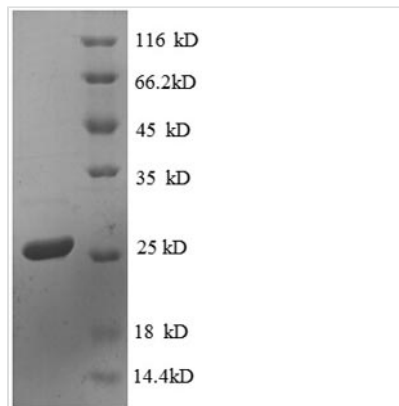




Recombinant Escherichia coli 30S ribosomal protein S4 (rpsD)

Product Code	CSB-RP086274Ba
Relevance	One of two assbly initiator proteins for the 30S subunit, it binds directly to 16S rRNA where it nucleates assbly of the body of the 30S subunit.With S5 and S12 plays an important role in translational accuracy; many suppressors of streptomycin-dependent mutants of protein S12 are found in this protein, some but not all of which decrease translational accuracy (ram, ribosomal ambiguity mutations).Plays a role in mRNA unwinding by the ribosome, possibly by forming part of a processivity clamp.Protein S4 is also a translational repressor protein, it controls the translation of the alpha-operon (which codes for S13, S11, S4, RNA polymerase alpha subunit, and L17) by binding to its mRNA.Also functions as a rho-dependent antiterminator of rRNA transcription, increasing the synthesis of rRNA under conditions of excess protein, allowing a more rapid return to homeostasis. Binds directly to RNA polymerase.
Abbreviation	Recombinant E.coli rpsD 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.	P0A7V8
Product Type	Recombinant Protein
Immunogen Species	Escherichia coli (strain K12)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	ARYLGPKLKLSRREGTDLFLKSGVRAIDTKCKIEQAPGQHGARKPRLSDYGVQ LREKQKVRRIYGVLERQFRNYYKEAARLKGNTGENLLALLEGRLDNVVYRMGF GATRAEARQLVSHKAIMVNGRVVNIASYQVSPNDVVSIREKAKKQSRVKAAL LAEQREKPTWLEVDAGKMEGTFKRKPERSDLSADINEHLIVELYSK
Research Area	Others
Source	E.coli
Target Names	rpsD
Expression Region	2-206aa
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	27.3kDa
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 30S ribosomal protein S4 (rpsD) represents a full-length protein expressed in E. coli, spanning amino acids 2 to 206. This protein carries an N-terminal 6xHis tag for easier purification and detection. SDS-PAGE analysis indicates the product achieves greater than 90% purity, which appears to make it suitable for various research applications.

The 30S ribosomal protein S4 is a crucial component of the small ribosomal subunit in Escherichia coli. It plays what seems to be a central role in ribosome assembly and function. S4 participates in the translation process, helping to ensure accurate decoding of mRNA into proteins. Its interactions with rRNA and other ribosomal proteins may be essential for maintaining ribosomal structural integrity, making it an important focus in molecular biology and genetics research.

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. Ribosome Assembly and Biogenesis Studies

This recombinant S4 protein offers a way to investigate the sequential assembly pathway of the 30S ribosomal subunit in vitro. Researchers might examine how S4 interacts with 16S rRNA and other ribosomal proteins during early ribosome assembly stages. The N-terminal His-tag makes purification straightforward and allows tracking of S4 incorporation into ribosomal complexes through pull-down assays or immunodetection methods.

2. Protein-RNA Interaction Analysis

The recombinant S4 protein appears well-suited for studying its specific binding interactions with 16S rRNA, particularly at the 5' domain where S4 is known to bind. Electrophoretic mobility shift assays (EMSA) or surface plasmon resonance experiments could help characterize binding kinetics and specificity.



The His-tag makes purification and immobilization for various binding assays more manageable.

3. Structural and Biochemical Characterization

This purified S4 protein might prove useful for detailed structural studies. X-ray crystallography, NMR spectroscopy, or cryo-electron microscopy could reveal its three-dimensional structure and conformational dynamics. The high purity (>90%) likely makes it suitable for biophysical analyses such as circular dichroism spectroscopy to study protein folding and stability under different conditions.

4. Antibody Development and Validation

The recombinant S4 protein could serve as an antigen for generating specific antibodies against E. coli ribosomal protein S4. These antibodies would likely prove valuable for immunoblotting, immunofluorescence, and immunoprecipitation experiments studying ribosome localization and dynamics in bacterial cells. The His-tag also enables ELISA-based assays for antibody screening and characterization.

5. Ribosome Reconstitution Experiments

This recombinant S4 protein can be incorporated into in vitro ribosome reconstitution systems to study minimal requirements for functional 30S subunit assembly. Researchers may systematically add or omit specific ribosomal components, including this S4 protein, to determine their individual contributions to ribosome function and assembly efficiency. Such studies could provide insights into the essential versus accessory roles of ribosomal proteins in translation machinery.

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.