

Product Data Sheet

Product Name: Tubercidin

Cat. No.: GC16879

Chemical Properties

Cas. No. 69-33-0

Chemical Name (2R,3R,4S,5R)-2-(4-amino-7H-pyrrolo[2,3-d]pyrimidin-7-yl)-5-(hydroxymethyl)tetrahydrofuran-3,4-diol

SMILES NC1=NC=NC2=C1C=CN2[C@H]3[C@H](O)[C@H](O)[C@@H](CO)O3

Formula $C_{11}H_{14}N_4O_4$ M.Wt 266.25

Solubility DMSO : ≥ 30 mg/mL (112.68 mM) 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.

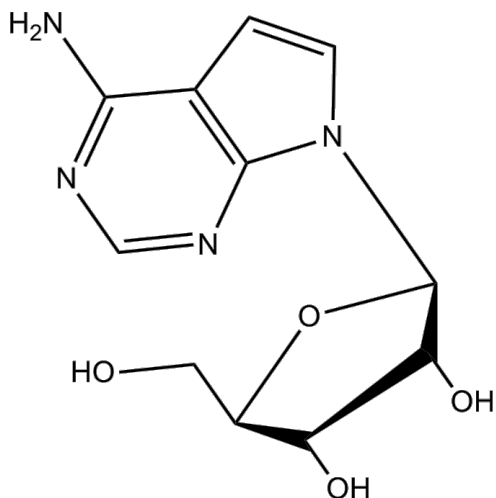
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Protocol

Cell experiment [1]:

Cell lines

A549 cells

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Preparation Method	A549 cells were cultured in DMEM medium supplemented with 10% fetal bovine serum (FBS), 2mM glutamine, and 1% penicillin-streptomycin at 37°C in 5% CO ₂ /atmosphere. A549 cells were seeded onto 96-well microplates (5×10 ⁴ cells/well) and cultured overnight. The cells were treated with different concentrations of Tubercidin (0, 0.0003, 0.001, 0.01, 0.1, 1, and 10μM). After 48h of incubation, cell viability was assessed.
Reaction Conditions	0, 0.0003, 0.001, 0.01, 0.1, 1, and 10μM; 48h
Applications	Tubercidin treatment reduced the cell viability of A549 cells in a dose-dependent manner.
Animal experiment [2]:	
Animal models	Nude mice
Preparation Method	Nude mice (6-weeks old) were housed under controlled temperature (21-23°C), humidity (30-35%) and light cycle (7:00 AM to 7:00 PM) and maintained on a standard rodent diet. 6×10 ⁵ DMS 114 cells in 50μl PBS plus 50μl growth factor-depleted matrigel were injected subcutaneously into the flank of nude mice. When tumors reached 8-10mm in diameter (about 1.5 weeks), the mice were randomly separated into different groups (4 mice per group) and received in situ subcutaneous injection with either vehicle, Tubercidin (5mg/kg), 3 times a week. The mice were observed and weighed every 2-3 days for the size of palpable tumors for an additional 3 weeks. At the end of the experiment, the tumors were excised and compared.
Dosage form	5mg/kg; 3 times a week; 3 weeks; s.c.

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Applications	Tubercidin treatment significantly inhibited tumor growth in mice with DMS 114 xenografts.
References: [1] Brel V K, Artyushin O I, Chuprov-Netochin R N, et al. Synthesis and biological evaluation of indolylglyoxylamide bisphosphonates, antimitotic microtubule-targeting derivatives of indibulin with improved aqueous solubility[J]. Bioorganic & Medicinal Chemistry Letters, 2020, 30(23): 127635. [2] Chen J, Barrett L, Lin Z, et al. Identification of natural compounds tubercidin and lycorine HCl against small-cell lung cancer and BCAT1 as a therapeutic target[J]. Journal of cellular and molecular medicine, 2022, 26(9): 2557-2565.	

Background

Tubercidin is an adenosine analog with potent antimycobacterial and antitumor bioactivities^[1]. Tubercidin inhibits the replication of porcine reproductive and respiratory syndrome virus (PRRSV) through the RIG-I/NF-κB pathway and interferes with the expression of the viral non-structural protein 2 and viral dsRNA synthesis^[2]. Tubercidin has been widely used to suppress *Phytophthora capsica* and control phytophthora blight in pepper plants^[3].

In vitro, Tubercidin treatment for 48 hours significantly inhibited the viability of A549, HST116, and A375 cells, with IC₅₀ values of 0.044μM, 0.082μM, and 0.043μM, respectively^[4]. Treatment with 0.014μM Tubercidin for 48h dramatically inhibited the proliferation of Jurkat cells^[5]. Under serum starvation or hypoxia stress, treatment with 5μg/ml Tubercidin for 6 hours significantly promoted apoptosis of HL-1 cells and exacerbated the destruction of nuclear speckles^[6].

In vivo, Tubercidin treatment via subcutaneous injection at a dose of 5mg/kg, three times per week for 3 weeks, significantly inhibited the growth of DMS 114 xenograft tumors in mice^[7].

References:

[1] Liu Y, Gong R, Liu X, et al. Discovery and characterization of the tubercidin biosynthetic pathway

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from *Streptomyces tubercidicus* NBRC 13090[J]. *Microbial cell factories*, 2018, 17(1): 131.

[2] Xu Y, Zhu Z, Zhang M, et al. Tubercidin inhibits PRRSV replication via RIG-I/NF- κ B pathways and interrupting viral nsp2 synthesis[J]. *Microbiology Spectrum*, 2024, 12(3): e03479-23.

[3] Hwang B K, Kim B S. In-vivo efficacy and in-vitro activity of tubercidin, an antibiotic nucleoside, for control of *Phytophthora capsici* blight in *Capsicum annuum*[J]. *Pesticide science*, 1995, 44(3): 255-260.

[4] Brel V K, Artyushin O I, Chuprov-Netochin R N, et al. Synthesis and biological evaluation of indolylglyoxylamide bisphosphonates, antimitotic microtubule-targeting derivatives of indibulin with improved aqueous solubility[J]. *Bioorganic & Medicinal Chemistry Letters*, 2020, 30(23): 127635.

[5] Olsen D B, Eldrup A B, Bartholomew L, et al. A 7-deaza-adenosine analog is a potent and selective inhibitor of hepatitis C virus replication with excellent pharmacokinetic properties[J]. *Antimicrobial agents and chemotherapy*, 2004, 48(10): 3944-3953.

[6] Shen G, Cheng Q, Liang L, et al. Tubercidin enhances apoptosis in serum-starved and hypoxic mouse cardiomyocytes by inducing nuclear speckle condensation[J]. *BMC Cardiovascular Disorders*, 2025, 25(1): 211.

[7] Chen J, Barrett L, Lin Z, et al. Identification of natural compounds tubercidin and lycorine HCl against small-cell lung cancer and BCAT1 as a therapeutic target[J]. *Journal of cellular and molecular medicine*, 2022, 26(9): 2557-2565.

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