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antibody and ELISA experts

# PicoKine® Quick ELISA Kit

## Catalog number: FEK0904

For the quantitation of **Human CEACAM5** concentrations in cell culture supernatants, cell lysates, serum and plasma (heparin, EDTA).

This package insert must be read in its entirety before using this product.
For research use only. Not for use in diagnostic procedures.

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# Human CEA / Carcino Embryonic Antigen PicoKine® Quick ELISA Kit

**Catalog Number:**FEK0904

## Assay Principle

The Boster Picokine® Human CEACAM5 Pre-Coated ELISA (Enzyme-Linked Immunosorbent Assay) kit is a solid phase immunoassay specially designed to measure Human CEACAM5 with a 96-well strip plate that is pre-coated with antibody specific for CEACAM5. The detection antibody is a biotinylated antibody specific for CEACAM5. The kit includes Human CEACAM5 protein as standards.

To measure Human CEACAM5, add standards and samples to the wells, then add the biotinylated detection antibody. Wash the wells with PBS or TBS buffer, and add Avidin-Biotin-Peroxidase Complex (ABC-HRP). Wash away the unbounded ABC-HRP with PBS or TBS buffer and add TMB. TMB is substrate to HRP and will be catalyzed to produce a blue color product, which changes into yellow after adding acidic stop solution. The density of the yellow product is linearly propotional to Human CEACAM5 in the sample. Read the density of the yellow product in each well using a plate reader, and benchmark the sample wells' readings against the standard curve to determine the concentration of Human CEACAM5 in the sample. For more information on assay principle, protocols, and troubleshooting tips, see Boster's ELISA Resource Center at https://www.bosterbio.com/elisa-technical-resource-center.

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## Overview

| | |
|---|---|
| Product Name | Human CEA / Carcino Embryonic Antigen PicoKine® Quick ELISA Kit |
| Reactive Species | Human |
| Size | 96 wells/kit, with removable strips. |
| Description | Human CEA / Carcino Embryonic Antigen PicoKine® Quick ELISA Kit (120 minutes, 96 Tests). Quantitate Human CEACAM5 in cell culture supernatants, cell lysates, serum and plasma (heparin, EDTA). Sensitivity: 10pg/ml. The brand Picokine indicates this is a premium quality ELISA kit. Each Picokine kit delivers precise quantification, high sensitivity, and excellent reproducibility. Only our most reliable and effective kits qualify as Picokine, guaranteeing top-tier results for your assays. |
| Sensitivity | <10 pg/ml<br>*The sensitivity or the minimum detectable dose (MDD) is the lower limit of target protein that can be detected by the kit. It is determined by adding two standard deviations to the mean O.D. value of twenty (20) blank wells and calculating the corresponding concentration. |
| Detection Range | 312 pg/ml - 20,000 pg/ml |
| Storage Instructions | Store at 4°C for 6 months, at -20°C for 12 months. Avoid multiple freeze-thaw cycles (Ships with gel ice, can store for up to 3 days in room temperature. Freeze upon receiving.) |

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| | |
|---|---|
| Uniprot ID | P06731 |

## Technical Details

| | |
|---|---|
| Specificity | Natural and recombinant Human CEACAM5 |
| Standard Protein | Expression system for standard: NS0; Immunogen sequence: K35-A685 |
| Cross Reactivity | There is no detectable cross-reactivity with other relevant proteins. |

## Kit Components/Materials Provided

| Description | Quantity | Volume |
|---|---|---|
| Anti-Human CEACAM5 Pre-coated 96-well strip microplate | 1 | 12 strips of 8 wells |
| Human CEACAM5 Standard | 2 | 20 ng/tube |
| Human CEACAM5 Biotinylated antibody (50x) | 1 | 100 µl |
| Avidin-Biotin-Peroxidase Complex (30x) | 1 | 400 µl |
| Sample Diluent | 1 | 30 ml |
| Antibody Diluent | 1 | 12 ml |
| Avidin-Biotin-Peroxidase Diluent | 1 | 12 ml |
| Wash Buffer (25x) | 1 | 20 ml |
| Color Developing Reagent (TMB) | 1 | 10 ml |
| Stop Solution | 1 | 10 ml |
| Plate Sealers | 4 | Piece |

## Required Materials That Are Not Supplied

Microplate Reader capable of reading absorbance at 450nm.
Automated plate washer (optional)
Pipettes and pipette tips capable of precisely dispensing 0.5 µl through 1 ml volumes of aqueous solutions.
Multichannel pipettes are recommended for large amount of samples.
Deionized or distilled water.
500ml graduated cylinders.
Test tubes for dilution.

