

Product Data Sheet

Product Name: Senkyunolide A

Cat. No.: GN10670

Chemical Properties

Cas. No. 62006-39-7

Chemical Name (3S)-3-butyl-4,5-dihydro-3H-2-benzofuran-1-one

SMILES CCCCC1C2=C(C=CCC2)C(=O)O1

Formula $C_{12}H_{16}O_2$

M.Wt 192.25

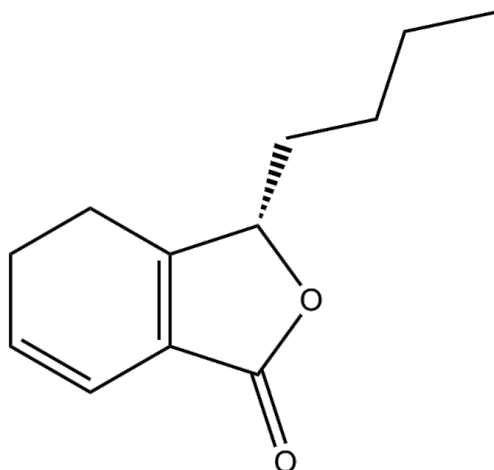
Solubility $\geq 50.2\text{mg/mL}$ in DMSO

Storage -80°C , protect from light, stored under nitrogen

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]:

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Cell lines	Mouse chondrocytes
Preparation Method	Mouse chondrocytes were cultured in DMEM/F12 medium, supplemented with 10% fetal bovine serum and 1% penicillin-streptomycin, at 37°C in an incubator with 5% CO ₂ . Chondrocytes were pre-treated with different concentrations of Senkyunolide A (0, 20, 40, and 80µg/ml) for 2h in serum-free medium and were stimulated with IL-1β (10ng/ml) for 24h to simulate an inflammatory response; cell viability was measured.
Reaction Conditions	0, 20, 40, and 80µg/ml; 2h
Applications	Senkyunolide A treatment markedly enhanced cell viability in IL-1β-stimulated chondrocytes in a dose-dependent manner.

Animal experiment [2]:

Animal models	Male Sprague-Dawley rats
Preparation Method	Male Sprague-Dawley rats (7 weeks old; 200±10g) were housed in a normal atmosphere under a 12h light-dark cycle at 23-25°C with 50% humidity and provided with standard laboratory food and water ad libitum. Rats were divided into a blank group, a model group, and a Senkyunolide A-administered group, with 12 rats in each group. Hyperuricemia was induced by intraperitoneal injection of potassium oxonate (100mg/kg) combined with intragastric administration of hypoxanthine (500mg/kg). Intragastric administration of Senkyunolide A (40mg/kg) was performed 2h after modeling each day, with continuous modeling and Senkyunolide A administration for 9 days in all groups. The ipsilateral kidneys were collected after the last administration for analysis.

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Dosage form	40mg/kg/day; 9 days; i.p.
Applications	Senkyunolide A treatment mitigated renal damage in rats with hyperuricemia.
References:[1] Shao M, Lv D, Zhou K, et al. Senkyunolide A inhibits the progression of osteoarthritis by inhibiting the NLRP3 signalling pathway[J]. <i>Pharmaceutical biology</i> , 2022, 60(1): 535-542.[2] Wu J F, Liu Y R, Weng J Y, et al. Alleviation of senkyunolide A on hyperuricemia and hyperuricemia-induced renal damage in rats[J]. <i>Biochemical and Biophysical Research Communications</i> , 2026: 154411.	

