Version 03-05/24

User's Manual

SARS-CoV-2 Nucleocapsid IgG Quantitative ELISA Kit

REF **DEIASL062**

Σ **96T**

RUO

This product is for research use only and is not intended for diagnostic use.

For illustrative purposes only. To perform the assay the instructions for use provided with the kit have to be used.

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PRODUCT INFORMATION

Intended Use

This kit is intended for quantitative detection of Anti-SARS-CoV-2(N) IgG in serum, plasma and other biological fluids.

Principles of Testing

This kit was based on indirect enzyme-linked immune-sorbent assay technology. Recombinant Nucleocapsid protein was pre-coated onto 96-well plates. And the HRP conjugated antibody was used as detection antibodies. The standards, test samples and HRP conjugated detection antibody were added to the wells subsequently, and washed with wash buffer. TMB substrates were used to visualize HRP enzymatic reaction. TMB was catalyzed by HRP to produce a blue color product that changed into yellow after adding acidic stop solution. The density of yellow is proportional to the target amount of sample captured in plate. Read the O.D. absorbance at 450nm in a microplate reader, and then the concentration of target can be calculated.

Reagents And Materials Provided

1. ELISA Microplate(Dismountable): 8×12strips
2. Standard: 1 vial
3. Sample/Standard Dilution Buffer: 20 mL
4. HRP-labeled Antibody(Concentrated): 60 µL (Avoid Direct Light)
5. Antibody Dilution Buffer: 5 mL
6. TMB Substrate: 5 mL (Avoid Direct Light)
7. Stop Solution: 5 mL
8. Wash Buffer(25X): 30 mL
9. Plate Sealer: 5pieces
10. Product Description: 1copy

Materials Required But Not Supplied

1. Microplate reader (wavelength:450nm)
2. 37°C incubator
3. Automated plate washer
4. Precision single and multi-channel pipette and disposable tips
5. Clean tubes and Eppendorf tubes
6. Deionized or distilled water

Storage

2-8°C for 6 months.

Specimen Collection And Preparation

1. Serum: Place whole blood sample at room temperature for 2 hours or put it at 2-8°C overnight and centrifugation for 20 minutes at approximately 1000×g, Collect the supernatant and carry out the assay immediately. Blood collection tubes should be disposable, non-pyrogenic, and non-endotoxin.
2. Plasma: Collect plasma using (EDTA-Na_2 or heparin as an anticoagulant. Centrifuge samples for 15 minutes at 1000×g at 2-8°C within 30 minutes of collection. Collect the supernatant and carry out the assay immediately. Avoid hemolysis, high cholesterol samples.
3. Other Biological Fluids: Centrifuge samples for 20 minutes at 1000×g at 2-8°C. Collect supernatant and carry out the assay immediately.

Note: Samples to be used within 5 days can be stored at 2-8°C, besides that, samples must be stored at -20°C (assay ≤1 month) or -80°C(assay≤2 months) to avoid loss of bioactivity and contamination. Avoid multiple freeze-thaw cycles. The hemolytic samples are not suitable for this assay.

Sample Dilution

The user should estimate the concentration of target protein in the test sample, and select a proper dilution factor to make the diluted target protein concentration fall in the optimal detection range of the kit. Dilute the sample with the provided dilution buffer, and several trials may be necessary. The test sample must be well mixed with the dilution buffer. And also standard curves and sample should be making in pre-experiment. If samples with very high concentrations, dilute samples with PBS first and then dilute the samples with Sample Dilution.

The matrix components in the sample will affect the test results, so it need to be diluted at least 1/50 with Sample Dilution Buffer before testing!

Reagent Preparation

Bring all reagents and samples to room temperature for 20 minutes before use.

1. Wash Buffer:

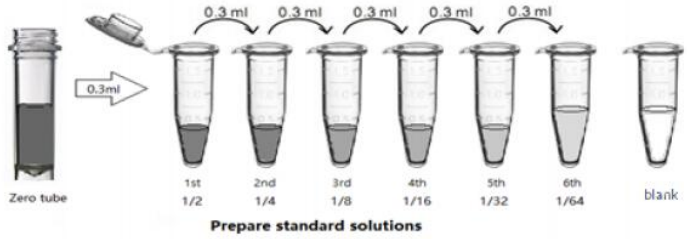
If crystals have formed in the concentrate, you can warm it with 40°C water bath (Heating temperature should not exceed 50°C) and mix it gently until the crystals have completely been dissolved. The solution should be cooled to room temperature before use.