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## Notice Before Application

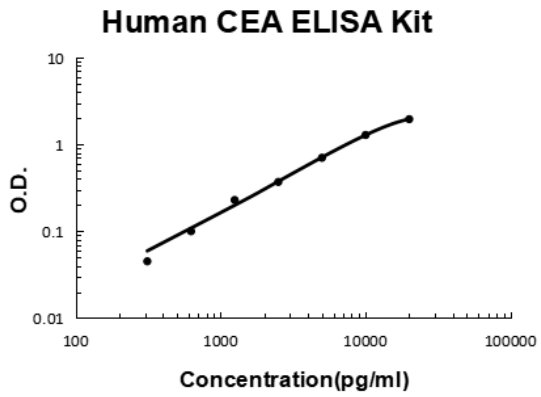
Please read the following instructions before starting the experiment.
1. To inspect the validity of experiment operation and the appropriateness of sample dilution proportion, pilot experiment using standards and a small number of samples is recommended.
2. Before using the Kit, spin tubes and bring down all components to the bottom of tubes.
3. Don't let 96-well plate dry, for dry plate will inactivate active components on plate.
4. Don't reuse tips and tubes to avoid cross contamination.
5. Avoid using the reagents from different batches together.

## Human CEA / Carcino Embryonic Antigen PicoKine® Quick ELISA Kit (FEK0904) Standard Curve Example

Highest O.D. value might be higher or lower than in the example. The experiment result is statistically significant if the highest O.D. value is no less than 1.0.

| Concentration (pg/ml) | 0 | 312 | 625 | 1250 | 2500 | 5000 | 10000 | 20000 |
|---|---|---|---|---|---|---|---|---|
| O.D. | 0.011 | 0.056 | 0.111 | 0.240 | 0.381 | 0.713 | 1.296 | 1.967 |

**Human CEA PicoKine ELISA Kit standard curve**




A standard curve is provided for demonstration only. A standard curve should be generated for each set of samples assayed.

## Intra/Inter Assay Variability

Boster spend great efforts in documenting lot to lot variability and make sure our assay kits produce robust data that are reproducible.

**Intra-Assay Precision (Precision within an assay):** Three samples of known concentration were tested on one plate to assess intra-assay precision.

**Inter-Assay Precision (Precision accross assays):**Three samples of known concentration were tested in separate assays to assess inter-assay precision.

| | Intra-Assay Precision | | | Inter-Assay Precision | | |
|---|---|---|---|---|---|---|
| Sample | 1 | 2 | 3 | 1 | 2 | 3 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| n | 16 | 16 | 16 | 24 | 24 | 24 |
| Mean (pg/ml) | 776 | 1668 | 10176 | 724 | 1662 | 10501 |
| Standard deviation | 39.57 | 124 | 407.04 | 39.09 | 137.94 | 420.04 |
| CV (%) | 4% | 7.5% | 4% | 5.4% | 8.3% | 4% |

