Human Cancer Antigen CA19-9 ELISA Kit

Catalog No.: BEK1247

Size: 96T

Range: 3.12 U/ml-200 U/ml

Sensitivity 0.5 U/ml

Storage and Expiration: Store at 2-8℃ for 4 months, or at -20℃ for 8 months.

Application: For quantitative detection of CA19-9 in human serum, plasma, or cell culture supernatant.

Introduction

CA19-9 (carbohydrate antigen 19-9, also called cancer antigen 19-9 or sialylated Lewis (a) antigen) is a tumor marker that is used primarily in the management of pancreatic cancer. Guidelines from the American Society of Clinical Oncology discourage the use of CA19-9 as a screening test for cancer, particularly pancreatic cancer. The reason is that the test may be falsely normal (false negative) in many cases, or abnormally elevated in people who have no cancer at all (false positive). The main use of CA19-9 is therefore to see whether a pancreatic tumor is secreting it; if that is the case, then the levels should fall when the tumor is treated, and they may rise again if the disease recurs. CA19-9 can be elevated in many types of gastrointestinal cancer, such as colorectal cancer, esophageal cancer and hepatocellular carcinoma. Apart from cancer, elevated levels may also occur in pancreatitis, cirrhosis, and diseases of the bile ducts. It can be elevated in people with obstruction of the bile ducts.

Principle of the Assay

This kit was based on sandwich enzyme-linked immune-sorbent assay technology. Anti-CA19-9 monoclonal antibody was pre-coated onto 96-well plates. And the biotin conjugated anti-CA19-9 monoclonal antibody was used as detection antibodies. The standards, test samples and biotin conjugated detection antibody were added to the wells subsequently, and wash with wash buffer. Avidin-Biotin-Peroxidase Complex was added and unbound conjugates were washed away 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 CA19-9 amount of sample captured in plate. Read the O.D. absorbance at 450nm in a microplate reader, and then the concentration of CA19-9 can be calculated.

Kit components

1. One 96-well plate pre-coated with anti-Human CA19-9 antibody
2. Lyophilized Human CA19-9 standards: 2 tubes (400 U/tube)
3. Sample / Standard diluent buffer: 30 ml
4. Biotin conjugated anti-Human CA19-9 antibody (Concentrated): 130 µl. Dilution: 1:100
5. Antibody diluent buffer: 12 ml
6. Avidin-Biotin-Peroxidase Complex (ABC) (Concentrated): 130 µl. Dilution: 1:100
7. ABC diluent buffer: 12 ml
8. TMB substrate: 10 ml
9. Stop solution: 10 ml
10. Wash buffer (25X): 30 ml

Note: Reconstitute standards and test samples with Kit Component 3.

Material Required But Not Provided

1. 37℃ incubator
2. Microplate reader (wavelength: 450nm)
3. Precise pipette and disposable pipette tips
4. Automated plate washer
5. ELISA shaker
6. 1.5ml of Eppendorf tubes
7. Plate cover
8. Absorbent filter papers
9. Plastic or glass container with volume of above 1L

Chongqing Biospes Co., Ltd Tel: +86-23-67567091 Fax: +86-23-67745923
Room 27-2, Building 7, No. 15, Paradise Walk, Jiangbei District, Chongqing, 400020, China
www.biospes.com

Protocol

- **Preparation of sample and reagents**

1. Sample

Isolate the test samples soon after collecting, then, analyze immediately (within 2 hours). Or aliquot and store at -20℃ for long term. Avoid multiple freeze-thaw cycles.

✧ **Cell culture supernatants:** Centrifuge to remove precipitate, analyze immediately or aliquot and store at -20℃.

✧ **Serum:** Coagulate the serum at room temperature (about 4 hours). Centrifuge at approximately 1000 × g for 15 min. Analyze the serum immediately or aliquot and store at -20℃.

