PRKAA1 Antibody – Rabbit Polyclonal

PRODUCT OVERVIEW

Product Name	PRKAA1, Polyclonal Antibody
Full Product Name	PRKAA1 Antibody, HRP conjugated
Product Gene Name	anti-PRKAA1 antibody
Product Synonym Names	5'-AMP-activated protein kinase catalytic subunit alpha-1; Acetyl-CoA carboxylase kinase (EC: 2.7.11.27
Clonality	Polyclonal
Isotype	IgG
Host	Rabbit
Species Reactivity	Human
Form/Format	Liquid
Purity/Purification	>95%, Protein G purified
Preparation and Storage	Shipped at 4 degree C. Upon delivery aliquot and store at -20 degree C or -80 degree C. Avoid repeated freeze.
Matching Pairs	Unconjugated Antibody: PRKAA1 (MBS7050188) HRP Conjugated Antibody: PRKAA1 (MBS7050189)
Molecular Weight	65,523 Da
OMIM	AC008810 Genomic DNA
3D Structure	ModBase 3D Structure for Q13131
Immunogen	Recombinant human 5'-AMP-activated protein kinase catalytic subunit alpha-1 protein (325-543AA)
Preservative	0.03% Proclin 300
Constituents	50% Glycerol, 0.01M PBS, PH 7.4
Conjugation	HRP
Santa Cruz Alternative	Potential replacement for Santa Cruz Biotechnology antibody catalog# sc-19128 / sc-19126 / sc-25792
ISO Certification	Manufactured in an ISO 9001:2015 Certified Laboratory.
Applications Tested/Suitable for anti-PRKAA1 antibody	ELISA (EIA)

Related Product Information for anti-PRKAA1 antibody	Catalytic subunit of AMP-activated protein kinase (AMPK), an energy sensor protein kinase that plays a key role in regulating cellular energy metabolism. In response to reduction of intracellular ATP levels, AMPK activates energy-producing pathways and inhibits energy-consuming processes: inhibits protein, carbohydrate and lipid biosynthesis, as well as cell growth and proliferation. AMPK acts via direct phosphorylation of metabolic enzymes, and by longer-term effects via phosphorylation of transcription regulators. Also acts as a regulator of cellular polarity by remodeling the actin cytoskeleton; probably by indirectly activating myosin. Regulates lipid synthesis by phosphorylating and inactivating lipid metabolic enzymes such as ACACA, ACACB, GYS1, HMGCR and LIPE; regulates fatty acid and cholesterol synthesis by phosphorylating acetyl-CoA carboxylase (ACACA and ACACB) and hormone-sensitive lipase (LIPE) enzymes, respectively. Regulates insulin-signaling and glycolysis by phosphorylating IRS1, PFKFB2 and PFKFB3. AMPK stimulates glucose uptake in muscle by increasing the translocation of the glucose transporter SLC2A4/GLUT4 to the plasma membrane, possibly by mediating phosphorylation of TBC1D4/AS160. Regulates transcription and chromatin structure by phosphorylating transcription regulators involved in energy metabolism such as CRTC2/TORC2, FOXO3, histone H2B, HDAC5, MEF2C, MLXIPL/ChREBP, EP300, HNF4A, p53/TP53, SREBF1, SREBF2 and PPARGC1A. Acts as a key regulator of glucose homeostasis in liver by phosphorylating CRTC2/TORC2, leading to CRTC2/TORC2 sequestration in the cytoplasm. In response to stress, phosphorylates 'Ser-36' of histone H2B (H2BS36ph), leading to promote transcription. Acts as a key regulator of cell growth and proliferation by phosphorylating TSC2, RPTOR and ATG1/ULK1: in response to nutrient limitation, negatively regulates the mTORC1 complex by phosphorylating RPTOR component of the mTORC1 complex and by phosphorylating and activating TSC2. In response to nutrient limitation, promotes autophagy by phosphorylating and activating ATG1/ULK1. AMPK also acts as a regulator of circadian rhythm by mediating phosphorylation of CRY1, leading to destabilize it. May regulate the Wnt signaling pathway by phosphorylating CTNNB1, leading to stabilize it. Also has tau-protein kinase activity: in response to amyloid beta A4 protein (APP) exposure, activated by CAMKK2, leading to phosphorylation of MAPT/TAU; however the relevance of such data remains unclear in vivo. Also phosphorylates CFTR, EEF2K, KLC1, NOS3 and SLC12A1.
Other Notes	Small volumes of anti-PRKAA1 antibody vial(s) may occasionally become entrapped in the seal of the product vial during shipment and storage. If necessary, briefly centrifuge the vial on a tabletop centrifuge to dislodge any liquid in the container`s cap. Certain products may require to ship with dry ice and additional dry ice fee may apply.
Searchable Terms for PRKAA1 purchase	MBS7050189 is an antibody targeting PRKAA1. Also known as PRKAA1 Antibody, HRP conjugated. Reactive in Human. Host: Rabbit.

ADDITIONAL DETAILS

NCBI/Uniprot data below describe general gene information for PRKAA1. It may not necessarily be applicable to this product.

