

Store at  
-20C  
#73618

# Leupeptin Hemisulfate

25 mg

**Orders:** 877-616-CELL (2355)  
orders@cellsignal.com**Support:** 877-678-TECH (8324)**Web:** info@cellsignal.com  
cellsignal.com

3 Trask Lane | Danvers | Massachusetts | 01923 | USA

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## Background

The peptide sulfate salt Leupeptin Hemisulfate is a serine and cysteine proteinase inhibitor that strongly blocks proteolysis by plasmin, trypsin, cathepsin B, and papain, but does not inhibit proteolysis by  $\alpha$ -chymotrypsin or thrombin (1). Inhibition of the calcium-dependent protease calpain by Leupeptin Hemisulfate in murine cochlea explant cultures prevented hearing loss from aminoglycoside ototoxicity and neomycin-induced loss of outer hair cells (2). Leupeptin Hemisulfate inhibited calpain, rescued primary rat motoneurons exposed to  $\alpha$ -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) from cell death, and improved muscle function following nerve injury (3). Exposure of starved rats to Leupeptin Hemisulfate resulted in inhibition of lysosomal cysteine proteinases and blocked autolysosomal protein degradation, resulting in hepatic autolysosome accumulation (4). Leupeptin Hemisulfate is one of several inhibitors of cathepsin L, a cysteine protease that can cleave and activate the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) spike protein. Leupeptin Hemisulfate treatment of HuH-7 cells inhibited infection by live SARS-CoV-2 virus *in vitro* (5).

## Molecular Formula

 $C_{20}H_{38}N_6O_4 \cdot 1/2H_2SO_4$ 

## Molecular Weight

475.6 g/mol

## Purity

&gt;96.5%

## CAS

103476-89-7

## Solubility

Soluble in methanol at 50 mg/mL or ethanol at 50 mg/mL or water at 50 mg/mL.

## Storage

Store lyophilized at  $-20^{\circ}C$ , desiccated. In lyophilized form, the chemical is stable for 24 months. Once in solution, store at  $-20^{\circ}C$  and use within 3 months to prevent loss of potency. *Aliquot to avoid multiple freeze/thaw cycles.*

## Directions for Use

Leupeptin Hemisulfate is supplied as a lyophilized powder. For a 10 mM stock, reconstitute 5 mg of powder in 1.05 mL of DMSO. Working concentrations and length of treatment can vary depending on the desired effect.

## Background References

1. Aoyagi, T. et al. (1969) *J Antibiot (Tokyo)* 22, 558-68.
2. Momiyama, J. et al. (2006) *Tohoku J Exp Med* 209, 89-97.
3. Kieran, D. and Greensmith, L. (2004) *Neuroscience* 125, 427-39.
4. Ueno, T. and Komatsu, M. (2019) *Methods Mol Biol* 1880, 535-540.
5. Yang, W.L. et al. (2022) *Comput Struct Biotechnol J* 20, 2442-2454.

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