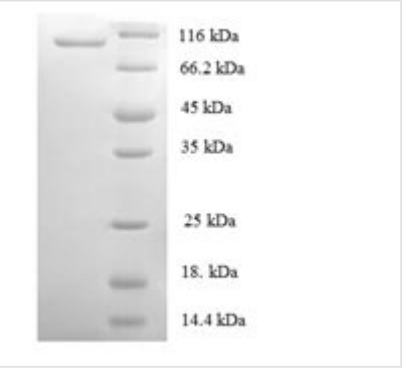
Recombinant Human DNA replication licensing factor MCM2 (MCM2)

Product Code	CSB-EP013590HU
Relevance	Acts as component of the MCM2-7 complex (MCM complex) which is the putative replicative helicase essential for 'once per cell cycle' DNA replication initiation and elongation in eukaryotic cells. The active ATPase sites in the MCM2-7 ring are formed through the interaction surfaces of two neighboring subunits such that a critical structure of a conserved arginine finger motif is provided in trans relative to the ATP-binding site of the Walker A box of the adjacent subunit. The six ATPase active sites, however, are likely to contribute differentially to the complex helicase activity. Required for the entry in S phase and for cell division.
Abbreviation	Recombinant Human MCM2 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.	P49736
Alias	Minichromosome maintenance protein 2 homologNuclear protein BM28
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	AESSESFTMASSPAQRRRGNDPLTSSPGRSSRRTDALTSSPGRDLPPFEDES EGLLGTEGPLEEEEDGEELIGDGMERDYRAIPELDAYEAEGLALDDEDVEELT ASQREAAERAMRQRDREAGRGLGRMRRGLLYDSDEEDEERPARKRRQVER ATEDGEEDEEMIESIENLEDLKGHSVREWVSMAGPRLEIHHRFKNFLRTHVDS HGHNVFKERISDMCKENRESLVVNYEDLAAREHVLAYFLPEAPAELLQIFDEAA LEVVLAMYPKYDRITNHIHVRISHLPLVEELRSLRQLHLNQLIRTSGVVTSCTGV LPQLSMVKYNCNKCNFVLGPFCQSQNQEVKPGSCPECQSAGPFEVNMEETIY QNYQRIRIQESPGKVAAGRLPRSKDAILLADLVDSCKPGDEIELTGIYHNNYDG SLNTANGFPVFATVILANHVAKKDNKVAVGELTDEDVKMITSLSKDQQIGEKIFA SIAPSIYGHEDIKRGLALALFGGEPKNPGGKHKVRGDINVLLCGDPGTAKSQFL KYIEKVSSRAIFTTGQGASAVGLTAYVQRHPVSREWTLEAGALVLADRGVCLID EFDKMNDQDRTSIHEAMEQQSISISKAGIVTSLQARCTVIAAANPIGGRYDPSLT FSENVDLTEPIISRFDILCVVRDTVDPVQDEMLARFVVGSHVRHHPSNKEEEGL ANGSAAEPAMPNTYGVEPLPQEVLKKYIIYAKERVHPKLNQMDQDKVAKMYS DLRKESMATGSIPITVRHIESMIRMAEAHARIHLRDYVIEDDVNMAIRVMLESFID TQKFSVMRSMRKTFARYLSFRRDNNELLLFILKQLVAEQVTYQRNRFGAQQDT IEVPEKDLVDKARQINIHNLSAFYDSELFRMNKFSHDLKRKMILQQF
Research Area	Cell Cycle
Source	E.coli

Target Names	MCM2
Expression Region	2-904aa
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	105.8kDa
Protein Length	Full Length of Mature Protein

Image



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

Description

The generation of recombinant human DNA replication licensing factor MCM2 starts with the isolation of the target gene that codes for the 2-904aa of the human MCM2. This gene is cloned into an expression vector and transformated into E. coli cells. The successfully transformed E. coli cells are selected and induced to express the recombinant MCM2 protein, which is harvested from the cell lysate. The recombinant MCM2 protein is purified using affinity chromatography. The final step involves analyzing the purity of the recombinant MCM2 protein using SDS-PAGE. Its purity exceeds 90%.

Human DNA replication licensing factor MCM2 is a crucial component involved in the initiation of DNA replication. MCM2 is part of the MCM2-7 complex, which plays a vital role in the licensing of DNA replication origins, ensuring that DNA is replicated only once per cell cycle [1]. This licensing process involves the loading of the MCM2-7 complex onto DNA, which is a prerequisite for DNA replication to occur [2]. This loading process is essential for restricting DNA replication to once per cell cycle. The MCM2-7 proteins, including MCM2, bind to replication origins during the G1 phase of the cell cycle, along with other proteins like ORC, Cdc6, and Cdt1, to form the prereplication complex necessary for replication origin activation [3].

Furthermore, MCM2 interacts with other factors like ESRG to regulate cell survival, self-renewal, and pluripotency [4]. The loading of the MCM2-7 complex onto DNA is a coordinated process that involves the assembly of double-hexameric MCM2-7 complexes around DNA during DNA replication origin licensing [5].

References:

[1] D. Remus, F. Beuron, G. Tolun, J. Griffith, E. Morris, & J. Diffley, Concerted

loading of mcm2–7 double hexamers around dna during dna replication origin licensing, Cell, vol. 139, no. 4, p. 719-730, 2009. https://doi.org/10.1016/j.cell.2009.10.015
[2] C. Evrin, P. Clarke, J. Zech, R. Lurz, J. Sun, S. Uhleet al., A double-hexameric mcm2-7 complex is loaded onto origin dna during licensing of eukaryotic dna replication, Proceedings of the National Academy of Sciences, vol. 106, no. 48, p. 20240-20245, 2009. https://doi.org/10.1073/pnas.0911500106
[3] M. Snyder, X. Huang, & J. Zhang, The minichromosome maintenance proteins 2-7 (mcm2-7) are necessary for rna polymerase ii (pol ii)-mediated transcription, Journal of Biological Chemistry, vol. 284, no. 20, p. 13466-13472, 2009. https://doi.org/10.1074/jbc.m809471200
[4] S. Li, H. Liu, W. Liu, N. Shi, M. Zhao, S. Wanggouet al., esrg is critical to maintain the cell survival and self-renewal/pluripotency of hpscs by collaborating with mcm2 to suppress p53 pathway, International Journal of Biological Sciences, vol. 19, no. 3, p. 916-935, 2023. https://doi.org/10.7150/ijbs.79095
[5] Y. Ishimi, T. Sugiyama, R. Nakaya, M. Kanamori, T. Kohno, T. Enomotoet al., Effect of heliquinomycin on the activity of human minichromosome maintenance 4/6/7 helicase, Febs Journal, vol. 276, no. 12, p. 3382-3391, 2009. https://doi.org/10.1111/j.1742-4658.2009.07064.x

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.