

## HMGB1/HMG-1 Protein, Mouse (HEK293, Fc)

Cat. No.:	HY-P73104A
Synonyms:	High mobility group protein B1; HMG-1; HMGB1; HMG1
Species:	Mouse
Source:	HEK293
Accession:	P63158 (M1-E215)
Gene ID:	15289
Molecular Weight:	Approximately 59.24 kDa

### PROPERTIES

AA Sequence	M G K G D P K K P R      G K M S S Y A F F V      Q T C R E E H K K K      H P D A S V N F S E F S K K C S E R W K      T M S A K E K G K F      E D M A K A D K A R      Y E R E M K T Y I P P K G E T K K K F K      D P N A P K R P P S      A F F L F C S E Y R      P K I K G E H P G L S I G D V A K K L G      E M W N N T A A D D      K Q P Y E K K A A K      L K E K Y E K D I A A Y R A K G K P D A      A K K G V V K A E K      S K K K K E E E D D      E E D E E D E E E E E E E E D E D E E E      D D D D E
Biological Activity	1. Measured by its ability to bind mouse AGER-His in functional ELISA. 2. Measured by its ability to induce TNF-alpha secretion by RAW 264.7 mouse monocyte/macrophage cells. The ED <sub>50</sub> for this effect is 41.87 ng/mL, corresponding to a specific activity is 2.39×10 <sup>4</sup> U/mg.
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 µm filtered solution of PBS, pH 7.4 ( Normally 5 % - 8 % trehalose, mannitol and 0.01% Tween 80 are added as protectants before lyophilization) or 20 mM PB, 150 mM NaCl, pH 7.4.
Endotoxin Level	<1 EU/µg, determined by LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 µg/mL in ddH <sub>2</sub> O.
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

### DESCRIPTION

Background	HMGB1/HMG-1 protein, a multifunctional redox-sensitive molecule, assumes diverse roles across different cellular compartments. Within the nucleus, it stands as a major chromatin-associated non-histone protein, functioning as a DNA
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chaperone pivotal in replication, transcription, chromatin remodeling, V(D)J recombination, DNA repair, and genome stability. Proposed as a universal biosensor for nucleic acids, HMGB1 also plays a crucial role in promoting host inflammatory responses to both sterile and infectious signals, contributing to the coordination and integration of innate and adaptive immune responses. In the cytoplasm, it serves as a sensor and/or chaperone for immunogenic nucleic acids, activating TLR9-mediated immune responses and mediating autophagy. Operating as a danger-associated molecular pattern (DAMP) molecule, HMGB1 amplifies immune responses during tissue injury. Upon release into the extracellular environment, it binds to a spectrum of molecules such as DNA, nucleosomes, IL-1 beta, CXCL12, AGER isoform 2/sRAGE, lipopolysaccharide (LPS), and lipoteichoic acid (LTA), activating cells through engagement with multiple surface receptors. The extracellular HMGB1 exhibits distinct functionalities, with fully reduced HMGB1 acting as a chemokine, disulfide HMGB1 functioning as a cytokine, and sulfonated HMGB1 from apoptotic cells promoting immunological tolerance. Beyond its immunomodulatory roles, HMGB1 demonstrates proangiogenic activity and may be involved in platelet activation. It engages in various cellular functions, including binding to phosphatidylserine and phosphatidylethanolamide, mediating signaling for neuronal outgrowth via RAGE, and potentially contributing to the accumulation of expanded polyglutamine (polyQ) proteins. In the nucleus, its nuclear functions are attributed to fully reduced HMGB1, associating with chromatin, binding DNA with a preference for non-canonical DNA structures, and participating in DNA repair pathways, including nucleotide excision repair (NER), mismatch repair (MMR), base excision repair (BER), and double-strand break repair such as non-homologous end joining (NHEJ). HMGB1 also acts as a cofactor of the RAG complex in V(D)J recombination, displaces histone H1 from highly bent DNA in vitro, and can restructure the canonical nucleosome, leading to relaxation of structural constraints for transcription factor binding. Furthermore, it enhances the binding of sterol regulatory element-binding proteins (SREBPs) like SREBF1 to their cognate DNA sequences, increases their transcriptional activities, and facilitates the binding of TP53 to DNA. While proposed to be involved in mitochondrial quality control and autophagy in a transcription-dependent fashion, this function has been subject to debate. Additionally, HMGB1 can modulate the activity of the telomerase complex and may be implicated in telomere maintenance. Overall, HMGB1 emerges as a versatile protein with intricate roles in cellular processes across diverse cellular compartments.

**Caution: Product has not been fully validated for medical applications. For research use only.**

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