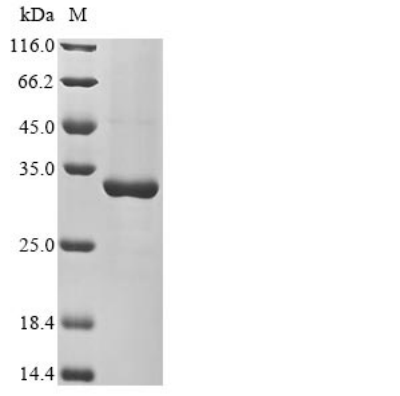
Recombinant Arabidopsis thaliana Heat shock protein 21, chloroplastic (HSP21)

Product Code	CSB-EP327028DOA
Abbreviation	Recombinant Mouse-ear cress HSP21 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.	P31170
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	Arabidopsis thaliana (Mouse-ear cress)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	AQDQRENSIDVVQQGQQKGNQGSSVEKRPQQRLTMDVSPFGLLDPLSPMRT MRQMLDTMDRMFEDTMPVSGRNRGGSGVSEIRAPWDIKEEEHEIKMRFDMP GLSKEDVKISVEDNVLVIKGEQKKEDSDDSWSGRSVSSYGTRLQLPDNCEKD KIKAELKNGVLFITIPKTKVERKVIDVQIQ
Research Area	Immunology
Source	E.coli
Target Names	HSP21
Expression Region	44-227aa
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	28.4 kDa
Protein Length	Full Length of Mature Protein
Image	



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

Description

Recombinant Arabidopsis thaliana Heat shock protein 21 (HSP21) is produced in an E. coli expression system, spanning the full length of the mature protein from amino acids 44 to 227. The protein includes an N-terminal 10xHis-tag and a C-terminal Myc-tag, which streamline purification and detection processes. SDS-PAGE analysis confirms purity greater than 90%, suggesting this preparation should deliver reliable results for research applications.

Heat shock protein 21 (HSP21) in Arabidopsis thaliana appears to be a chloroplast-localized protein that may play a crucial role in how plants respond to heat stress. This protein belongs to the small heat shock protein family, which works to stabilize and refold denatured proteins, helping maintain cellular balance. Research into HSP21 could be vital for understanding plant stress responses and how they adapt to challenging conditions.

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 Protein-Protein Interaction Studies

This dual-tagged HSP21 protein can help researchers investigate how molecular chaperones interact with client proteins or co-chaperones in plant stress response pathways. The N-terminal His-tag makes it possible to immobilize the protein on nickel-affinity surfaces for pull-down assays. Meanwhile, the C-terminal Myc-tag allows detection and measurement using anti-Myc antibodies. Scientists can examine HSP21's binding partners under different temperature conditions to better understand how chloroplasts respond to stress. With purity exceeding 90%, this preparation should give reliable results in co-immunoprecipitation and surface plasmon resonance experiments.

2. Antibody Development and Validation

The recombinant HSP21 protein works well as an antigen for creating specific antibodies against plant heat shock proteins. Its dual-tag system makes

purification straightforward and enables quality control during antibody production. Scientists can test antibody specificity using this protein in Western blotting, ELISA, and immunofluorescence applications. Since the mature protein region (44-227aa) represents the functional domain, it's likely suitable for producing antibodies that recognize native HSP21 in actual plant tissues.

3. Biochemical Characterization of Heat Shock Response

This recombinant protein opens doors for detailed biochemical analysis of HSP21 properties. These might include thermal stability, oligomerization states, and structural changes under stress conditions. The His-tag makes protein purification easier for biophysical studies such as dynamic light scattering, circular dichroism spectroscopy, and analytical ultracentrifugation. Researchers can study how the protein behaves across different temperature ranges to understand its role in chloroplastic thermotolerance. The high purity level appears well-suited for quantitative biochemical assays and kinetic studies.

4. Comparative Plant Stress Biology Research

The recombinant Arabidopsis HSP21 may serve as a reference standard for comparing heat shock proteins across different plant species. Scientists can use this protein in cross-reactivity studies to identify conserved regions and functional domains among plant HSP21 orthologs. The dual-tag system provides standardized detection methods across multiple experimental platforms. This application could support evolutionary biology research and help develop universal plant stress markers.

5. Chloroplast Proteomics and Pathway Analysis

This HSP21 protein can work as both a positive control and reference standard in chloroplastic proteomics experiments that investigate heat stress responses. The Myc-tag enables specific detection in complex protein mixtures, while the His-tag allows for controlled spiking experiments in mass spectrometry workflows. Researchers can use this protein to validate proteomic identification methods and measure HSP21 expression levels in plant stress studies. The mature protein sequence should represent the native chloroplastic form in experimental systems.

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.