

# **Data Sheet**

Product Name:	Flufenamic acid
Cat. No.:	CS-4811
CAS No.:	530-78-9
Molecular Formula:	C <sub>14</sub> H <sub>10</sub> F <sub>3</sub> NO <sub>2</sub>
Molecular Weight:	281.23
Target:	AMPK; Calcium Channel; Chloride Channel; COX; Parasite; Potassium Channel
Pathway:	Anti-infection; Epigenetics; Immunology/Inflammation; Membrane Transporter/Ion Channel; Neuronal Signaling; PI3K/Akt/mTOR
Solubility:	DMSO : 100 mg/mL (ultrasonic)



## **BIOLOGICAL ACTIVITY:**

Flufenamic acid is a non-steroidal anti-inflammatory agent, inhibits cyclooxygenase (COX), activates AMPK, and also modulates ion channels, blocking chloride channels and L-type Ca<sup>2+</sup> channels, modulating non-selective cation channels (NSC), activating K<sup>+</sup> channels. Flufenamic acid binds to the central pocket of TEAD2 YBD and inhibits both TEAD function and TEAD-YAP-dependent processes, such as cell migration and proliferation. IC50 & Target:COX, Chloride Channel, Calcium Channel, Potassium Channel<sup>[1]</sup>, AMPK<sup>[2]</sup> In Vitro:Flufenamic acid is a non-steroidal anti-inflammatory agent, inhibits cyclooxygenase (COX), and also modulates ion channels, blocking chloride channels and L-type Ca<sup>2+</sup> channels, modulating non-selective cation channels (NSC), activating K<sup>+</sup> channels. Flufenamic acid inhibits a wide spectrum of TRP channels, including: C3, C7, M2, M3, M4, M5, M7, M8, V1, V3, and V4 but activates at least two TRP channels (C6 and A1)<sup>[1]</sup>. Flufenamic acid induces AMPK activation in T84 cells, and such an effect is via a direct stimulation of calcium/calmodulin-dependent protein kinase kinase beta (CaMKKß) activity<sup>[2]</sup>. Moreover, Flufenamic acid (FFA; 5-50 µM) dose-dependently inhibits cAMP-dependent CI<sup>-</sup> secretion in intact T84 cells, suppresses CFTR-mediated apical I<sub>CI</sub>, and blocks the Ca<sup>2+</sup>-dependent Cl<sup>-</sup> secretion in a dose-dependent manner with IC<sub>50</sub> of appr 10 µM and near complete inhibition at 100 µ M in T84 cell monolayers, but shows no effect on Na<sup>+</sup>-K<sup>+</sup> ATPase or NKCC in T84 cells<sup>[3]</sup>. Ufenamat at low concentrations can promote osteogenesis of bone marrow mesenchymal stem cells (mBMMSCs) by co-culture with mouse skin mesenchymal stem cells (mSMSCs)<sup>[5]</sup>. In Vivo:Flufenamic acid (50 mg/kg, i.p.) has anti-inflammatory effect in a mouse model of Vibrio cholerae El Tor variant (EL)-induced diarrhea and significantly abrogates EL-induced intestinal fluid secretion and barrier disruption at 20 mg/kg. Furthermore. Flufenamic acid suppresses NF-KB nuclear translocation and expression of proinflammatory mediators and promotes AMPK phosphorylation in the EL-infected mouse intestine<sup>[2]</sup>.

### PROTOCOL (Extracted from published papers and Only for reference)

**Cell Assay:** Flufenamic acid is dissolved in DMSO<sup>[3],[3]</sup>In brief, apical and basolateral chambers are filled symmetrically with Kreb's solutions. Thereafter, **DMSO** or **Flufenamic acid** is added into the basolateral chamber followed by apical membrane permealization by amphotericin B. After the amphotericin B-elicited  $I_{sc}$  is stabilized, ouabain is added into the basolateral chamber. The ouabain sensitive  $I_{sc}$  is used as an indicator of **Na<sup>+</sup>-K<sup>+</sup> ATPase activity**<sup>[3]</sup>.

#### Animal Administration:<sup>[2]</sup>Rats<sup>[2]</sup>

**Six-week-old male ICR outbred mice** (weight 30-35 g) are fasted for 24 h before anesthesia using an intraperitoneal injection of nembutal (60 mg/kg). Following abdominal incision, the ileum is ligated (appr 3-4 cm long) and inoculated with 100 µL of **PBS** or PBS containing V. cholerae (10<sup>5</sup> CFU/loop) with or without a concomitant **intraperitoneal injection** of **Flufenamic acid** or metformin. Twelve hours post-inoculation, ileal loops are removed for weight/length ratio measurement, biochemical analysis and ultrastructural evaluation<sup>[2]</sup>.

#### **References:**

[1]. Guinamard R, et al. Flufenamic acid as an ion channel modulator. Pharmacol Ther. 2013 May;138(2):272-84.

[2]. Pongkorpsakol P, et al. Flufenamic acid protects against intestinal fluid secretion and barrier leakage in a mouse model of Vibrio cholerae infection through NF-κB inhibition and AMPK activation. Eur J Pharmacol. 2017 Mar 5;798:94-104.

[3]. Pongkorpsakol P, et al. Cellular mechanisms underlying the inhibitory effect of flufenamic acid on chloride secretion in human intestinal epithelial cells. J Pharmacol Sci. 2017 Jun;134(2):93-100.

[4]. Pobbati AV, et al. Targeting the Central Pocket in Human Transcription Factor TEAD as a Potential Cancer Therapeutic Strategy. Structure. 2015;23(11):2076-2086.

[5]. Fan Yang, et al. Topical Application of Butyl Flufenamate Ointment Promotes Cranial Defect Healing in Mice by Inducing BMP2 Secretion in Skin Mesenchymal Stem Cells. Cells. 2022 Nov 15;11(22):3620.

#### **CAIndexNames:**

Benzoic acid, 2-[[3-(trifluoromethyl)phenyl]amino]-

#### SMILES:

O=C(O)C1=CC=CC=C1NC2=CC=CC(C(F)(F)F)=C2

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

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