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PRKAA2
Purified Mouse Monoclonal Antibody
Catalog # AO2507a

Specification

PRKAA2 - Product Information

Application	**E, WB, IHC**
Primary Accession	P54646
Reactivity	**Human, Monkey**
Host	**Mouse**
Clonality	**Monoclonal**
Isotype	**Mouse IgG1**
Calculated MW	**62.3kDa KDa**

Immunogen
Purified recombinant fragment of human PRKAA2 (AA: 453-552) expressed in E. Coli.

Formulation
Purified antibody in PBS with 0.05% sodium azide

PRKAA2 - Additional Information

Gene ID 5563

Other Names
AMPK; AMPK2; PRKAA; AMPKa2

Dilution
E~~ 1/10000
WB~~ 1/500 - 1/2000
IHC~~ 1/200 - 1/1000

Storage
Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.

Precautions
PRKAA2 is for research use only and not for use in diagnostic or therapeutic procedures.

PRKAA2 - Protein Information

Name PRKAA2 (HGNC:9377)

Synonyms AMPK, AMPK2

Function
Catalytic subunit of AMP-activated protein kinase (AMPK), an energy sensor protein kinase that plays a key role in regulating cellular energy metabolism (PubMed:<a

href="http://www.uniprot.org/citations/17307971" target="_blank">17307971, PubMed:17712357). 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 (PubMed:17307971, PubMed:17712357). AMPK acts via direct phosphorylation of metabolic enzymes, and by longer-term effects via phosphorylation of transcription regulators (PubMed:17307971, PubMed:17712357). 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 (PubMed:7959015). Promotes lipolysis of lipid droplets by mediating phosphorylation of isoform 1 of CHKA (CHKalpha2) (PubMed:34077757). Regulates insulin-signaling and glycolysis by phosphorylating IRS1, PFKFB2 and PFKFB3 (By similarity). 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 (By similarity). 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 (PubMed:11518699, PubMed:11554766, PubMed:15866171, PubMed:17711846, PubMed:18184930). Acts as a key regulator of glucose homeostasis in liver by phosphorylating CRTC2/TORC2, leading to CRTC2/TORC2 sequestration in the cytoplasm (By similarity). In response to stress, phosphorylates 'Ser-36' of histone H2B (H2BS36ph), leading to promote transcription (By similarity). Acts as a key regulator of cell growth and proliferation by phosphorylating FNIP1, TSC2, RPTOR, WDR24 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 (PubMed:14651849, PubMed:20160076, PubMed:21205641). Also phosphorylates and inhibits GATOR2 subunit WDR24 in response to nutrient limitation, leading to suppress glucose-mediated mTORC1 activation (PubMed:36732624). In response to energetic stress, phosphorylates FNIP1, inactivating the non-canonical mTORC1 signaling, thereby promoting nuclear translocation of TFEB and TFE3, and inducing transcription of lysosomal or autophagy genes (PubMed:37079666). In response to nutrient limitation, promotes autophagy by phosphorylating and activating ATG1/ULK1 (PubMed:21205641). In that process also activates WDR45/WIPI4 (PubMed:28561066). Phosphorylates CASP6, thereby preventing its autoprocessing and subsequent activation (PubMed:32029622). AMPK also acts as a regulator of circadian rhythm by mediating phosphorylation of CRY1, leading to destabilize it (By similarity). May regulate the Wnt signaling pathway by phosphorylating CTNNB1, leading to stabilize it (By similarity). Also acts as a regulator of cellular polarity by remodeling the actin cytoskeleton; probably by indirectly activating myosin (PubMed:17486097). Also

phosphorylates CFTR, EEF2K, KLC1, NOS3 and SLC12A1 (PubMed:12519745, PubMed:20074060). 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 (By similarity). Can inhibit the non-autophagy complex by phosphorylating PIK3C3 and can activate the pro-autophagy complex by phosphorylating BECN1 (By similarity). Upon glucose starvation, promotes ARF6 activation in a kinase-independent manner leading to cell migration (PubMed:36017701). Upon glucose deprivation mediates the phosphorylation of ACSS2 at 'Ser- 659', which exposes the nuclear localization signal of ACSS2, required for its interaction with KPNA1 and nuclear translocation (PubMed:28552616). Upon stress, regulates mitochondrial fragmentation through phosphorylation of MTFR1L (PubMed:36367943).

Cellular Location
Cytoplasm {ECO:0000250|UniProtKB:Q8BRK8}. Nucleus. Note=In response to stress, recruited by p53/TP53 to specific promoters.

PRKAA2 - Protocols

Provided below are standard protocols that you may find useful for product applications.

