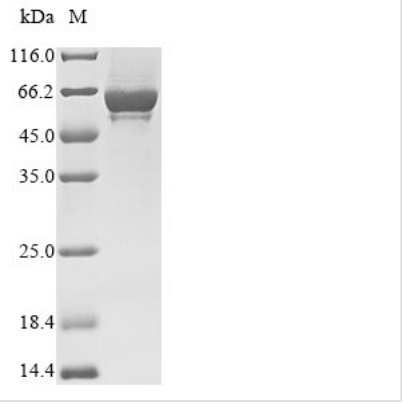
Recombinant Human Toll-like receptor 4 (Tlr4), partial

Product Code	CSB-BP023603HU1
Abbreviation	Recombinant Human TLR4 protein, partial
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.	O00206
Product Type	Recombinant Proteins
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	EPCVEVVPNITYQCMELNFYKIPDNLPFSTKNLDLSFNPLRHLGSYSFFSFPEL QVLDLSRCEIQTIEDGAYQSLSHLSTLILTGNPIQSLALGAFSGLSSLQKLVAVE TNLASLENFPIGHLKTLKELNVAHNLIQSFKLPEYFSNLTNLEHLDLSSNKIQSIY CTDLRVLHQMPLLNLSLDLSLNPMNFIQPGAFKEIRLHKLTLRNNFDSLNVMKT CIQGLAGLEVHRLVLGEFRNEGNLEKFDKSALEGLCNLTIEEFRLAYLDYYLDDI IDLFNCLTNVSSFSLVSVTIERVKDFSYNFGWQHLELVNCKFGQFPTLKLKSLK RLTFTSNKGGNAFSEVDLPSLEFLDLSRNGLSFKGCCSQSDFGTTSLKYLDLS FNGVITMSSNFLGLEQLEHLDFQHSNLKQMSEFSVFLSLRNLIYLDISHTHTRV AFNGIFNGLSSLEVLKMAGNSFQENFLPDIFTELRNLTFLDLSQCQLEQLSPTA FNSLSSLQVLNMSHNNFFSLDTFPYKCLNSLQVLDYSLNHIMTSKKQELQHFP SSLAFLNLTQNDFACTCEHQSFLQWIKDQRQLLVEVERMECATPSDKQGMPV LSLNITCQMNK
Research Area	Cardiovascular
Source	Baculovirus
Target Names	TLR4
Expression Region	27-631aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	69.8
Protein Length	Partial
Image	



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

Description

Recombinant Human Toll-like receptor 4 (TLR4) is produced through a baculovirus expression system and spans amino acids 27 to 631, representing a partial protein length. The protein carries an N-terminal 6xHis tag and shows purity levels exceeding 85% when analyzed by SDS-PAGE. This preparation is intended solely for research purposes and may serve as a dependable tool across different experimental setups.

Toll-like receptor 4 (TLR4) appears to be a crucial player in the innate immune system, best known for its ability to recognize lipopolysaccharides from Gram-negative bacteria. As a transmembrane protein, it seems to help activate immune cell signaling cascades that trigger inflammatory responses. TLR4 has drawn considerable research interest because of its central role in innate immunity and its apparent involvement in numerous inflammatory 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. Protein-Protein Interaction Studies

This recombinant TLR4 protein could help researchers examine interactions with established binding partners like MD-2, CD14, and different pathogen-associated molecular patterns (PAMPs). Methods such as surface plasmon resonance or bio-layer interferometry appear suitable for these investigations. The N-terminal 6xHis tag makes immobilization on nickel-coated surfaces relatively straightforward, allowing for real-time binding kinetic measurements. Since the extracellular domain (aa 27-631) likely represents the ligand-binding region, it should work well for studying receptor-ligand interactions in controlled laboratory conditions. Such studies might reveal important details about how TLR4 recognizes different molecules and what determines its binding preferences.

2. Antibody Development and Characterization

The purified recombinant TLR4 protein could work as an effective immunogen for creating monoclonal or polyclonal antibodies that target the extracellular domain specifically. With purity levels above 85%, contamination that might cause cross-reactive antibodies appears minimal. Researchers can use the His-tagged protein in ELISA-based screening to identify and assess antibody specificity and binding strength. This application seems particularly useful for creating research tools that help study TLR4 expression patterns and cellular location across different experimental models.

3. Structural and Biophysical Analysis

The recombinant TLR4 extracellular domain may be well-suited for various biophysical studies. Dynamic light scattering, analytical ultracentrifugation, and circular dichroism spectroscopy could help assess protein folding quality, oligomerization behavior, and thermal stability. The baculovirus expression system generally produces properly folded proteins with appropriate post-translational modifications, which should make this preparation suitable for structural investigations. These types of analyses might provide valuable information about TLR4's shape and stability, and how these properties connect to its biological role.

4. Pull-Down Assays and Co-Immunoprecipitation Studies

The N-terminal 6xHis tag allows for straightforward purification and attachment of the TLR4 protein in pull-down experiments designed to find new binding partners or verify known interactions. Researchers can mix cell lysates or purified protein samples with immobilized TLR4 to capture interacting molecules, then analyze these using mass spectrometry or Western blotting techniques. This strategy appears useful for studying TLR4 signaling networks and identifying other components that work together in innate immune recognition.

5. Competitive Binding and Inhibition Assays

The recombinant TLR4 protein might prove valuable for creating competitive binding assays that screen potential inhibitors or modulators of TLR4-ligand interactions. Researchers can attach the protein through its His-tag and set up plate-based assays where test compounds compete with known ligands for the same binding sites. These assays could be particularly helpful for early-stage research focused on understanding TLR4 pharmacology and for discovering small molecules or biological compounds that alter TLR4 function in research contexts.

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