Recombinant Mouse USAG1

Catalog Number: 9008-SD

DESCRIPTION

Source	*E. coli*-derived Phe24-Ser206, with an N-terminal Met Accession # Q9CQN4
N-terminal Sequence Analysis	Met
Predicted Molecular Mass	21 kDa

SPECIFICATIONS

SDS-PAGE	21 kDa, reducing conditions
Activity	Measured by its binding ability in a functional ELISA. When Recombinant Human USAG1 (Catalog # 5370-SD) is immobilized at 1 µg/mL (100 µL/well), the concentration of Recombinant Mouse LRP-6 (Catalog # 2960-LR) that produces 50% of the optimal binding response is approximately 0.1-0.6 µg/mL.
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Formulation	Lyophilized from a 0.2 µm filtered solution in HCl. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 250 µg/mL in 4 mM HCl.
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

USAG1, also known as WISE, Ectodin, or SOSTDC1, is a secreted, monomeric 26-32 kDa glycoprotein of the sclerostin family of BMP antagonists. It functions as a BMP and Wnt antagonist during the development of kidney, tooth, and mammary tissues (1-3). Mature mouse USAG1 contains one cystine knot domain and shares 97% and 99.5% aa identity with human and rat USAG1, respectively (2, 3). USAG1 co-localizes with BMP-7 in the developing and adult kidney, particularly in distal tubule epithelial cells (2, 4). It is also found in ectodermal tissues such as tooth ameloblasts, osteoblasts, cells of the dermal papilla, mammary placode epithelium, and uterine lumenal epithelium (1, 2, 5-7). USAG1 binds BMP-2, -4, -6, and -7, sequestering BMPs and preventing their interaction with BMP receptors (1-4, 8). USAG1 also binds to LRP5 and LRP6 and blocks LRP engagement of Wnt (3, 9). USAG1 coordinates BMP, Wnt, FGF, and Shh signals to regulate apoptosis during tooth and bone development (1, 5, 9, 10). Deletion of USAG1 in mice results in supernumerary teeth, nipples, and whiskers as well as increased bone mineral density (5, 6, 8, 9, 11), while concurrent decreased expression of LRP5 and LRP6 restores normal tooth configurations (9). USAG1$^{-/-}$ mice also show decreased susceptibility to kidney injury which is reversed by neutralizing antibody to BMP-7 (4). In a mouse model of Alport syndrome, deletion of USAG1 ameliorates the loss of renal function (10).

References:

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