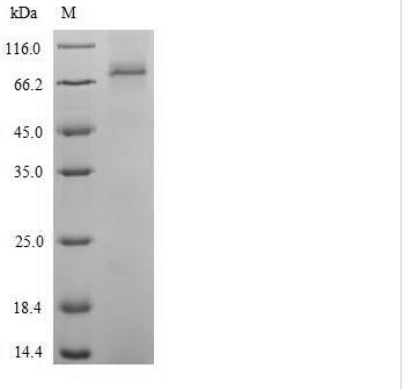
Recombinant Arabidopsis thaliana Catalase-2 (CAT2)

Product Code	CSB-EP333109DOA
Relevance	Occurs in almost all aerobically respiring organisms and serves to protect cells from the toxic effects of hydrogen peroxide.
Abbreviation	Recombinant Mouse-ear cress CAT2 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.	P25819
Product Type	Recombinant Protein
Immunogen Species	Arabidopsis thaliana (Mouse-ear cress)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MDPYKYRPASSYNSPFFTTNSGAPVWNNNSSMTVGPRGPILLEDYHLVEKLA NFDRERIPERVVHARGASAKGFFEVTHDISNLTCADFLRAPGVQTPVIVRFSTV IHERGSPETLRDPRGFAVKFYTREGNFDLVGNNFPVFFIRDGMKFPDMVHALK PNPKSHIQENWRILDFFSHHPESLNMFTFLFDDIGIPQDYRHMDGSGVNTYMLI NKAGKAHYVKFHWKPTCGVKSLLEEDAIRVGGTNHSHATQDLYDSIAAGNYP EWKLFIQIIDPADEDKFDFDPLDVTKTWPEDILPLQPVGRMVLNKNIDNFFAENE QLAFCPAIIVPGIHYSDDKLLQTRVFSYADTQRHRLGPNYLQLPVNAPKCAHHN NHHEGFMNFMHRDEEVNYFPSRYDQVRHAEKYPTPPAVCSGKRERCIIEKEN NFKEPGERYRTFTPERQERFIQRWIDALSDPRITHEIRSIWISYWSQADKSLGQ KLASRLNVRPSI
Research Area	Others
Source	E.coli
Target Names	CAT2
Protein Names	Recommended name: Catalase-2 EC= 1.11.1.6
Expression Region	1-492aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-SUMO-tagged
Mol. Weight	72.9kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Arabidopsis thaliana Catalase-2 (CAT2) comes from an E.coli expression system and contains the complete sequence spanning amino acids 1-492. The protein carries an N-terminal 6xHis-SUMO tag that helps with purification, reaching over 90% purity based on SDS-PAGE analysis. This product is intended solely for research purposes and appears to meet strict standards for both purity and consistency, which should provide reliable performance in experimental work.

Catalase-2 (CAT2) serves as a crucial enzyme that breaks down hydrogen peroxide—a byproduct from various metabolic processes—into water and oxygen. In Arabidopsis thaliana, CAT2 seems to play an essential role in shielding cells from oxidative damage. Plant biologists find this enzyme particularly interesting when studying stress responses and how reactive oxygen species get regulated within cells.

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 Catalase Enzyme Activity Assays

This recombinant CAT2 protein works well for setting up standardized catalase activity assays that measure how quickly hydrogen peroxide breaks down under different experimental conditions. The N-terminal 6xHis-SUMO tag makes purification straightforward and allows for immobilization on nickel-based surfaces during kinetic studies. Scientists can explore how factors like pH, temperature, ionic strength, and various inhibitors or activators might affect catalase function. With purity exceeding 90%, the protein likely delivers reliable and reproducible results in biochemical characterization work.

2. Comparative Plant Catalase Research

The complete Arabidopsis CAT2 protein acts as a useful reference standard when comparing catalases from different plant species or other CAT isoforms.

Scientists can run side-by-side biochemical analyses to better understand evolutionary relationships and functional differences among plant catalases. Using recombinant protein eliminates the complications that come with plant tissue extraction and the variability that often accompanies purification. This approach may prove valuable for phylogenetic studies and research into structure-function relationships within plant antioxidant enzymes.

3. Antibody Development and Validation

The purified recombinant CAT2 protein can work as an immunogen for creating specific antibodies against Arabidopsis catalase-2, or it might serve as a positive control when validating antibodies. The N-terminal tag makes detection and quantification easier during antibody screening. Scientists can incorporate this protein into ELISA-based assays, Western blot controls, and immunoprecipitation experiments. High purity levels should minimize cross-reactivity with other proteins throughout antibody development workflows.

4. Protein-Protein Interaction Studies

The 6xHis-SUMO tagged CAT2 protein works in pull-down assays to identify potential protein interaction partners from Arabidopsis protein extracts. This tag system allows for immobilization on affinity matrices, capturing interacting proteins that can then undergo mass spectrometry analysis. Such an approach helps reveal the cellular networks and regulatory mechanisms that may involve catalase-2 in plant stress responses. The full-length protein preserves native domain architecture that appears necessary for physiologically relevant protein interactions.

5. Structural and Biophysical Characterization

This recombinant CAT2 protein provides material for detailed structural studies, including X-ray crystallography, NMR spectroscopy, or cryo-electron microscopy investigations. Both the high purity and full-length nature make it suitable for biophysical analyses like dynamic light scattering, analytical ultracentrifugation, and thermal stability studies. Scientists can investigate the three-dimensional structure and conformational dynamics of plant catalase enzymes. When structural studies require native termini, the SUMO tag can be removed if necessary.

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.