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Product Information

Carbonic Anhydrase IV, human recombinant, expressed in *Escherichia coli*

Catalog Number **A4112**
Storage Temperature –20 °C

Synonyms: CAIV, Car4, RP17

Product Description
Carbonic anhydrases (CA) are a family of enzymes that catalyze the rapid conversion of carbon dioxide to bicarbonate and protons, an otherwise slow reaction that occurs rather slowly in the absence of a catalyst. Since the active site of most carbonic anhydrases contains a zinc ion, they are classified as metalloenzymes.[1-2]

CA are widely distributed in plant and animal tissues where they are involved in diverse physiological processes, such as photosynthesis, pH homeostasis, calcification, and bone resorption.

There are at least five distinct CA families (α, β, γ, δ, and ε). These families have no significant amino acid sequence similarity and in most cases are thought to be an example of convergent evolution. The α-CAs are found in humans. At least 14 isoforms of α-CA have been identified in vertebrates with different physiological and pathological roles. The enzymes can be localized in the cytosol or mitochondria, membrane bound with extracellular domains, or secreted.[2-4]

Carbonic anhydrase IV (CAIV) is a membrane-associated enzyme anchored to plasma membrane surfaces by glycosyl-phosphatidylinositol (GPI).[5] It is expressed in various organs, including on the luminal surface of pulmonary capillaries and the choriocapillaris of the eye epithelial cells.[6-8] Mutations in the human CAIV gene have been associated with retinal degeneration in an autosomal-dominant form of retinitis pigmentosa (RP17).[9]

The product is supplied in a solution of 20 mM Tris, pH 7.5, with 150 mM NaCl.

Purity: ≥90% (SDS-PAGE)

Enzyme reaction - Conversion of carbon dioxide to bicarbonate:

$$CO_2 + H_2O \rightarrow HCO_3 + H^+$$

Specific activity: >5000 units/mg

Unit Definition: One unit will decrease the pH of a 20 mM Tris buffer from pH 8.3 to 6.3 in 1 minute at 0 °C.

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability
Store the product at –20 °C. The product is stable for at least 2 years as supplied.

After initial thawing, the enzyme should be refrozen at –20 °C in aliquots. Repeated freezing and thawing is not recommended.

References
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