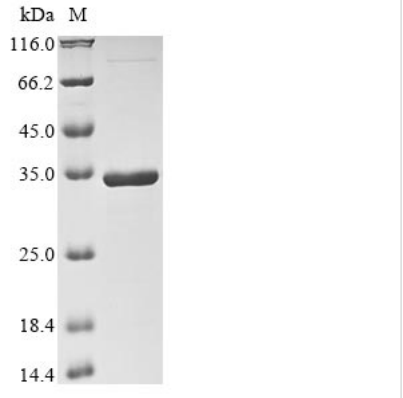
Recombinant Amanita muscaria DOPA 4,5-dioxygenase (DODA)

Product Code	CSB-EP310823AZZ
Abbreviation	Recombinant Amanita muscaria DODA 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.	P87064
Form	Liquid or Lyophilized powder
Storage Buffer	If the delivery form is liquid, the default storage buffer is Tris/PBS-based buffer, 5%-50% glycerol. If the delivery form is lyophilized powder, the buffer before lyophilization is Tris/PBS-based buffer, 6% Trehalose.
Product Type	Recombinant Protein
Immunogen Species	Amanita muscaria (Fly agaric)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MVPSFVVYSSWVNGRQRYIRQAFASILFYIIRDTTLSFPSHTTMSTKPETDLQT VLDSEIKEWHFHIYFHQNNAAEHQAALELRDAVLRLRQDGAFVAVPLFRVNMD PMGPHPVGSYEIWVPSETFASVFSYLCMNRGRLSILVHPLTREELRDHEIRNA WIGPSFPLNLANLPIKSDEIPLQYPSLKLGYSSTAHKMSLEERRKLGDDIEAVLR GEKEAARAPHRDA
Research Area	Neuroscience
Source	E.coli
Target Names	DODA
Expression Region	1-228aa
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 and C-terminal Myc-tagged
Mol. Weight	33.6 kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Amanita muscaria DOPA 4,5-dioxygenase (DODA) is expressed in E. coli and contains the complete protein sequence spanning amino acids 1 to 228. The protein has been designed with an N-terminal 10xHis-tag and a C-terminal Myc-tag to help with purification and detection. SDS-PAGE analysis confirms the product achieves greater than 90% purity, which appears to make it appropriate for various research experiments.

DOPA 4,5-dioxygenase (DODA) is an enzyme that catalyzes the oxidative cleavage of DOPA—a step that may be critical in certain metabolic pathways. This activity seems particularly important in producing various secondary metabolites, though the specific roles in biochemical and pharmacological contexts remain areas of active investigation. Research into DODA could offer insights into enzymatic mechanisms and help researchers better understand how metabolic pathways function in fungi.

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 Enzyme Activity Characterization

Researchers can likely use this recombinant DODA protein to set up and fine-tune enzyme activity assays for studying DOPA 4,5-dioxygenase function. Scientists might develop substrate specificity studies with L-DOPA and similar compounds to figure out kinetic parameters like Km and Vmax values. The dual His and Myc tags should make protein purification and detection more straightforward, allowing for better quantification of enzyme concentration during activity measurements. Such studies would probably add to our understanding of how fungal DODA enzymes work and what role they play in betalain biosynthesis pathways.

2. Antibody Development and Validation

The dual-tagged recombinant protein appears well-suited as both an

immunogen and positive control for creating antibodies against Amanita muscaria DODA. The N-terminal His tag should allow for efficient purification during immunization protocols. Meanwhile, the C-terminal Myc tag offers an internal control for testing antibody specificity. Scientists can validate these antibodies through Western blot, ELISA, and immunoprecipitation assays using this recombinant protein as a reference standard. These antibodies could prove valuable for studying DODA expression and where it's located within fungal systems.

3. Protein-Protein Interaction Studies

Scientists might employ the recombinant DODA protein in pull-down assays and co-immunoprecipitation experiments to find potential binding partners in betalain biosynthesis pathways. The His tag permits attachment to nickel-based resins, while the Myc tag helps detect and confirm successful protein capture. These interaction studies could uncover regulatory proteins or enzyme complexes that participate in secondary metabolite production in fungi. The protein's high purity is likely to produce more reliable results in binding assays.

4. Structural and Biophysical Analysis

This purified recombinant protein provides appropriate material for structural biology approaches—X-ray crystallography, NMR spectroscopy, and cryo-electron microscopy studies all seem feasible. The dual tags and high purity help with concentration determination and quality assessment, both necessary for structural work. Scientists can perform biophysical characterization techniques like dynamic light scattering, differential scanning calorimetry, and circular dichroism spectroscopy to analyze protein folding, stability, and oligomerization states. These studies may advance our understanding of how fungal dioxygenases are structured at the molecular level.

5. Comparative Enzyme Evolution Studies

The recombinant Amanita muscaria DODA could serve as a reference enzyme for phylogenetic and comparative biochemistry studies examining how DODA has evolved across different species. Researchers might compare this fungal enzyme with plant and bacterial DODA homologs to understand evolutionary relationships and functional differences. The standardized expression system and purification tags should allow for consistent preparation protocols when conducting comparative kinetic and structural analyses. Studies like these contribute to understanding how secondary metabolite biosynthesis pathways have evolved across different kingdoms of life.

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.