Naproxen sodium

Cat. No.: HY-15030A

CAS No.: 26159-34-2

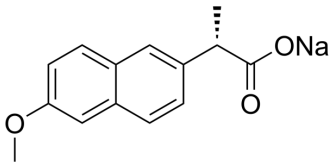
Molecular Formula: $C_{14}H_{13}NaO_3$

Molecular Weight: 252.24

Target: Autophagy; COX

Pathway: Autophagy; Immunology/Inflammation

Storage: 4°C, sealed storage, away from moisture
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

H_2O : 75 mg/mL (297.34 mM; Need ultrasonic and warming)
DMSO : 5 mg/mL (19.82 mM; Need ultrasonic)

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	3.9645 mL	19.8224 mL	39.6448 mL
5 mM	0.7929 mL	3.9645 mL	7.9290 mL
10 mM	0.3964 mL	1.9822 mL	3.9645 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 120 mg/mL (475.74 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 0.5 mg/mL (1.98 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 0.5 mg/mL (1.98 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 0.5 mg/mL (1.98 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Naproxen sodium is a COX-1 and COX-2 inhibitor with IC_{50}s of 8.72 and 5.15 μM, respectively in cell assay.

IC_{50} & Target

COX-2	COX-1
5.65 μM (IC_{50}, in intact cells)	9.55 μM (IC_{50}, in intact cells)

In Vitro	Naproxen etemesil is a lipophilic, non-acidic, inactive prodrug of naproxen that is hydrolysed to pharmacologically active Naproxen once absorbed. Naproxen is a well known nonsteroidal anti-inflammatory drug. Naproxen is approximately equipotent inhibitor of COX-1 and COX-2 in intact cells with IC_{50}s of 2.2 μg/mL and 1.3 μg/mL, respectively[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Naproxen exerts an anti-inflammatory and antifibrotic effect in mouse model of bleomycin-induced lung fibrosis. Naproxen also downregulates TGF-β levels and Smad3/4 complex formation[2]. Naproxen is shown to inhibit the time-courses of pain, fever and PGE2 with similar potencies (IC_{50}=27, 40, 13 μM)[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]	BAEC are incubated for 30 min with Naproxen (0.1 ng/mL to 1 mg/mL). Arachidonic acid (30 μM) is then added, and the cells are incubated for a further 15 min at 37°C. The medium is then removed, and radioimmunoassay is used to measure the formation of 6-keto-PGF,a, PGE2, thromboxane B2, or PGF2a[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2][3]	Rats[3] To measure the analgesic effects of naproxen in a carrageenaninduced model of monoarthritis, Male Sprague–Dawley rats (n=48, 217±28 g) are randomly divided into four groups of 12 by an internally developed computer program, allowing the blind performance of the behavioral experiment. To induce hyperalgesia by inflammation, animals in groups 1B, 1C, and 1D receive a 40-μL intra-articular injection of a saline solution containing 7.5 mg/mL carrageenan in the left hind limb under isoflurane anesthesia (time=−1 h). Animals in group 1A receive no injection. After 1 h (time=0) the animals in groups 1A, 1B, 1C, and 1D receive oral doses of naproxen in saline of 0, 0, 7.5 and 30 μmol/kg, respectively. The doses and time points of measurements are selected on the basis of simulations predicting measuring a full concentration-effect relationship within the time-span of the experiment[3]. Mice[2] Bleomycin (0.05 IU) is instilled intratracheally to C57BL/6 mice, which are then treated by micro-osmotic pump with vehicle, JNJ7777120 (40 mg/kg b.wt.), naproxen (21 mg/kg b.wt.), or a combination of both. Airway resistance to inflation, an index of lung stiffness, is assessed, and lung specimens are processed for inflammation, oxidative stress, and fibrosis markers[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Chemosphere. 2019 Jun;225:378-387.
- Biotechnol Bioeng. 2021 Sep 3.

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REFERENCES

[1]. Mitchell JA, et al. Selectivity of nonsteroidal antiinflammatory drugs as inhibitors of constitutive and inducible cyclooxygenase. Proc Natl Acad Sci U S A. 1993 Dec 15;90(24):11693-7.

[2]. Rosa AC, et al. Prevention of bleomycin-induced lung inflammation and fibrosis in mice by naproxen and JNJ7777120 treatment. J Pharmacol Exp Ther. 2014 Nov;351(2):308-16.

[3]. Krekels EH, et al. Pharmacokinetic-pharmacodynamic modeling of the inhibitory effects of naproxen on the time-courses of inflammatory pain, fever, and the ex vivo synthesis of TXB2 and PGE2 in rats.

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