

Product Data Sheet

Product Name: TMP269
Cat. No.: GC17703

Chemical Properties

Cas. No. 1314890-29-3

Chemical Name (Z)-N-((4-(4-phenylthiazol-2-yl)tetrahydro-2H-pyran-4-yl)methyl)-3-(5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl)benzimidic acid

SMILES FC(F)(F)C1=NC(C2=CC(/C(O)=N/CC3(C4=NC(C5=CC=CC=C5)=CS4)CCOCC3)=CC=C2)=NO1

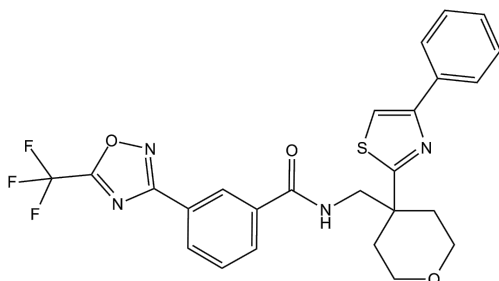
Formula $C_{25}H_{21}F_3N_4O_3S$ M.Wt 514.52

Solubility $\geq 23\text{mg/mL}$ in DMSO Storage Store at -20°C

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]:

Cell lines

THP-1 cells

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

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Preparation Method	THP-1 cells were cultivated in RPMI 1640 medium supplemented with 10% fetal bovine serum, 120IU/ml penicillin and 120µg/ml streptomycin at 37°C in an incubator with 5% CO ₂ . THP-1 cells were plated in 96-well plates at 5000 cells/well for 24h, and were treated with different concentrations of TMP269 (0, 0.1, 1, 10, and 100µM) for 72h. Cell proliferation was measured.
Reaction Conditions	0, 0.1, 1, 10, and 100µM; 72h
Applications	TMP269 treatment reduced the cell proliferation of THP-1 cells in a dose-dependent manner.
Animal experiment [2]:	
Animal models	Male C57/BL mice
Preparation Method	Male C57/BL mice (8 weeks old; 20-25g) were housed in a specific pathogen-free (SPF) barrier environment and were continuously provided with sterilized food, water, and bedding. To establish folic acid-induced acute kidney injury (AKI), a single dose of folic acid (dissolved in 0.3M NaHCO ₃) at 200mg/kg was intraperitoneally administered. Control mice were injected with an equal volume of 0.3M NaHCO ₃ . TMP269 at 50mg/kg/day was intraperitoneally administered immediately after folic acid injection for 2 days. At the end of experiments, mice were sacrificed by injecting an overdose of phenobarbital (100mg/kg) and kidneys were collected for analysis.
Dosage form	50mg/kg/day; 2 days; i.p.

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Applications	TMP269 treatment attenuated renal tubule injury and inhibited renal tubular cell apoptosis in murine models of folic acid-induced AKI.
References:[1] Asfaha Y, Bollmann L M, Skerhut A J, et al. 5-(Trifluoromethyl)-1, 2, 4-oxadiazole (TFMO)-based highly selective class IIa HDAC inhibitors exhibit synergistic anticancer activity in combination with bortezomib[J]. European Journal of Medicinal Chemistry, 2024, 263: 115907.[2] Li J, Yu C, Shen F, et al. Class IIa histone deacetylase inhibition ameliorates acute kidney injury by suppressing renal tubular cell apoptosis and enhancing autophagy and proliferation[J]. Frontiers in Pharmacology, 2022, 13: 946192.	

Background

TMP269 is a potent and selective inhibitor of Histone deacetylase (HDAC) with IC₅₀ values of 157nM, 97nM, 43nM, 23nM for HDAC 4, 5, 7, 9, respectively^[1]. TMP269 upregulates the expression of the neurotrophic factor BMP2 and the BMP-Smad transcriptional signaling pathway, thereby preventing neuronal degeneration and improving neurological function^[2]. TMP269 suppresses Lumpy skin disease virus (LSDV) replication by regulating the host's lysophosphatidic acid metabolism and blocking the activation of the MEK/ERK signaling pathway^[3]. TMP269 has been widely used in preclinical models to improve rehabilitation after ischemic stroke^[4].

In vitro, TMP269 treatment for 72 hours significantly induced cell death in THP-1 cells, with an IC₅₀ value of 13μM, accompanied by activation of Caspase 3/7^[5]. Treatment with 12.5μM TMP269 for 48 hours inhibited the growth of MOLM-13 cells, downregulated the expression of ribosomal proteins, and promoted cell apoptosis^[6]. Incubation with 50μM TMP269 for 48 hours increased the expression of FOXO3a and induced G1/S phase arrest in AsPC-1 cells^[7].

In vivo, TMP269 treatment via intraperitoneal injection at a dose of 23mg/kg/day for 10 days improved the depressive-like behaviors, alleviated the stress-induced changes in hippocampal synaptic plasticity, and increased the expression of hippocampal synaptic proteins in learned helplessness mice^[8]. Intraperitoneal injection of TMP269 (50mg/kg/day) for 2 days improved the renal function of the kidney injury mouse model and alleviated the pathological changes in the kidneys^[9].

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References:

- [1] Lobera M, Madauss K P, Pohlhaus D T, et al. Selective class IIa histone deacetylase inhibition via a nonchelating zinc-binding group[J]. Nature chemical biology, 2013, 9(5): 319-325.
- [2] O'Mahony A G, Mazzocchi M, Morris A, et al. The class-IIa HDAC inhibitor TMP269 promotes BMP-Smad signalling and is neuroprotective in in vitro and in vivo 6-hydroxydopamine models of Parkinson's disease[J]. Neuropharmacology, 2025, 268: 110319.
- [3] Cheng P, Wang X, Wang S, et al. Class IIa histone deacetylase (HDAC) inhibitor TMP269 suppresses lumpy skin disease virus replication by regulating host lysophosphatidic acid metabolism[J]. Journal of Virology, 2025, 99(2): e01827-24.
- [4] Jiang Q, Ding Y, Li F, et al. Inhibition of class IIa HDACs reduces neuroinflammation via NEU1-LAMP1 regulation and promotes M2 macrophage polarization in ischemic stroke[J]. Brain Research, 2025, 1864: 149806.
- [5] Asfaha Y, Bollmann L M, Skerhut A J, et al. 5-(Trifluoromethyl)-1, 2, 4-oxadiazole (TFMO)-based highly selective class IIa HDAC inhibitors exhibit synergistic anticancer activity in combination with bortezomib[J]. European Journal of Medicinal Chemistry, 2024, 263: 115907.
- [6] Urwanisch L, Unger M S, Sieberer H, et al. The class IIA histone deacetylase (HDAC) inhibitor TMP269 downregulates ribosomal proteins and has anti-proliferative and pro-apoptotic effects on AML cells[J]. Cancers, 2023, 15(4): 1039.
- [7] Usami M, Kikuchi S, Takada K, et al. FOXO3a activation by HDAC class IIa inhibition induces cell cycle arrest in pancreatic cancer cells[J]. Pancreas, 2020, 49(1): 135-142.
- [8] Meng Y, Xiao L, Liu R, et al. Antidepressant effect and mechanism of TMP269 on stress-induced depressive-like behavior in mice[J]. Biochemical Pharmacology, 2024, 225: 116320.
- [9] Li J, Yu C, Shen F, et al. Class IIa histone deacetylase inhibition ameliorates acute kidney injury by suppressing renal tubular cell apoptosis and enhancing autophagy and proliferation[J]. Frontiers in Pharmacology, 2022, 13: 946192.

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