S100A9 Protein, Human

Cat. No.:	HY-P70532
Synonyms:	Protein S100-A9; Calgranulin-B; Calprotectin L1H subunit; Leukocyte L1 complex heavy chain; MRP-14; CAGB; CFAG
Species:	Human
Source:	E. coli
Accession:	P06702 (T2-P114)
Gene ID:	6280
Molecular Weight:	Approximately 14.0 kDa

PROPERTIES

AA Sequence	T C K M S Q L E R N I E T I I N T F H Q Y S V K L G H P D T L N Q G E F K E L V R K D L Q N F L K K E N K N E K V I E H I M E D L D T N A D K Q L S F E E F I M L M A R L T W A S H E K M H E G D E G P G H H H K P G L G E G T P
Biological Activity	Measured by its ability to induce CXCL1/KC secretion by C3H10T1/2 mouse embryonic fibroblast cells. The ED_{50} for this effect is 1.616 - 3.295 μg/mL, corresponding to a specific activity is 3.03×10^2 - 6.19×10^2 U/mg.
Appearance	Lyophilized powder
Formulation	Lyophilized from a 0.2 μm filtered solution of PBS, pH 7.4 or 50 mM Tris-HCL, 300 mM NaCL, pH 8.0.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
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	S100A9, a calcium- and zinc-binding protein, plays a pivotal role in regulating inflammatory processes and immune responses. Its diverse functions include inducing neutrophil chemotaxis, adhesion, and enhancing the bactericidal activity of neutrophils through SYK, PI3K/AKT, and ERK1/2 activation, as well as promoting phagocytosis. Often found in the form of calprotectin (S100A8/A9), it serves intra- and extracellular roles, including facilitating leukocyte arachidonic acid trafficking and NADPH-oxidase activation intracellularly. Extracellularly, it exhibits pro-inflammatory, antimicrobial, oxidant-scavenging, and apoptosis-inducing activities, recruiting leukocytes, promoting cytokine and chemokine production, and

regulating leukocyte adhesion and migration. Functioning as an alarmin or DAMP molecule, S100A9 stimulates innate immune cells via Toll-like receptor 4 (TLR4) and receptor for advanced glycation endproducts (AGER), activating MAP-kinase and NF-kappa-B signaling pathways. With antimicrobial activity against bacteria and fungi, it likely acts by chelating Zn(2+), essential for microbial growth. S100A9 can induce cell death through autophagy and apoptosis via mitochondrial-lysosomal cross-talk involving BNIP3 and regulates neutrophil number and apoptosis, acting as an anti-apoptotic factor. Its role as an oxidant scavenger protects against tissue damage by scavenging oxidants. Notably, S100A9 can act as a potent amplifier of inflammation in autoimmunity, cancer development, and tumor spread. It also exhibits transnitrosylase activity, contributing to S-nitrosylation of various targets, and forms complexes with other proteins, such as the iNOS-S100A8/A9 transnitrosylase complex, indicating its multifaceted involvement in immune regulation and inflammatory responses.

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