

## Background

Dentin matrix protein 1 (DMP-1) is a member of the SIBLING family that also includes bone sialoprotein, dentin sialophosphoprotein, MEPE, and osteopontin. These highly phosphorylated integrin-binding proteins are rich in acidic amino acids and function in the formation of calcified bone and tooth matrix (1, 2). The phosphate content, spacing of acidic residues, and calcium-dependent dimerization of DMP-1 contribute to its ability to sequester calcium phosphate clusters and promote hydroxyapatite (HA) crystal formation (3 - 5). Rodent DMP-1 is cleaved by BMP-1 family proteases at a single site which is conserved in human, generating a 37 kDa N-terminal and a 57 kDa C-terminal fragment (6). The N-terminal fragment in rat carries chondroitin sulfate (7). The C-terminal fragment alone can nucleate HA crystals, while crystal growth into a needle-like morphology is inhibited by the N-terminal fragment (3, 4). Crystal maturation is dependent on the presence of type I collagen (4). DMP-1 is required for odontoblast differentiation as well as dentin formation (8). Nonphosphorylated DMP-1 is targeted to the nucleus, where it activates the transcription of odontoblast and osteoblast specific genes (9, 10). Early in osteoblast maturation, nuclear DMP-1 is extensively phosphorylated by casein kinase II, triggering its secretion (9). DMP-1 mutations in humans are associated with hypophosphatemia and FGF23 overexpression (11, 12). DMP-1 induces the activation of proMMP-9 and displaces mature MMP-9 from TIMP1 (13). DMP-1 tethering of MMP-9 to the cell surface via CD44 and integrins  $\alpha\beta 3$  and  $\alpha\beta 5$  promotes tumor cell invasiveness *in vitro* (14). Full length DMP-1 circulates in human serum in a tight complex with complement factor H (13, 14). When first bound to CD44 or integrin  $\alpha\beta 3$ , DMP-1 can anchor factor H to the cell surface and protect the cell from complement-mediated lysis (15). Mature human DMP-1 shares 61% - 67% amino acid sequence identity with bovine, mouse, and rat DMP-1.

## References:

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## Description

<b>Source</b>	Murine myeloma cell line, NS0-derived Leu17 - Tyr497 & Asp202 - Tyr497, both with a C-terminal 6-His tag & Leu17 - Ser201 Accession # NP_001073380
<b>N-terminal Sequence Analysis</b>	Leu17 & Asp202
<b>Predicted Molecular Mass</b>	53.1 kDa, 19.7 kDa and 33.4 kDa

## Specifications

<b>SDS-PAGE</b>	20 - 90 kDa, reducing conditions
<b>Activity</b>	Measured by its binding ability in a functional ELISA. Immobilized rhIntegrin $\alpha\beta 3$ at 2 $\mu\text{g}/\text{mL}$ can bind rhDMP-1 with an apparent $K_D < 20 \text{ nM}$ .
<b>Endotoxin Level</b>	<1.0 EU per 1 $\mu\text{g}$ of the protein by the LAL method.
<b>Purity</b>	>90%, by SDS-PAGE under reducing conditions and visualized by silver stain.
<b>Formulation</b>	Lyophilized from a 0.2 $\mu\text{m}$ filtered solution in PBS. See Certificate of Analysis for details.

## Preparation and Storage

<b>Reconstitution</b>	Reconstitute at 100 $\mu\text{g}/\text{mL}$ in sterile PBS.
<b>Shipping</b>	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
<b>Stability &amp; Storage</b>	<b>Use a manual defrost freezer and avoid repeated freeze-thaw cycles.</b> <ul style="list-style-type: none"> <li>● 12 months from date of receipt, -20 to -70 °C as supplied.</li> <li>● 1 month, 2 to 8 °C under sterile conditions after reconstitution.</li> <li>● 3 months, -20 to -70 °C under sterile conditions after reconstitution.</li> </ul>

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NOT FOR USE IN HUMANS.