

# CA XII (D-2): sc-374314

## BACKGROUND

Carbonic anhydrases (CAs) are members of a large family of zinc metallo-enzymes that catalyze the reversible hydration of carbon dioxide. CAs are involved in a variety of biological processes including respiration, calcification, acid-base balance and bone resorption, as well as the formation of aqueous humor, cerebrospinal fluid, saliva and gastric juice. They show extensive diversity in distribution and in their subcellular localization. The human CA2 gene, which maps to chromosome 8q21.2, encodes CA II, a cytoplasmic protein that has the highest turnover rate and widest tissue distribution of any known human CA isozyme. The human CA4 gene, which maps to chromosome 17q23.1, encodes CA IV, a membrane-anchored isozyme that is expressed on the luminal surfaces of pulmonary capillaries and proximal renal tubules. The human CA9, CA12 and CA14 genes, which map to chromosomes 9p13.3, 15q22.2 and 1q21.2, respectively, encode transmembrane proteins that have unique patterns of tissue-specific expression. CA IX is specifically expressed in clear-cell renal carcinomas, whereas CA XII is highly expressed in normal tissues, such as kidney, colon and pancreas. Human CA XIV is also expressed in normal tissues, such as brain, but differs from CA XII in its expression pattern.

## CHROMOSOMAL LOCATION

Genetic locus: CA12 (human) mapping to 15q22.2.

## SOURCE

CA XII (D-2) is a mouse monoclonal antibody raised against amino acids 241-354 of CA XII of human origin.

## PRODUCT

Each vial contains 200 µg IgG<sub>1</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

CA XII (D-2) is available conjugated to agarose (sc-374314 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-374314 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-374314 PE), fluorescein (sc-374314 FITC), Alexa Fluor® 488 (sc-374314 AF488), Alexa Fluor® 546 (sc-374314 AF546), Alexa Fluor® 594 (sc-374314 AF594) or Alexa Fluor® 647 (sc-374314 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-374314 AF680) or Alexa Fluor® 790 (sc-374314 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

## APPLICATIONS

CA XII (D-2) is recommended for detection of CA XII of human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

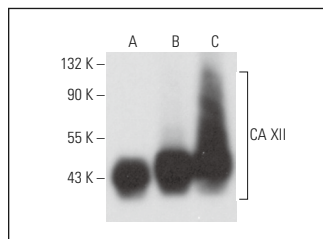
Suitable for use as control antibody for CA XII siRNA (h): sc-41463, CA XII shRNA Plasmid (h): sc-41463-SH and CA XII shRNA (h) Lentiviral Particles: sc-41463-V.

Molecular Weight of CA XII isoforms: 43/44 kDa.

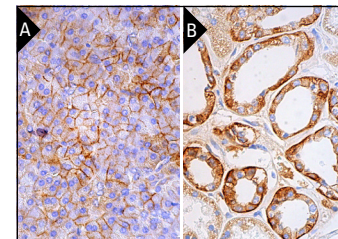
## STORAGE

Store at 4° C, **\*\*DO NOT FREEZE\*\***. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## DATA



CA XII (D-2): sc-374314. Western blot analysis of CA XII expression in A549 (A), ZR-75-1 (B) and T-47D (C) whole cell lysates.



CA XII (D-2): sc-374314. Immunoperoxidase staining of formalin fixed, paraffin-embedded human pancreas tissue showing membrane staining of glandular cells (A). Immunoperoxidase staining of formalin fixed, paraffin-embedded human kidney tissue showing membrane and cytoplasmic staining of cells in tubules (B).

## SELECT PRODUCT CITATIONS

- Tavares-Valente, D., et al. 2013. Cancer cell bioenergetics and pH regulation influence breast cancer cell resistance to paclitaxel and doxorubicin. *J. Bioenerg. Biomembr.* 45: 467-475.
- Ochi, F., et al. 2015. Carbonic anhydrase XII as an independent prognostic factor in advanced esophageal squamous cell carcinoma. *J. Cancer* 6: 922-929.
- Kim, S.W., et al. 2017. PEGylated anticancer-carbon nanotubes complex targeting mitochondria of lung cancer cells. *Nanotechnology* 28: 465102.
- Kim, S.W., et al. 2017. Covalent, non-covalent, encapsulated nanodrug regulate the fate of intra- and extracellular trafficking: impact on cancer and normal cells. *Sci. Rep.* 7: 6454.
- Zengin Kurt, B., et al. 2019. Synthesis of coumarin-sulfonamide derivatives and determination of their cytotoxicity, carbonic anhydrase inhibitory and molecular docking studies. *Eur. J. Med. Chem.* 183: 111702.
- Tavares-Valente, D., et al. 2021. Disruption of pH dynamics suppresses proliferation and potentiates doxorubicin cytotoxicity in breast cancer cells. *Pharmaceutics* 13: 242.
- Zengin Kurt, B., et al. 2023. Tail-approach-based design and synthesis of coumarin-monoterpenes as carbonic anhydrase inhibitors and anticancer agents. *ACS Omega* 8: 5787-5807.
- Twomey, J.D. and Zhang, B. 2023. Exploring the role of hypoxia-inducible carbonic anhydrase IX (CAIX) in circulating tumor cells (CTCs) of breast cancer. *Biomedicines* 11: 934.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.

Alexa Fluor® is a trademark of Molecular Probes, Inc., Oregon, USA