG	Enzyme Conjugate IgG Red colored. Ready to use. Contains anti-human IgG, conjugated to peroxidase, protein-containing buffer, stabilizers.
1 x 12 x 8	MTP	Microtiter Plate Break apart strips. Coated with specific antigen.
1 x 14 mL	TMB SUBS	TMB Substrate Solution Ready to use. Contains TMB.
1 x 14 mL	TMB STOP	TMB Stop Solution Ready to use. 0.5 M H ₂ SO ₄ .
1 x 60 mL	DILBUF	Diluent Buffer Ready to use. Contains PBS Buffer, BSA, < 0.1 % NaN ₃ .
1 x 60 mL	WASHBUF CONC	Wash Buffer, Concentrate (10x) Contains PBS Buffer, Tween 20.
2 x	FOIL	Adhesive Foil For covering of Microtiter Plate during incubation.
1 x	BAG	Plastic Bag Resealable. For dry storage of non-used strips.

8. MATERIALS REQUIRED BUT NOT SUPPLIED

1. Micropipettes (Multipette Eppendorf or similar devices, < 3% CV). Volumes: 5; 50; 100; 500 µL
2. Calibrated measures
3. Tubes (1 mL) for sample dilution
4. 8-Channel Micropipettor with reagent reservoirs
5. Wash bottle, automated or semi-automated microtiter plate washing system
6. Microtiter plate reader capable of reading absorbance at 450 nm (reference wavelength 600-650 nm)
7. Bidistilled or deionised water
8. Paper towels, pipette tips and timer

9. PROCEDURE NOTES

1. Any improper handling of samples or modification of the test procedure may influence the results. The indicated pipetting volumes, incubation times, temperatures and pretreatment steps have to be performed strictly according to the instructions. Use calibrated pipettes and devices only.
2. Once the test has been started, all steps should be completed without interruption. Make sure that required reagents, materials and devices are prepared ready at the appropriate time. Allow all reagents and specimens to reach room temperature (18-25 °C) and gently swirl each vial of liquid reagent and sample before use. Mix reagents without foaming.
3. Avoid contamination of reagents, pipettes and wells/tubes. Use new disposable plastic pipette tips for each reagent, standard or specimen. Do not interchange caps. Always cap not used vials. Do not reuse wells/tubes or reagents.
4. Use a pipetting scheme to verify an appropriate plate layout.

5. Incubation time affects results. All wells should be handled in the same order and time sequences. It is recommended to use an 8-channel Micropipettor for pipetting of solutions in all wells.
6. Microplate washing is important. Improperly washed wells will give erroneous results. It is recommended to use a multichannel pipette or an automatic microplate washing system. Do not allow the wells to dry between incubations. Do not scratch coated wells during rinsing and aspiration. Rinse and fill all reagents with care. While rinsing, check that all wells are filled precisely with Wash Buffer, and that there are no residues in the wells.
7. Humidity affects the coated wells/tubes. Do not open the pouch until it reaches room temperature. Unused wells/tubes should be returned immediately to the resealed pouch including the desiccant.

10. PRE-TEST SETUP INSTRUCTIONS

10.1. Preparation of Components

Dilute/dissolve	Component		Diluent	Relation	Remarks	Storage	Stability
60 mL	Wash Buffer	ad 600 mL	bidist. Water	1:10	Warm up at 37°C to dissolve crystals. Mix vigorously.	2-8°C	8 w

10.2. Dilution of Samples

Sample	to be diluted	with	Relation	Remarks
Serum / Plasma	generally	Diluent Buffer	1:101	e.g. 5 µL + 500 µL

Samples containing concentrations higher than the highest standard have to be diluted further.

11. TEST PROCEDURE

	Pipette 100 µL of each Standard and diluted sample into the respective wells of the Microtiter Plate. In the qualitative test only Standard B is used.
	Cover plate with adhesive foil. Incubate 60 min at 18-25°C.
	Remove adhesive foil. Discard incubation solution. Wash plate 3 x with 300 µL of diluted Wash Buffer . Remove excess solution by tapping the inverted plate on a paper towel.
	Pipette 100 µL of Enzyme Conjugate into each well.
	Cover plate with new adhesive foil. Incubate 30 min at 18-25°C.
	Remove adhesive foil. Discard incubation solution. Wash plate 3 x with 300 µL of diluted Wash Buffer . Remove excess solution by tapping the inverted plate on a paper towel.
	For adding of Substrate and Stop Solution use, if available, an 8-channel Micropipettor. Pipetting should be carried out in the same time intervals for Substrate and Stop Solution. Use positive displacement and avoid formation of air bubbles.
	Pipette 100 µL of TMB Substrate Solution into each well.
	Incubate 20 min at 18-25°C in the dark (without adhesive foil).
	Stop the substrate reaction by adding 100 µL of TMB Stop Solution into each well. Briefly mix contents by gently shaking the plate. Color changes from blue to yellow.
	Measure optical density with a photometer at 450 nm (Reference-wavelength: 600-650 nm) within 60 min after pipetting of the Stop Solution.

