

## Product datasheet for **MC218868**

### Prkaa2 (NM\_178143) Mouse Untagged Clone

#### Product data:

Product Type:	Expression Plasmids
Product Name:	Prkaa2 (NM_178143) Mouse Untagged Clone
Tag:	Tag Free
Symbol:	Prkaa2
Synonyms:	2310008I11Rik; A830082D05; AMPKalpha2
Mammalian Cell Selection:	Neomycin
Vector:	pCMV6-Entry (PS100001)
E. coli Selection:	Kanamycin (25 ug/mL)



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**Fully Sequenced ORF:** >MC218868 representing NM\_178143  
 Red=Cloning site Blue=ORF Orange=Stop codon

TTTTGTAATACGACTCACTATAGGGCGGCCGGGAATTCGTCGACTGGATCCGGTACCGAGGAGATCTGCC  
 GCC**CGGATCGCC**

ATGGCTGAGAAGCAGAAGCACGACGGGCGGGTGAAGATCGGACACTACGTCTGGGGACACCCTGGGCG  
 TCGGCACCTTCGGCAAAGTGAAGATTGGAGAACCAATTGACAGGCCATAAAGTGGCAGTTAAGATCTT  
 AAATAGACAGAAGATTCCGAGTTTATAGTGTGTTGGAAAAATAAAACGAGAAATTCAAAATCTTAAACT  
 TTTCTGTCATCCTCATATTATCAAACCTACCAGGTGATCAGCACTCCGACAGACTTTTTTATGGTAAATGG  
 AATATGTGTCTGGAGGTGAATTGTTGACTACATCTGCAAACATGGGCGGGTTGAAGAGGTGGAAGCGCG  
 CCGGCTCTCCAGCAGATCCTGTCTGCCGTGGATTACTGTCACAGGCATATGGTTGTCCATAGGGACCTG  
 AAGCCAGAGAATGTGCTGCTGGATGCCAGATGAACGCTAAGATAGCTGACTTTGGACTATCTAATATGA  
 TGTGAGATGGTGAATTTCTACGAACTAGCTGTGGATCGCCAAATTATGCAGCACCTGAGGTATCTCAGG  
 AAGGCTGTATGCAGGTCCGAGGTGCATATCTGGAGCTGTGGTGTATCCTGTATGCCCTCTCTGTGGC  
 ACCCTCCCTTTCCGATGATGAGCAGTGCCTACGCTCTTCAAGAAGATCCGAGGGGGTGTGTTTTACATCC  
 CAGACTATCTCAACCGTTCTGTGCCACTCTGCTGATGCACATGCTCCAGGTGGACCCCTGAAGCGGAGC  
 GACTATCAAAGACATACGAGAACATGAATGGTTTAAACAGGATTTGCCAGCTACCTATTTCTGAAGAC  
 CCCTCCTACGATGCGAATGTCATTGACGATGAGGCTGTGAAGGAAGTCTGTGAGAAATTCGAGTGTACAG  
 AGTCAGAAGTGATGAATAGTCTGTATAGTGGTGACCCCAAGACCAGCTTGCAAGTGGCTTATCATCTTAT  
 CATTGACAATCGGAGAATAATGAACCAAGCCAGTGAGTTCTACCTCGCTCTAGTCCCTCCATCAGTTCT  
 TTTATGGATGACAGCGCCATGCATATTCCTCCAGGCTTGAACCAACATCCAGAAAGGATGCCGCCTCTCA  
 TCGCAGACAGCCCCAAAGCAGCTGTCCACTGGATGCACTCAACACAACGAAGCCCAAGTCTAGCTGT  
 GAAAAAAGCCAAGTGGCATCTTGAATCCGAAGCCAGAGCAAAGCGTGTGACATTATGGCTGAAGTGTAC  
 CGAGCTATGAAGCAGCTGGGTTTTGAATGGAAGGTAGTGAATGCATACCATCTTCGAGTAAGAAGAAAA  
 ACCCAGTGACTGGCAACTATGTGAAAAAGACTTACAGCTTTACCTGGTAGACAGTCGGAGCTATCTTCT  
 GGACTTCAAAGCATCGATGATGAGGTGGTGGAGCAGAGGTCTGGTTCTTCAACACCCAGCGCTCCTGT  
 TCTGCTGCGGGCCTCCACAGAGCAGGTCAAGTTTTGATTCCAGCACAGCTGAGAACCACTCCCTTTCTG  
 GCTCTCTACTGGCTCTTTGACTGGCAGCACTTTGTCCTCGGCATCCCCGCGCTGGGCAGTCACACCAT  
 GGATTTTTTTGAATGTGCGCCAGTCTTATCACTGCTTTAGCTCGT**TGA**

**ACGCGT**ACGCGGCCGCTCGAGCAGAAACTCATCTCAGAAGAGGATCTGGCAGCAAATGATATCCTGGATT  
 ACAAGGATGACGACGATAAGGTTTAA

**Restriction Sites:** SgfI-MluI  
**ACCN:** NM\_178143  
**Insert Size:** 1659 bp

**OTI Disclaimer:** Due to the inherent nature of this plasmid, standard methods to replicate additional amounts of DNA in E. coli are highly likely to result in mutations and/or rearrangements. Therefore, OriGene does not guarantee the capability to replicate this plasmid DNA. Additional amounts of DNA can be purchased from OriGene with batch-specific, full-sequence verification at a reduced cost. Please contact our customer care team at [custsupport@origene.com](mailto:custsupport@origene.com) or by calling 301.340.3188 option 3 for pricing and delivery.

The molecular sequence of this clone aligns with the gene accession number as a point of reference only. However, individual transcript sequences of the same gene can differ through naturally occurring variations (e.g. polymorphisms), each with its own valid existence. This clone is substantially in agreement with the reference, but a complete review of all prevailing variants is recommended prior to use. [More info](#)

**Components:** The ORF clone is ion-exchange column purified and shipped in a 2D barcoded Matrix tube containing 10ug of transfection-ready, dried plasmid DNA (reconstitute with 100 ul of water).

**Reconstitution Method:**

1. Centrifuge at 5,000xg for 5min.
2. Carefully open the tube and add 100ul of sterile water to dissolve the DNA.
3. Close the tube and incubate for 10 minutes at room temperature.
4. Briefly vortex the tube and then do a quick spin (less than 5000xg) to concentrate the liquid at the bottom.
5. Store the suspended plasmid at -20°C. The DNA is stable for at least one year from date of shipping when stored at -20°C.

**RefSeq:** [NM\\_178143.2](#), [NP\\_835279.2](#)

**RefSeq Size:** 8201 bp

**RefSeq ORF:** 1659 bp

**Locus ID:** 108079

**UniProt ID:** [Q8BRK8](#)

**Cytogenetics:** 4 C6

**Gene Summary:**

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 (By similarity). 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. In that process also activates WDR45. 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 (PubMed:23332761). [UniProtKB/Swiss-Prot Function]