

BCKDK (E-12): sc-374425

BACKGROUND

BCKDK (branched chain ketoacid dehydrogenase kinase), also known as BCKDHKIN, is a 412 amino acid mitochondrial matrix protein that exists as a monomer and contains one histidine kinase domain. Expressed ubiquitously, BCKDK catalyzes the ATP-dependent phosphorylation and subsequent inactivation of the branched-chain α -ketoacid dehydrogenase (BCKD) complex, a regulatory enzyme complex that plays a crucial role in the catabolic pathways of valine, leucine and isoleucine. Specifically, the BCKD complex functions as the second enzyme in branched-chain amino acid (BCAA) catabolism, effectively catalyzing the irreversible oxidative decarboxylation of BCAAs. Due to the ability of BCKDK to regulate the activity of the BCKD complex, BCKDK plays an essential role in the catabolic pathways of branched-chain amino acid metabolism.

REFERENCES

1. Popov, K.M., et al. 1992. Branched-chain α -ketoacid dehydrogenase kinase. Molecular cloning, expression, and sequence similarity with histidine protein kinases. *J. Biol. Chem.* 267: 13127-13130.
2. Popov, K.M., et al. 1997. Mitochondrial α -ketoacid dehydrogenase kinases: a new family of protein kinases. *Adv. Second Messenger Phosphoprotein Res.* 31: 105-111.
3. Suryawan, A., et al. 1998. A molecular model of human branched-chain amino acid metabolism. *Am. J. Clin. Nutr.* 68: 72-81.
4. Machius, M., et al. 2001. Structure of rat BCKD kinase: nucleotide-induced domain communication in a mitochondrial protein kinase. *Proc. Natl. Acad. Sci. USA* 98: 11218-11223.

CHROMOSOMAL LOCATION

Genetic locus: BCKDK (human) mapping to 16p11.2.

SOURCE

BCKDK (E-12) is a mouse monoclonal antibody raised against amino acids 1-280 mapping at the N-terminus of BCKDK of human origin.

PRODUCT

Each vial contains 200 μ g IgG₁ kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

BCKDK (E-12) is recommended for detection of BCKDK of human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)], immunofluorescence (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 BCKDK siRNA (h): sc-93313, BCKDK shRNA Plasmid (h): sc-93313-SH and BCKDK shRNA (h) Lentiviral Particles: sc-93313-V.

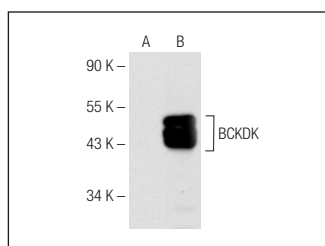
Molecular Weight of BCKDK: 46 kDa.

Positive Controls: BCKDK (h4): 293T Lysate: sc-158293.

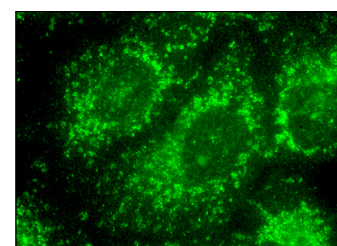
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



BCKDK (E-12): sc-374425. Western blot analysis of BCKDK expression in non-transfected: sc-117752 (A) and human BCKDK transfected: sc-158293 (B) 293T whole cell lysates.



BCKDK (E-12): sc-374425. Immunofluorescence staining of methanol-fixed HeLa cells showing mitochondrial localization.

SELECT PRODUCT CITATIONS

1. Xue, P., et al. 2017. BCKDK of BCAA catabolism cross-talking with the MAPK pathway promotes tumorigenesis of colorectal cancer. *EBioMedicine* 20: 50-60.
2. White, P.J., et al. 2018. The BCKDH kinase and phosphatase integrate BCAA and lipid metabolism via regulation of ATP-citrate lyase. *Cell Metab.* 27: 1281-1293.e7.
3. Tian, Q., et al. 2020. Phosphorylation of BCKDK of BCAA catabolism at Y246 by Src promotes metastasis of colorectal cancer. *Oncogene* 39: 3980-3996. 2022: 3691635.
4. Li, H., et al. 2022. BCKDK promotes ovarian cancer proliferation and migration by activating the MEK/ERK signaling pathway. *J. Oncol.* 2022: 3691635.
5. Ragni, M., et al. 2022. An amino acid-defined diet impairs tumour growth in mice by promoting endoplasmic reticulum stress and mTOR inhibition. *Mol. Metab.* 60: 101478.
6. Ogawa, T., et al. 2023. Downregulation of extramitochondrial BCKDH and its uncoupling from AMP deaminase in type 2 diabetic OLETF rat hearts. *Physiol. Rep.* 11: e15608.

STORAGE

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

RESEARCH USE

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