12. QUALITY CONTROL

The test results are only valid if the test has been performed following the instructions. Moreover the user must strictly adhere to the rules of GLP (Good Laboratory Practice) or other applicable standards/laws. All standards must be found within the acceptable ranges as stated on the QC Certificate. If the criteria are not met, the run is not valid and should be repeated. Each laboratory should use known samples as further controls.

In case of any deviation the following technical issues should be proven: Expiration dates of (prepared) reagents, storage conditions, pipettes, devices, incubation conditions and washing methods.

It is recommended to participate at appropriate quality assessment trials.

13. CALCULATION OF RESULTS

The obtained OD of the standards (y-axis, linear) are plotted against their concentration (x-axis, logarithmic) either on semi-logarithmic graph paper or using an automated method. A good fit is provided with cubic spline, 4 Parameter Logisitcs or Logit-Log.

For the calculation of the standard curve, apply each signal of the standards (one obvious outlier of duplicates might be omitted and the more plausible single value might be used).

The concentration of the samples can be read from the standard curve.

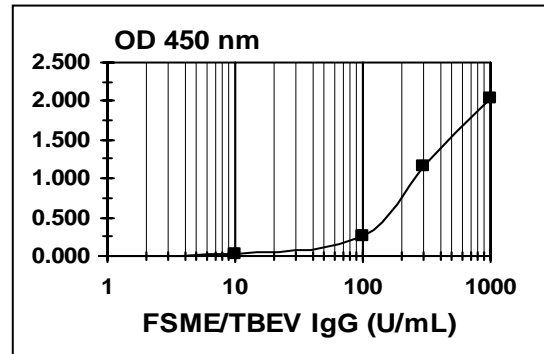
The initial dilution has been taken into consideration when reading the results from the graph. Results of samples of higher predilution have to be multiplied with the dilution factor.

Samples showing concentrations above the highest standard have to be diluted as described in PRE-TEST SETUP INSTRUCTIONS and reassayed.

Typical Calibration Curve

(Example. Do not use for calculation!)

Standard	U/mL	Mean OD
A	0	0.009
B	10	0.034
C	100	0.251
D	300	1.149
E	1000	2.044



14. INTERPRETATION OF RESULTS

U/mL	Interpretation
< 80	negative
80 - 120	equivocal
> 120	positive

The results themselves should not be the only reason for any therapeutical consequences. They have to be correlated to other clinical observations and diagnostic tests.

15. EXPECTED VALUES

In an in-house study, apparently healthy subjects showed the following results:

Ig Isotype	n	Interpretation		
		positive	equivocal	negative
IgG	53	7.6 %	9.4 %	83.0 %

16. LIMITATIONS OF THE PROCEDURE

Specimen collection has a significant effect on the test results. See SPECIMEN COLLECTION AND STORAGE for details.

For cross-reactivities, see PERFORMANCE.

Azide and thimerosal at concentrations > 0.1 % interfere in this assay and may lead to false results.

The following blood components do not have a significant effect (+/- 15 % of expected) on the test results up to the concentrations stated below:

Hemoglobin	8.0 mg/mL
Bilirubin	0.3 mg/mL
Triglyceride	5.0 mg/mL

17. PERFORMANCE

Analytical Specificity (Cross Reactivity)	No cross-reactivities were found to:		Borrelia, Measles IgG	
Precision	Mean (U/mL)	CV (%)		
	Intra-Assay	99	5.4	
	Inter-Assay	313	6.8	
Linearity	Range (U/mL)	Serial dilution up to	Range (%)	
	11 – 148	1:8	84 - 125	
Recovery	92 – 107 %	% Recovery after spiking (n = 3)		
Method Comparison versus ELISA	Rel. Sensitivity	> 95 %		
	Rel. Specificity	> 95 %		