Product Data Sheet

Product Name: 5-Fluorouridine
Cat. No.: GC38141

Chemical Properties

Cas. No.	316-46-1		
SMILES	OC[C@@H]1[C@H]([C@H]([C@H](N2C(NC(C(F)=C2)=O)=O)O1)O)O		
Formula	$C_9H_{11}FN_2O_6$	M.Wt	262.19
Solubility	Water: 100 mg/mL (381.40 mM); DMSO: ≥ 100 mg/mL (381.40 mM)	Storage	Store at 4°C, stored under nitrogen
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ 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	5-Fluorouridine		

Protocol

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1. □□□

□1□□□□□□□□□□5-Fluorouridine□□□□□□□□□□

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2. 5-Fluorouridine□□□[1](□□□□□□□)

□1□□□□□□□5-Fluorouridine□□□10μL/g□0.4M 5-Fluorouridine□□□0.9%□□

□2□□45min□□□□□□□□□□0.5% Triton X□HPEM□□□2× HPEM□60mM Hepes□130mM Pipes□20mM EGTA□4mM $MgCl_2·6H_2O$□□3.7%□□□□□□10min□

□3□□□□□□□□□□□□1h□□HPEM□□□

□4□□□□□□□□□□□

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□5□□□□□□□□□BrdU□37°C□□□1h□

□6□□□□0.1% Tween20□PBS□□□□□□□□□□□□FITC□□□□□□□□45min□

□7□PBS□□□□□□□□□□□□□□□□□□□5-Fluorouridine□□RNA□□□□

3. 5-Fluorouridine□□□□[2](□□□□□□□□□)

□1□□2mM 5-Fluorouridine□□□□□□20min□

□2□□2%□□□□□□10min□□0.5% Triton X-100□□□□10min□□□□□□0.1% Tween20□PBS□□□□□□1h□

□3□□BrdU□□□4°C□□□□□□

□4□PBS□□□□□□□□□FITC□□□□□□□□1h□

□5□ PBS□□□□□DAPI□□□□□□□□□□□□□□□□□5-Fluorouridine□□RNA□□□□

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References:

[1]Puente-Bedia A, Berciano M T, Tapia O, et al. Nuclear reorganization in hippocampal granule cell neurons from a mouse model of Down syndrome: changes in chromatin configuration, nucleoli and Cajal bodies[J]. International Journal of Molecular Sciences, 2021, 22(3): 1259.

[2]Awasthi S, Verma M, Mahesh A, et al. DDX49 is an RNA helicase that affects translation by regulating mRNA export and the levels of pre-ribosomal RNA[J]. Nucleic Acids Research, 2018, 46(12): 6304-6317.

Background

5-Fluorouridine is a ribonucleotide metabolite of 5-Fluorouracil with anticancer activity[1]. 5-Fluorouridine can mark active transcription sites of cells in vivo and in vitro for immunodetection of nascent RNA[2, 3]. 5-Fluorouridine is an organofluorine compound belonging to pyrimidine nucleosides and their analogs. It is uridine with a fluorine substituent at the 5th position of the uracil ring and has a mutagenic effect[4].

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In vitro, 5-Fluorouridine (10μM) treatment of HCT-116 cells for 24h increased the percentage of apoptotic cells, affected the expression of 1200 different genes during apoptosis, and increased the expression of macrophage inhibitory cytokine 1 (MIC-1) by up to 100-fold[5]. 5-Fluorouridine (167μM) treatment of gastric cancer cells (MKN45 and MKN28 cells) for 24-96h inhibited cell proliferation in a time-dependent manner[6].

In vivo, 5-Fluorouridine (567-1500mg/kg/day) was intraperitoneally injected into male CBA/J mice for 20 days, which induced gastrointestinal toxicity in mice[7].

References:
[1]Ghoshal K, Jacob S T. An alternative molecular mechanism of action of 5-fluorouracil, a potent anticancer drug[J]. Biochemical pharmacology, 1997, 53(11): 1569-1575.
[2]Puente-Bedia A, Berciano M T, Tapia O, et al. Nuclear reorganization in hippocampal granule cell neurons from a mouse model of Down syndrome: changes in chromatin configuration, nucleoli and Cajal bodies[J]. International Journal of Molecular Sciences, 2021, 22(3): 1259.
[3]Awasthi S, Verma M, Mahesh A, et al. DDX49 is an RNA helicase that affects translation by regulating mRNA export and the levels of pre-ribosomal RNA[J]. Nucleic Acids Research, 2018, 46(12): 6304-6317.
[4]Gmeiner W H. Chemistry of fluorinated pyrimidines in the era of personalized medicine[J]. Molecules, 2020, 25(15): 3438.
[5]Schmittgen T D, Gissel K A, Zakrajsek B A, et al. Diverse gene expression pattern during 5-fluorouridine-induced apoptosis[J]. International journal of oncology, 2005, 27(2): 297-306.
[6]Wu F, Li R T, Yang M, et al. Gelatinases-stimuli nanoparticles encapsulating 5-fluorouridine and 5-aza-2′-deoxycytidine enhance the sensitivity of gastric cancer cells to chemical therapeutics[J]. Cancer Letters, 2015, 363(1): 7-16.
[7]Houghton J A, Houghton P J, Wooten R S. Mechanism of induction of gastrointestinal toxicity in the mouse by 5-fluorouracil, 5-fluorouridine, and 5-fluoro-2′-deoxyuridine[J]. Cancer research, 1979, 39(7_Part_1): 2406-2413.

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