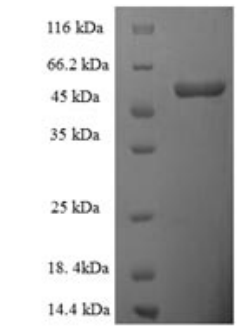
Recombinant Human D-amino-acid oxidase (DAO)

Product Code	CSB-EP006494HU
Relevance	Regulates the level of the neuromodulator D-serine in the brain. Has high activity towards D-DOPA and contributes to dopamine synthesis. Could act as a detoxifying agent which roves D-amino acids accumulated during aging. Acts on a variety of D-amino acids with a preference for those having small hydrophobic side chains followed by those bearing polar, aromatic, and basic groups. Does not act on acidic amino acids.
Abbreviation	Recombinant Human DAO 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.	P14920
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MRVVVIGAGVIGLSTALCIHERYHSVLQPLDIKVYADRFTPLTTTDVAAGLWQP YLSDPNNPQEADWSQQTFDYLLSHVHSPNAENLGLFLISGYNLFHEAIPDPSW KDTVLGFRKLTPRELDMFPDYGYGWFHTSLILEGKNYLQWLTERLTERGVKFF QRKVESFEEVAREGADVIVNCTGVWAGALQRDPLLQPGRGQIMKVDAPWMK HFILTHDPERGIYNSPYIIPGTQTVTLGGIFQLGNWSELNNIQDHNTIWEGCCRL EPTLKNARIIGERTGFRPVRPQIRLEREQLRTGPSNTEVIHNYGHGGYGLTIHW GCALEAAKLFGRILEEKKLSRMPPSHL
Research Area	Metabolism
Source	E.coli
Target Names	DAO
Protein Names	Recommended name: D-amino-acid oxidase Short name= DAAO Short name= DAMOX Short name= DAO EC= 1.4.3.3
Expression Region	1-347aa
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	55.5kDa
Protein Length	Full Length
Image	



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

Description

Recombinant Human D-amino-acid oxidase (DAO) gets expressed in E. coli and matches the complete amino acid sequence (1-347aa) found in the human protein. This product comes with an N-terminal 6xHis-SUMO tag, which makes purification and detection more straightforward. The protein reaches greater than 90% purity, as confirmed by SDS-PAGE analysis. This appears to provide high-quality material suitable for research work. Worth noting - this product is meant strictly for research purposes.

D-amino-acid oxidase (DAO) is an enzyme that handles the oxidative deamination of D-amino acids, turning them into their corresponding imino acids. The enzyme likely plays an important role in amino acid breakdown and participates in several metabolic pathways. DAO has caught researchers' attention, particularly those studying its function in brain processes and its possible connections to neurological disorders.

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. Enzyme Kinetics and Substrate Specificity Studies

This recombinant human DAO works well for characterizing the enzyme's kinetic parameters and substrate preferences under controlled lab conditions. Scientists can track enzyme activity using different D-amino acid substrates to figure out Km, Vmax, and kcat values. The high purity (>90%) may help ensure accurate kinetic measurements without interference from other proteins. That N-terminal His-SUMO tag makes purification easier and allows for immobilization during repeated testing.

2. Inhibitor Screening and Drug Discovery Research

The purified DAO protein appears to be an ideal target for testing potential inhibitors in pharmaceutical research. Small molecule libraries can be screened against the enzyme to find compounds that change DAO activity. The His-tag

allows for simple protein capture in high-throughput screening setups like 96-well or 384-well plates. This supports early-stage research into compounds that might influence D-amino acid metabolism.

3. Antibody Development and Validation

The full-length recombinant human DAO protein works as an antigen for creating specific antibodies against human DAO. Its high purity seems suitable for immunization protocols in antibody production. The protein can also function as a positive control and standard when validating newly developed anti-DAO antibodies in Western blotting, ELISA, and immunoprecipitation experiments.

4. Protein-Protein Interaction Studies

The His-SUMO tagged DAO can be used in pull-down assays to find potential binding partners or regulatory proteins that might interact with human DAO. The dual tagging system offers flexibility for different capture approaches - either His-tag affinity chromatography or SUMO-specific interactions. Cell lysates or purified protein libraries can be tested to map out the DAO interactome and better understand how it gets regulated within cells.

5. Structural and Biophysical Characterization

This recombinant protein preparation makes detailed structural studies possible, including X-ray crystallography, NMR spectroscopy, and cryo-electron microscopy experiments. The high purity and full-length characteristics may make it well-suited for biophysical analyses like dynamic light scattering, differential scanning calorimetry, and circular dichroism spectroscopy. These studies could reveal insights into protein folding, stability, and how the protein changes shape under various experimental conditions.

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.