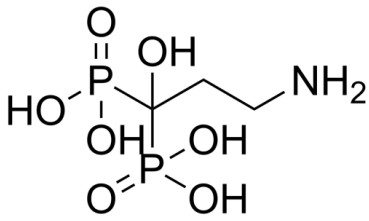
Data Sheet

Product Name:	Pamidronic acid
Cat. No.:	CS-7787
CAS No.:	40391-99-9
Molecular Formula:	$C_3H_{11}NO_7P_2$
Molecular Weight:	235.07
Target:	RANKL/RANK ; Toll-like Receptor (TLR); Wnt; β-catenin
Pathway:	Immunology/Inflammation; NF-κB; Stem Cell/Wnt
Solubility:	DMSO : < 1 mg/mL;H_2O : 5 mg/mL (ultrasonic;warming;heat to 80°C)



BIOLOGICAL ACTIVITY:

Pamidronic acid, the second-generation nitrogen-containing bisphosphonate, is an inhibitor of bone loss. Pamidronic acid significantly inhibits subchondral bone loss in early osteoarthritis by upregulating the expression of **OPG** in cartilage and subchondral bone, and inhibiting the expression of **RANKL** and **MMP-9** in both tissues, as well as **TLR-4** in cartilage, thereby alleviating cartilage degeneration. Additionally, Pamidronic acid can inhibit the signaling of **Wnt** and **β-catenin**, and is applicable for research on osteoporosis and osteosarcoma[1][2][3][4].

PROTOCOL (Extracted from published papers and Only for reference)

Cell Assay: [1]Cell counts and cell viability assays are performed in cultures of osteosarcoma cells (POS, HMPOS, and COS31 cell lines) and fibroblasts after 24, 48, and 72 hours of incubation with pamidronate at concentrations of 0.001 to 1000 microM or with no drug (control treatment). Percentage viability is determined in cell samples for each concentration of pamidronate and each incubation time. A DNA fragmentation analysis is performed to assess bisphosphonate-induced apoptosis[1]. **Animal Administration:** [3]Rabbits: The rabbits are randomly divided into four groups. Sham-operated with vehicle treatment, OA induced by ACLT with vehicle treatment, OA-induced ACLT treated with short-term pamidronic acid treatment after ACLT, and ACLT treated with long-term PAM treatment. PAM is injected at the 4th week after ACLT in PAM-S and PAM-L groups, and followed by once monthly ear vein injections at a dosage of 3 mg/kg body weight. In the other groups, only saline infusions of equal volumes are administered. 10 animals are humanely sacrificed at both 2 and 10 weeks after pamidronic acid treatment. In the ACLT and Sham groups, five animals are sacrificed at 2, 4, 6, and 14 weeks after model establishment[3].

References:

[1]. Ashton JA, et al. Investigation of the effect of pamidronate disodium on the in vitro viability of osteosarcoma cellsfrom dogs. Am J Vet Res. 2005 May;66(5):885-92.

[2]. Xu Y, et al. Pamidronate Disodium Leads to Bone Necrosis via Suppression of Wnt/β-Catenin Signaling in Human Bone Marrow Mesenchymal Stem Cells In Vitro. J Oral Maxillofac Surg. 2017 Mar 23.

[3]. Lv Y, et al. Effects of pamidronate disodium on the loss of osteoarthritic subchondral bone and the expression of cartilaginous and subchondral osteoprotegerin and RANKL in rabbits. BMC Musculoskelet Disord. 2014 Nov 6;15:371.

[4]. Kovacs R, et al. The synthesis of pamidronic derivatives in different solvents: An optimization and a mechanistic study[J]. Heteroatom Chemistry, 2014, 25(3): 186-194.

CAIndexNames:

Phosphonic acid, P,P'-(3-amino-1-hydroxypropylidene)bis-

SMILES:

OC(P(O)(O)=O)(P(O)(O)=O)CCN

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