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Myeloperoxidase Antibody

Purified Mouse Monoclonal Antibody
Catalog # AO1249a

Product Information

Application	WB, E
Primary Accession	P05164
Reactivity	Human
Host	Mouse
Clonality	Monoclonal
Clone Names	9B12G7; 4D8B12; 9B12D9; 9C11A5
Isotype	IgG1
Calculated MW	83869
Description	Myeloperoxidase (MPO) is a heme protein synthesized during myeloid differentiation that constitutes the major component of neutrophil azurophilic granules. Produced as a single chain precursor, myeloperoxidase is subsequently cleaved into a light and heavy chain. The mature myeloperoxidase is a tetramer composed of 2 light chains and 2 heavy chains. This enzyme produces hypohalous acids central to the microbicidal activity of netrophils.
Immunogen	Purified recombinant fragment of MPO (aa1-193) expressed in E. Coli.
Formulation	Ascitic fluid containing 0.03% sodium azide.

Additional Information

Gene ID	4353
Other Names	Myeloperoxidase, MPO, 1.11.2.2, Myeloperoxidase, 89 kDa myeloperoxidase, 84 kDa myeloperoxidase, Myeloperoxidase light chain, Myeloperoxidase heavy chain, MPO
Dilution	WB~~1/500 - 1/2000 E~~N/A
Storage	Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	Myeloperoxidase Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	MPO {ECO:0000303|PubMed:21880720, ECO:0000312|HGNC:HGNC:7218}

Function

Peroxidase that plays a central role in the host defense system of polymorphonuclear leukocytes by mediating both (1) formation of neutrophil extracellular trap (NETs) and (2) microbicidal activity (PubMed:16125131, PubMed:17438335, PubMed:20974672, PubMed:20974816, PubMed:22131345, PubMed:25066128, PubMed:28574339, PubMed:40963017, PubMed:4978299, PubMed:6295491). Promotes NET formation by mediating chromatin disassembly: translocates to the nucleus and specifically binds to nucleosomes, both as monomer and homodimer, leading to nucleosome unstacking and initial chromatin decondensation (PubMed:40963017). Homodimers clash with one end of the nucleosomal DNA, leading to DNA unwrapping, initiating complete disassembly of nucleosomes and chromatin transformation into NETs in an ATP-independent manner (PubMed:40963017). NETs, which are mainly composed of DNA fibers and globular proteins, are then extruded into the extracellular space by neutrophils to trap pathogens and release antimicrobial proteins to destroy them (PubMed:40963017). Participates to the microbicidal activity against a wide range of organisms by acting as a peroxidase that catalyzes the formation of oxidants in presence of hydrogen peroxide (PubMed:16125131, PubMed:17074761, PubMed:17438335, PubMed:21880720, PubMed:22131345, PubMed:22352991, PubMed:22902565, PubMed:24194519, PubMed:33273015, PubMed:9359420, PubMed:9922160). Mediates the formation of hypohalous acids, mainly hypochlorous acid (HOCl) in physiologic situations, that greatly enhance polymorphonuclear leukocyte microbicidal activity (PubMed:16125131, PubMed:17074761, PubMed:17438335, PubMed:19608745, PubMed:21880720, PubMed:22902565, PubMed:24194519, PubMed:9359420, PubMed:9922160). In addition to hypochlorous acid, catalyzes formation of hypobromous acid (HOBr), hypoiodous acid (HOI) and hypothiocyanous acid (HOSCN) (PubMed:1318692, PubMed:16125131, PubMed:17438335, PubMed:19608745, PubMed:6295491, PubMed:9359420). Also catalyzes oxidation of nitrite into the highly reactive nitrogen dioxide radical (PubMed:10777476, PubMed:8385644, PubMed:9450756). Formation of oxidants are widely believed to be responsible for much of the anti-bactericidal activity of neutrophils (PubMed:8385644, PubMed:9450756). Oxidants, such as hypochlorous acid or nitrogen dioxide radical, can also oxidize amino acid residues on proteins and generate chlorination and nitration post-translational modifications, respectively (PubMed:15314690, PubMed:15326314, PubMed:15498770, PubMed:15574409, PubMed:16091367, PubMed:7622459). Chlorination and nitration of the lipid-free form of APOA1 impairs cholesterol transport (PubMed:15326314, PubMed:15498770, PubMed:15574409). Superoxides generated by MPO can also promote dioxygenation of tryptophan residues on proteins (PubMed:16091367, PubMed:40081572). Also able to oxidize melatonin into N1-acetyl-N2-formyl-5-methoxykynuramine either in presence of hydrogen peroxide or superoxide (PubMed:15636586, PubMed:16148002). Oxidizes urate into 5-hydroxyisourate (PubMed:21266577). Functions as a nitric oxide (NO) oxidase during inflammation, by catalytically consuming NO, impairing NO's ability to maintain vascular tone and function (PubMed:12089442). May also mediate the proteolytic cleavage of alpha-1-microglobulin to form t-alpha-1- microglobulin, which potently inhibits oxidation of low-density lipoprotein particles and limits vascular damage (PubMed:25698971).

Cellular Location

Lysosome. Cytolytic granule. Cytoplasmic vesicle, phagosome. Secreted. Nucleus. Chromosome Note=Localizes to azurophil granules, a type of primary lysosome found in neutrophils and monocytes that contains antimicrobial proteins (PubMed:25066128, PubMed:2981589, PubMed:6095812, PubMed:6192815). A substantial fraction is also constitutively secreted by normal bone marrow granulocyte precursors (PubMed:6095812). During formation of neutrophil extracellular traps (NETs), translocates into the nucleus and associates to chromatin, leading to

	chromatin dislocation and its transformation into NETs (PubMed:25066128, PubMed:40963017). Core component of NETs (PubMed:22131345, PubMed:32434865, PubMed:40963017)
Tissue Location	Specifically expressed in neutrophils and monocytes.

References

1. J Pediatr Hematol Oncol. 2007 May;29(5):293-7. 2. PLoS ONE. 2008 Jun 30;3(7):e2816.

Images

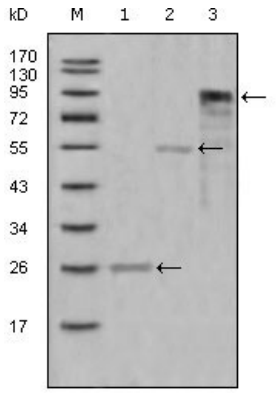


Figure 1: Western blot analysis using MPO mouse mAb against truncated Trx-MPO recombinant protein (1),truncated MBP-MPO (aa1-193) recombinant protein (2) and truncated MPO(aa165-745)-hIgGFc transfected CHO-K1 cell lysate(3).

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