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S100A9 (Macrophage Marker) Antibody - With BSA and Azide

Mouse Monoclonal Antibody [Clone 47-8D3]
Catalog # AH12296

Product Information

Application	IF, FC, IHC-P
Primary Accession	P06702
Other Accession	6280, 112405
Reactivity	Human, Rat
Host	Mouse
Clonality	Monoclonal
Isotype	Mouse / IgG1, kappa
Clone Names	47-8D3
Calculated MW	13242

Additional Information

Gene ID	6280
Other Names	Protein S100-A9, Calgranulin-B, Calprotectin L1H subunit, Leukocyte L1 complex heavy chain, Migration inhibitory factor-related protein 14, MRP-14, p14, S100 calcium-binding protein A9, S100A9, CAGB, CFAG, MRP14
Application Note	IF~~1:50~200 FC~~1:10~50 IHC-P~~N/A
Storage	Store at 2 to 8°C.Antibody is stable for 24 months.
Precautions	S100A9 (Macrophage Marker) Antibody - With BSA and Azide is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	S100A9 {ECO:0000303|PubMed:12626582, ECO:0000312|HGNC:HGNC:10499}
Function	S100A9 is a calcium- and zinc-binding protein which plays a prominent role in the regulation of inflammatory processes and immune response (PubMed:12626582, PubMed:15331440, PubMed:16258195, PubMed:19122197, PubMed:20103766, PubMed:21325622, PubMed:8423249). It can induce neutrophil chemotaxis, adhesion, can increase the bactericidal activity of neutrophils by promoting phagocytosis via activation of SYK, PI3K/AKT, and ERK1/2 and can induce degranulation of neutrophils by a MAPK-dependent mechanism (PubMed:12626582, PubMed:15331440, PubMed:20103766). Predominantly found as calprotectin (S100A8/A9) which has a wide plethora of intra- and extracellular functions

(PubMed:16258195, PubMed:19122197, PubMed:8423249). The intracellular functions include: facilitating leukocyte arachidonic acid trafficking and metabolism, modulation of the tubulin-dependent cytoskeleton during migration of phagocytes and activation of the neutrophilic NADPH-oxidase (PubMed:15331440, PubMed:21325622). Also participates in regulatory T-cell differentiation together with CD69 (PubMed:26296369). Activates NADPH-oxidase by facilitating the enzyme complex assembly at the cell membrane, transferring arachidonic acid, an essential cofactor, to the enzyme complex and S100A8 contributes to the enzyme assembly by directly binding to NCF2/P67PHOX (PubMed:15642721, PubMed:22808130). The extracellular functions involve pro-inflammatory, antimicrobial, oxidant-scavenging and apoptosis- inducing activities (PubMed:19534726, PubMed:8423249). Its pro-inflammatory activity includes recruitment of leukocytes, promotion of cytokine and chemokine production, and regulation of leukocyte adhesion and migration (PubMed:15598812, PubMed:21487906). Acts as an alarmin or a danger associated molecular pattern (DAMP) molecule and stimulates innate immune cells via binding to pattern recognition receptors such as Toll-like receptor 4 (TLR4) and receptor for advanced glycation endproducts (AGER) (PubMed:19402754). Binding to TLR4 and AGER activates the MAP-kinase and NF-kappa-B signaling pathways resulting in the amplification of the pro-inflammatory cascade (PubMed:19402754, PubMed:22804476). Has antimicrobial activity towards bacteria and fungi and exerts its antimicrobial activity probably via chelation of Zn(2+) which is essential for microbial growth (PubMed:19087201). Can induce cell death via autophagy and apoptosis and this occurs through the cross-talk of mitochondria and lysosomes via reactive oxygen species (ROS) and the process involves BNIP3 (PubMed:19935772). Can regulate neutrophil number and apoptosis by an anti-apoptotic effect; regulates cell survival via ITGAM/ITGB and TLR4 and a signaling mechanism involving MEK-ERK (PubMed:22363402). Its role as an oxidant scavenger has a protective role in preventing exaggerated tissue damage by scavenging oxidants (PubMed:21912088, PubMed:22489132). Can act as a potent amplifier of inflammation in autoimmunity as well as in cancer development and tumor spread (PubMed:16258195). Has transnitrosylase activity; in oxidatively-modified low-density lipoprotein (LDL(ox))- induced S-nitrosylation of GAPDH on 'Cys-247' proposed to transfer the NO moiety from NOS2/iNOS to GAPDH via its own S-nitrosylated Cys-3 (PubMed:25417112). The iNOS-S100A8/A9 transnitrosylase complex is proposed to also direct selective inflammatory stimulus-dependent S-nitrosylation of multiple targets such as ANXA5, EZR, MSN and VIM by recognizing a [IL]-x-C-x-x-[DE] motif (PubMed:25417112).

