ab283996 – Human Carbonic Anhydrase 14 /CA14 ELISA Kit

For the quantitative measurement of Carbonic Anhydrase 14 /CA14 in Human cell lysate and tissue samples
For research use only - not intended for diagnostic use.

For overview, typical data and additional information please visit: www.abcam.com/ab283996

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.

Materials Supplied

Item	Quantity	Storage Condition
100X Streptavidin-Peroxidase Conjugate	80 µL	-20°C
10X Diluent M Concentrate	20 mL	4°C
1X Standard Diluent	2 mL	4°C
20X Wash Buffer Concentrate	2 x 30 mL	4°C
50X Biotinylated Human Carbonic Anhydrase 14/CA14 Antibody	1 vial	-20°C
Carbonic Anhydrase 14/CA14 Standard	1 vial	-20°C
Chromogen Substrate	8 mL	4°C
Human Carbonic Anhydrase 14/CA14 Microplate	96 wells	4°C
Sealing Tapes	3 units	N/A
Stop Solution	12 mL	4°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 M Concentrate: Dilute the Diluent M Concentrate 10-fold with reagent grade water to produce a 1x solution. Store for up to 30 days at 4°C.

50X Biotinylated Human Carbonic Anhydrase 14/CA14 Antibody: Spin down the antibody briefly and dilute the desired amount of the antibody 50-fold with 1X Diluent M to produce a 1x solution. The undiluted antibody should be stored at -20°C.

20X Wash Buffer Concentrate: Dilute the Wash Buffer Concentrate 20-fold with reagent grade water to produce a 1x solution.

100X Streptavidin-Peroxidase Conjugate: Spin down the SP Conjugate briefly and dilute the desired amount of the conjugate 100-fold with 1X Diluent M 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 Carbonic Anhydrase 14/CA14 Standard vial to prepare a 40 ng/mL Stock Standard.

- First consult the Carbonic Anhydrase 14/CA14 Standard vial to determine the mass of protein in the vial.
- Calculate the appropriate volume of Standard Diluent to add when resuspending the Carbonic Anhydrase 14/CA14 Standard vial to produce a 40 ng/mL Carbonic Anhydrase 14/CA14 Stock Standard by using the following equation:
    - C_S = Starting mass of Carbonic Anhydrase 14/CA14 Standard (see vial label) (ng)
    - C_F = The 40 ng/mL Carbonic Anhydrase 14/CA14 Stock Standard final required concentration
    - V_D = Required volume of Standard Diluent for reconstitution (µL)
    - Calculate total required volume Standard Diluent for resuspension:

$$(C_S / C_F) \times 1{,}000 = V_D$$

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

CS = 20 ng of Human CA14 Standard in vial
CF = 40 ng/mL Human CA14 Stock Standard final concentration
VD = Required volume of Standard Diluent for reconstitution (20 ng / 40 ng/mL) x 1,000 = 500 µL

- Reconstitute the Human CA14 Standard vial by adding the appropriate calculated amount VD of **Standard Diluent** to the vial to generate the 40 ng/mL Human CA14 Stock Standard. Mix gently and thoroughly.
- Allow the reconstituted 40 ng/mL Human CA14 Stock Standard to sit for 10 minutes with gentle agitation prior to making subsequent dilutions
- Label tubes #1 – 8.
- Add 120 µL of **1X Diluent M** to tubes #1 – 8.
- To prepare Standard #1, add 120 µL of the Stock Standard (40 ng/mL) into tube #1 and mix gently.
- To prepare Standard #2, add 120 µL of the Standard #1 into tube #2 and mix gently
- Using the table below as a guide, prepare subsequent serial dilutions. 1X Diluent M serves as the zero standard (0 ng/mL).

Standard #	Volume to dilute (µL)	Volume 1X Diluent M (µL)	CA14 (ng/mL)
1	120 µL Stock Standard (40 ng/mL)	120	20
2	120 µL Standard #1	120	10
3	120 µL Standard #2	120	5
4	120 µL Standard #3	120	2.5
5	120 µL Standard #4	120	1.25
6	120 µL Standard #5	120	0.625
7	120 µL Standard #6	120	0.313
8	-	120	0.0

Sample Preparation

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.
Re-suspend pellet in ice-cold Lysis Buffer (10 mM Tris, pH8.0, 130 mM NaCl, 1% Triton X-100, protease inhibitor cocktail).
For every 1 x 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.

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.

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 Carbonic Anhydrase 14/CA14 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 five times with 200 µL of Wash Buffer manually. Invert the plate each time and decant the contents; hit 4-5 times on absorbent material to completely remove the liquid. If using a machine, wash six times with 300 µL of Wash Buffer and then invert the plate, decanting the contents; hit 4-5 times on absorbent material to completely remove the liquid.
3. Add 50 µL of Biotinylated Human Carbonic Anhydrase 14/CA14 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 Streptavidin-Peroxidase 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 for 20 minutes or until the optimal blue color density develops.
8. Add 50 µL of Stop Solution to each well. The color 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.

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Additional information

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.

Standard #	ng/mL	OD	Average OD
1	20.00	2.236 2.304	2.271
2	10.00	1.830 1.814	1.822
3	5.000	1.298 1.311	1.305
4	2.500	0.823 0.820	0.822
5	1.250	0.495 0.502	0.499
6	0.625	0.323 0.330	0.327
7	0.313	0.225 0.228	0.227
8	0.0	0.121 0.120	0.121

PERFORMANCE CHARACTERISTICS

1. The minimum detectable dose of human CA14 as calculated by 2SD from the mean of a zero standard was established to be 0.13 ng/mL.
2. Intra-assay precision was determined by testing three samples twenty times in one assay
3. Inter-assay precision was determined by testing three samples in twenty assays.

	Intra-Assay Precision	Inter-Assay Precision
CV (%)	3.0%	10.6%

RECOVERY

Standard Added Value	0.625 – 10 ng/mL
Recovery %	95 – 118%
Average Recovery %	107%

CROSS REACTIVITY

Protein	Cross-Reactivity (%)
Carbonic anhydrase 1	None
Carbonic anhydrase 2	None
Carbonic anhydrase 3	None
Carbonic anhydrase 8	None

Download our ELISA guide for technical hints, results, calculation, and troubleshooting tips:
www.abcam.com/protocols/the-complete-elisa-guide

Technical Support

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Version 3a | 24 June 2026