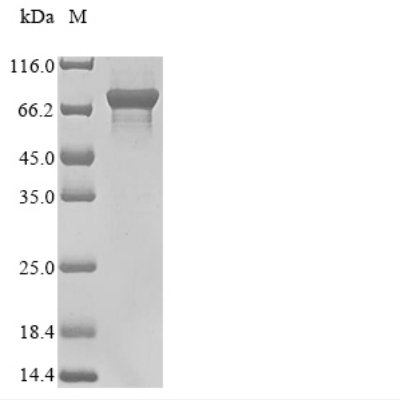
Recombinant Escherichia coli Polyphosphate kinase (ppk)

Product Code	CSB-EP358948ENVb1
Abbreviation	Recombinant E.coli ppk 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.	P0A7B1
Storage Buffer	Tris-based buffer,50% glycerol
Product Type	Recombinant Proteins
Immunogen Species	Escherichia coli (strain K12)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	GQEKLYIEKELSWLSFNERVLQEAADKSNPLIERMRFLGIYSNNLDEFYKVRFA ELKRRIIISEEQGSNSHSRHLLGKIQSRVLKADQEFDGLYNELLLEMARNQIFLIN ERQLSVNQQNWLRHYFKQYLRQHITPILINPDTDLVQFLKDDYTYLAVEIIRGDT IRYALLEIPSDKVPRFVNLPPEAPRRRKPMILLDNILRYCLDDIFKGFFDYDALNA YSMKMTRDAEYDLVHEMEASLMELMSSSLKQRLTAEPVRFVYQRDMPNALVE VLREKLTISRYDSIVPGGRYHNFKDFINFPNVGKANLVNKPLPRLRHIWFDKAQ FRNGFDAIRERDVLLYYPYHTFEHVLELLRQASFDPSVLAIKINIYRVAKDSRIID SMIHAAHNGKKVTVVVELQARFDEEANIHWAKRLTEAGVHVIFSAPGLKIHAKL FLISRKENGEVVRYAHIGTGNFNEKTARLYTDYSLLTADARITNEVRRVFNFIEN PYRPVTFDYLMVSPQNSRRLLYEMVDREIANAQQGLPSGITLKLNNLVDKGLV DRLYAASSSGVPVNLLVRGMCSLIPNLEGISDNIRAISIVDRYLEHDRVYIFENG GDKKVYLSSADWMTRNIDYRIEVATPLLDPRLKQRVLDIIDILFSDTVKARYIDKE LSNRYVPRGNRRKVRAQLAIYDYIKSLEQPE
Research Area	Cell Biology
Source	E.coli
Target Names	ppk
Protein Names	Recommended name: Polyphosphate kinase EC= 2.7.4.1Alternative name(s): ATP-polyphosphate phosphotransferase Polyphosphoric acid kinase
Expression Region	2-688aa
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	87.7 kDa
Protein Length	Full Length of Mature Protein

Image



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

Description

Recombinant Escherichia coli Polyphosphate kinase (ppk) is produced in an E.coli expression system, spanning the full-length mature protein from amino acids 2 to 688. The protein comes with an N-terminal 10xHis-tag and a C-terminal Myc-tag to streamline purification and detection processes, reaching a purity level greater than 85% as determined by SDS-PAGE. This product is intended for research use only.

Polyphosphate kinase (PPK) in Escherichia coli plays a crucial role in synthesizing polyphosphate, a polymer that appears to be involved in energy storage and regulation of various cellular processes. PPK catalyzes the transfer of ATP's terminal phosphate to form polyphosphate, which is likely a vital component in bacterial stress response and survival. Studying this enzyme may be significant for understanding bacterial physiology and potential biotechnology applications.

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. In Vitro Polyphosphate Synthesis Assays

This recombinant E. coli polyphosphate kinase can be used to study polyphosphate synthesis mechanisms under controlled laboratory conditions. Researchers might investigate the enzyme's substrate specificity by testing various nucleotide donors and acceptors in biochemical assays. The dual His and Myc tags make purification and detection straightforward, allowing for quantitative analysis of polyphosphate chain formation. Such studies could provide insights into bacterial polyphosphate metabolism and help determine the enzyme's kinetic parameters.

2. Protein-Protein Interaction Studies

The N-terminal His tag and C-terminal Myc tag make this protein well-suited for

pull-down assays to identify potential binding partners or regulatory proteins. Researchers can use the His tag for immobilization on nickel-based resins while the Myc tag works for detection in Western blotting or immunofluorescence applications. This approach might help reveal the regulatory networks governing polyphosphate kinase function in bacterial cells. The high purity level should minimize background interference in interaction studies.

3. Antibody Development and Validation

This recombinant protein serves as a promising antigen for generating specific antibodies against E. coli polyphosphate kinase. Since the full-length mature protein sequence is preserved, antibodies should recognize native epitopes present in the bacterial enzyme. Researchers can use the Myc tag as a positive control for antibody specificity testing and the His tag for antigen purification during immunization protocols. These antibodies would likely prove valuable for studying polyphosphate kinase expression and localization in bacterial research.

4. Structural and Biophysical Characterization

The high purity recombinant protein can be used for structural biology studies including X-ray crystallography, NMR spectroscopy, or cryo-electron microscopy. Researchers might investigate the enzyme's three-dimensional structure to understand its catalytic mechanism and substrate binding sites. The dual tags provide additional purification and identification options during protein preparation for structural studies. This structural information could advance understanding of polyphosphate kinase family enzymes across different bacterial species.

5. Enzyme Inhibitor Screening Assays

This recombinant polyphosphate kinase can serve as a target protein in high-throughput screening campaigns to identify potential enzyme inhibitors. Researchers can develop biochemical assays using the purified protein to test compound libraries for inhibitory activity. The His and Myc tags allow for straightforward protein detection and quantification in screening formats. Such inhibitor discovery efforts would likely contribute to understanding bacterial polyphosphate metabolism and could provide research tools for studying this pathway.

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.