Specification

5-Fluorouracil *BioChemica*

A7686

Synonym	2,4-Dihydroxy-5-fluoropyrimidine, 5-Fluoro-1H-pyrimidine-2,4-dione, 5-Fluoro-2,4(1*H*,3*H*)-pyrimidinedione, 5-FU
Melting point	282 - 286°C (dec.)
Formula	$C_4H_3FN_2O_2$
M	130.08 g/mol
CAS-No.:	51-21-8
HS-No.:	29335995
EC-No.:	200-085-6
Storage:	RT protected from light
R:	22-40
S:	22-24/25-36/37
	harmful
Class / PG:	6.1/III
UN-No.	UN2811
WGK:	3
Specification	
Assay (HPLC)	min. 99 %

Literature

(1) van Zant, G. (1984) *J. Exp. Med.* **159**, 679-690 Studies of Hematopoietic Stem Cells Spared by 5-Fluorouracil.
(2) Szilvassy, S.J. & Cory, S. (1994) *Blood* **84**, 74-83 Efficient Retroviral Gene Transfer to Purified Long-Term Repopulating Hematopoietic Stem Cells.
(3) Yamane, N. *et al.* (1999) *Cancer* **85**, 309-317 S-Phase Accumulation Precedes Apoptosis Induced by Preoperative Treatment with 5-Fluorouracil in Human Colorectal Carcinoma Cells.
(4) Yoshikawa, R. *et al.* (2001) *Cancer Res.* **61**, 1029-1037 Dual Antitumor Effects of 5-Fluorouracil on the Cell Cycle in Colorectal Carcinoma Cells.
(5) Fang, F. *et al.* (2004) *Mol. Cell. Biol.* **24**, 10766-10776 5-Fluorouracil Enhances Exosome-Dependent Accumulation of Polyadenylated rRNAs.
(6) Noordhuis, P. *et al.* (2004) *Ann. Oncol.* **15**, 1025-1032 5-Fluorouracil incorporation into RNA and DNA in relation to thymidylate synthase inhibition of human colorectal cancers.
(7) Zhao, X. & Yu, Y.-T. (2007) *Nucleic Acids Res.* **35**, 550-558 Incorporation of 5-fluorouracil into U2 snRNA blocks pseudouridylation and pre-mRNA splicing *in vivo*.

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Comment

5-Fluorouracil (5-FU) is a pyrimidine analog, frequently administered in cancer therapy. Within a cell, it is metabolized to cytotoxic substances and called an antimetabolite. It is incorporated into DNA and RNA (6,7). As a consequence, the cell cycle is interrupted at the S phase and apoptosis is induced, since no more DNA is synthesized (3,4). 5-FU inhibits the thymidylate synthase (6), an important enzyme in thymidine synthesis (methylation of deoxyuracil monophosphate to form deoxythymine monophosphate). The RNA-processing exosome is another target of 5-FU, leading to an accumulation of polyadenylated rRNA (5). For the isolation and enrichment of hematopietic stem cells from e.g. mice, 5-FU is injected. Dividing cells will be killed, while progenitor / stem cells will survive (1,2). **Solubility**: 5-FU is soluble in water (approx. 12 g/L) and ethanol (approx. 2,9 g/L). An aqueous solution (10 g/L) has a pH value of 4.3 - 5.3.