ProductInformation

MMP CONTROL-4

Product Number **M 4815**

Product Description

MMP Control-4 is an ammonium sulfate concentrate of serum-free, cell culture media from human fibroblasts producing MMP-12 treated with phorbol ester (TPA). The concentrate contains human MMP-12 (macrophage elastase), as well as other MMPs and TIMPs.

MMP Contol-4 may be used as a qualitative positive control for the detection of MMP-12 by immunoblotting and substrate gel electrophoresis (zymography). It is not recommended as a quantitative control.

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, the structure of MMPs is characterized by a signal peptide, a propeptide, and a catalytic domain containing the highly conserved zinc-binding site. In addition, fibronectin-like repeats, a hinge region, and a carboxyl-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-Xaa-His that binds zinc in the catalytic site, as well as another zinc molecule and two calcium molecules structurally. They fall within the matrixin subfamily, with the EC designation 3.4.24.x. This group also includes astacin, reprolysin, and serralysin, as well as other more divergent metalloproteinases. All MMPs are synthesized as proenzymes, and most are secreted from the cells as proenzymes. Thus, the activation of these proenzymes is a critical step that leads to extracellular matrix breakdown.

MMPs 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.

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 tightly bound 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.

Reagents

MMP Control-4 is supplied in 0.01 M phosphate buffered saline with no preservative.

Preparation Instructions

For immunoblotting, mix 1:1 with SDS-PAGE buffer and apply 20-40 µl per lane.

Storage/Stability

Store at –20 °C in working aliquots. Repeated freezing and thawing is not recommended.

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).

kaa 11/01