

ab283977 – Human Carbonic Anhydrase 3/CA3 ELISA Kit

For the quantitative measurement of Carbonic Anhydrase 3/CA3 in human plasma, serum, urine, cell culture, and cell lysate samples.

For research use only - not intended for diagnostic use.

For overview, typical data and additional information please visit: www.abcam.com/ab283977

Storage and Stability: Store kit at +4°C immediately upon receipt, apart from the Standard, SP Conjugate, and Biotinylated Antibody which should be stored at -20°C. Kit has a storage time of 1 year from receipt, providing components have not been reconstituted.

Materials Supplied

Item	Quantity	Storage Condition
100X Streptavidin-Peroxidase Conjugate	80 µL	-20°C
10X Diluent N Concentrate	30 mL	4°C
1X Standard Diluent	2 mL	4°C
20X Wash Buffer Concentrate	2 x 30 mL	4°C
Carbonic Anhydrase 3/CA3 Standard	1 vial	-20°C
Chromogen Substrate	7 mL	4°C
Human Carbonic Anhydrase 3/CA3 Microplate	96 wells	4°C
Sealing Tapes	3 units	4°C
Stop Solution	11 mL	4°C
50X Biotinylated Human Carbonic Anhydrase 3/CA3 Antibody	1 vial	-20°C

Materials Required, Not Supplied

These materials are not included in the kit, but will be required to successfully utilize this assay:

Microplate reader capable of measuring absorbance at 450 nm

Pipettes (1-20 µL, 20-200 µL, 200-1000 µL, and multiple channel)

Deionized or distilled reagent grade water

Reagents Preparation

Equilibrate all reagents to room temperature (18-25°C) prior to use. The kit contains enough reagents for 96 wells.

Prepare only as much reagent as is needed on the day of the experiment.

If crystals have formed in the concentrate, mix gently until the crystals have completely dissolved.

Δ Note: Concentration of the kit components are lot-specific, and the end user should always refer to the vial label.

10X Diluent N Concentrate: Dilute the Diluent N Concentrate 1:10 with reagent grade water to produce a 1x solution. When diluting the concentrate, make sure to rinse the bottle thoroughly to extract any precipitates left in the bottle. Store for up to 30 days at 4°C.

50X Biotinylated Human CA3 Antibody: Spin down the antibody briefly and dilute the desired amount of the antibody 1:50 with Diluent N to produce a 1x solution. The undiluted antibody should be stored at -20°C.

20X Wash Buffer Concentrate: Dilute the Wash Buffer Concentrate 1:20 with reagent grade water to produce a 1x solution. When diluting the concentrate, make sure to rinse the bottle thoroughly to extract any precipitates left in the bottle.

100X Streptavidin-Peroxidase Conjugate: Spin down the SP Conjugate briefly and dilute the desired amount of the conjugate 1:100 with Diluent N to produce a 1x solution. The undiluted conjugate should be stored at -20°C.

Standard Preparation

Always prepare a fresh set of standards for every use.

Prepare serially diluted standards immediately prior to use.

Any remaining standard should be stored at -20°C after reconstitution and used within 30 days. The following section describes the preparation of a standard curve for duplicate measurements (recommended).

Reconstitution of the CA3 Standard vial to prepare a 16 ng/ml Stock Standard.

- First consult the CA3 Standard vial to determine the mass of protein in the vial.
- Calculate the appropriate volume of 1X Diluent N to add when resuspending the CA3 Standard vial to produce a 16 ng/ml CA3 Stock Standard by using the following equation:
 - o C_s = Starting mass of CA3 Standard (see vial label) (ng)
 - o C_f = The 16 ng/ml CA3 Stock Standard final required concentration
 - o V_D = Required volume of 1X Diluent N for reconstitution (µL)
 - o Calculate total required volume 1X Diluent N for resuspension:

$$(C_s / C_f) \times 1,000 = V_D$$

Example: Δ Note: This example is for demonstration purposes only. Please remember to check your standard vial for the actual amount of standard provided.

