

Product Data Sheet

Product Name: Kartogenin

Cat. No.: GC15057

Chemical Properties

Cas. No. 4727-31-5

Chemical Name 2-[(4-phenylphenyl)carbamoyl]benzoic acid

SMILES O=C(C1=CC=CC=C1C(O)=O)NC2=CC=C(C=C2)C3=CC=CC=C3

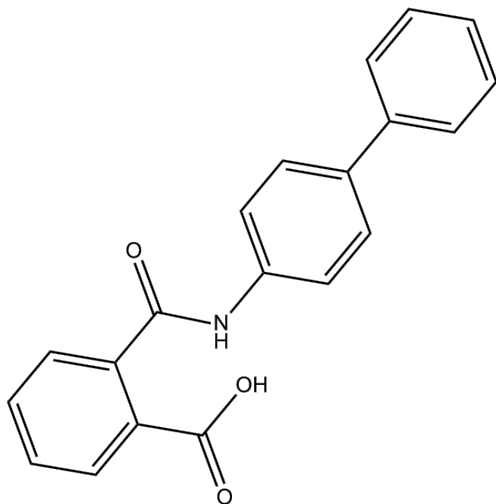
Formula $C_{20}H_{15}NO_3$ M.Wt 317.34

Solubility $\geq 10.6\text{mg/mL}$ in DMSO Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines Rabbit bone marrow stromal cells (BMSCs)

Caution: Product has not been fully validated for medical applications. For research use only.

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Preparation Method	Rabbit BMSCs were seeded in 6-well plates at a density of 6×10^4 per well and cultured for two weeks in growth medium with various concentrations (1nM–5μM) of Kartogenin. The medium was changed every 3 days and after 2 weeks, cell proliferation was measured by population doubling time (PDT), and cell differentiation was assessed by measuring the expression of chondrogenic markers (aggrecan, collagen type II and Sox-9) using quantitative RT-PCR (qRT-PCR), cytochemical and immunocytochemical staining for proteoglycans, collagen type II and osteocalcin.
Reaction Conditions	1nM–5μM; 3d
Applications	Kartogenin enhances cell proliferation and induces chondrogenic differentiation of stem cells in a concentration-dependent manner.
Animal experiment [2]:	
Animal models	Surgically induced osteoarthritis mouse model
Preparation Method	A knee osteoarthritis (OA) model was established in six- to eight-week-old male C57BL/6J mice using DMM (medial meniscus instability transection) surgery. Mice were anesthetized with 2% isoflurane in 30% oxygen, and the medial meniscotibial ligament was transected using microscissors by the same surgeon. A sham surgery group was treated with joint capsule exposure but no ligamentous integrity was altered. Following surgery, intra-articular injections of 10μL of saline were administered to the control group, while 1μM or 100μM Kartogenin solutions (Kartogenin dissolved in DMSO and diluted in 0.9% saline) were administered to the experimental groups twice weekly. MiR-146a mimics were used simultaneously in some mice to further explore its protective effect on Kartogenin.
Dosage form	1μM, 100μM; intra-articular injection; 4 weeks

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Applications Kartogenin prevents cartilage degradation and alleviates osteoarthritis progression in mice via the miR-146a/NRF2 axis.

References:

- [1]. Zhang J, Wang J H C. Kartogenin induces cartilage-like tissue formation in tendon–bone junction[J]. Bone research, 2014, 2(1): 1-10.
- [2]. Hou M, Zhang Y, Zhou X, et al. Kartogenin prevents cartilage degradation and alleviates osteoarthritis progression in mice via the miR-146a/NRF2 axis[J]. Cell death & disease, 2021, 12(5): 483.

Background

Kartogenin is an inducer of cartilage-like tissue formation (EC₅₀: 100nM) [1]. Kartogenin activates chondrogenesis and promotes cartilage matrix synthesis by regulating signaling pathways such as filaminA/CBFβ/RUNX1, Ihh, and TGF-β/Smad [2-3]. Kartogenin is commonly used to treat osteoarthritis and tendon repair [4].

In rabbit bone marrow stromal cells (BMSCs), Kartogenin (1nM–5μM; 3d) enhances cell proliferation and induces chondrogenic differentiation of stem cells in a concentration-dependent manner [5]. In rat cartilage-derived chondrogenic stem/progenitor cells (CSPCs), Kartogenin (10μM; 7d) promotes the proliferation of cell [6].

In surgically induced osteoarthritis mouse model, Kartogenin (1μM, 100μM; intra-articular injection; 4 weeks) prevents cartilage degradation and alleviates osteoarthritis progression in mice via the miR-146a/NRF2 axis [7]. In monoiodoacetate-induced osteoarthritis mouse model, Kartogenin (100μM; intra-articular injection; 14d) inhibits pain behavior, chondrocyte inflammation, and attenuates osteoarthritis progression in mice through induction of IL-10 [8].

References:

- [1]. Johnson K A. A stem cell-based approach to cartilage repair[J]. Osteoarthritis and Cartilage, 2013, 21: S4.
- [2]. Cai J, Zhang L, Chen J, et al. Kartogenin and its application in regenerative medicine[J]. Current medical science, 2019, 39(1): 16-20.

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- [3]. Bhuyan S, Swain S, Misra R D K, et al. Nanomedicine-Driven Approaches for Kartogenin Delivery: Advancing Chondrogenic Differentiation and Cartilage Regeneration in Tissue Engineering[J]. International Journal of Nanomedicine, 2025: 7443-7468.
- [4]. Im G I. Application of kartogenin for musculoskeletal regeneration[J]. Journal of Biomedical Materials Research Part A, 2018, 106(4): 1141-1148.
- [5]. Zhang J, Wang J H C. Kartogenin induces cartilage-like tissue formation in tendon–bone junction[J]. Bone research, 2014, 2(1): 1-10.
- [6]. Liu T, Li X, Wang T, et al. Kartogenin mediates cartilage regeneration by stimulating the IL-6/Stat3-dependent proliferation of cartilage stem/progenitor cells[J]. Biochemical and Biophysical Research Communications, 2020, 532(3): 385-392.
- [7]. Hou M, Zhang Y, Zhou X, et al. Kartogenin prevents cartilage degradation and alleviates osteoarthritis progression in mice via the miR-146a/NRF2 axis[J]. Cell death & disease, 2021, 12(5): 483.
- [8]. Kwon J Y, Lee S H, Na H S, et al. Kartogenin inhibits pain behavior, chondrocyte inflammation, and attenuates osteoarthritis progression in mice through induction of IL-10[J]. Scientific reports, 2018, 8(1): 13832.

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