

Product Information

Anti-Matrix Metalloproteinase-1

produced in goat, affinity isolated antibody

Catalog Number **M4696**

Product Description

Anti-Matrix Metalloproteinase-1 (MMP-1) is produced in goat using as immunogen purified, CHO cell-derived, recombinant human matrix metalloproteinase 1 (MMP-1) (Gene ID: 4312). MMP-1 specific IgG was purified by human MMP-1 affinity chromatography.

Anti-Matrix Metalloproteinase-1 may be used for the detection and localization of the proform and active forms of human MMP-1 by various immunochemical techniques such as immunoblotting, immunohistochemistry, and immunocytochemistry. The antibody reacts with both the reduced and non-reduced protein. By immunoblotting, this antibody shows less than 5% cross-reactivity with recombinant human MMP-2, recombinant human MMP-3, recombinant human MMP-7, recombinant human MMP-8, recombinant human MMP-9, and recombinant human MMP-10.

The matrix metalloproteinases (MMPs) are a family of at least eighteen secreted and membrane-bound zinc-endopeptidases. Collectively, these enzymes can degrade all the components of the extracellular matrix, including fibrillar and non-fibrillar collagens, fibronectin, laminin, and basement membrane glycoproteins. In general, a signal peptide, a propeptide, and a catalytic domain containing the highly conserved zinc-binding site characterize the structure of MMPs. In addition, fibronectin-like repeats, a hinge region, and a C-terminal hemopexin-like domain allow categorization of MMPs into the collagenase, gelatinase, stomelysin and membrane-type MMP subfamilies.¹⁻³ MMPs contain the motif His-Glu-X-X-His (X represents any amino acid) that binds zinc in the catalytic site, as well as another zinc molecule and two calcium molecules structurally. They fall within the matrixin subfamily and are EC designated 3.4.24.x.

MMPs are considered to play an important role in wound healing, apoptosis, bone elongation, embryo development, uterine involution, angiogenesis,⁴ and tissue remodeling, and in diseases such as multiple sclerosis,^{2,5} Alzheimer's,² malignant gliomas,² lupus,

arthritis, periodontitis, glomerulonephritis, atherosclerosis, tissue ulceration, and in cancer cell invasion and metastasis.⁶ Numerous studies have shown that there is a close association between expression of various members of the MMP family by tumors and their proliferative and invasive behavior and metastatic potential.

Matrix Metalloproteinase-1, also known as interstitial collagenase and collagenase-1, degrades fibrillar collagen types I, II, III, VII, VIII, X, aggrecan, serpins, and α_2 -macroglobulin. All collagenases cleave fibrillar collagens at one specific site resulting in generation of N-terminal $\frac{3}{4}$ and C-terminal $\frac{1}{4}$ fragments, which then denature to gelatin at body temperature.

The substrate specificity of the collagenases is variable: MMP-1 degrades type III collagen more efficiently than type I or type II collagen, whereas MMP-8 is more potent in degrading type I collagen than type III or type II collagen.^{7,8} MMP-13, in turn degrades type II collagen 6-fold more efficiently than type I and type II collagens and displays almost 50-fold stronger gelatinolytic activity than MMP-1 and MMP-8.^{9,10} Increased synthesis of MMP-1 is caused by a wide variety of agents that include: TNF,^{11,12} IL-1,¹³ serum, EGF and TGF- β ,¹⁴⁻¹⁶ phorbol ester tumor promoter, PMA,¹⁷ ECM (extracellular matrix) components,¹⁸ and polyoma and RSV infections. In contrast to these activators, several well-known antagonists, dexamethasone and all-trans-retinoic acid (RA) block the induced gene expression.¹⁹ MMP-1 is expressed by fibroblasts, keratinocytes, endothelial cells, monocytes, and macrophages.

Reagent

Supplied as a lyophilized powder from a 0.2 μ m filtered solution in PBS containing 5% trehalose.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store at lyophilized product at -20°C or below. Lyophilized samples are stable for twelve months from date of receipt when stored at -20°C or below. Upon reconstitution, the antibody may be stored at $2-8^{\circ}\text{C}$ for up to one month without detectable loss of activity. For extended storage, the reconstituted antibody solution may be aliquotted and stored at -20°C or below. Do not store in a frost-free freezer. Avoid repeated freeze-thaw cycles. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

Preparation Instructions

Reconstitute with $0.2\ \mu\text{m}$ filtered or sterile phosphate buffered saline. If 1 mL of PBS is used, the antibody concentration will be $0.1\ \text{mg/mL}$.

Product Profile

Immunoblotting: a working antibody concentration of $0.1-0.2\ \mu\text{g/mL}$ with the appropriate secondary reagents will detect human MMP-1. The detection limit for rhMMP-1 is $\sim 1\ \text{ng/lane}$ under non-reducing and reducing conditions.

Immunohistochemistry: a working concentration of $2-15\ \mu\text{g/mL}$ is recommended to detect human MMP-1 in $10-15\ \mu\text{m}$ thick paraffin-embedded tissue sections.

Note: In order to obtain the best results and assay sensitivity using various techniques and preparations, we recommend determining the optimum working dilutions by titration.

References

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