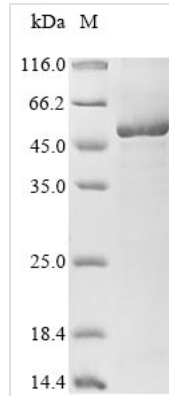




Recombinant Methanosarcina barkeri Pyrrolysine--tRNA ligase (pylS)

Product Code	CSB-EP673888MSM
Abbreviation	Recombinant Methanosarcina barkeri pylS 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.	Q46E77
Form	Liquid or Lyophilized powder
Storage Buffer	If the delivery form is liquid, the default storage buffer is Tris/PBS-based buffer, 5%-50% glycerol. If the delivery form is lyophilized powder, the buffer before lyophilization is Tris/PBS-based buffer, 6% Trehalose.
Product Type	Recombinant Protein
Immunogen Species	Methanosarcina barkeri (strain Fusaro / DSM 804)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	MDKKPLDVLISATGLWMSRTGTLHKIKHYEVSRSKIYIEMACGDHLVVNNSRSC RTARAFRRHHKYRKTCRRCRVSDDEDINNFLTRSTEGKTSVKVKVVSAPKVKKAM PKSVSRAPKPLENPVSAKASTDTSRSPSPAKSTPNPVPPTSAPAPSLTRSQ LDRVEALLSPEDKISLNIAPFRELESELVTRRKNDFFQRLYTNDREDYLGKLERDI TKFFVDRDFLEIKSPILIPAEYVERMGINNDTELSKQIFRVDKNLCLRPMLAPTLY NYLRKLDRLPDPIKIFEVGPCYRKESDQKEHLEEFMTMVNFCQMGSGCTREN L ESLIKEFLDYLEIDFEIVGDSCMVYGDITDIMHGDLELSSAVVGPVPLDREWGID K KPWIGAGFGLERLLKVMHGFKNIKRASRSSESYNGISTNL
Research Area	others
Source	E.coli
Target Names	pylS
Expression Region	1-419aa
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	51.8 kDa
Protein Length	Full Length
Image	



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

Description

Recombinant *Methanosarcina barkeri* Pyrrolysine--tRNA ligase (pylS) is expressed in *E. coli* as a full-length protein comprising amino acids 1 to 419, with an N-terminal 6xHis tag for simplified purification. The protein reaches purity levels above 85% as determined by SDS-PAGE, which appears to ensure dependable performance in research applications. This product is suitable for research use only, not for therapeutic or diagnostic purposes.

Pyrrolysine--tRNA ligase, encoded by the pylS gene, plays a critical role in translation machinery by helping incorporate the rare amino acid pyrrolysine into proteins. This enzyme participates in a unique genetic code expansion process and seems essential for studying protein synthesis and engineering. Its function may be key to understanding how genetic code diversity and protein translation work in archaeal species.

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 Aminoacylation Assays for Pyrrolysine tRNA Charging

This recombinant pylS can be used to study how pyrrolysyl-tRNA synthetase charges tRNA under controlled laboratory conditions. Researchers might investigate the enzyme's specificity for pyrrolysine and its matching tRNA through biochemical assays that measure tRNA charging efficiency. The N-terminal 6xHis tag makes protein purification and immobilization easier for kinetic studies. These experiments would likely provide insights into the unique properties of this archaeal aminoacyl-tRNA synthetase compared to the canonical 20 synthetases.

2. Antibody Development and Immunological Studies

The purified recombinant protein can work as an antigen for generating specific antibodies against *Methanosarcina barkeri* pyrrolysyl-tRNA synthetase. The >85% purity level appears sufficient for immunization protocols in laboratory



animals or for in vitro antibody screening applications. The 6xHis tag can be used in ELISA-based assays to monitor antibody binding specificity and affinity. Such antibodies would probably become valuable research tools for studying pyrrolysine biosynthesis pathways in archaeal systems.

3. Protein-Protein Interaction Studies Using Affinity Purification

The N-terminal 6xHis tag allows nickel-affinity based pull-down experiments to identify potential binding partners of pylS in archaeal cellular extracts. This approach might help reveal the protein networks involved in pyrrolysine incorporation and expanded genetic code machinery. The recombinant protein can be attached to nickel-charged resins and used to capture interacting proteins from Methanosarcina cell lysates. Mass spectrometry analysis of captured proteins would likely reveal novel components of the pyrrolysine translation system.

4. Comparative Biochemical Analysis of Archaeal Translation Machinery

This recombinant pylS can be used in comparative studies examining differences between archaeal and bacterial/eukaryotic aminoacyl-tRNA synthetases. Researchers might analyze substrate specificity, cofactor requirements, and enzymatic properties through various biochemical assays. The protein represents the unique 21st aminoacyl-tRNA synthetase found only in certain methanogenic archaea. Such studies could contribute to understanding the evolution and diversity of genetic code expansion mechanisms.

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.