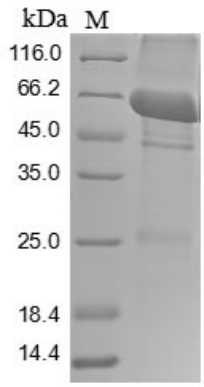
Recombinant Rat Pyruvate kinase PKM (Pkm)

Product Code	CSB-BP018072RA
Relevance	Glycolytic enzyme that catalyzes the transfer of a phosphoryl group from phosphoenolpyruvate (PEP) to ADP, generating ATP. Stimulates POU5F1-mediated transcriptional activation
Abbreviation	Recombinant Rat Pkm 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.	P11980
Product Type	Recombinant Protein
Immunogen Species	Rattus norvegicus (Rat)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	MPKPDSEAGTAFIQTQQLHAAMADTFLEHMCRLDIDSAPITARNTGIICTIGPAS RSVEMLKEMIKSGMNVARLNFSHGTHEYHAETIKNVRAATESFASDPILYRPVA VALDTKGPEIRTGLIKGSGTAEVELKKGATLKITLDNAYMEKCDENILWLDYKNI CKVVEVGSKIYVDDGLISLQVKEKGADYLVTEVENGGSLGSKKGVNLPGAAVD LPAVSEKDIQDLKFGVEQDVDMVFASFIRKAADVHEVRKVLGEKGKNIKIISKIE NHEGVRRFDEILEASDGIMVARGDLGIEIPAEKVFLAQKMMIGRCNRAGKPVIC ATQMLESMIKKPRPTRAEGSDVANAVLDGADCIMLSGETAKGDYPLEAVRMQ HLIAREAEAAVFHRLLFEELARASSQSTDPLEAMAMGSVEASYKCLAAALIVLT ESGRSAHQVARYRPRAPIIAVTRNPQTARQAHLYRGIFPVLCKDAVLDAWAED VDLRVNLAMNVGKARGFFKKGDVVIVLTGWRPGSGFTNTMRVVPVP
Research Area	Signal Transduction
Source	Baculovirus
Target Names	Pkm
Protein Names	Pyruvate kinase muscle isozyme Pkm2, Pykm
Expression Region	1-531aa of Isoform M1
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 10xHis-tagged and C-terminal Myc-tagged
Mol. Weight	61.8 kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Rat Pyruvate kinase PKM is produced in a baculovirus expression system, covering the full-length protein sequence from amino acids 1 to 531. It features an N-terminal 10xHis-tag and a C-terminal Myc-tag, ensuring efficient purification and detection. The protein is purified to over 85% purity, as verified by SDS-PAGE, and is designed for research use only. This appears to provide a reliable tool for experimental applications.

Pyruvate kinase PKM plays a crucial role in glycolysis, catalyzing the conversion of phosphoenolpyruvate to pyruvate with the generation of ATP. This enzyme is essential for energy production and participates in various metabolic pathways. Its activity and regulation seem critical for understanding metabolic processes, which may make it a valuable target in research focused on cellular energy dynamics and metabolic diseases.

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. Enzyme Kinetics and Metabolic Pathway Studies

This recombinant rat pyruvate kinase can help investigate glycolytic enzyme kinetics and metabolic flux analysis in controlled in vitro systems. Researchers might examine substrate specificity, cofactor requirements, and allosteric regulation mechanisms by measuring the conversion of phosphoenolpyruvate and ADP to pyruvate and ATP under various experimental conditions. The full-length protein (1-531aa) expressed in baculovirus system likely provides a eukaryotic post-translational modification profile that closely mimics native rat PKM. Comparative studies between different PKM isoforms or mutant variants could potentially elucidate structure-function relationships in glycolytic regulation.

2. Protein-Protein Interaction Screening

The dual-tagged design with N-terminal His-tag and C-terminal Myc-tag makes

this protein suitable for pull-down assays and co-immunoprecipitation experiments to identify PKM binding partners. The His-tag allows immobilization on nickel-based resins for affinity purification of interacting proteins from rat tissue lysates or cell extracts. Meanwhile, the Myc-tag provides an additional detection and capture method for validation experiments and Western blot analysis. These interaction studies may reveal novel regulatory networks involving pyruvate kinase in cellular metabolism.

3. Antibody Development and Validation

This recombinant protein appears to serve as an excellent immunogen and standard for developing rat PKM-specific antibodies for research applications. The high purity (>85%) and full-length sequence likely ensure proper epitope presentation for generating polyclonal or monoclonal antibodies with high specificity. The protein can be used as a positive control in Western blotting, immunofluorescence, and ELISA-based detection systems. Researchers might validate antibody cross-reactivity and establish quantitative detection methods for PKM in rat tissue samples and cell culture studies.

4. Structural and Biophysical Characterization

The recombinant rat PKM can be applied in structural biology studies including X-ray crystallography, NMR spectroscopy, and cryo-electron microscopy to understand conformational changes and allosteric mechanisms. Biophysical techniques such as dynamic light scattering, differential scanning calorimetry, and surface plasmon resonance may provide insights into protein stability, oligomerization states, and ligand binding kinetics. The baculovirus expression system appears to ensure proper protein folding and post-translational modifications necessary for native-like structural studies.

5. Comparative Species Analysis and Evolution Studies

This rat PKM protein enables comparative biochemical studies across different mammalian species to understand evolutionary conservation and divergence of glycolytic enzymes. Researchers can perform side-by-side kinetic analyses with human, mouse, or other mammalian PKM orthologs to identify species-specific regulatory mechanisms. The protein may serve as a reference standard in phylogenetic studies examining metabolic enzyme evolution and adaptation in different mammalian lineages.

Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
Shelf Life	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.