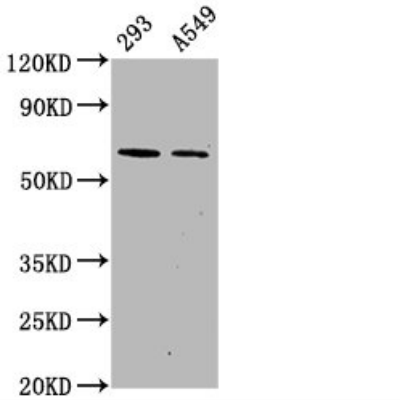
Phospho-PRKAA2 (S491) Recombinant Monoclonal Antibody

Product Code	CSB-RA805325A491phHU
Abbreviation	5'-AMP-activated protein kinase catalytic subunit alpha-2
Storage	Upon receipt, store at -20°C or -80°C. Avoid repeated freeze.
Uniprot No.	P54646
Immunogen	A synthesized peptide derived from Human Phospho-PRKAA2 (S491)
Species Reactivity	Human
Tested Applications	ELISA, WB; Recommended dilution: WB:1:500-1:5000
Relevance	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. Involved in insulin receptor/INSR internalization (PubMed:25687571). 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 phosphorylates CFTR, EEF2K, KLC1, NOS3 and SLC12A1. Plays an important role in the differential regulation of pro-autophagy (composed

	of PIK3C3, BECN1, PIK3R4 and UVRAG or ATG14) and non-autophagy (composed of PIK3C3, BECN1 and PIK3R4) complexes, in response to glucose starvation. Can inhibit the non-autophagy complex by phosphorylating PIK3C3 and can activate the pro-autophagy complex by phosphorylating BECN1 (By similarity).
Form	Liquid
Conjugate	Non-conjugated
Storage Buffer	Rabbit IgG in phosphate buffered saline , pH 7.4, 150mM NaCl, 0.02% sodium azide and 50% glycerol.
Purification Method	Affinity-chromatography
Isotype	Rabbit IgG
Clonality	Monoclonal
Alias	5'-AMP-activated protein kinase catalytic subunit alpha-2, Acetyl-CoA carboxylase kinase, PRKAA2, AMPK, AMPK2
Immunogen Species	Homo sapiens (Human)
Research Area	Signal Transduction
Gene Names	PRKAA2
Clone No.	3H10

Image



Western Blot
Positive WB detected in 293 whole cell lysate, A549 whole cell lysate
All lanes Phospho-PRKAA2 antibody at 1.1µg/ml
Secondary
Goat polyclonal to rabbit IgG at 1/50000 dilution
Predicted band size: 62 KDa
Observed band size: 62 KDa

Description

In the process of creating the phospho-PRKAA2 (S491) recombinant monoclonal antibody, the initial step involves the isolation of genes responsible for encoding the PRKAA2 antibody from rabbits that have been immunized with a synthesized peptide derived from the human PRKAA2 protein phosphorylated at S491. Subsequently, these antibody genes are cloned into expression vectors. Following this genetic modification, the modified vectors are carefully transfected into host suspension cells. Once transfection is successful, positive cells are cultivated to facilitate the expression and secretion of antibodies. The phospho-PRKAA2 (S491) recombinant monoclonal antibody is then purified from the cell culture supernatant using affinity chromatography. Finally, the antibody's activity is rigorously assessed through ELISA and WB tests, confirming its capability to interact effectively with the human PRKAA2 protein phosphorylated at S491.

Phosphorylation of PRKAA2 at S491 is a crucial regulatory event in the AMPK signaling pathway, allowing cells to adapt to energy fluctuations and maintain energy homeostasis. Dysregulation of this phosphorylation event can have significant implications for cellular metabolism and is implicated in various metabolic disorders and cancers.