Cellular Location

Secreted. Cytoplasm. Cytoplasm, cytoskeleton. Cell membrane; Peripheral membrane protein. Note=Predominantly localized in the cytoplasm. Upon elevation of the intracellular calcium level, translocated from the cytoplasm to the cytoskeleton and the cell membrane (PubMed:18786929). Upon neutrophil activation or endothelial adhesion of monocytes, is secreted via a microtubule-mediated, alternative pathway (PubMed:15598812).

Tissue Location

Calprotectin (S100A8/9) is predominantly expressed in myeloid cells. Except for inflammatory conditions, the expression is restricted to a specific stage of myeloid differentiation since both proteins are expressed in circulating neutrophils and monocytes but are absent in normal tissue macrophages and lymphocytes. Expressed in the epidermis (at protein level) (PubMed:34905516). Under chronic inflammatory conditions, such as psoriasis and malignant disorders, also expressed in the epidermis. Found in high concentrations at local sites of inflammation or in the serum of patients with inflammatory diseases such as rheumatoid, cystic fibrosis, inflammatory bowel disease, Crohn's disease, giant cell arteritis, cystic fibrosis, Sjogren's syndrome, systemic lupus erythematosus, and progressive systemic sclerosis. Involved in the formation and deposition of amyloids in the aging prostate

known as corpora amylacea inclusions Strongly up-regulated in many tumors, including gastric, esophageal, colon, pancreatic, bladder, ovarian, thyroid, breast and skin cancers

Background

This MAb stains the cytoplasm of macrophages and histiocytes in hematopoietic organs, Kupfferā€™s cells of the liver and Langerhanā€™s cells of the skin. It also stains the mantle zone B-lymphocytes of the lymph node and spleen, spermatogonia, and chief cells of the stomach. S100A9 is expressed by macrophages in acutely inflamed tissues and in chronic inflammation. It is detected in peripheral blood leukocytes, in neutrophils and granulocytes. It is present at sites of vascular inflammation. S100A9 is also expressed in epithelial cells constitutively or induced during dermatoses. S100A9 is a Calcium-binding protein. It has antimicrobial activity towards bacteria and fungi. It is important for resistance to invasion by pathogenic bacteria. It up-regulates transcription of genes that are under the control of NF-kappa-B. S100A9 plays a role in the development of endotoxic shock in response to bacterial lipopolysaccharide (LPS). It promotes tubulin polymerization when unphosphorylated. It also promotes phagocyte migration and infiltration of granulocytes at sites of wounding. It plays a role as a pro-inflammatory mediator in acute and chronic inflammation and up-regulates the release of IL8 and cell-surface expression of ICAM1.

References

Flavell DJ. et al., J. Histochem. Cytochem. 35, 12171226, 1987. | Facchetti F. et al., Am. J. Clin. Pathol. 92, 4250, 1989. | Bardadin KA. et al., J. Pathol. 164, 253259, 1991. | Goebeler M. Et al., J. Leukocyte Biol. 55, 259-261, 1994

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