

Product Information

Matrix Metalloproteinase-3, Catalytic Domain human, recombinant expressed in *E. coli*

Catalog Number **M9320**
Storage Temperature $-70\text{ }^{\circ}\text{C}$

EC 3.4.24.17

Synonyms: MMP-3; Stromelysin-1; Transin;
Proteoglycanase

Product Description

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 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, stromelysin and membrane-type MMP subfamilies.¹⁻⁴ 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 ion and two calcium ions structurally. They fall within the matrixin subfamily and are EC designated 3.4.24.x. This group also contains astacin, reprolysin, and serralyisin, 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, 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-3 (MMP-3) degrades a wide range of substrates, including gelatin, type IV, V, IX, and X collagens, elastin, laminin, vitronectin, casein, fibronectin, proteoglycans, aggrecan, myelin basic protein, and α -1-antitrypsin.^{8,9} MMP-3 can be induced by cytokines IL-1 β and TNF- α , by growth factors EGF, PDGF, and IGFBP-3, and by the tumor promotor PMA. Its expression is inhibited by TGF- β and by all-trans retinoic acid (RA). The MMP-3 substrate repertoire extends beyond the extracellular matrix proteins and suggests that MMP-3 has additional roles other than in direct tissue remodeling (i.e., enzyme cascades and cytokine regulation).

MMP-3 does not cleave the triple helical region of the interstitial collagens, which is a characteristic that distinguishes the stromelysins from the collagenases. Structurally, MMP-3 is divided into several distinct domains: a pro-domain which is cleaved upon activation, a catalytic domain containing the zinc binding site, a short hinge region, and a carboxyl terminal (hemopexin-like) domain. Keratinocytes and fibroblasts express MMP-3 (stromelysin-1) and MMP-10 (stromelysin-2). Chondrocytes, osteoblasts, endothelial cells, smooth muscle cells, and macrophages also express MMP-3

This recombinant, human Matrix Metalloproteinase-3, Catalytic Domain product is a highly purified recombinant enzyme containing the 22 kDa catalytic domain of MMP-3, in which no other MMP activity is detected. It is supplied in a solution of 50 mM Tris-HCl, pH 7.5, with 10 mM calcium chloride, 1 μ M zinc chloride, and 0.05% sodium azide.

The enzyme may be used to study enzyme kinetics, cleave target substrates, and screen for inhibitors.

Molecular mass: 22 kDa

Purity: \geq 90% (SDS-PAGE)

One unit will hydrolyze 1.0 μ mol of MCA-Arg-Pro-Lys-Pro-Val-Glu-Nva-Trp-Arg-Lys(DNP)-NH₂ per minute at pH 7.0 at 37 $^{\circ}$ C. (1 mU = 1 milliunit).

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 product at -70 °C. Avoid repeated freeze/thaw cycles.

References

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