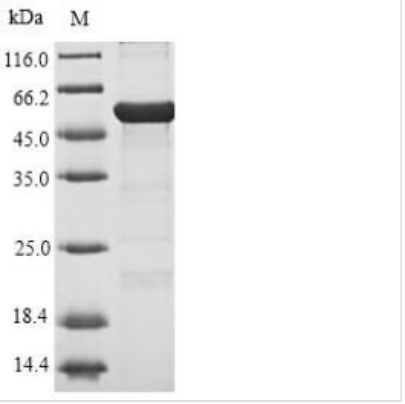
Recombinant Pseudomonas putida Metapyrocatechase (xylE)

Product Code	CSB-EP356892FFZ
Relevance	This protein is involved in the pathway toluene degradation, which is part of Xenobiotic degradation. View all proteins of this organism that are known to be involved in the pathway toluene degradation and in Xenobiotic degradation.
Abbreviation	Recombinant Pseudomonas putida xylE 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.	P06622
Alias	CatO2ase Catechol 2,3-dioxygenase
Product Type	Recombinant Protein
Immunogen Species	Pseudomonas putida (Arthrobacter siderocapsulatus)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MNKGVMRPGHVQLRVLDMSKALEHYVELLGLIEMDRDDQGRVYLKAWTEVD KFSLVLREADEPGMDFMGFKVVDEDALRQLERDLMAYGCAVEQLPAGELNSC GRRVRFQAPSGHHFELYADKEYTGKWGLNDVNPEAWPRDLKGMAAVRFDH ALMYGDELPATYDLFTKVLGFYLAEQVLDENGTRVAQFLSLSTKAHDVAFIHHP EKGRLHHVSFHLETWEDLLRAADLISMTDTSIDIGPTRHGLTHGKTIYFFDPSG NRNEVFCGGDYNYPDHKPVTWTTDQLGKAIFYHDRILNERFMTVLT
Research Area	others
Source	E.coli
Target Names	xylE
Protein Names	Recommended name: Metapyrocatechase Short name= MPC EC= 1.13.11.2 Alternative name(s): CatO2ase Catechol 2,3-dioxygenase
Expression Region	1-307aa
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	55.2kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Pseudomonas putida Metapyrocatechase (xylE) represents a full-length protein expressed in E. coli, spanning 1-307 amino acids. The protein carries an N-terminal 10xHis-SUMO tag and a C-terminal Myc tag, which appear to simplify purification and detection processes. SDS-PAGE analysis suggests purity levels exceeding 90%, making it potentially suitable for research applications that demand high-quality protein preparations.

Metapyrocatechase functions as an enzyme in aromatic compound breakdown. It seems to play an important role in catechol's catabolic pathway. The enzyme catalyzes the oxidative cleavage of catechol to 2-hydroxymuconic semialdehyde, which may prove fundamental for bioremediation studies and research examining how microbes degrade environmental pollutants.

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 Dual-Tag System

The N-terminal His-SUMO tag paired with the C-terminal Myc tag appears to offer valuable tools for exploring protein interactions through co-immunoprecipitation and pull-down assays. Metal affinity chromatography-based pull-downs using the His tag might help identify potential binding partners from bacterial lysates or purified protein libraries. Meanwhile, the Myc tag could prove useful for immunoprecipitation experiments with anti-Myc antibodies to capture protein complexes. This dual-tag approach likely allows researchers to validate interactions through different methods, potentially reducing false-positive results in protein interaction screens.

2. Antibody Development and Validation Platform

Recombinant metapyrocatechase may serve as an effective immunogen for producing both polyclonal and monoclonal antibodies specific to this enzyme. The >90% purity level appears adequate for immunization protocols and

subsequent antibody characterization steps. Both Myc and His tags offer built-in controls for testing antibody specificity through competitive binding assays and cross-reactivity studies. Researchers could validate generated antibodies using Western blot, ELISA, and immunofluorescence techniques, with the tagged protein acting as a positive control.

3. Biochemical Characterization and Enzyme Kinetics Studies

This purified full-length protein (1-307aa) likely provides an excellent foundation for thorough biochemical analysis. Studies might include thermal stability assessments, pH optimization, and determining cofactor requirements. Size exclusion chromatography and dynamic light scattering experiments could reveal the enzyme's oligomerization state and solution behavior patterns. The high purity level should enable precise protein concentration measurements for quantitative biochemical assays and comparative studies with other catechol-cleaving enzymes from various bacterial species.

4. Tag-Assisted Protein Purification Method Development

The dual-tag system makes this protein an attractive model for developing and refining multi-step purification protocols that combine metal affinity chromatography with immunoaffinity techniques. Researchers might use this protein to establish standardized protocols for His-SUMO tag cleavage and subsequent purification steps. The protein could serve as a benchmark for evaluating how efficiently different tag removal strategies work and comparing yields across various purification approaches for similarly tagged recombinant proteins.

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.