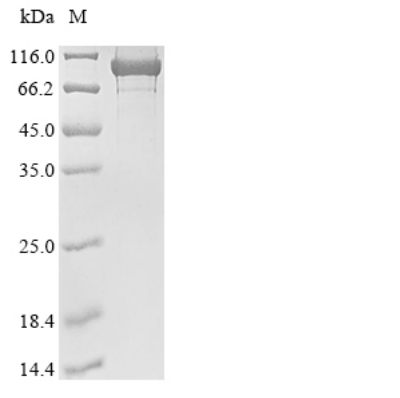
Recombinant Escherichia coli DNA gyrase subunit A (gyrA) (D87G)

Product Code	CSB-EP365190ENV(A4M2)
Abbreviation	Recombinant E.coli gyrA protein (D87G)
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.	P0AES4
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	SDLAREITPVNIEEELKSSYLDYAMSVIVGRALPDVRDGLKPVHRRVLYAMNVL GNDWNKAYKKSARVVGDVIGKYHPHGDSAVYGTIVRMAQPFSLRYMLVDGQ GNFGSIDGDSAAAMRYTEIRLAKIAHELMADLEKETVDFVDNYDGTEKIPDVMP TKIPNLLVNGSSGIAVGMATNIPPHNLTEVINGCLAYIDDEDISIEGLMEHIPGPD FPTAAIINGRRGIEEAYRTGRGKVYIRARAEVEVDAKTGRETIIVHEIPYQVNKA RLIEKIAELVKEKRVEGISALRDESDKDGMRIVIEVKRDAVGEVVLNNLYSQTQL QVSFGINMVALHHGQPKIMNLKDIIAAFVRHRREVVTRRTIFELRKARDRAHILE ALAVALANIDPIIELIRHAPTPAEAKTALVANPWQLGNVAAMLERAGDDAARPE WLEPEFGVRDGLYYLTEQQAQAILDLRLQKLTGLEHEKLLDEYKELLDQIAELL RILGSADRLMEVIREELELVREQFGDKRRTEITANSADINLEDLITQEDVVVTLS HQGYVKYQPLSEYEAQRRGGKGKSAARIKEEDFIDRLLVANTHDHILCFSSRG RVYSMKVYQLPEATRGARGRPIVNLLPLEQDERITAILPVTEFEEGVKVFMATA NGTVKKTVLTEFNRLRTAGKVAIKLVDGDELIGVDLTSGEDEVMLFSAEGKVVR FKESSVRAMGCNTTGVRGIRLGEGDKVVSLIVPRGDGAILTATQNGYGKRTAV AEYPTKSRATKGVISIKVTERNGLVVGAVQVDDCDQIMMITDAGTLVRTRVSEI SIVGRNTQGVILIRTAEDENVVGLQRVAEPVDEEDLDTIDGSAAEGDDEIAPEV DVDDEPEEE
Research Area	Others
Source	E.coli
Target Names	gyrA
Expression Region	2-875aa(D87G)
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
Mol. Weight	102.8 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 DNA gyrase subunit A (gyrA) (D87G) is expressed in E. coli and comes with an N-terminal 10xHis-tag that makes purification straightforward. The protein appears as the full-length mature form, spanning amino acids 2-875 with the D87G mutation. SDS-PAGE analysis indicates purity greater than 85%, which should provide adequate reliability for most research applications.

DNA gyrase subunit A represents a crucial piece of the bacterial DNA gyrase enzyme - the molecular machine that introduces negative supercoils into DNA. This supercoiling process is essential for both DNA replication and transcription to proceed normally. Researchers have shown considerable interest in this protein because of its central role in DNA manipulation and its connection to antibiotic resistance mechanisms. A deeper understanding of how it functions may help guide the development of new antimicrobial agents.

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. Protein-Protein Interaction Studies with DNA Gyrase Subunit B

This recombinant gyrA subunit offers a useful tool for examining how DNA gyrase subunit A and subunit B (gyrB) come together and interact. Co-immunoprecipitation or pull-down assays can take advantage of the N-terminal 10xHis tag to study these dynamics. The D87G mutation is known to confer quinolone resistance, which creates an interesting opportunity to compare how wild-type and mutant forms behave when forming the enzyme complex. Such studies might reveal whether this specific mutation disrupts the way the DNA gyrase holoenzyme assembles or affects its overall stability. The His-tag simplifies purification and allows for easy immobilization on nickel-based resins during binding experiments.

2. Antibody Development and Validation

Researchers can use this recombinant protein as an immunogen to generate either polyclonal or monoclonal antibodies targeting E. coli DNA gyrase subunit A. The D87G variant presents a particularly intriguing possibility - developing mutation-specific antibodies that could potentially distinguish between wild-type and resistant bacterial strains in research settings. The protein's 85%+ purity level should work well for standard immunization protocols. The His-tag proves handy for ELISA-based screening and validating antibody specificity. These antibodies would likely become valuable research tools for investigating DNA gyrase expression patterns, cellular localization, and function in bacterial cell biology studies.

3. Drug-Protein Interaction Screening

Biochemical assays using this recombinant protein can help screen and characterize how quinolone antibiotics and other DNA gyrase inhibitors bind to their target. The D87G mutation is especially relevant here since this substitution appears to reduce quinolone binding affinity - making it useful for studying resistance mechanisms. Surface plasmon resonance, fluorescence polarization, or thermal shift assays could determine binding kinetics and thermodynamic parameters for various compounds. The His-tag allows for consistent protein immobilization and purification, which should improve the reproducibility of binding studies.

4. Structural and Biophysical Characterization

Biophysical studies using this recombinant protein might include dynamic light scattering, analytical ultracentrifugation, and circular dichroism spectroscopy to examine the folding and oligomerization properties of the mutant protein. Comparing the D87G variant with wild-type protein could reveal structural changes caused by this resistance mutation. Limited proteolysis experiments may help map accessible regions and identify conformational differences. These approaches would likely provide insights into how the D87G substitution affects protein stability and overall structure, without needing to test biological activity directly.

Shelf Life

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