C_s = 50 ng of Human CA3 Standard in vial

C_f = 16 ng/mL Human CA3 Standard #1 final concentration

V_D = Required volume of 1X Diluent N for reconstitution (50 ng / 16 ng/mL) x 1,000 = 3125 µL

- Reconstitute the Human CA3 Standard vial by adding the appropriate calculated amount V_D of 1X Diluent N to the vial to generate the 16 ng/mL Human CA3 Standard #1. Mix gently and thoroughly.
- Allow the reconstituted 16 ng/mL CA3 Standard #1 to sit for 10 minutes with gentle agitation prior to making subsequent dilutions
- Label five tubes #2 – 8.
- Add 120 µL of 1X Diluent N to tube #2 – 8.
- To prepare Standard #2, add 120 µL of the Standard #1 into tube #2 and mix gently.
- To prepare Standard #3, add 120 µL of the Standard #2 into tube #3 and mix gently

Using the table below as a guide, prepare subsequent serial dilutions. 1X Diluent N serves as the zero standard (0 ng/mL).

Standard #	Volume to dilute (µL)	Volume 1X Diluent N (µL)	CA3 (ng/ml)
1	240 µL	-	16
2	120 µL Standard #1	120 µL	8.0
3	120 µL Standard #2	120 µL	4.0
4	120 µL Standard #3	120 µL	2.0
5	120 µL Standard #4	120 µL	1.0
6	120 µL Standard #5	120 µL	0.5
7	120 µL Standard #6	120 µL	0.25
8	-	120 µL	0.0

Sample Preparation

Plasma: Collect plasma using one-tenth volume of 0.1 M sodium citrate as an anticoagulant. Centrifuge samples at 3000 x g for 10 minutes and collect plasma. A 1:8 sample dilution is suggested into Diluent N; however, user should determine optimal dilution factor depending on application needs. The undiluted samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles (EDTA or Heparin can also be used as an anticoagulant).

Serum: Samples should be collected into a serum separator tube. After clot formation, centrifuge samples at 3000 x g for 10 minutes and remove serum. A 1:8 sample dilution is suggested into Diluent N; however, user should determine optimal dilution factor depending on application needs. The undiluted samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles.

Urine: Collect urine using sample pot. Centrifuge samples at 800 x g for 10 minutes. The sample is suggested for use at 1x; however, user should determine optimal dilution factor depending on application needs. The undiluted samples can be stored at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles.

Cell Culture Supernatant: Centrifuge cell culture media at 1500 rpm for 10 minutes at 4°C to remove debris and collect supernatant. If necessary, dilute samples into Diluent N; user should determine optimal dilution factor depending on application needs. The undiluted samples can be stored at -80°C. Avoid repeated freeze-thaw cycles.

Cell Lysate: Rinse cell with cold PBS and then scrape the cell into a tube with 5 ml of cold PBS and 0.5 M EDTA. Centrifuge suspension at 1500 rpm for 10 minutes at 4°C and aspirate supernatant. Resuspend pellet in ice-cold Lysis Buffer (PBS, 1% Triton X-100, protease inhibitor cocktail). For every 1×10^6 cells, add approximately 100 µl of ice-cold Lysis Buffer. Incubate on ice for 60 minutes. Centrifuge at 13000 rpm for 30 minutes at 4°C and collect supernatant. Samples can be stored at -80°C. Avoid repeated freeze-thaw cycles.

Tissue: Extract tissue samples with 0.1 M phosphate-buffered saline (pH 7.4) containing 1% Triton X-100 and centrifuge at 14000 x g for 20 minutes. Collect the supernatant and measure the protein concentration. If necessary, dilute samples into Diluent N; user should determine optimal dilution factor depending on application needs. Store remaining extract at -80°C. Avoid repeated freeze-thaw cycles.

Plate Preparation

The 96 well plate strips included with this kit are supplied ready to use. It is not necessary to rinse the plate prior to adding reagents.

Unused plate strips should be immediately returned to the foil pouch containing the desiccant pack, resealed and stored at 4°C.

For each assay performed, a minimum of two wells must be used as the zero control.

For statistical reasons, we recommend each sample should be assayed with a minimum of two replicates (duplicates).

Assay Procedure

Equilibrate all materials and prepared reagents to room temperature prior to use.

