



## **Human anti-cyclic citrullinated peptide antibody (anti-CCP antibody) ELISA Kit**

**Catalog Number. CSB-E09077h**

**For the quantitative determination of human anti-cyclic citrullinated peptide antibody (anti-CCP antibody) concentrations in serum, plasma.**

This package insert must be read in its entirety before using this product.

### **If You Have Problems**

#### **Technical Service Contact information**

Phone: 86-27-87582341

Fax: 86-27-87196150

Email: [tech@cusabio.com](mailto:tech@cusabio.com)

Web: [www.cusabio.com](http://www.cusabio.com)

In order to obtain higher efficiency service, please ready to supply the lot number of the kit to us (found on the outside of the box).

## **PRINCIPLE OF THE ASSAY**

This assay employs the quantitative enzyme immunoassay technique. The microtiter plate provided in this kit has been pre-coated with CCP antigen. Samples are pipetted into the wells with anti-human IgG conjugated Horseradish Peroxidase (HRP). Any antibodies specific for CCP present will bind to the pre-coated antigen. Following a wash to remove any unbound reagent, a substrate solution is added to the wells and color develops in proportion to the amount of human anti-CCP antibody bound in the initial step. The color development is stopped and the intensity of the color is measured.

## **DETECTION RANGE**

5 U/ml-400 U/ml.

## **SENSITIVITY**

The minimum detectable dose of human anti-CCP antibody is typically less than 5 U/ml.

The sensitivity of this assay, or Lower Limit of Detection (LLD) was defined as the lowest human anti-CCP antibody concentration that could be differentiated from zero. It was determined the mean O.D value of 20 replicates of the zero standard added by their three standard deviations.

## **SPECIFICITY**

This assay has high sensitivity and excellent specificity for detection of human anti-CCP antibody. No significant cross-reactivity or interference between human anti-CCP antibody and analogues was observed.

**Note:** Limited by current skills and knowledge, it is impossible for us to complete the cross-reactivity detection between human anti-CCP antibody and all the analogues, therefore, cross reaction may still exist.

## **PRECISION**

### **Intra-assay Precision (Precision within an assay): CV%<15%**

Three samples of known concentration were tested twenty times on one plate to assess.

### **Inter-assay Precision (Precision between assays): CV%<15%**

Three samples of known concentration were tested in twenty assays to assess.

## **LIMITATIONS OF THE PROCEDURE**

- **FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.**
- The kit should not be used beyond the expiration date on the kit label.
- Do not mix or substitute reagents with those from other lots or sources.
- If samples generate values higher than the highest standard, dilute the samples and repeat the assay.
- Any variation in operator, pipetting technique, washing technique, incubation time or temperature, and kit age can cause variation in binding.
- This assay is designed to eliminate interference by soluble receptors, binding proteins, and other factors present in biological samples. Until all factors have been tested in the Immunoassay, the possibility of interference cannot be excluded.

## **MATERIALS PROVIDED**

Reagents	Quantity
Assay plate	1(96 wells)
Standard	5 x 1 ml
HRP-conjugate	1 x 10 ml
Negative Control	1 x 0.8 ml
Positive Control	1 x 0.8 ml
Sample Diluent	1 x 20 ml
Wash Buffer (25 x concentrate)	1 x 20 ml
Substrate A	1 x 5 ml
Substrate B	1 x 5 ml
Stop Solution	1 x 5 ml
Adhesive Strip (For 96 wells)	4
Instruction manual	1

## **STANDARD CONCENTRATION**

Standard	S1	S2	S3	S4	S5
Concentration (U/ml)	5	10	25	100	400

## **STORAGE**

Unopened kit	Store at 2 - 8°C. Do not use the kit beyond the expiration date.
Opened kit	May be stored for up to one month at 2 - 8° C.

**\*Provided this is within the expiration date of the kit.**

## **OTHER SUPPLIES REQUIRED**

- Microplate reader capable of measuring absorbance at 450 nm, with the correction wavelength set at 600 nm - 630 nm.
- An incubator which can provide stable incubation conditions up to 37°C±0.5°C.
- Squirt bottle, manifold dispenser, or automated microplate washer.

- Absorbent paper for blotting the microtiter plate.
- 100 mL and 500 mL graduated cylinders.
- Deionized or distilled water.
- Pipettes and pipette tips.
- Test tubes for dilution.

### **PRECAUTIONS**

The Stop Solution provided with this kit is an acid solution. Wear eye, hand, face, and clothing protection when using this material.

### **SAMPLE COLLECTION AND STORAGE**

- **Serum** Use a serum separator tube (SST) and allow samples to clot for two hours at room temperature or overnight at 4°C before centrifugation for 15 minutes at 1000 xg. Remove serum and assay immediately or aliquot and store samples at -20°C or -80°C. Avoid repeated freeze-thaw cycles.
- **Plasma** Collect plasma using EDTA, or heparin as an anticoagulant. Centrifuge for 15 minutes at 1000 xg at 2-8°C within 30 minutes of collection. Assay immediately or aliquot and store samples at -20°C or -80°C. Avoid repeated freeze-thaw cycles.

### **SAMPLE PREPARATION**

Serum and plasma samples require a 101-fold dilution into Sample Diluent. The suggested 101-fold dilution can be achieved by adding 2µl sample to 200µl of Sample Diluent.

