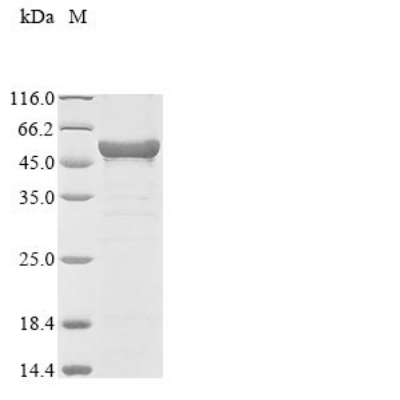
Recombinant Enterobacteria phage T4 ATP-dependent DNA helicase dda (dda)

Product Code	CSB-EP329153EDZ
Abbreviation	Recombinant Enterobacteria phage T4 ATP-dependent DNA helicase dda 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.	P32270
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	Enterobacteria phage T4 (Bacteriophage T4)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	MTFDDLTEGQKNAFNIVMKAIKEKKHHVTINGPAGTGKTTLTKFIIEALISTGGT GIILAAPTHAAKKILSKLSGKEASTIHSILKINPVTYEENVLFEQKEVPDLAKCRVL ICDEVSMYDRKLFKILLSTIPPWCTIIGIGDNKQIRPVEPGENTAYISPFFTHKDF YQCELTEVKRSNAPIIDVATDVRNGKWNYDKVVDGHGVRGFTGDTALRDFMV NYFSIVKSLDDLFENRVMAFTNKSVDKLNSIIRKKIFETDKDFIVGEIIVMQEPLFK TYKIDGKPVSEIIFNNGQLVRIIEAEYTSTFVKARGVPGEYLIRHWDLTVETYGD DEYYREKIKIISSDEELYKFNLFLAKTAETYKNWNKGGKAPWSDFWDAKSQFS KVKALPASTFHKAQGMSVDRAFIYTPCIHYADVELAQQLLYVGVTRGRYDVFY V
Research Area	Neuroscience
Source	E.coli
Target Names	dda
Expression Region	1-439aa
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	57.3 kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Enterobacteria phage T4 ATP-dependent DNA helicase dda is expressed in E. coli and includes both an N-terminal 10xHis-tag and a C-terminal Myc-tag for convenient purification and detection. The protein is produced as a full-length sequence covering amino acids 1 to 439. When analyzed via SDS-PAGE, it achieves a purity level exceeding 85%, which appears to ensure high-quality results for research applications.

The ATP-dependent DNA helicase dda from Enterobacteria phage T4 seems to be a key enzyme involved in DNA replication and repair processes. It functions by unwinding DNA helix structures, which facilitates the progression of replication forks and the repair of damaged DNA. This protein represents a significant tool for studying molecular mechanisms of DNA manipulation and phage biology. It may provide insight into the enzymatic actions essential for genetic material processing.

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 DNA Helicase Activity Assays

This recombinant T4 dda protein can be used to establish and optimize helicase activity assays using various DNA substrates such as forked DNA, partial duplex DNA, or G-quadruplex structures. The dual His and Myc tags make protein purification and detection straightforward, enabling researchers to monitor helicase unwinding activity through gel-based assays or fluorescence-based methods. Such studies would likely contribute to understanding the mechanistic properties of ATP-dependent DNA helicases and their substrate specificity. The full-length construct (1-439aa) appears to ensure that all functional domains are present for comprehensive biochemical characterization.

2. Protein-DNA Interaction Studies

The tagged recombinant dda protein serves as what appears to be an excellent

tool for investigating protein-DNA binding interactions through electrophoretic mobility shift assays (EMSA) or surface plasmon resonance studies. The N-terminal His tag enables immobilization on nickel-coated surfaces for binding kinetics analysis. Meanwhile, the C-terminal Myc tag allows for detection and quantification in various binding assays. These studies can elucidate the DNA-binding specificity and affinity of the T4 helicase, potentially providing insights into its role in bacteriophage DNA replication and repair processes.

3. Antibody Development and Validation

This purified recombinant protein can serve as an immunogen for generating specific antibodies against the T4 dda helicase or as a positive control for validating existing antibodies. The high purity (>85%) and dual tagging system make it suitable for immunization protocols and subsequent antibody characterization through Western blotting, ELISA, or immunoprecipitation assays. The Myc tag provides an additional epitope for comparative studies and may serve as an internal control in immunoassays.

4. Protein Pull-Down and Interaction Mapping

The His-tagged recombinant dda protein can be used in pull-down experiments to identify potential protein partners or cofactors that interact with the T4 DNA helicase. Using nickel affinity chromatography, researchers can capture protein complexes from bacteriophage lysates or reconstituted systems, followed by mass spectrometry analysis to identify interacting partners. This approach may help elucidate the protein networks involved in T4 DNA metabolism and replication machinery assembly.

5. Comparative Helicase Structure-Function Studies

This full-length recombinant T4 dda protein provides what appears to be a valuable tool for comparative studies with other DNA helicases from different organisms or viral systems. The standardized expression system and tagging strategy allow for direct comparison of enzymatic properties, substrate preferences, and inhibitor sensitivities across different helicase families. Such comparative analyses might reveal conserved mechanisms and unique features of ATP-dependent DNA unwinding processes in bacteriophage systems.

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.