We recommend that you assay all standards, controls and samples in duplicate

1. Add 50 µl of CA3 Standard or sample to each well. Gently tap plate to thoroughly coat the wells. Break any bubbles that may have formed. Cover wells with a sealing tape and incubate for 2 hours. Start the timer after the last addition.
2. Wash the microplate manually or automatically using a microplate washer. Invert the plate and decant the contents; hit 4-5 times on absorbent material to completely remove the liquid. If washing manually, wash five times with 200 µl of Wash Buffer per well. Invert the plate each time and decant the contents; hit 4-5 times on absorbent material to completely remove the liquid. If using a microplate washer, wash six times with 300 µl of Wash Buffer per well; invert the plate and hit 4-5 times on absorbent material to completely remove the liquid.
3. Add 50 µl of Biotinylated Human CA3 Antibody to each well. Gently tap plate to thoroughly coat the wells. Break any bubbles that may have formed. Cover wells with a sealing tape and incubate for 1 hour.
4. Wash the microplate as described above.
5. Add 50 µl of SP Conjugate to each well. Gently tap plate to thoroughly coat the wells. Break any bubbles that may have formed. Cover wells with a sealing tape and incubate for 30 minutes. Turn on the microplate reader and set up the program in advance.
6. Wash the microplate as described above.
7. Add 50 µl of Chromogen Substrate to each well. Gently tap plate to thoroughly coat the wells. Break any bubbles that may have formed. Incubate in ambient light for 20 minutes or until the optimal blue colour density develops.
8. Add 50 µl of Stop Solution to each well. The colour will change from blue to yellow. Gently tap plate to ensure thorough mixing. Break any bubbles that may have formed.
9. Read the absorbance on a microplate reader at a wavelength of 450 nm immediately. If wavelength correction is available, subtract readings at 570 nm from those at 450 nm to correct optical imperfections. Otherwise, read the plate at 450 nm only. Please note that some unstable black particles may be generated at high concentration points after stopping the reaction for about 10 minutes, which will reduce the readings.

Download our ELISA guide for technical hints, results, calculation, and troubleshooting tips:

www.abcam.com/protocols/the-complete-elisa-guide

For all technical or commercial enquiries please go to:

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Additional information

	Intra-Assay Precision	Inter-Assay Precision
CV (%)	5.5	10.2

CALCULATION

1. Calculate the mean value of the duplicate or triplicate readings for each standard and sample.
2. To generate a standard curve, plot the graph using the standard concentrations on the x-axis and the corresponding mean 450 nm absorbance (OD) on the y-axis. The best fit line can be determined by regression analysis using log-log or four-parameter logistic curve fit.
3. Determine the unknown sample concentration from the Standard Curve and multiply the value by the dilution factor.

TYPICAL DATA

Typical data provided for demonstration purposes only. A new standard curve must be generated for each assay performed.

Standard Point	ng/ml	OD	Average OD
1	16	1.933 1.855	1.894
2	8.0	1.327 1.279	1.303
3	4.0	0.807 0.775	0.791
4	2.0	0.488 0.472	0.480
5	1.0	0.323 0.309	0.316
6	0.5	0.232 0.224	0.228
7	0.25	0.182 0.178	0.180
8	0.0	0.118 0.116	0.117
Sample: Pooled Normal Sodium Citrate Plasma (8x)		0.611 0.593	0.602

PERFORMANCE CHARACTERISTICS

1. This assay recognizes both natural and recombinant human CA3.
2. The minimum detectable dose of human CA3 as calculated by 2SD from the mean of a zero standard was established to be 0.17 ng/ml.
3. Intra-assay precision was determined by testing three plasma samples twenty times in one assay.
4. Inter-assay precision was determined by testing three plasma samples in twenty assays.

RECOVERY

Standard Added Value	1 – 8 ng/ml
Recovery %	89 – 106
Average Recovery %	95

LINEARITY

Average Percentage of Expected Value (%)		
Sample Dilution	Plasma	Serum
4x	96	95
8x	97	99
16x	107	106

CROSS REACTIVITY

Species	Cross-Reactivity (%)
Canine	10
Bovine	None
Monkey	90
Mouse	50
Rat	5
Swine	50
Rabbit	None

No significant cross-reactivity observed with CA1, CA2, CA8, and CA14.

10% FBS in culture media will not affect the assay.

Download our ELISA guide for technical hints, results, calculation, and troubleshooting tips:

www.abcam.com/protocols/the-complete-elisa-guide

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