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[KD]cAMP Protein Kinase Catalytic Subunit Rabbit mAb

Catalog # AP75185

Product Information

Application	WB, IHC-P, IHC-F, FC, IP
Primary Accession	P17612
Reactivity	Rat, Human, Mouse
Host	Rabbit
Clonality	Monoclonal Antibody
Isotype	IgG
Conjugate	Unconjugated
Purification	Affinity Purified
Calculated MW	40590

Additional Information

Gene ID	5566
Other Names	PRKACA
Dilution	WB~~1:2000-1:20000 IHC-P~~N/A IHC-F~~N/A FC~~1:50-1:100 IP~~1:20-1:50
Format	1xPBS(pH 7.4), 150mM NaCl, 50% Glycerol, 0.02% Sodium azide and 0.05% BSA
Storage	Store at 4°C short term. Aliquot and store at -20°C long term. Avoid freeze/thaw cycles.

Protein Information

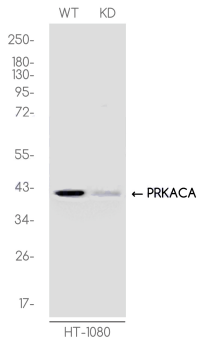
Name	PRKACA
Synonyms	PKACA
Function	Phosphorylates a large number of substrates in the cytoplasm and the nucleus (PubMed:15642694, PubMed:15905176, PubMed:16387847, PubMed:17333334, PubMed:17565987, PubMed:17693412, PubMed:18836454, PubMed:19949837, PubMed:20356841, PubMed:21085490, PubMed:21514275, PubMed:21812984, PubMed:21852232, PubMed:31112131, PubMed:41652173). Phosphorylates CDC25B, ABL1, NFKB1, CLDN3, histone H1.4 (H1-4), PSMC5/RPT6, PJA2, RYR2, RORA, SLC6A6, SOX9, UHRF1 and VASP (PubMed:15178447, PubMed:15642694, PubMed:15905176, PubMed:16387847, PubMed:17333334, PubMed:17565987, PubMed:17693412, PubMed:18836454, PubMed:19949837, PubMed:20356841, PubMed:21085490, PubMed:21514275, PubMed:21812984, PubMed:41652173). Regulates the abundance of compartmentalized pools of

	its regulatory subunits through phosphorylation of PJA2 which binds and ubiquitinates these subunits, leading to their subsequent proteolysis (PubMed:21423175). RORA is activated by phosphorylation (PubMed:21514275). Required for glucose- mediated adipogenic differentiation increase and osteogenic differentiation inhibition from osteoblasts (PubMed:19949837). Involved in chondrogenesis by mediating phosphorylation of SOX9 (By similarity). Involved in the regulation of platelets in response to thrombin and collagen; maintains circulating platelets in a resting state by phosphorylating proteins in numerous platelet inhibitory pathways when in complex with NF-kappa-B (NFKB1 and NFKB2) and I-kappa-B-alpha (NFKBIA), but thrombin and collagen disrupt these complexes and free active PRKACA stimulates platelets and leads to platelet aggregation by phosphorylating VASP (PubMed:15642694, PubMed:20356841). Prevents the antiproliferative and anti-invasive effects of alpha-difluoromethylornithine in breast cancer cells when activated (PubMed:17333334). RYR2 channel activity is potentiated by phosphorylation in presence of luminal Ca(2+), leading to reduced amplitude and increased frequency of store overload-induced Ca(2+) release (SOICR) characterized by an increased rate of Ca(2+) release and propagation velocity of spontaneous Ca(2+) waves, despite reduced wave amplitude and resting cytosolic Ca(2+) (PubMed:17693412). PSMC5/RPT6 activation by phosphorylation stimulates proteasome (PubMed:17565987). Negatively regulates tight junctions (TJs) in ovarian cancer cells via CLDN3 phosphorylation (PubMed:15905176). NFKB1 phosphorylation promotes NF-kappa-B p50-p50 DNA binding (PubMed:15642694). Acts as a key inhibitor of smoothened signaling pathway by mediating phosphorylation of GLI (GLI1, GLI2 and GLI3) transcription factors in absence of hedgehog (DHH, IHH or SHH) morphogens: GLI phosphorylation promotes their processing and prevents transcriptional activation of smoothened target genes (PubMed:16705181). GLI transcription factor phosphorylation is inhibited by interaction of PRKACA with SMO which sequesters PRKACA at the cell membrane (PubMed:36202993, PubMed:39138140). Also inhibits the smoothened signaling pathway in embryonic development by catalyzing phosphorylation of OFD1 in ciliogenesis (PubMed:33934390). Prevents meiosis resumption in prophase-arrested oocytes via CDC25B inactivation by phosphorylation (By similarity). May also regulate rapid eye movement (REM) sleep in the pedunculopontine tegmental (PPT) (By similarity). Phosphorylates APOBEC3G and AICDA (PubMed:16387847, PubMed:18836454). Phosphorylates HSF1; this phosphorylation promotes HSF1 nuclear localization and transcriptional activity upon heat shock (PubMed:21085490). Acts as a negative regulator of mTORC1 by mediating phosphorylation of RPTOR (PubMed:31112131). Phosphorylates AKAP19 (PubMed:27028580).
Cellular Location	Cytoplasm. Cell membrane. Membrane; Lipid-anchor. Nucleus. Mitochondrion {ECO:0000250|UniProtKB:P05132}. Note=Translocates into the nucleus (monomeric catalytic subunit). The inactive holoenzyme is found in the cytoplasm. Distributed throughout the cytoplasm in meiotically incompetent oocytes. Associated to mitochondrion as meiotic competence is acquired. Aggregates around the germinal vesicles (GV) at the immature GV stage oocytes (By similarity). Colocalizes with HSF1 in nuclear stress bodies (nSBs) upon heat shock (PubMed:21085490) Recruited to the cell membrane through interaction with SMO (By similarity). {ECO:0000250|UniProtKB:P05132, ECO:0000269|PubMed:21085490}
Tissue Location	Isoform 1 is ubiquitous. Isoform 2 is sperm- specific and is enriched in pachytene spermatocytes but is not detected in round spermatids.

