Recombinant Mouse DMP-1

Catalog Number: 4386-DM

DESCRIPTION

Source	Mouse myeloma cell line, NS0-derived Leu17-Tyr503, with a C-terminal 6-His tag Accession # Q2HJ09
N-terminal Sequence Analysis	Leu17
Predicted Molecular Mass	52.9 kDa (monomer)

SPECIFICATIONS

SDS-PAGE	57 kDa, 99 kDa and 180 kDa, reducing conditions
Activity	Measured by its binding ability in a functional ELISA. Immobilized rhIntegrin αVβ3 at 5 µg/mL can bind rmDMP-1 with an apparent K_D < 25 nM.
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>85%, 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

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.** ● 12 months from date of receipt, -20 to -70 °C as supplied. ● 1 month, 2 to 8 °C under sterile conditions after reconstitution. ● 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 of proteins that includes bone sialoprotein, dentin sialophosphoprotein, MEPE, and osteopontin. These are highly phosphorylated integrin-binding proteins that are rich in acidic amino acids and function in the formation of calcified bone and tooth matrix (1, 2). Its 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). Mature mouse DMP-1 is 487 amino acids (aa) in length. It contains a poly-Pro segment (aa 41 - 44) and an RGD binding motif (aa 350 - 352). DMP-1 may be cleaved by BMP-1 family proteases at a single site which is conserved in human, generating a 37 kDa N-terminal (aa 17 - 212) and a 57 kDa C-terminal (aa 213 - 503) 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 retained intracellularly where it is targeted to the nucleus. Here, 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 tethers MMP-9 to the cell surface *via* CD44 and integrins αVβ3 and αVβ5, promoting 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 mouse DMP-1 shares 63%, 61%, and 87% aa sequence identity with bovine, human, and rat DMP-1, respectively.

References:

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