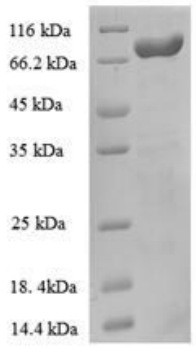
Recombinant Escherichia coli Anaerobic ribonucleoside-triphosphate reductase (nrdD)

Product Code	CSB-EP326837ENV
Abbreviation	Recombinant E.coli nrdD 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.	P28903
Product Type	Recombinant Protein
Immunogen Species	Escherichia coli (strain K12)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MTPHVMKRDGCKVPFKSERIKEAILRAAKAAEVDDADYCATVAAVVSEQMQG RNQVDINEIQTAVENQLMSGPYKQLARAYIEYRHDRDIEREKRGRLNQEIRGLV EQTNASLLNENANKDSKVIPTQRDLLAGIVAKHYARQHLLPRDVVQAHERGDI HYHDLDYSPFFPMFNCMLIDLKGMLTQGFKMGNAEIEPPKSISTATAVTAQIIA QVASHIYGGTTINRIDEVLAPFVTASYNKHRKTAEEWNIPDAEGYANSRTIKEC YDAFQSLEYEVNTLHTANGQTPFVTFGFGLGTSWESRLIQESILRNRIAGLGKN RKTAVFPKLVFAIRDGLNHKKGDPNYDIKQLALECASKRMYPDILNYDQVVKVT GSFKTPMGCRSFLGVWENENGEQIHDGRNNLGVISLNLPRIALEAKGDEATF WKLLDERLVLARKALMTRIARLEGVKARVAPILYMEGACGVRLNADDDVSEIFK NGRASISLGYIGIHETINALFGGEHVYDNEQLRAKGIAIVERLRQAVDQWKEET GYGFSLYSTPSENLCDRFCRLDTAEFGVVPGVTDKGYYTNSFHLDVEKKVNP YDKIDFEAPYPPLANGGFICYGEYPNIQHNLKALEDVWDYSYQHVPYYGTNTPI DECYECGFTGEFECTSKGFTCPKCGNHDASRVSVTRRVCGYLGSPDARPFN AGKQEEVKRRVKHLGNGQIG
Research Area	Others
Source	E.coli
Target Names	nrdD
Expression Region	1-712aa
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	84.0kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Escherichia coli Anaerobic ribonucleoside-triphosphate reductase (nrdD) is expressed in an E. coli system, covering the full-length protein from amino acids 1 to 712. The protein carries an N-terminal 6xHis tag, which simplifies purification and detection processes. It reaches a purity level exceeding 90% as verified by SDS-PAGE, making it suitable for demanding research applications. This product is intended for research use only.

Anaerobic ribonucleoside-triphosphate reductase, known as nrdD, plays a critical role in converting ribonucleotides to deoxyribonucleotides—a vital process in DNA synthesis. This enzyme functions under anaerobic conditions, setting it apart from its aerobic counterparts. It appears to be a key component in the ribonucleotide reduction pathway, which may be crucial for understanding bacterial DNA replication and repair mechanisms.

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 Using His-Tag Affinity Purification

The N-terminal 6xHis-tag allows for nickel-based affinity purification to isolate nrdD and any associated protein complexes from E. coli lysates or in vitro binding reactions. This approach could identify potential regulatory proteins or cofactors that interact with the anaerobic ribonucleoside-triphosphate reductase. Mass spectrometry analysis of the purified protein complexes might characterize the nrdD interactome under anaerobic conditions. The >90% purity should minimize contamination that could lead to false positive interactions, though some background proteins may still be present.

2. Antibody Development and Validation

Researchers can use the recombinant nrdD protein as an immunogen for generating polyclonal or monoclonal antibodies specific to E. coli anaerobic ribonucleoside-triphosphate reductase. The high purity (>90%) and full-length

nature of the protein likely ensures proper epitope presentation for antibody production. These antibodies can be validated using the recombinant protein in Western blot, ELISA, or immunoprecipitation assays. The His-tag provides a convenient way to immobilize the protein on nickel-coated surfaces for antibody screening and characterization.

3. Biochemical Characterization and Cofactor Binding Studies

The purified nrdD protein can be used to investigate cofactor requirements and binding properties through spectroscopic and binding assays. Metal ion dependencies, radical chemistry involvement, and allosteric regulation can be studied using various biochemical approaches including UV-Vis spectroscopy, EPR, and isothermal titration calorimetry. The full-length protein (1-712aa) preserves all potential cofactor binding sites and regulatory domains. These studies may provide insights into the enzyme's mechanism under anaerobic conditions without requiring activity measurements, though some conformational changes could occur during the purification process.

4. Comparative Structural and Functional Analysis

The recombinant nrdD can be used in comparative studies with other ribonucleotide reductase classes to understand evolutionary relationships and structural differences. Cross-linking mass spectrometry experiments might provide information about protein conformation and domain organization. The protein can also serve as a control in studies examining the differences between aerobic and anaerobic ribonucleotide reduction pathways in bacterial systems. The His-tag should allow for consistent purification protocols across different experimental conditions, making comparative analyses more straightforward.

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.
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