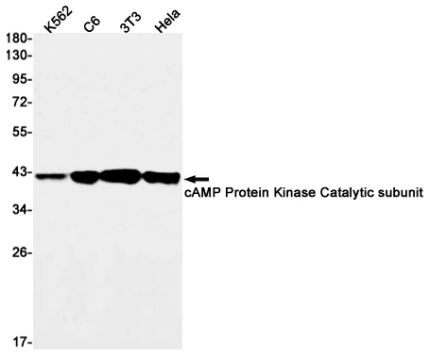
Background

Phosphorylates a large number of substrates in the cytoplasm and the nucleus. Regulates the abundance of compartmentalized pools of its regulatory subunits through phosphorylation of PJA2 which binds and ubiquitinates these subunits, leading to their subsequent proteolysis. Phosphorylates CDC25B, ABL1, NFKB1, CLDN3, PSMC5/RPT6, PJA2, RYR2, RORA and VASP. RORA is activated by phosphorylation. Required for glucose-mediated adipogenic differentiation increase and osteogenic differentiation inhibition from osteoblasts. Involved in the regulation of platelets in response to thrombin and collagen; maintains circulating platelets in a resting state by phosphorylating proteins in numerous platelet inhibitory pathways when in complex with NF-kappa-B (NFKB1 and NFKB2) and I-kappa-B-alpha (NFKBIA), but thrombin and collagen disrupt these complexes and free active PRKACA stimulates platelets and leads to platelet aggregation by phosphorylating VASP. Prevents the antiproliferative and anti-invasive effects of alpha-difluoromethylornithine in breast cancer cells when activated. RYR2 channel activity is potentiated by phosphorylation in presence of luminal Ca2+, leading to reduced amplitude and increased frequency of store overload-induced Ca2+ release (SOICR) characterized by an increased rate of Ca2+ release and propagation velocity of spontaneous Ca2+ waves, despite reduced wave amplitude and resting cytosolic Ca2+. PSMC5/RPT6 activation by phosphorylation stimulates proteasome. Negatively regulates tight junctions (TJs) in ovarian cancer cells via CLDN3 phosphorylation. NFKB1 phosphorylation promotes NF-kappa-B p50-p50 DNA binding. Involved in embryonic development by down-regulating the Hedgehog (Hh) signaling pathway that determines embryo pattern formation and morphogenesis. Prevents meiosis resumption in prophase-arrested oocytes via CDC25B inactivation by phosphorylation. May also regulate rapid eye movement (REM) sleep in the pedunculopontine tegmental (PPT). Phosphorylates APOBEC3G and AICDA. Isoform 2 phosphorylates and activates ABL1 in sperm flagellum to promote spermatozoa capacitation. Phosphorylates HSF1; this phosphorylation promotes HSF1 nuclear localization and transcriptional activity upon heat shock (PubMed:21085490).

Images

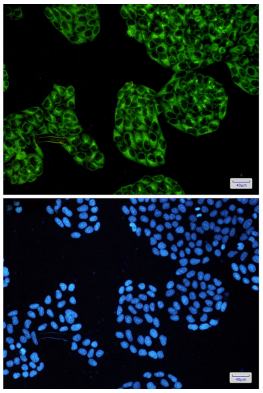


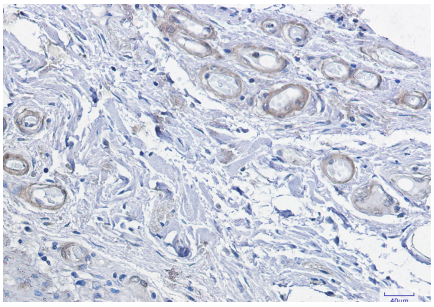
Western blot analysis of cAMP Protein Kinase Catalytic Subunit in HT1080(WT) and cAMP Protein Kinase Catalytic Subunit-Knockdown HT1080(KD) using cAMP Protein Kinase Catalytic Subunit antibody.

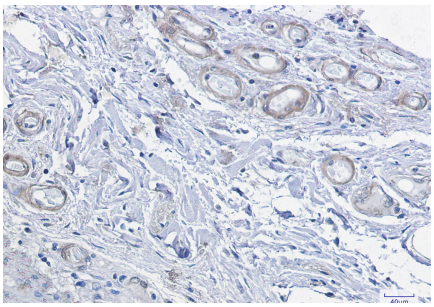


Western blot analysis of cAMP Protein Kinase Catalytic subunit in K562, C6, 3T3, Hela lysates using cAMP Protein Kinase Catalytic Subunit antibody.

Immunocytochemistry analysis of cAMP Protein Kinase Catalytic subunit (green) in Hela using cAMP Protein Kinase Catalytic subunit antibody,and DAPI(blue)







Immunohistochemistry analysis of paraffin-embedded Human colon cancer using cAMP Protein Kinase Catalytic subunit antibody. High-pressure and temperature Sodium Citrate pH 6.0 was used for antigen retrieval.