NCBI GI #	94557301
NCBI GeneID	5562
NCBI Accession #	NP_006242.5
UniProt Primary Accession #	Q13131
UniProt Secondary Accession #	O00286; Q5D0E1; Q86VS1; Q9UNQ4; A8MTQ6; B2R7E1
UniProt Related Accession #	Q13131
GenBank Nucleotide #	NM_006251.5
NCBI Official Full Name	5'-AMP-activated protein kinase catalytic subunit alpha-1 isoform 1
NCBI Official Synonym Full Names	protein kinase AMP-activated catalytic subunit alpha 1
NCBI Official Symbol	PRKAA1
NCBI Official Synonym Symbols	AMPK; AMPKa1
UniProt Protein Name	5'-AMP-activated protein kinase catalytic subunit alpha-1
UniProt Synonym Protein Names	Acetyl-CoA carboxylase kinase (EC:2.7.11.27
UniProt Gene Name	PRKAA1
UniProt Synonym Gene Names	AMPK1; HMGCR kinase
UniProt Entry Name	AAPK1_HUMAN

NCBI Protein Information	5'-AMP-activated protein kinase catalytic subunit alpha-1
NCBI Summary for PRKAA1	The protein encoded by this gene belongs to the ser/thr protein kinase family. It is the catalytic subunit of the 5'-prime-AMP-activated protein kinase (AMPK). AMPK is a cellular energy sensor conserved in all eukaryotic cells. The kinase activity of AMPK is activated by the stimuli that increase the cellular AMP/ATP ratio. AMPK regulates the activities of a number of key metabolic enzymes through phosphorylation. It protects cells from stresses that cause ATP depletion by switching off ATP-consuming biosynthetic pathways. Alternatively spliced transcript variants encoding distinct isoforms have been observed. [provided by RefSeq, Jul 2008]
UniProt Comments for PRKAA1	AMPKA1: a catalytic subunit of AMP-activated protein kinase (AMPK). Acts as an energy sensor, playing a key role in regulating cellular energy metabolism. A protein kinase of the CAMKL family whose activation is regulated by the balance between ADP/AMP/ATP, and intracellular Ca(2+) levels. Acts as a metabolic stress-sensing protein kinase switching off biosynthetic pathways when cellular ATP levels are depleted and when 5'-ADP and -AMP rise in response to fuel limitation and/or hypoxia. Activates energy-producing pathways and inhibits energy-consuming processes. Restores ATP levels in cells by switching off anabolic and switching on catabolic pathways. Activated primarily by rising ADP levels and not, as previously thought, solely by AMP. AMPK resembles an adenylate charge regulatory system in which anabolic and catabolic pathways are regulated by adenine nucleotide ratios. Acts via direct phosphorylation of a number of metabolic enzymes and transcription regulators. Activated by at least two distinct upstream kinases: the tumor suppressor LKB1 and CaMKK2. Also acts as a regulator of cellular polarity by remodeling the actin cytoskeleton, probably by indirectly activating myosin. AMPK is a heterotrimer of an alpha catalytic subunit (AMPKA1 or -2), a beta (AMPKB1 or -2) and a gamma non-catalytic subunit (AMPKG1, -2 or -3). Different possible combinations of subunits give rise to 12 different holoenzymes. Binding of ADP or AMP to non-catalytic gamma subunit (PRKAG1, -2 or -3) results in allosteric activation. AMPK is activated by antihyperglycemic drug metformin, a drug prescribed to patients with type 2 diabetes: in vivo, metformin seems to mainly inhibit liver gluconeogenesis. However, metformin can be used to activate AMPK in muscle and other cells in culture or ex vivo. Selectively inhibited by compound C (6-[4-(2-Piperidin-1-yl-ethoxy)-phenyl)]-3-pyridin-4-yl-pyyrazolo[1,5-a] pyrimidine. Activated by resveratrol, a natural polyphenol present in red wine, and S17834, a synthetic polyphenol. Two isoforms of the human protein are produced by alternative splicing. Protein type: AMPK subfamily; Autophagy; CAMK group; CAMKL family; EC 2.7.11.1; EC 2.7.11.26; EC 2.7.11.27; EC 2.7.11.31; Kinase, protein; Protein kinase, CAMK; Protein kinase, Ser/Thr (non-receptor) Chromosomal Location of Human Ortholog: 5p12 Cellular Component: AMP-activated protein kinase complex; cytoplasm; cytosol; intracellular; nucleoplasm; nucleus Molecular Function: AMP-activated protein kinase activity; chromatin binding; histone serine kinase activity; protein binding; protein kinase activity Biological Process: cell cycle arrest; cellular response to glucose starvation; cellular response to nutrient levels; fatty acid homeostasis; glucose homeostasis; lipid biosynthetic process; macroautophagy; negative regulation of apoptosis; negative regulation of lipid catabolic process; negative regulation of TOR signaling pathway; positive regulation of autophagy; positive regulation of glycolysis; protein amino acid phosphorylation; regulation of circadian rhythm; response to gamma radiation; signal transduction
Research Articles on PRKAA1	**1.** human cells were infected with lentiviruses expressing shRNA targeting both alpha1 and alpha2 AMPK subunits. AMPK activation inhibits Gli1-driven proliferation and that this effect is linked to Ser408 phosphorylation, which represents a key metabolic checkpoint for Hh signaling.
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