✧ **Plasma:** Collect plasma with EDTA or heparin as the anticoagulant. Centrifuge for 15 min at 2-8°C at 1500 x g within 30 min of collection. For eliminating the platelet effect, suggesting that further centrifugation for 10 min at 2-8°C at 10000 x g. Analyze immediately or aliquot and store samples at -20°C.

Note: 1. Coagulate blood samples completely, then, centrifuge, and avoid hemolysis and particle.

2. NaN_3 can not be used as test sample preservative, since it is the inhibitor for HRP.

>> Sample Dilution Guideline

End user should estimate the concentration of the target protein in the test sample first, and select a proper dilution factor to make the diluted target protein concentration falls the optimal detection range of the kit. Dilute the sample with the provided diluent buffer, and several trials may be necessary in practice. The test sample must be well mixed with the diluent buffer.

✧ **High target protein concentration (2-20 KU/ml)**: Dilution: 1:100. i.e. Add 1μl of sample into 99 μl of Sample / Standard diluent buffer (Kit Component 3).

✧ **Medium target protein concentration (200-2000 U/ml)**: Dilution: 1:10. i.e. Add 10 μl of sample into 90 μl of Sample / Standard diluent buffer (Kit Component 3).

✧ **Low target protein concentration (3.12-200 U/ml)**: Dilution: 1:2. i.e. Add 50 μl of sample into 50 μl of Sample / Standard diluent buffer (Kit Component 3).

✧ **Very low target protein concentration (≤3.12 U/ml)**: Unnecessary to dilute, or dilute at 1:2.

2. Wash buffer

Dilute the concentrated Wash buffer 25-fold (1:25) with distilled water (i.e. add 30 ml of concentrated wash buffer into 720 ml of distilled water).

3. Standard

Reconstitution of the lyophilized human CA19-9 standard (Kit Component 2): standard solution should be prepared no more than 2 hours prior to the experiment. Two tubes of standard are included in each kit. Use one tube for each experiment. **(Note: Do not dilute the standard directly in the plate)**

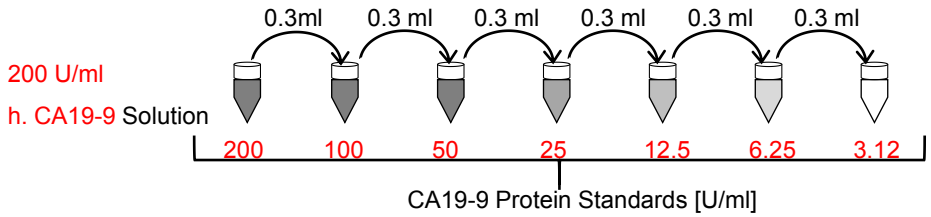
a. 400 U/ml of standard solution: Add **1 ml** of Sample / Standard diluent buffer (Kit Component 3) into one Standard (Kit Component 2) tube, keep the tube at room temperature for 10 min and mix thoroughly.

b. 200 U/ml of standard solution: Add **0.5 ml** of the above 400 U/ml standard solution into **0.5 ml** sample diluent buffer (Kit Component 3) and mix thoroughly.

c. 100 U/ml → 3.12 U/ml of standard solutions: Label 6 Eppendorf tubes with 100 U/ml, 50 U/ml, 25 U/ml, 12.5 U/ml, 6.25 U/ml, 3.12 U/ml, respectively. Aliquot **0.3 ml** of the Sample / Standard diluent

Chongqing Biospes Co., Ltd Tel: +86-23-67567091 Fax: +86-23-67745923
Room 27-2, Building 7, No. 15, Paradise Walk, Jiangbei District, Chongqing, 400020, China
www.biospes.com

buffer (Kit Component 3) into each tube. Add **0.3 ml** of the above 200 U/ml standard solution into 1st tube and mix thoroughly. Transfer **0.3 ml** from 1st tube to 2nd tube and mix thoroughly. Transfer **0.3 ml** from 2nd tube to 3rd tube and mix thoroughly, and so on.



Note: The standard solutions are best used within 2 hours. The 400 U/ml standard solution should be used within 12 hours. Or store at -20℃ for up to 48 hours. Avoid repeated freeze-thaw cycles.