Dilute 30 mL Concentrated Wash Buffer into 750 mL Wash Buffer with deionized or distilled water. Put unused solution back at 2-8°C.

2. Standards:

1) . Label 7 EP tubes with 1/2, 1/4, 1/8, 1/16, 1/32, 1/64 and blank respectively. Add 0.3 mL of the Sample Dilution Buffer into each tube. Add 0.3 mL of the Standard solution (250 ng/mL, labeled as zero tube) into 1st tube and mix them thoroughly. Transfer 0.3 mL from 1st tube to 2nd tube and mix them thoroughly. Transfer 0.3 mL from 2nd tube to 3rd tube and mix them thoroughly, and so on. Sample Dilution Buffer was used for the blank control.

Note: It is best to use Standard Solutions within 15 minutes.



3. Preparation of HRP-labeled Antibody Working Solution:

Prepare it within 30 minutes before experiment.

1) Calculate required total volume of the working solution: 50 µL/well × quantity of wells. (Allow 55-60 µL more than the total volume.)
2) Dilute the HRP-detection antibody with Antibody Dilution Buffer at 1:100 and mix them thoroughly. (i.e. Add 1 µL HRP-labeled antibody into 99 µL Antibody Dilution Buffer.)

Assay Procedure

When diluting samples and reagents, they must be mixed completely and evenly. Before adding TMB into wells, equilibrate TMB Substrate for 30 minutes at 37°C. It is recommended to plot a standard curve for each test.

1. Set standard, test samples (diluted at least 1/50 with Sample Dilution Buffer), control (blank) wells on the pre-coated plate respectively, and then, record their positions. It is recommended to measure each standard and sample in duplicate. Wash plate 2 times before adding standard, sample and control (blank) wells!
2. Prepare Standards: Aliquot 50 µL of zero tube, 1st tube, 2nd tube, 3rd tube, 4th tube, 5th tube, 6th tube and Sample Dilution Buffer (blank) into the standard wells.
3. Add Samples: Add 50 µL of properly diluted sample into test sample wells.
4. Incubate: Seal the plate with a cover and incubate at 37°C for 30 minutes.
5. Wash: Remove the cover and discard the plate content, and wash plate 3 times with Wash Buffer. Do NOT let the wells dry completely at any time.
6. HRP-labeled Antibody: Add 50 µL HRP-labeled antibody working solution into above wells (standard, test sample and blank wells). Add the solution at the bottom of each well without touching the sidewall, cover the plate and incubate at 37°C for 30 minutes.
7. Wash: Remove the cover, and wash plate 5 times with Wash Buffer, and let the Wash Buffer stay in the wells for 1-2 minutes each time.
8. TMB Substrate: Add 50 µL TMB Substrate into each well, cover the plate and incubate at 37°C in dark within 10-15 minutes. (Note: The reaction time can be shortened or extended according to the actual color change, but not more than 30 minutes. You can terminate the reaction when apparent gradient appeared in standard wells.)
9. Stop: Add 50 µL Stop Solution into each well. The color will turn yellow immediately. The adding order of Stop Solution should be as the same as the TMB Substrate Solution.
10. OD Measurement: Read the O.D. absorbance at 450nm in Microplate Reader immediately after adding the stop solution.

Manual: Discard the solution in the plate without touching the side walls. Clap the plate on absorbent filter

papers or other absorbent material. Fill each well completely with 350 µL wash buffer and soak for 1 to 2 minutes, then aspirate contents from the plate, and clap the plate on absorbent filter papers or other absorbent material.

Automatic: Aspirate all wells, and then wash plate with 350 µL wash buffer. After the final wash, invert plate, and clap the plate on absorbent filter papers or other absorbent material. It is recommended that the washer shall be set for soaking 1 minute. (Note: set the height of the needles; be sure the fluid can be sipped up completely).

