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KO-Validated Anti-BCKDK Rabbit Polyclonal Antibody

Rabbit polyclonal antibody
Catalog # AGI2405

Product Information

Application	WB
Primary Accession	O14874
Reactivity	Rat, Human, Mouse
Clonality	Polyclonal
Isotype	Rabbit IgG
Calculated MW	46360
Gene Name	BCKDK
Aliases	BCKDK; Branched Chain Keto Acid Dehydrogenase Kinase; [3-Methyl-2-Oxobutanoate Dehydrogenase [Lipoamide]] Kinase, Mitochondrial; Branched-Chain Alpha-Ketoacid Dehydrogenase Kinase; BCKDH Kinase; EC 2.7.11.4; BCKDHKIN; BDK; 3-Methyl-2-Oxobutanoate Dehydrogenase [Lipoamide] Kinase, Mitochondrial; Branched Chain Alpha-Ketoacid Dehydrogenase Kinase; Branched Chain Ketoacid Dehydrogenase Kinase; BCKD-Kinase; EC 2.7.11.1; EC 2.7.11; BCKDKD
Immunogen	A synthesized peptide derived from human BCKDK

Additional Information

Gene ID	10295
Other Names	Branched-chain alpha-ketoacid dehydrogenase kinase, BCKDH kinase, BCKDHKIN, BDK, 2.7.11.1, [3-methyl-2-oxobutanoate dehydrogenase [lipoamide]] kinase, mitochondrial, 2.7.11.4, BCKDK {ECO:0000303|PubMed:29779826, ECO:0000312|HGNC:HGNC:16902}

Protein Information

Name	BCKDK {ECO:0000303|PubMed:29779826, ECO:0000312|HGNC:HGNC:16902}
Function	Serine/threonine-protein kinase component of macronutrients metabolism. Forms a functional kinase and phosphatase pair with PPM1K, serving as a metabolic regulatory node that coordinates branched-chain amino acids (BCAAs) with glucose and lipid metabolism via two distinct phosphoprotein targets: mitochondrial BCKDHA subunit of the branched- chain alpha-ketoacid dehydrogenase (BCKDH) complex and cytosolic ACLY, a lipogenic enzyme of Krebs cycle (PubMed:24449431, PubMed:29779826, PubMed:37558654). Phosphorylates and inactivates mitochondrial BCKDH complex a multisubunit complex consisting of three multimeric components each involved in different steps of BCAA catabolism: E1 composed of BCKDHA and BCKDHB, E2 core composed of DBT monomers, and E3 composed of DLD monomers. Associates with the E2 component of BCKDH complex and phosphorylates

BCKDHA on Ser-337, leading to conformational changes that interrupt substrate channeling between E1 and E2 and inactivates the BCKDH complex (PubMed:29779826, PubMed:37558654). Phosphorylates ACLY on Ser-455 in response to changes in cellular carbohydrate abundance such as occurs during fasting to feeding metabolic transition. Refeeding stimulates MLXIPL/ChREBP transcription factor, leading to increased BCKDK to PPM1K expression ratio, phosphorylation and activation of ACLY that ultimately results in the generation of malonyl-CoA and oxaloacetate immediate substrates of de novo lipogenesis and glucogenesis, respectively (PubMed:29779826). Recognizes phosphosites having SxxE/D canonical motif (PubMed:29779826).

Cellular Location Mitochondrion matrix {ECO:0000250|UniProtKB:Q00972, ECO:0000305|PubMed:24449431} Note=Detected in the cytosolic compartment of liver cells {ECO:0000250|UniProtKB:Q00972}

Tissue Location Ubiquitous.