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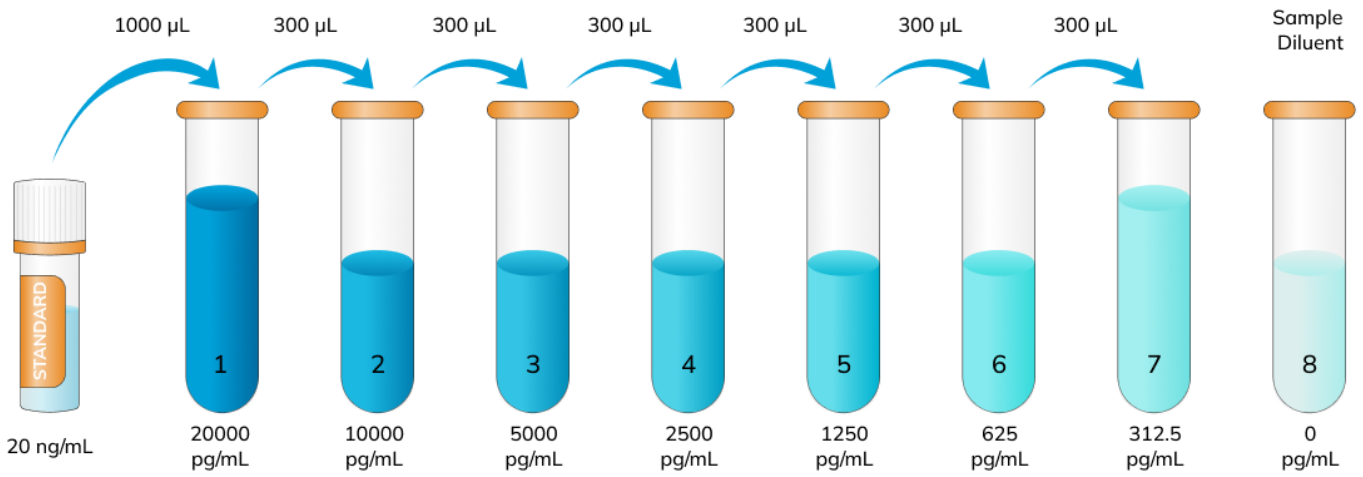
## Preparation Before The Experiment

| Item | Preparation |
|---|---|
| All reagents | Bring all reagents to 37°C prior to use. Also the TMB incubation time estimate (20-25min) is based on 37°C. |
| Wash buffer | Prepare 500 ml of Working Wash Buffer by diluting the supplied 20 ml of Wash Buffer (25 x) with 480 ml of deionized or distilled water. If crystals have formed in the concentrate, warm to room temperature and mix it gently until crystals have completely dissolved. |
| Biotinylated Anti-Human CEACAM5 antibody | It is recommended to prepare this reagent immediately prior to use by diluting the Human CEACAM5 Biotinylated antibody (50x) 1:50 with Antibody Diluent. Prepare 50 µl by adding 1 µl of Biotinylated antibody (50x) to 49 µl of Antibody Diluent. Mix gently and thoroughly and use within 2 hours of generation. |
| Avidin-Biotin-Peroxidase Complex | It is recommended to prepare this reagent immediately prior to use by diluting the Avidin-Biotin-Peroxidase Complex (30x) 1:30 with Avidin-Biotin-Peroxidase Diluent. Prepare 400 µl by adding 10 µl of Avidin-Biotin-Peroxidase Complex (30x) to 390 µl of Avidin-Biotin-Peroxidase Diluent. Mix gently and thoroughly and use within 2 hours of generation. |
| Human CEACAM5 Standard | It is recommended that the standards be prepared no more than 2 hours prior to performing the experiment. Use one 20 ng of lyophilized Human CEACAM5 standard for each experiment. Gently spin the vial prior to use. Reconstitute the standard to a stock concentration of 20 ng/ml using 1ml of sample diluent. Allow the standard to sit for a minimum of 10 minutes with gentle agitation prior to making dilutions. |
| Microplate | The included microplate is coated with capture antibodies and ready-to-use. It does not require additional washing or blocking. The unused well strips should be sealed and stored in the original packaging. |

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## Dilution of Human CEACAM5 Standard

1. Number tubes 1-8. Final Concentrations to be Tube # 1: 20,000.00 pg/ml, # 2: 10,000.00 pg/ml, # 3: 5,000.00 pg/ml, # 4: 2,500.00 pg/ml,
   # 5: 1,250.00 pg/ml, # 6: 625.00 pg/ml, # 7: 312.50 pg/ml, # 8: Sample Diluent serves as the zero standard (0 pg/ml).
2. For standard #1, add 1000 µl of undiluted standard stock solution to tube #1.
3. Add 300 µl of sample diluent to tubes # 2-7.
4. To generate standard # 2, add 300 µl of standard # 1 from tube # 1 to tube # 2 for a final volume of 600 µl. Mix thoroughly.
5. To generate standard # 3, add 300 µl of standard # 2 from tube # 2 to tube # 3 for a final volume of 600 µl. Mix thoroughly.
6. Continue the serial dilution for tube # 4-7.