4. Preparation of Biotin conjugated anti-Human CA19-9 antibody (Kit Component 4) working solution: prepare no more than 2 hours before the experiment.

a. Calculate the total volume of the working solution: 0.1 ml / well × quantity of wells. (Allow 0.1-0.2 ml more than the total volume)

b. Dilute the Biotin conjugated anti-Human CA19-9 antibody (Kit Component 4) with Antibody diluent buffer (Kit Component 5) at 1:100 and mix thoroughly. i.e. Add 1 μl of Biotin conjugated anti-Human CA19-9 antibody into 99 μl of Antibody diluent buffer.

5. Preparation of Avidin-Biotin-Peroxidase Complex (ABC) (Kit Component 6) working solution: prepare no more than 1 hour before the experiment.

a. Calculate the total volume of the working solution: 0.1 ml / well × quantity of wells. (Allow 0.1-0.2 ml more than the total volume)

b. Dilute the Avidin-Biotin-Peroxidase Complex (ABC) (Kit Component 6) with ABC diluent buffer (Kit Component 7) at 1:100 and mix thoroughly. i.e. Add 1 μl of Avidin-Biotin-Peroxidase Complex (ABC) into 99 μl of ABC diluent buffer.

- **Assay procedure**

Before adding to wells, equilibrate the ABC working solution and TMB substrate (Kit Component 8) for at least 30 min at room temperature (37℃). It is recommend to plot a standard curve for each test.

1. Set standard, test sample and control (zero) wells on the pre-coated plate respectively, and then, record their positions. It is recommend to measure each standard and sample in duplicate.
2. Aliquot 0.1 ml of 200 U/ml, 100 U/ml, 50 U/ml, 25 U/ml, 12.5 U/ml, 6.25 U/ml, 3.12 U/ml, standard solutions into the standard wells.
3. Add 0.1 ml of Sample / Standard diluent buffer (Kit Component 3) into the control (zero) well.
4. Add 0.1 ml of properly diluted sample (human serum, plasma or cell culture supernatant) into test sample wells.
5. Seal the plate with a cover and incubate at 37℃ for 90 min.
6. Remove the cover and discard the plate content, clap the plate on the absorbent filter papers or other absorbent material. **Do NOT let the wells completely dry at any time. Do not wash plate!**
7. Add 0.1 ml of Biotin conjugated anti-Human CA19-9 antibody work solution into the above wells (standard, test sample & zero wells). Add the solution at the bottom of each well without touching

the side wall.

8. Seal the plate with a cover and incubate at 37℃ for 60 min.
9. Remove the cover, and wash plate 3 times with Wash buffer (Kit Component 10) using one of the following methods:

   Manual Washing: 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 Wash buffer (Kit Component 10) and vortex mildly on ELISA shaker for 2 min, then aspirate contents from the plate, and clap the plate on absorbent filter papers or other absorbent material. Repeat this procedure two more times for a **total of THREE washes**.

   Automated Washing: Aspirate all wells, then wash plate **THREE times** with Wash buffer (Kit Component 10) (overfilling wells with the 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 be set for a soaking time of 1 min or shaking.
10. Add 0.1 ml of ABC working solution into each well, cover the plate and incubate at 37℃ for 30 min.
11. Remove the cover and wash plate 5 times with Wash buffer (Kit Component 10), and each time let the wash buffer stay in the wells for 1-2 min. (See Step 9 for plate wash method).
12. Add 0.1 ml of TMB substrate (Kit Component 8) into each well, cover the plate and incubate at 37℃ in dark within 30 min. (**Note:** This incubation time is for reference use only, the optimal time should be determined by end user.) And the shades of blue can be seen in the first 3-4 wells (with most concentrated Human CA19-9 standard solutions), the other wells show no obvious color.
13. Add 0.1 ml of Stop solution (Kit Component 9) into each well and mix thoroughly. The color changes into yellow immediately.
14. Read the O.D. absorbance at 450 nm in a microplate reader within 30 min after adding the stop solution.