**Note:**

1. CUSABIO is only responsible for the kit itself, but not for the samples consumed during the assay. The user should calculate the possible amount of the samples used in the whole test. Please reserve sufficient samples in advance.
2. Samples to be used within 5 days may be stored at 2-8°C, otherwise samples must be stored at -20°C (≤1month) or -80°C (≤2month) to avoid loss of bioactivity and contamination.
3. Grossly hemolyzed samples are not suitable for use in this assay.
4. If the samples are not indicated in the manual, a preliminary experiment to determine the validity of the kit is necessary.
5. Please predict the concentration before assaying. If values for these are not within the range of the standard curve, users must determine the optimal sample dilutions for their particular experiments.

**REAGENT PREPARATION****Note:**

- **Kindly use graduated containers to prepare the reagent.**
- Bring all reagents to room temperature (18-25°C) before use for 30min.
- Distilled water is recommended to be used to make the preparation for reagents or samples. Contaminated water or container for reagent preparation will influence the detection result.

**Wash Buffer(1x)-** If crystals have formed in the concentrate, warm up to room temperature and mix gently until the crystals have completely dissolved. Dilute 20 ml of Wash Buffer Concentrate (25 x) into deionized or distilled water to prepare 500 ml of Wash Buffer (1 x).

## ASSAY PROCEDURE

**Bring all reagents and samples to room temperature before use. Centrifuge the sample again after thawing before the assay. It is recommended that all samples, standards or controls be assayed in duplicate.**

1. Prepare all reagents and samples as directed in the previous sections.
2. Determine the number of wells to be used and put any remaining wells and the desiccant back into the pouch and seal the ziploc, store unused wells at 4°C.
3. Set a **Blank** well without any solution.
4. Add 100µl of **Negative Control, Positive Control, Standard** and **diluted Samples** to each wells.
5. Cover with the adhesive strip provided and then incubate for 30 minutes at 37°C.
6. Aspirate each well and wash, repeating the process four times for a total of five washes. Wash by filling each well with **Wash Buffer** (200µl -300µl) using a squirt bottle, multi-channel pipette, manifold dispenser, or autowasher, and let it stand for 30 seconds, complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating ordecanting. Invert the plate and blot it against clean paper towels.
7. Add 100µl of **HRP-conjugate** to each well(Not to Blank well). Mix well and then incubate for 30 minutes at 37°C.
8. Repeat the aspiration/wash process for five times as in step 6.
9. Add 50µl of **Substrate A** and 50µl of **Substrate B** to each well, mix well. Incubate for 10 minutes at 37°C. Keeping the plate away from drafts and other temperature fluctuations in the dark.
10. Add 50µl of **Stop Solution** to each well, gently tap the plate to ensure thorough mixing.
11. Take blank well as zero, determine the optical density of each well within 10 minutes, using a microplate reader set to 450 nm.

Note:

1. The final experimental results will be closely related to validity of the products, operation skills of the end users and the experimental environments.
2. Samples or reagents addition: Please carefully add samples to wells and mix gently to avoid foaming. Do not touch the well wall as possible. For each step in the procedure, total dispensing time for addition of reagents or samples to the assay plate should not exceed 10 minutes. This will ensure equal elapsed time for each pipetting step, without interruption. Duplication of all standards and specimens, although not required, is recommended. To avoid cross-contamination, change pipette tips between additions of each standard level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.
3. Incubation: To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary. Do not allow wells to sit uncovered for extended periods between incubation steps. Once reagents have been added to the well strips, DO NOT let the strips DRY at any time during the assay. Incubation time and temperature must be observed.
4. Washing: The wash procedure is critical. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Solution by aspirating or decanting and remove any drop of water and fingerprint on the bottom of the plate. Insufficient washing will result in poor precision and falsely elevated absorbance reading. When using an automated plate washer, adding a 30 second soak period following the addition of wash buffer, and/or rotating the plate 180 degrees between wash steps may improve assay precision.
5. Controlling of reaction time: Observe the change of color after adding Substrates (e.g. observation once every 10 minutes). Substrates should change from colorless or light blue to gradations of blue. If the color is too deep, add Stop Solution in advance to avoid excessively strong reaction which will result in inaccurate absorbance reading.
6. Substrates are easily contaminated. Substrates should remain colorless or light blue until added to the plate. Please protect it from light.
7. Stop Solution should be added to the plate in the same order as the Substrates. The color developed in the wells will turn from blue to yellow upon addition of the Stop Solution. Wells that are green in color indicate that the Stop Solution has not mixed thoroughly with the Substrates.



## **CALCULATION OF RESULTS**

**Using the professional soft "Curve Expert 1.3" to make a standard curve is recommended, which can be downloaded from our web.**

Average the duplicate readings for each standard and sample and subtract the average optical density of Blank.

Create a standard curve by reducing the data using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, construct a standard curve by plotting the mean absorbance for each standard on the x-axis against the concentration on the y-axis and draw a best fit curve through the points on the graph. The data may be linearized by plotting the log of the human anti-CCP antibody concentrations versus the log of the O.D. and the best fit line can be determined by regression analysis. This procedure will produce an adequate but less precise fit of the data.

### **Quality Control**

In order to ensure the accuracy of results, negative control and positive control should be detected simultaneously with samples.

OD values of negative control should be less than 0.100 and OD values of positive control should be greater than 1.000.

- While anti-CCP antibody concentration of sample  $\geq 25\text{U/ml}$  : Positive
- While anti-CCP antibody concentration of sample  $< 25\text{U/ml}$  : Negative