# Recombinant Human DMP-1

Catalog Number: 4129-DM

## DESCRIPTION

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

## SPECIFICATIONS

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| **SDS-PAGE** | 20-90 kDa, reducing conditions |
| **Activity** | Measured by its binding ability in a functional ELISA.<br>Immobilized rhIntegrin αvβ3 at 2 µg/mL can bind rhDMP-1 with an apparent $K_D$ <20 nM. |
| **Endotoxin Level** | <0.10 EU per 1 µg of the protein by the LAL method. |
| **Purity** | >90%, by SDS-PAGE under reducing conditions and visualized by silver stain. |
| **Formulation** | Lyophilized from a 0.2 µm filtered solution in PBS. See Certificate of Analysis for details. |

## PREPARATION AND STORAGE

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| **Reconstitution** | Reconstitute at 100 µg/mL in sterile PBS. |
| **Shipping** | The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below. |
| **Stability & Storage** | **Use a manual defrost freezer and avoid repeated freeze-thaw cycles.**<br>● 12 months from date of receipt, -20 to -70 °C as supplied.<br>● 1 month, 2 to 8 °C under sterile conditions after reconstitution.<br>● 3 months, -20 to -70 °C under sterile conditions after reconstitution. |

## 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 αvβ3 and αvβ5 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 αvβ3, 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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