

Product datasheet for **MG226994**

Prkaa2 (NM_178143) Mouse Tagged ORF Clone

Product data:

Product Type:	Expression Plasmids
Product Name:	Prkaa2 (NM_178143) Mouse Tagged ORF Clone
Tag:	TurboGFP
Symbol:	Prkaa2
Synonyms:	2310008I11Rik; A830082D05; AMPKalpha2
Mammalian Cell Selection:	Neomycin
Vector:	pCMV6-AC-GFP (PS100010)
E. coli Selection:	Ampicillin (100 ug/mL)



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ORF Nucleotide Sequence:

>MG226994 representing NM_178143
 Red=Cloning site Blue=ORF Green=Tags(s)

TTTTGTAATACGACTCACTATAGGGCGGCCGGAATTCGTCGACTGGATCCGGTACCGAGGAGATCTGCC
 GCC**CGCATCGCC**

ATGGCTGAGAAGCAGAAGCACGACGGGCGGGTGAAGATCGGACACTACGTCTGGGGACACCCCTGGGCG
 TCGGCACCTTCGGCAAAGTGAAGATTGGAGAACCAATTGACAGGCCATAAAGTGGCAGTTAAGATCTT
 AAATAGACAGAAGATTCCAGATTAGATGTTGTTGGAAAAATAAAACGAGAAATCAAAAATCTAAACTC
 TTTCTGTCATCCTCATATTATCAAACCTACCAGGTGATCAGCACTCCGACAGACTTTTTTATGGTAAATGG
 AATATGTGTCTGGAGGTGAATTGTTGACTACATCTGCAAACATGGGCGGGTTGAAGAGGTGAAGCGCG
 CCGGCTCTCCAGCAGATCCTGTCTGCCGTGGATTACTGTCACAGGCATATGGTTGTCCATAGGGACCTG
 AAGCCAGAGAATGTGCTGCTGGATGCCAGATGAACGCTAAGATAGCTGACTTTGGACTATCTAATATGA
 TGTGAGATGGTGAATTTCTACGAACTAGCTGTGGATCGCCAAATATGCAGCACCTGAGGTCATCTCAGG
 AAGGCTGTATGCAGGTCCCGAGGTGCATATCTGGAGCTGTGGTGCATCCTGTATGCCCTCTCTGTGGC
 ACCCTCCCTTTTCGATGATGAGCAGTGCCTACGCTCTTCAAGAAGATCCGAGGGGTGTGTTTTACATCC
 CAGACTATCTCAACCGTTCTGTGCCACTCTGCTGATGCACATGCTCCAGGTGGACCCCTGAAGCGGAGC
 GACTATCAAAGACATACGAGAACATGAATGGTTTAAACAGGATTTGCCAGCTACCTATTTCTGAAGAC
 CCCTCCTACGATGCGAATGTCATTGACGATGAGGCTGTGAAGGAAGTCTGTGAGAAATTCGAGTGTACAG
 AGTCAGAAGTGATGAATAGTCTGTATAGTGGTGACCCCAAGACCAGCTTGCAAGTGGCTTATCATCTTAT
 CATTGACAATCGGAGAATAATGAACCAAGCCAGTGAGTTCTACCTCGCTCTAGTCTCCATCAGGTTCT
 TTTATGGATGACAGCGCCATGCATATCCTCCAGGCTTGAACACATCCAGAAAGGATGCCGCCTCTCA
 TCGCAGACAGCCCCAAAGCAGCCTGTCCACTGGATGCACTCAACACAACGAAGCCCAAGTCTTACGCTGT
 GAAAAAAGCCAAGTGGCATCTTGAATCCGAAGCCAGAGCAAAGCGTGTGACATTATGGCTGAAGTGTAC
 CGAGCTATGAAGCAGCTGGGTTTTGAATGGAAGGTAGTGAATGCATACCATCTTCGAGTAAGAAGAAAA
 ACCCAGTGACTGGCAACTATGTAAAAATGAGCTTACAGCTTTACCTGGTAGACAGTCGGAGCTATCTTCT
 GGACTTCAAAGCATCGATGATGAGGTGGTGGAGCAGAGGTCTGGTTCTTCAACACCCAGCGCTCTGT
 TCTGCTGCGGGCCTCCACAGAGCAGGTCAAGTTTTGATTCCAGCACAGCTGAGAACCACTCCCTTTCTG
 GCTCTCTACTGGCTCTTTGACTGGCAGCACTTTGTCTCGGCATCCCCGCGCTGGGCAGTCACACCAT
 GGATTTTTTTGAAATGTGCGCCAGTCTTATCACTGCTTTAGCTCGT

ACGCGTACGCGGCCGCTCGAG - GFP Tag - GTTTAA

Protein Sequence:

>MG226994 representing NM_178143
 Red=Cloning site Green=Tags(s)

MAEKQKHDGRVKIGHYVLGDTLGVGTGFKVKIGEHQLTGHKVAVKILNRQKIRSLDVGKIKREIQNLKL
 FRPHPIIKLYQVISTPTDFFMVMEYVSGGELFDYICKHGRVEEVEARRLFQQILSAVDYCHRHMVVHRDL
 KPENVLLDAQMNAKIADFLSNMMSDGEFLRTSCGSPNYAAPEVISGRLYAGPEVDIWSGCVILYALLCG
 TLPFDDEHVPTLFFKIRGGVFYIPDYLNRSVATLLMHMLQVDPLKRATIKDIREHEWFKQDLPSYLFPE
 PSYDANVIDDEAVKEVCEKFECTESEVMNSLYSGDPQDQLAVAYHLIIDNRRIMNQASEFYASSPPSGS
 FMDDSAMHIPPGLKPHPERMPPLIADSPKARCPLDALNTTKPKSLAVKKAKWHLGIRSQSKACDIMAEVY
 RAMKQLGFEWKVNAYHLRVRKPNVPTGNVVKMSLQLYLVDSSRYLLDFKSIDDEVVEQRSSTPQRSC
 SAAGLHRARSSFDSSTAENHSLSGSLTGSLTGSTLSSASPRLGSHTMDFEMCASLITALAR

TRTRPLE - GFP Tag - V

Restriction Sites:

Sgfl-MluI

Cloning Scheme:


ACCN: NM_178143

ORF Size: 1656 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 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](#)

OTI Annotation: This clone was engineered to express the complete ORF with an expression tag. Expression varies depending on the nature of the gene.

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

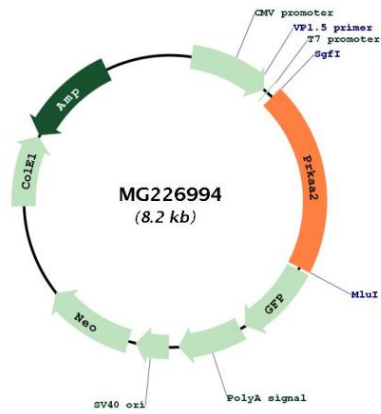
Locus ID: 108079

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]

Product images:



Circular map for MG226994