Calculation

Regarding calculation, (the relative O.D.450) = (the O.D.450 of each well) – (the O.D.450 of blank well). The standard curve can

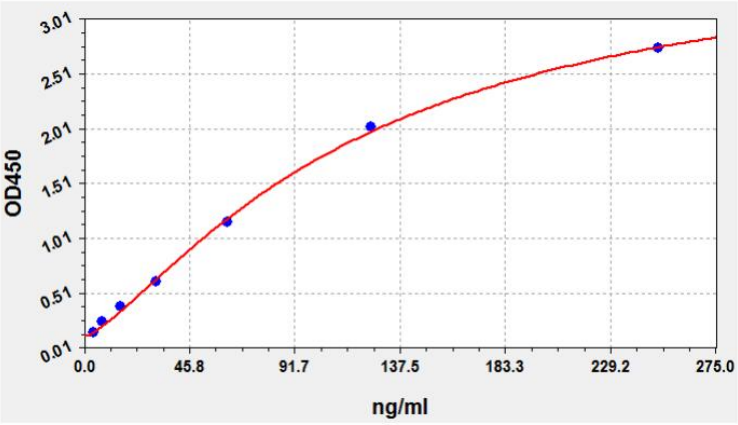
be plotted as the relative O.D.450 of each standard solution (Y) vs. the respective concentration of the standard solution (X).

The target concentration of the samples can be interpolated from the standard curve. It is recommended to use some professional software to do this calculation, such as Curve Expert 1.3 or 1.4.

Note: If the samples measured were diluted, multiply the dilution factor to the concentrations from interpolation to obtain the concentration before dilution.

Results of a typical standard operation of a Anti-SARS-CoV-2(N) IgG ELISA Kit are listed below. This standard curve was generated at our lab for demonstration purpose only. Users shall obtain standard curve as per experiment by themselves. (N/A=not applicable)

STD.(ng/ml)	OD-1	OD-2	Average	Corrected
0	0.077	0.079	0.078	0.000
3.906	0.145	0.153	0.149	0.071
7.812	0.246	0.258	0.252	0.174
15.625	0.397	0.379	0.388	0.310
31.25	0.610	0.628	0.619	0.541
62.5	1.131	1.189	1.16	1.082
125	2.054	2.004	2.029	1.951
250	2.677	2.811	2.744	2.666



Reference Values

Samples came from rehabilitation clients of mobile cabin hospital. The plasma samples were diluted 1:100. TMB Color development time was 10 minutes at 37°C.

Due to individual differences, it is recommended to dilute the sample 1:50-1:2000.

Rehabilitation clients(ug/ml)				Healthy volunteers(ng/ml)			
1#	31	5#	35	1#	<0.1	5#	not detected
2#	7	6#	17	2#	not detected	6#	not detected
3#	24	7#	38	3#	not detected	7#	not detected
4#	47	8#	0.6	4#	not detected	8#	not detected

Precision

Intra-Assay: CV<8%

Inter-Assay: CV<10%

Detection Range

3.906-250 ng/mL

Sensitivity

2.344 ng/mL

Specificity

This assay has high sensitivity and excellent specificity for detection of Anti-SARS-CoV-2(N) IgG. No significant cross-reactivity or interference between Anti-SARS-CoV-2(N) IgG and analogues was observed.

Note: Limited by current skills and knowledge, it is difficult for us to complete the cross-reactivity detection between Anti-SARS-CoV-2(N) IgG and all the analogues, therefore, cross reaction may still exist.

Linearity

The linearity of the kit was assayed by testing samples spiked with appropriate concentration of Anti-SARS-CoV-2(N) IgG and their serial dilutions. The results were demonstrated by percentage of calculated concentration to the expectation.

Sample	1:2	1:4	1:8
Serum(n=5)	88-102%	87-105%	91-103%
EDTA Plasma(n=5)	86-101%	83-101%	82-98%
Heparin Plasma(n=5)	81-98%	83-97%	90-96%

Recovery

Matrices listed below were spiked with certain level of Anti-SARS-CoV-2(N) IgG and the recovery rates were calculated by comparing the measured value to the expected amount of Anti-SARS-CoV-2(N) IgG in samples.

Matrix	Recovery Range (%)	Average (%)
Serum(n=5)	87-105	95
EDTA Plasma(n=5)	90-103	97
Heparin Plasma(n=5)	86-104	97

Precautions

1. To inspect the validity of experiment operation and the appropriateness of sample dilution proportion, pilot experiment using standards and a small number of samples is recommended.
2. After opening and before using, keep plate dry.
3. Before using the kit, spin tubes and bring down all components to the bottom of tubes.
4. Storage TMB reagents avoid light.
5. Washing process is very important, not fully wash easily cause a false positive and high background.
6. Duplicate well assay is recommended for both standard and sample testing.
7. Don't let microplate dry at the assay, for dry plate will inactivate active components on plate.
8. Don't reuse tips and tubes to avoid cross contamination.
9. Avoid using the reagents from different batches together.