

## Carbonic Anhydrase 12 Protein, Human, Recombinant (His)

### General Information

Synonyms:	HsT18816;FLJ20151;carbonic anhydrase XII;CA12;CAXII
Protein Construction:	A DNA sequence encoding the extracellular domain of human CA12 (NP_001209.1) (Met 1-Gln 291) was expressed with a C-terminal polyhistidine tag. Predicted N terminal: Ala 25
Species:	Human
Expression Host:	HEK293 Cells
Accession:	O43570-1
Molecular Weight:	31.6 kDa (predicted); 40-45 kDa (reducing condition, due to glycosylation)

### QC Testing

Biological Activity:	Measured by its esterase activity. The specific activity is >40 pmoles/min/μg, as measured with 1 mM 4-Nitrophenyl acetate and 2.5 μg enzyme at 400 nm in 100 μL of 12.5 mM Tris, 75 mM NaCl, pH 7.5.
Purity:	≥ 97 % as determined by SDS-PAGE ≥ 90 % as determined by SEC-HPLC.
Endotoxin:	< 1.0 EU/μg of the protein as determined by the LAL method.
Formulation:	Lyophilized from a solution filtered through a 0.22 μm filter, containing PBS, pH 7.4. Typically, a mixture containing 5% to 8% trehalose, mannitol, and 0.01% Tween 80 is incorporated as a protective agent before lyophilization.

### Preparation and Storage

**Reconstitution:**  
Reconstituted with sterile deionized water to 0.25 mg/mL. Reconstitution conditions may vary depending on the lot.

#### Stability & Storage:

It is recommended to store recombinant proteins at -20°C to -80°C for future use. Lyophilized powders can be stably stored for over 12 months, while liquid products can be stored for 6-12 months at -80°C. For reconstituted protein solutions, the solution can be stored at -20°C to -80°C for at least 3 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

#### Shipping:

In general, lyophilized powders are shipped with blue ice, while solutions are shipped with dry ice.

### Protein Background

Carbonic anhydrases (CAs) are a large family of zinc metalloenzymes first discovered in 1933 that catalyze the reversible hydration of carbon dioxide. CAs participate in a variety of biological processes, including respiration, calcification, acid-base balance, bone resorption, and the formation of aqueous humor, cerebrospinal fluid, saliva, and gastric acid. CA12, also known as Car12 and carbonic anhydrase XII, is a type I membrane enzyme of

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an N-terminal extracellular catalytic domain, a membrane-spanning  $\alpha$ -helix, and a small intracellular C-terminal domain. It is highly expressed in colon, kidney, prostate, intestine and activated lymphocytes and moderately expressed in pancreas, ovary, and testis. Overexpression of the CA12 is observed in certain human cancers and is used as a tumor marker. rmCA12 corresponds to the extracellular domain and has both carbonic anhydrase activity and esterase activity.

### Reference

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