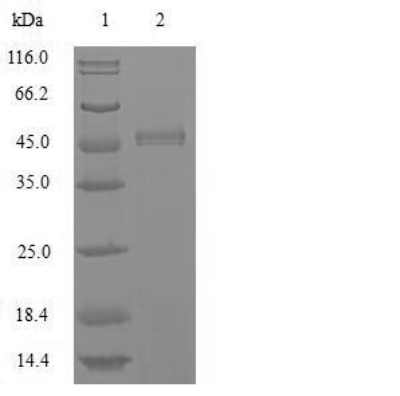
Recombinant Apis mellifera Major royal jelly protein 1 (MRJP1)

Product Code	CSB-BP522725DNK
Relevance	Major royal jelly protein 1: induces the differentiation of honeybee larvae into queens through an Egfr-mediated signaling pathway. Promotes body size increase by activating p70 S6 kinase, stimulates ovary development by augmenting the titer of vitellogenin (Vg) and juvenile hormone, and reduces developmental time by increasing the activity of mitogen-activated protein kinase and inducing the 20-hydroxyecdysone protein (20E). Most abundant protein found in the royal jelly which is the food of the queen honey bee larva. The royal jelly determines the development of the young larvae and is responsible for the high reproductive ability of the honeybee queen. Jellein-1: has antibacterial activity against the Gram-positive bacteria S.aureus ATCC 6535, S.saprophyticus and B.subtilis CCT2471, and the Gram-negative bacteria E.coli CCT1371, E.cloacae ATCC 23355, K.pneumoniae ATCC 13883 and P.aeruginosa ATCC 27853, and antifungal activity against C.albicans. Lack cytolytic activity and does not induce rat peritoneal mast cell degranulation. Jellein-2: has antibacterial activity against the Gram-positive bacteria S.aureus ATCC 6535, S.saprophyticus and B.subtilis CCT2471, and the Gram-negative bacteria E.coli CCT1371, E.cloacae ATCC 23355, K.pneumoniae ATCC 13883 and P.aeruginosa ATCC 27853, and antifungal activity against C.albicans. Lack cytolytic activity and does not induce rat peritoneal mast cell degranulation. Jellein-4: lacks antibacterial and antifungal activity. Lacks cytolytic activity and does not induce rat peritoneal mast cell degranulation.
Abbreviation	Recombinant Apis mellifera MRJP1 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.	O18330
Product Type	Recombinant Protein
Immunogen Species	Apis mellifera (Honeybee)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	NILRGESLNKSLPILHEWKFFDYDFGSDERRQDAILSGEYDYKNNYPSDIDQW HDKIFVTMLRYNGVPSSLNVISKKVGDGGPLLQPYPDWSFAKYDDCSGIVSAS KLAIDKCDRLWVLDSGLVNNTQPMCSPKLLTFDLTTSQLLKQVEIPHDVAVNAT TGKGRLSSLAVQSLDCNTNSDTMVYIADEKGEGLIVYHNSDDSFHRLTSNTFD YDPKFTKMTIDGESYTAQDGISGMALSPMTNNLYYSPVASTSLYYVNTEQFRT SDYQQNDIHYEGVQNILDTQSSAKVVSKSGVLFFGLVGDSALGCWNEHRTLE RHNIRTVAQSDETLQMIASMKIKEALPHVPIFDRYINREYILVLSNKMQKMVNND FNFDDVNFRIMNANVNELILNTRCENPDNDRTPFKISIHL
Research Area	others

Source	Baculovirus
Target Names	MRJP1
Protein Names	56-kDa protein 4
Expression Region	20-432aa
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
Mol. Weight	49.4kDa
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 Apis mellifera Major royal jelly protein 1 (MRJP1) is produced using a baculovirus expression system, which appears to ensure high-quality protein synthesis. The protein spans the full mature length from amino acids 20-432. It includes an N-terminal 10xHis-tag that makes purification and detection more straightforward. SDS-PAGE analysis confirms purity levels exceeding 85%, suggesting it's well-suited for various research applications.

Major royal jelly protein 1 (MRJP1) represents a key component of royal jelly - that remarkable secretion honeybees use to nourish their larvae and adult queens. The protein likely plays a crucial role in honeybee development and colony dynamics. Given MRJP1's biological functions and its apparent involvement in nutrition and development, it has become an important subject of study in entomology and related fields.

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 His-Tag Pull-Down Assays

The N-terminal 10xHis tag on this recombinant MRJP1 protein makes nickel-affinity based pull-down experiments possible for identifying potential binding partners. Researchers can immobilize the His-tagged MRJP1 on nickel-coated beads or columns, then incubate with cell lysates or purified protein libraries from honeybee tissues. This approach may help clarify the molecular interactions of MRJP1 within royal jelly formation pathways or honeybee developmental processes. The 85% purity level should be sufficient for these interaction studies, since contaminating proteins can typically be distinguished from specific binding partners through appropriate controls.

2. Antibody Development and Immunoassay Applications

This recombinant MRJP1 can serve as an immunogen for generating polyclonal or monoclonal antibodies specific to honeybee MRJP1. The full-length mature protein (20-432aa) provides what appears to be comprehensive epitope coverage for antibody production in laboratory animals. The His-tagged protein can then function as a positive control and standard in ELISA-based assays to characterize antibody specificity and binding kinetics. These antibodies might later be applied in research studying MRJP1 expression patterns, localization, or quantification in honeybee samples.

3. Biochemical Characterization and Stability Studies

The recombinant MRJP1 protein opens doors for systematic biochemical analysis. This includes thermal stability profiling, pH tolerance testing, and proteolytic susceptibility assays. Researchers can investigate how the protein behaves under various buffer conditions, salt concentrations, and temperature ranges to understand its biophysical properties. The baculovirus expression system typically produces proteins with proper folding, which makes this particularly suitable for studying the inherent stability characteristics of MRJP1. Such studies could provide insights into the protein's role in royal jelly preservation and optimal storage conditions.

4. Comparative Protein Analysis and Evolutionary Studies

This recombinant MRJP1 may serve as a reference standard for comparative studies with MRJP1 variants from different honeybee subspecies or related proteins from other social insects. Researchers can perform side-by-side biochemical comparisons, electrophoretic mobility analysis, and cross-reactivity studies using the standardized recombinant protein. Consistent production through baculovirus expression should ensure reproducible material for multi-laboratory collaborative studies investigating the evolution and functional divergence of major royal jelly proteins across Apis species.

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.