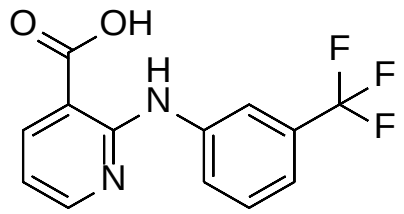
Product data sheet

MedKoo Cat#: 318365 Name: Niflumic Acid CAS: 4394-00-7 Chemical Formula: $C_{13}H_9F_3N_2O_2$ Exact Mass: 282.0616 Molecular Weight: 282.218	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
Niflumic acid is a drug used for joint and muscular pain. It is categorized as an inhibitor of cyclooxygenase-2. In experimental biology, it has been employed to inhibit chloride channels. Niflumic acid has also been reported to act on GABA-A and NMDA channels and to block T-type calcium channels.

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMF	65.0	230.32
DMSO	57.06	202.17
Ethanol	33.61	119.09

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.54 mL	17.72 mL	35.43 mL
5 mM	0.71 mL	3.54 mL	7.09 mL
10 mM	0.35 mL	1.77 mL	3.54 mL
50 mM	0.07 mL	0.35 mL	0.71 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study
In vitro study

1. Nakano T, Inoue H, Fukuyama S, Matsumoto K, Matsumura M, Tsuda M, Matsumoto T, Aizawa H, Nakanishi Y. Niflumic acid suppresses interleukin-13-induced asthma phenotypes. Am J Respir Crit Care Med. 2006 Jun 1;173(11):1216-21. doi: 10.1164/rccm.200410-1420OC. Epub 2006 Mar 9. PMID: 16528019.
2. White MM, Aylwin M. Niflumic and flufenamic acids are potent reversible blockers of Ca2(+)-activated Cl- channels in Xenopus oocytes. Mol Pharmacol. 1990 May;37(5):720-4. PMID: 1692608.

In vivo study

1. Pérez FJ, Iturra PA, Ponce CA, Magne F, Garcia-Angulo V, Vargas SL. Niflumic Acid Reverses Airway Mucus Excess and Improves Survival in the Rat Model of Steroid-Induced Pneumocystis Pneumonia. Front Microbiol. 2019 Jul 5;10:1522. doi: 10.3389/fmicb.2019.01522. PMID: 31333624; PMCID: PMC6624676.
2. Marwaha L, Bansal Y, Singh R, Saroj P, Sodhi RK, Kuhad A. Niflumic acid, a TRPV1 channel modulator, ameliorates stavudine-induced neuropathic pain. Inflammopharmacology. 2016 Dec;24(6):319-334. doi: 10.1007/s10787-016-0285-0. Epub 2016 Oct 18. PMID: 27757590.

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7. Bioactivity

Biological target:

Niflumic acid is a Ca^{2+}-activated Cl^- channel blocker.

In vitro activity

The effects of niflumic acid and flufenamic acid, two nonsteroidal anti-inflammatory agents known to block anion transport in red blood cells, on Ca2(+)-activated Cl- currents (ICl(Ca)) in Xenopus oocytes were examined. Both compounds reversibly inhibited ICl(Ca), elicited in response to depolarizing voltage steps, in a dose-dependent manner, with no effect on the shape of the current-voltage curve. The apparent inhibition constant for niflumic acid was 17 microM, whereas that for flufenamic acid was 28 microM. Niflumic acid also inhibited ICl(Ca) elicited by bath application of Ca2+ to oocytes permeabilized using the Ca2+ ionophore A23187, demonstrating that the inhibition of ICl(Ca) is due to a direct interaction with the Cl- channel, rather than by interference with Ca2+ entry through voltage-dependent Ca2+ channels.

Reference: Mol Pharmacol. 1990 May;37(5):720-4. https://pubmed.ncbi.nlm.nih.gov/1692608/

In vivo activity

This study used the steroid-induced rat model of PcP to evaluate inflammation and mucus progression, and tested the effect of niflumic acid (NFA), a fenamate-type drug with potent CLCA1 blocker activity, in decreasing Pneumocystis-associated immunopathology. Administration of NFA caused a significant decrease in total mucus, MUC5AC and mCLCA3 and also, in Pneumocystis-associated inflammation. Most relevant, NFA treatment improved survival at 8 weeks of steroids.

Reference: Front Microbiol. 2019 Jul 5;10:1522. https://pubmed.ncbi.nlm.nih.gov/31333624/