



Recombinant Escherichia coli dITP/XTP pyrophosphatase (rdgB)

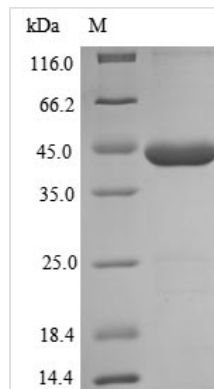
Product Code	CSB-EP345967ENV
Relevance	Pyrophosphatase that catalyzes the hydrolysis of nucleoside triphosphates to their monophosphate derivatives, with a high preference for the non-canonical purine nucleotides XTP (xanthosine triphosphate), dITP (deoxyinosine triphosphate) and ITP. Can also efficiently hydrolyze 2'-deoxy-N-6-hydroxylaminopurine triphosphate (dHAPTP). Seems to function as a house-cleaning enzyme that removes non-canonical purine nucleotides from the nucleotide pool, thus preventing their incorporation into DNA/RNA and avoiding chromosomal lesions. To a much lesser extent, is also able to hydrolyze GTP, dGTP and dUTP, but shows very low activity toward the canonical nucleotides dATP, dCTP and dTTP and toward 8-oxo-dGTP, purine deoxyribose triphosphate, 2-aminopurine deoxyribose triphosphate and 2,6-diaminopurine deoxyribose triphosphate
Abbreviation	Recombinant E.coli rdgB 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.	P52061
Product Type	Recombinant Protein
Immunogen Species	Escherichia coli (strain K12)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	MQKVVLATGNVGKVVRELASLLSDFGLDIVAQTDLGVDSAEETGLTFIENAILKARHAAKVLTALPAIADDSGLAVDVLGGAPGIYSARYSGEDATDQKNLQKLLETMKDVPDDQRQARFHCVLVYLRHAEDPTPLVCHGSWPGVITREPAGTGGFGYDPIFFVPSEGKTAAELTREEKSAISHRGQALKLLLDALRNG
Research Area	Others
Source	E.coli
Target Names	rdgB
Protein Names	Deoxyribonucleoside triphosphate pyrophosphohydrolase1 Inosine triphosphate pyrophosphatase1 Short name: ITPase1 Non-canonical purine NTP pyrophosphataseUniRule annotation1 Non-standard purine NTP pyrophosphataseUniRule annotation1 Nucleoside-triphosphate
Expression Region	1-197aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 10xHis-SUMO-tagged and C-terminal Myc-tagged



Mol. Weight 41.0 kDa

Protein Length Full Length

Image



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

Description

Recombinant Escherichia coli dITP/XTP pyrophosphatase (rdgB) is expressed in E. coli and covers the full length of the protein (1-197 amino acids). This product includes an N-terminal 10xHis-SUMO tag and a C-terminal Myc tag, which help with purification and detection. The protein appears to be purified to over 85% purity, as determined by SDS-PAGE, suggesting it should work well for research applications.

dITP/XTP pyrophosphatase is an essential enzyme in Escherichia coli that's involved in nucleotide metabolism. It breaks down non-canonical nucleotides like dITP and XTP to prevent their incorporation into DNA, which helps maintain genomic stability. This function makes it an important subject for studying DNA replication fidelity and how cells respond to nucleotide pool imbalances.

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 Tag-Assisted Pull-Down Assays

The dual-tagged nature of this recombinant rdgB protein, with both N-terminal His-SUMO and C-terminal Myc tags, seems well-suited for investigating protein-protein interactions within nucleotide metabolism pathways. The His tag can be used for immobilization on nickel-affinity matrices, while the Myc tag allows detection and validation of binding partners through Western blot analysis. This approach might help identify novel interacting proteins involved in DNA repair and replication processes where dITP/XTP pyrophosphatase activity is relevant. The 85% purity level appears sufficient for pull-down experiments where specific interactions can be distinguished from non-specific binding.



2. Antibody Development and Validation Platform

The recombinant rdgB protein can work as an antigen for generating specific antibodies against E. coli dITP/XTP pyrophosphatase. Both His-SUMO and Myc tags provide built-in controls for antibody specificity testing, allowing researchers to distinguish between antibodies that recognize the target protein versus those that cross-react with the tags. The protein's purity level of greater than 85% should be adequate for immunization protocols and subsequent antibody characterization through ELISA, Western blot, and other immunoassays. This would be particularly valuable for researchers studying nucleotide pool sanitization mechanisms in bacterial systems.

3. Biochemical Characterization and Substrate Specificity Analysis

This recombinant protein provides a useful tool for detailed biochemical characterization of E. coli rdgB enzyme properties, including substrate binding affinity, cofactor requirements, and optimal reaction conditions. Researchers can investigate the protein's interaction with various nucleotide substrates and analogs to better understand its role in maintaining nucleotide pool integrity. The dual tagging system makes protein purification and detection easier throughout biochemical assays, while the 85% purity is likely sufficient for most enzymatic characterization studies. Such studies would contribute to understanding bacterial DNA repair mechanisms and nucleotide metabolism pathways.

4. Structural and Biophysical Studies

The recombinant rdgB protein can be used in various biophysical analyses to investigate its structural properties and conformational dynamics. Techniques such as dynamic light scattering, circular dichroism spectroscopy, and analytical ultracentrifugation can provide insights into protein folding, stability, and oligomerization states. The His tag makes consistent protein purification easier for reproducible biophysical measurements, while the known molecular weight and composition allow for accurate data interpretation. These studies would enhance understanding of the structure-function relationships in this class of pyrophosphatases and inform comparative analyses with homologous enzymes from other species.

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.