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## Sample Preparation and Storage

These sample collection instructions and storage conditions are intended as a general guideline and the sample stability has not been evaluated.

| Sample Type | Procedure |
|---|---|
| Cell culture supernatants | Clear sample of particulates by centrifugation, assay immediately, or store samples at -20°C. |
| Serum | Use a serum separator tube (SST) and allow serum to clot at room temperature for about four hours. Then, centrifuge for 15 min at approximately 1,000 x g. assay immediately or store samples at -20°C. |
| Plasma | Collect plasma using heparin or EDTA as an anticoagulant. Centrifuge for 15 min at approximately 1,000 x g. Assay immediately or store samples at -20°C.<br>*Note: it is important to not use anticoagulants other than the ones described above to treat plasma, for other anticoagulants could block the antibody binding site. |
| Cell lysates | Lyse the cells, make sure there are no visible cell sediments. Centrifuge cell lysates at approximately 10,000 x g for 5 min. Collect the supernatant. |

## Sample Dilution

The target protein concentration should be estimated and appropriate sample dilutions should be selected such that the final protein concentration lies near the middle of the linear dynamic range of the assay.

It is recommended to prepare 150 µl of sample for each replicate to be assayed. The samples should be diluted with sample diluent and mixed gently.

## Assay protocol

It is recommended that all reagents and materials be equilibrated to 37°C/room temperature prior to the experiment (see Preparation Before The Experiment if you have missed this information).

1. Prepare all reagents and working standards as directed previously.
2. Remove excess microplate strips from the plate frame and seal and store them in the original packaging.
3. Add 50 µl of the standard, samples, or control per well. And add 50µl of the prepared 1x Biotinylated Anti-Human CEACAM5 antibody per well. Add 50 µl of the sample diluent buffer and 50µl of the prepared 1x Biotinylated Anti-Human CEACAM5 antibody into the control well (Zero well). At least two replicates of each standard, sample, or control is recommended.
4. Cover with the plate sealer provided and incubate for 60 minutes at RT.
5. Wash the plate 3 times with the 1x wash buffer.
 a. Discard the liquid in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
 b. Add 300 µl of the 1x wash buffer to each assay well. (For cleaner background incubate for 60 seconds between each wash).
 c. Repeat steps a-b 2 additional times.
6. Add 100 µl of the prepared 1x Avidin-Biotin-Peroxidase Complex into each well. Cover with plate sealer provided and incubate for 15 minutes at RT.
7. Wash the plate 5 times with the 1x wash buffer.
 a. Discard the liquid in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to

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gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
b. Add 300 µl of the 1x wash buffer to each assay well. (For cleaner background incubate for 60 seconds between each wash).
c. Repeat steps a-b 4 additional times.
8. Add 90 µl of Color Developing Reagent to each well and incubate in the dark for 30 minutes at RT (or 25-30 minutes at 37°C). (The optimal incubation time must be empirically determined. A guideline to look for is blue shading the top four standard wells, while the remaining standards remain clear.)
9. Add 100 µl of Stop Solution to each well. The color should immediately change to yellow.
10. Within 30 minutes of stopping the reaction, the O.D. absorbance should be read with a microplate reader at 450nm.

## Data Analysis

Average the duplicate readings for each standard, sample, and control. Subtract the average zero standard O.D. reading.

It is recommended that a standard curve be created using computer software to generate a four parameter logistic (4-PL) curve-fit. A free program capable of generating a four parameter logistic (4-PL) curve-fit can be found online at: www.myassays.com/four-parameter-logistic-curve.assay.

Alternatively, plot the mean absorbance for each standard against the concentration. The measured concentration in the sample can be interpolated by using linear regression of each average relative OD against the standard curve generated using curve fitting software. This will generate an adequate but less precise fit of the data.

For diluted samples, the concentration reading from the standard curve must be multiplied by the dilution factor.

## Background on CEACAM5

Carcinoembryonic antigen (CEA) is a complex immunoreactive glycoprotein with a molecular weight of 180,000 comprising 60% carbohydrate. It is found in adenocarcinomas of endodermally derived digestive system epithelia and in fetal colon.Carcinoembryonic antigen is one of the most widely used tumor markers in serum immunoassay determinations of carcinoma.



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