- Western Blot
- Blocking Peptides
- Dot Blot
- Immunohistochemistry
- Immunofluorescence
- Immunoprecipitation
- Flow Cytomety
- Cell Culture

PRKAA2 - Images

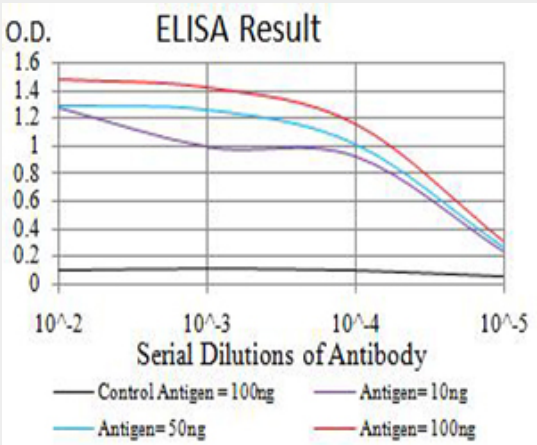

Figure 1:Black line: Control Antigen (100 ng);Purple line: Antigen (10ng); Blue line: Antigen (50 ng); Red line:Antigen (100 ng)

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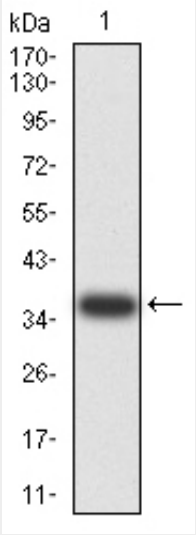

Figure 2:Western blot analysis using PRKAA2 mAb against human *** (AA: 453-552) recombinant protein. (Expected MW is 36.7 kDa)

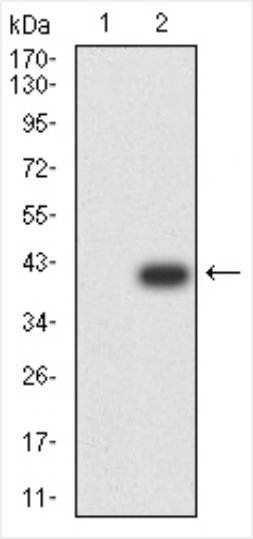

Figure 3:Western blot analysis using PRKAA2 mAb against HEK293 (1) and PRKAA2 (AA: 453-552)-hIgGFc transfected HEK293 (2) cell lysate.

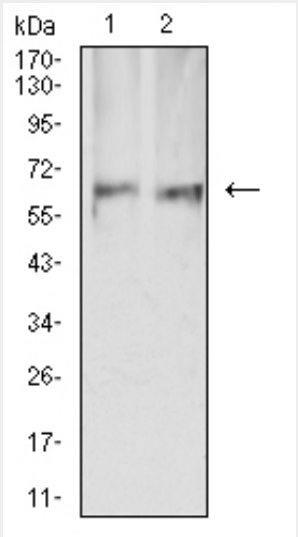

Figure 4:Western blot analysis using PRKAA2 mouse mAb against HEK293 (1) and COS7 (2) cell lysate.

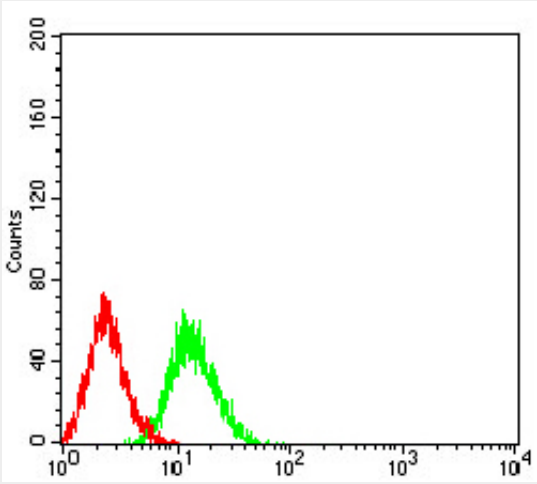

Figure 5:Flow cytometric analysis of Jurkat cells using PRKAA2 mouse mAb (green) and negative control (red).

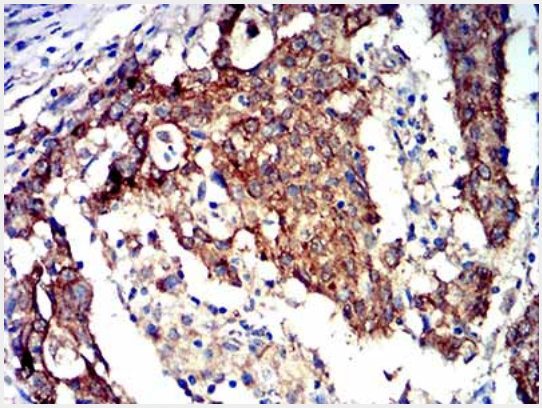

Figure 6:Immunohistochemical analysis of paraffin-embedded stomach cancer tissues using PRKAA2 mouse mAb with DAB staining.

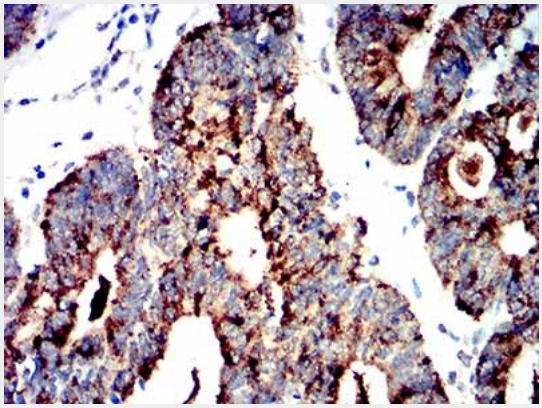

Figure 7:Immunohistochemical analysis of paraffin-embedded rectum cancer tissues using PRKAA2 mouse mAb with DAB staining.

PRKAA2 - References

1.Pathobiology. 2015;82(5):203-11.2.Acta Crystallogr D Biol Crystallogr. 2011 May;67(Pt 5):480-7.