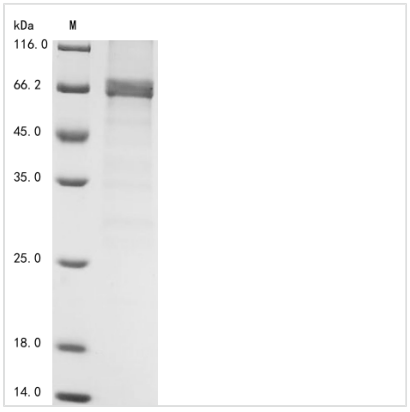
Recombinant Mouse 5-AMP-activated protein kinase catalytic subunit alpha-1 (Prkaa1)

Product Code	CSB-BP707843MOa0
Abbreviation	Recombinant Mouse Prkaa1 protein
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	Q5EG47
Product Type	Recombinant Proteins
Immunogen Species	Mus musculus (Mouse)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	MRRLSSWRKMATAEKQKHDGRVKIGHYILGDTLGVGTFGKVKVGKHELTGHK VAVKILNRQKIRSLDVVGKIRREIQNLKLFRHPHIIKLYQVISTPSDIFMVMEYVS GGELFDYICKNGRLDEKESRRLFQQILSGVDYCHRHMVVHRDLKPENVLLDAH MNAKIADFGLSNMMSDGEFLRTSCGSPNYAAPEVISGRLYAGPEVDIWSSGVI LYALLCGTLPFDDDHVPTLFKKICDGIFYTPQYLNPSVISLLKHMLQVDPMKRAA IKDIREHEWFKQDLPKYLFPEDPSYSSTMIDDEALKEVCEKFECSEEEVLSCLY NRNHQDPLAVAYHLIIDNRRIMNEAKDFYLATSPPDSFLDDHHLTRPHPERVPF LVAETPRARHTLDELNPQKSKHQGVRKAKWHLGIRSQSRPNDIMAEVCRAIKQ LDYEWKVVNPYYLRVRRKNPVTSTFSKMSLQLYQVDSRTYLLDFRSIDDEITEA KSGTATPQRSGSISNYRSCQRSDSDAEAQGKPSDVSLTSSVTSLDSSPVDVA PRPGSHTIEFFEMCANLIKILAQ
Research Area	Metabolism
Source	Baculovirus
Target Names	Prkaa1
Expression Region	1-559aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	65
Protein Length	Full Length
Image	



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Description

Recombinant Mouse 5-AMP-activated protein kinase catalytic subunit alpha-1 (Prkaa1) is produced using a baculovirus expression system and spans amino acids 1-559. This full-length protein carries an N-terminal 6xHis-tag and shows purity greater than 85% when analyzed by SDS-PAGE. The product is designed exclusively for research applications and adheres to rigorous quality standards to meet experimental requirements.

5-AMP-activated protein kinase catalytic subunit alpha-1 (Prkaa1) appears to be a vital component of the cellular energy sensor AMPK complex. It likely plays an important role in maintaining cellular energy homeostasis and participates in pathways that respond to metabolic stress. This protein may prove particularly valuable for research focused on metabolic regulation, potentially offering insights into energy balance and how cells respond to stress.

Potential Applications

Note: The applications listed below are based on what we know about this protein's biological functions, published research, and experience from experts in the field. However, we haven't fully tested all of these applications ourselves yet. We'd recommend running some preliminary tests first to make sure they work for your specific research goals.

1. Protein-Protein Interaction Studies Using Pull-Down Assays

The N-terminal 6xHis-tagged recombinant mouse Prkaa1 can be attached to nickel-affinity resins to identify and study protein binding partners. This method lets researchers explore how AMPK catalytic subunit alpha-1 interacts with regulatory subunits, upstream kinases, and downstream targets. The full-length protein (1-559aa) from the baculovirus system maintains the complete domain structure needed for biologically relevant protein interactions. Cell lysates or purified protein libraries can be mixed with the attached Prkaa1 to capture interacting proteins for later mass spectrometry analysis or Western blot confirmation.

2. Antibody Development and Validation

This recombinant mouse Prkaa1 protein works well as an antigen for creating specific antibodies against the AMPK catalytic subunit alpha-1. The full-length

protein offers numerous epitopes for producing both monoclonal and polyclonal antibodies in different host species. High purity levels (>85%) help minimize cross-reactivity with contaminating proteins during immunization procedures. Researchers can then validate these antibodies using the same recombinant protein in ELISA, Western blot, and immunoprecipitation assays to verify specificity and find optimal working concentrations.

3. Structural and Biophysical Characterization Studies

The baculovirus-expressed full-length Prkaa1 protein may be suitable for detailed structural biology research, including X-ray crystallography, NMR spectroscopy, and cryo-electron microscopy studies. Protein stability and folding characteristics can be examined through differential scanning fluorimetry, circular dichroism spectroscopy, and dynamic light scattering experiments. The N-terminal His-tag simplifies purification for these applications, while the full-length construct preserves the complete domain organization that's essential for understanding how structure relates to function. Such studies could reveal conformational changes and allosteric mechanisms within the AMPK catalytic subunit.

4. In Vitro Enzyme Kinetics and Inhibitor Screening Assays

While biological activity isn't tested, this recombinant Prkaa1 protein might be useful for establishing and refining kinase activity assays in research settings. The protein could serve as a substrate or component in biochemical assays designed to study AMPK complex assembly and regulation. Researchers may investigate how various small molecules, metabolites, or regulatory proteins affect Prkaa1 using fluorescence polarization, luminescence-based, or radioactive kinase assays. The His-tag allows for straightforward purification and attachment in high-throughput screening applications for drug discovery research.

5. Comparative Species Analysis and Evolutionary Studies

This mouse Prkaa1 protein allows for comparative biochemical studies with AMPK catalytic subunits from other species to explore evolutionary conservation and differences. Researchers can conduct cross-species protein interaction studies, comparing binding strengths and specificities between mouse, human, and other mammalian AMPK alpha-1 subunits. The recombinant protein supports phylogenetic analysis at the molecular level through direct biochemical comparisons beyond sequence analysis alone. These studies may contribute to understanding species-specific metabolic regulation mechanisms and how energy sensing pathways evolved.

Shelf Life

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