For calculation, (the relative $O.D._{450}$) = (the $O.D._{450}$ of each well) – (the $O.D._{450}$ of Zero 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 Human CA19-9 concentration of the samples can be interpolated from the standard curve.

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

Precautions

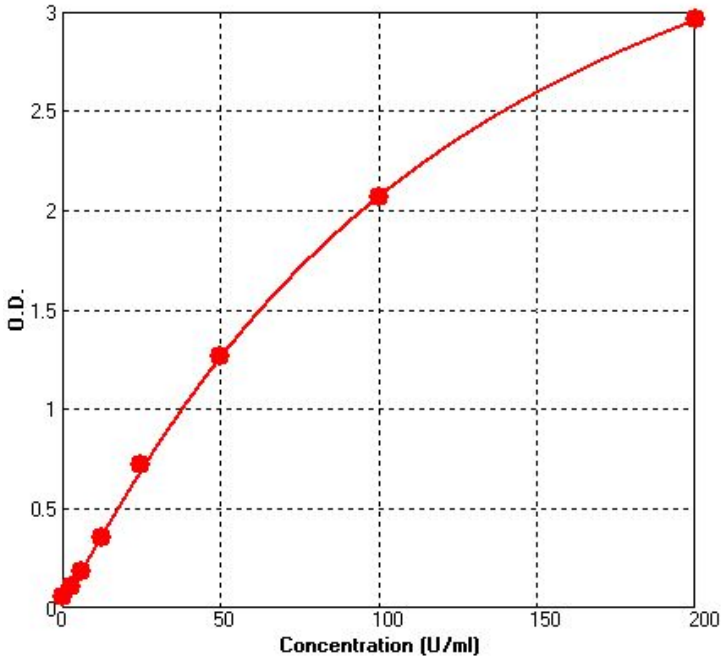
1. Before the experiment, centrifuge each kit component for several minutes to bring down all reagents to the bottom of tubes.
2. It is recommend to measure each standard and sample in duplicate.
3. Do NOT let the plate completely dry at any time! Since the dry condition can inactivate the biological material on the plate.
4. Do not reuse pipette tips and tubes to avoid cross contamination.
5. Do not use the expired components and the components from different batches.
6. To avoid the marginal effect of plate incubation for temperature differences (the marginal wells always get stronger reaction), it is recommend to equilibrate the ABC working solution and TMB substrate for at least 30 min at room temperature (37℃) before adding to wells.
7. The TMB substrate (Kit Component 8) is colorless and transparent before use, if not, please contact

us for replacement.

Typical Data & Standard Curve

Results of a typical standard run of a Human CA19-9 ELISA Kit are shown below. This standard curve was generated at our lab for demonstration purpose only. Each user should obtain their own standard curve as per experiment. (N/A=not applicable)

X	U/ml	0	3.12	6.25	12.5	25	50	100	200
Y	OD450	0.052	0.104	0.186	0.350	0.716	1.268	2.064	2.962



Reference

1. Perkins, G.; Slater, E.; Sanders, G.; Prichard, J. (2003). "Serum tumor markers". American family physician 68 (6): 1075–1082.

2. Locker G, Hamilton S, Harris J, Jessup J, Kemeny N, Macdonald J, Somerfield M, Hayes D, Bast R (2006). "ASCO 2006 update of recommendations for the use of tumor markers in gastrointestinal cancer". J. Clin. Oncol. 24 (33): 5313–27.

3. Goonetilleke KS, Siriwardena AK (April 2007). "Systematic review of carbohydrate antigen (CA 19-9) as a biochemical marker in the diagnosis of pancreatic cancer". Eur J Surg Oncol 33 (3): 266–70.

Chongqing Biospes Co., Ltd Tel: +86-23-67567091 Fax: +86-23-67745923
Room 27-2, Building 7, No. 15, Paradise Walk, Jiangbei District, Chongqing, 400020, China
www.biospes.com