Background

Senkyunolide A is an orally active component derived from the Chuanxiong essential oil, with vasodilatory, antiplatelet aggregation, antithrombotic, and antiproliferative effects^[1]. Senkyunolide A promotes scalp homeostasis by enhancing the epidermal differentiation complex at both gene and protein levels, enhancing detoxification and anti-inflammatory pathways to reduce irritation and redness, and simultaneously controlling the microenvironment of *Malassezia* to reduce dandruff production and soothe the scalp^[2]. Senkyunolide A decreases the expression of the cell efflux protein p-glycoprotein and opens tight junctions between cells to promote blood-brain barrier (BBB) transport^[3]. Senkyunolide A has been widely used to inhibit the activation of the trigeminal nerve vascular system and to regulate pathological vascular changes^[4].

In vitro, Senkyunolide A treatment for 12 hours suppressed lipopolysaccharide (LPS)-induced TNF- α production in THP-1 cells, with an IC₅₀ value of 56 μ M^[5]. Pretreatment with 80 μ g/ml Senkyunolide A for 2 hours enhanced the viability of chondrocytes stimulated by IL-1 β , inhibited the expression of MMP13 and ADAMTS4/5, and blocked the activation of the NLRP3 signaling pathway^[6]. Incubation with 50 μ M Senkyunolide A for 48 hours alleviated the MPC5 podocyte injury induced by high glucose and mitigated mitochondrial dysfunction^[7].

In vivo, Senkyunolide A treatment via intraperitoneal injection at a dose of 40mg/kg 1 hour before ovalbumin (OVA) aerosol treatment alleviated airway injury and airway remodeling in OVA-induced asthmatic mice, and inhibited the activity of the TGF- β /Smad2/3 signaling pathway in the lung tissues

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of asthmatic mice^[8]. Intragastric administration of Senkyunolide A (40mg/kg/day) for 9 days alleviated renal damage in rats with hyperuricemia, reduced uric acid production and promoted uric acid excretion^[9].

References:

- [1] Zhang H, Liu C, Wang M, et al. Metabolic profiling of senkyunolide A and identification of its metabolites in hepatocytes by ultra-high-performance liquid chromatography combined with diode-array detector and high-resolution mass spectrometry[J]. Rapid Communications in Mass Spectrometry, 2020, 34(21): e8894.
- [2] Mondon P, Ringenbach C, Doridot E, et al. Reinforcement of barrier function and scalp homeostasis by Senkyunolide A to fight against dandruff[J]. International Journal of Cosmetic Science, 2017, 39(6): 617-621.
- [3] Li Q, Wan J B, Zhao L. Research progress on the pharmacological activities of senkyunolides[J]. Acupuncture and Herbal Medicine, 2023, 3(3): 180-188.
- [4] Long Y, Li D, Jian X, et al. Senkyunolides: a promising natural compounds for the treatment of migraine headaches[J]. Frontiers in Nutrition, 2026, 13: 1750201.
- [5] Liu L, Ning Z Q, Shan S, et al. Phthalide lactones from Ligusticum chuanxiong inhibit lipopolysaccharide-induced TNF- α production and TNF- α -mediated NF- κ B activation[J]. Planta Medica, 2005, 71(09): 808-813.
- [6] Shao M, Lv D, Zhou K, et al. Senkyunolide A inhibits the progression of osteoarthritis by inhibiting the NLRP3 signalling pathway[J]. Pharmaceutical biology, 2022, 60(1): 535-542.
- [7] Yu J, Bian D, Yao S, et al. Senkyunolide A from Danggui Buxue Decoction Protects Podocytes Against Diabetic Nephropathy via the miR-223-3p/NLRP3 Inflammasome Axis[J]. Journal of Ethnopharmacology, 2026: 122138.
- [8] Zhang M, Wang C, Zhao R, et al. Senkyunolide A alleviates asthma by inhibiting TGF- β /Smad2/3 signaling pathway and NLRP3 inflammasome activation[J]. Biochemical and Biophysical Research Communications, 2025: 152809.
- [9] Wu J F, Liu Y R, Weng J Y, et al. Alleviation of senkyunolide A on hyperuricemia and hyperuricemia-induced renal damage in rats[J]. Biochemical and Biophysical Research Communications, 2026: 154411.

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