

## Recombinant Human MMP-1 (carrier-free)

<b>Catalog# / Size</b>	592902 / 10 µg 592904 / 25 µg 592908 / 500 µg
<b>Regulatory Status</b>	RUO
<b>Other Names</b>	Interstitial collagenase, Fibroblast collagenase, MMP1, MMP
<b>Description</b>	MMP-1 is a member of matrix metalloproteinase family proteins (MMPs); members of this family are structurally related, zinc-containing enzymes that degrade the extracellular matrix (ECM) and connective tissue proteins. MMP-1 consists of a prodomain which is cleaved upon activation: a catalytic domain containing the zinc binding site, a short hinge region, and a carboxyl terminal (hemopexin-like repeats) domain. Substrates of MMP-1 include collagen I, II, III, VII, VIII, and X as well as casein, gelatin, alpha1 antitrypsin, myelin basic protein, L Selectin, pro-TNF, IL-1β, IGFBP3, IGFBP5, pro-MMP-2, and pro-MMP-9. In addition, chemokines are substrates for MMP-1. CCL2, CCL7, CCL8, and CCL13 are catalytically cleavage by MMP-1 to produce receptor antagonists. CXCL5 and CXCL12 are also substrates for MMP-1. TIMPs inhibit MMPs in a 1:1 inhibitor to enzyme ratio through interaction of the N-terminal domain of the TIMP molecule with the active site of the MMP. MMPs are involved in the breakdown of ECM in normal physiological processes, such as embryonic development, reproduction, and tissue remodeling as well as in disease processes such as arthritis and metastasis. MMP-1 is overexpressed in invasive melanoma, colorectal, and esophageal cancers. Importantly, MMP-1 expression was shown to increase progressively with tumor stage.

### Product Details

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<b>Source</b>	Human MMP-1, amino acids (Phe20-Asn469) (Accession# NP_002412.1), is expressed with N-terminal His9-SGGGSGGGIEGR tag in 293E cell line.
<b>Molecular Mass</b>	Predicted molecular mass of approximately 54 kD. The protein migrates at about 55 kD in DTT-reducing conditions and about 60 kD in non-reducing condition by SDS-PAGE. The N-terminal amino acid is Histidine.
<b>Formulation</b>	0.22 µm filtered protein solution is in TCN (25 mM TRIS, 10 mM CaCl <sub>2</sub> , 150 mM NaCl, pH 7.5).
<b>Endotoxin Level</b>	Less than 1.0 EU per µg of protein as determine by the LAL method
<b>Concentration</b>	10 and 25 µg sizes are bottled at 200 µg/mL. 100 µg size and larger sizes are lot-specific and bottled at the concentration indicated on the vial. To obtain lot-specific concentration, please enter the lot number in our <a href="#">Concentration and Expiration Lookup</a> or <a href="#">Certificate of Analysis</a> online tools.
<b>Storage &amp; Handling</b>	Unopened vial can be stored at -20°C or -70°C for six months. For maximum results, quick spin vial prior to opening. <b>Avoid repeated freeze/thaw cycles.</b>
<b>Activity</b>	Human MMP-1 cleaves the peptide substrate Mca-KPLGL-Dpa-AR-NH <sub>2</sub> with an activity above 200 pmol/min/µg.
<b>Application</b>	<a href="#">Bioassay</a>
<b>Application Notes</b>	This protein is in the latent form and needs to be activated for bioassay.

BioLegend carrier-free recombinant proteins provided in liquid format are shipped on blue-ice. Our comparison testing data indicates that when handled and stored as recommended, the liquid format has equal or better stability and shelf-life compared to commercially available lyophilized proteins after reconstitution. Our liquid proteins are verified in-house to maintain activity after shipping on blue ice and are backed by our [100% satisfaction guarantee](#). If you have any concerns, contact us at [tech@biolegend.com](mailto:tech@biolegend.com).

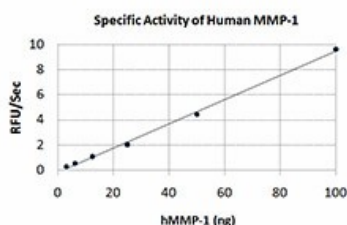
### Antigen Details

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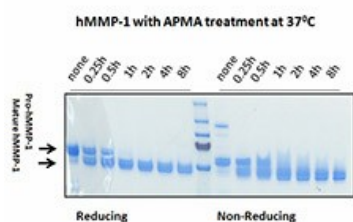
<b>Structure</b>	Monomer
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<b>Distribution</b>	MMP-1 is expressed by fibroblasts, keratinocytes, endothelial cells, monocytes, and macrophages.
<b>Function</b>	Degradation of ECM and connective tissue proteins. Angiogenesis, tissue remodeling, cancer metastasis. MMP-1 regulates chemokine activity. MMP1 is inhibited by TIMPs, $\alpha$ 2-macroglobulin (inhibitor of MMPs in bodily fluids). TNF $\alpha$ downregulates TIMPs and enhances the expression of MMPs.
<b>Interaction</b>	Extracellular matrix proteins
<b>Ligand/Receptor</b>	TIMPs
<b>Bioactivity</b>	hMMP-1 cleaves a peptide substrate Mca-KPLGL-Dpa-AR-NH2
<b>Biology Area</b>	Angiogenesis, Cell Adhesion, Cell Biology, Neuroinflammation, Neuroscience, Stem Cells
<b>Molecular Family</b>	Enzymes and Regulators
<b>Antigen References</b>	<ol style="list-style-type: none"> <li>1. Nagase H and Woessner JF Jr. 1999. <i>J. Biol. Chem.</i> 274:21491.</li> <li>2. Kader AK, <i>et al.</i> 2007. <i>Clin. Cancer Res.</i> 13:2614.</li> <li>3. Gill SE and Parks WC. 2008. <i>Int. J. Biochem. Cell Biol.</i> 40:1334.</li> <li>4. Mazor R, <i>et al.</i> 2013. <i>J. Biol. Chem.</i> 288:598.</li> <li>5. Sommer K, <i>et al.</i> 2013. <i>PLoS One</i> 8:e73992.</li> </ol>
<b>Gene ID</b>	<a href="#">4312</a>

## Product Data



The activity of human MMP-1 was measured with 10  $\mu$ M of fluorogenic MMP substrate, Mca-KPLGLDpa-AR, in the presence of 3.125, 6.25, 12.5, 25, 50, 100 ng of activated human MMP-1.



Human MMP-1 (~54 kD) was activated by 1 mM of p-Aminophenylmercuric acetate (APMA) at different time points at 37°C. After 1 h of activation, the mature form hMMP-1 (~45 kD) could be readily observed. Samples at reducing and non-reducing condition were resolved in a SDS-PAGE. Molecular weight markers at 250, 150, 100, 70, 55 kD were labeled here. *Protein per lane: 2.5  $\mu$ g*

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