ProductInformation

ANTI-MATRIX METALLOPROTEINASE-3 (MMP-3), PROPEPTIDE REGION
Developed in Rabbit, Affinity Isolated Antibody

Product Number **M 6053**

Product Description

Anti-Matrix Metalloproteinase-3 (MMP-3) is developed in rabbit using a synthetic peptide corresponding to the propeptide region of human MMP-3 (Stromelysin-1) as immunogen. Affinity isolated antigen specific antibody is obtained from rabbit anti-MMP-3 by immuno-specific purification which removes essentially all rabbit serum proteins, including immunoglobulins, which do not specifically bind to the peptide.

Rabbit Anti-MMP-3, propeptide region may be used for the detection and localization of MMP-3 by immuno-blotting.

Rabbit Anti-MMP-3, propeptide region specifically binds to stromelysin-1 and stromelysin-2, but does not cross-react with stromelysin-3 or other MMP family members (MMP-1, MMP-2, MMP-9, etc). By immunoblotting against the reduced protein, the antibody reacts with bands at 59 kDa and 57 kDa (the proform), and not the active forms), thus anti-MMP-3, propeptide region can be used to discriminate latent from activated MMP-3. Anti-MMP-3, propeptide region will also bind to the non-reduced protein, but less efficiently than to the reduced protein, and thus has limited use in immunoprecitiation, immunohistochemistry, and ELISA.

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 characterizes the structure of the 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. This group also contains astacin, reprolysin, and serralysin, as well as other more divergent metalloproteinases. All MMPs are synthesized as proenzymes, and most of them are secreted from the cells as proenzymes. Thus, the activation of these proenzymes is a critical step that leads to extracellular matrix breakdown.

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, periodontis, glumerulonephritis, 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 metastaic potential.

The tissue inhibitors of metalloproteinases (TIMPs) are naturally occurring proteins that specifically inhibit matrix metalloproteinases and regulate extracellular matrix turnover and tissue remodeling by forming tight-binding inhibitory complexes with the MMPs. Thus, TIMPs maintain the balance between matrix destruction and formation. An imbalance between MMPs and the associated TIMPs may play a significant role in the invasive phenotype of malignant tumors. MMPs and TIMPs can be divided into two groups with respect to gene expression: the majority exhibit inducible expression and a small number are produced constitutively or are expressed at very low levels and are not inducible. Among agents that induce MMP and TIMP production are the inflammatory cytokines TNF-α and IL-1β. A marked cell type specificity is a hallmark of both MMP and TIMP gene expression (i.e., a limited number of cell types can be induced to make these proteins).

Matrix Metalloproteinase-3 (MMP-3) is also termed stromelysin-1. MMP-3 and MMP-10 (stromelysin-2) are both expressed by keratinocytes and fibroblasts and they are able to degrade a wide range of substrates. MMP-3 degrades gelatin, type IV, V, IX and X collagens, elastin, laminin, vitronectin, and proteoglycans.[8, 9] MMP-3 can be induced by cytokines

IL-1β and TNFα, by growth factors EGF and PDGF, and by the tumor promotor PMA, and expression is inhibited by TGFβ and by all-trans retinoic acid (RA). The human MMP-3 gene has the chromosomal location of 11q22.2-22.3.

Reagent
Rabbit Anti-MMP-3, Propeptide Domain is supplied in 0.01 M phosphate buffered saline, pH 7.4, containing 50% glycerol and 0.1% sodium azide.
Protein concentration is approximately 1 mg/ml.

Precautions and Disclaimer
Due to the sodium azide content a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

Storage/Stability
For continuous use, store at 2-8 °C for up to six months. For extended storage, the solution may be stored 0 ° to –20 °C. The antibody is supplied with 50% glycerol to prevent freezing. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

Product Profile
A working dilution of 1:1,000 is determined by immunoblotting using a concentrated cell culture media from a stimulated human cell line, an alkaline phosphatase conjugated secondary antibody and BCIP/NBT as substrate.

Higher antibody concentrations may be necessary for non-human samples.
Control: MMP Control-1, Product Code M 2928.

Note: MMP-3 levels in quiescent cells and tissue are minimal, and stimulation of protein concentration is often needed to visualize the bands by immunoblotting. In addition, cell types differ greatly in the quantity of MMP-3 produced.

In order to obtain best results and assay sensitivity in different techniques and preparations we recommend determining optimum working dilutions by titration assay.

References

1. Borkakoti, N., Prog. Biophy. Mol. Biol., **70**, 73 (1998).
2. Yong, V.W., et al., Trends in Neuroscience, **21**, 75 (1998).
3. Kähäri, V.M., and Saarialho-Kere, U., Exp. Dermatol., **6**, 199 (1997).
4. Halbert, I., et al., Proc. Natl. Acad. Sci., USA, **93**, 9748 (1996).
5. Chandler, S., et al., J. Neuroimmunol., **72**, 155 (1997).
6. Birkedal-Hansen, H., et al., Crit. Rev. Oral. Biol. Med., **4**, 197 (1993).
7. Hasty, K.A., et al., J. Exp. Med., **159**, 1455 (1984).
8. Murphy, G., et al., Biochem. J., **277**, 277 (1991).
9. Windsor, L.J., J. Biol. Chem., **268**, 17341 (1993).

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