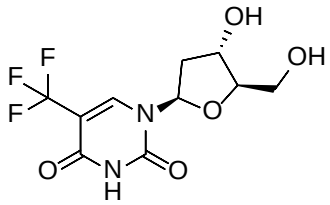
Product data sheet

MedKoo Cat#: 206038 Name: Trifluridine CAS#: 70-00-8 Chemical Formula: $C_{10}H_{11}F_3N_2O_5$ Exact Mass: 296.0620 Molecular Weight: 296.20	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
Trifluridine (also called trifluorothymidine or TFT) is an anti-herpesvirus antiviral drug, used primarily on the eye. It was sold under the trade name, Viroptic, by Glaxo Wellcome, now merged into GlaxoSmithKline. The brand is now owned by Monarch Pharmaceuticals, which is wholly owned by King Pharmaceuticals. It is a nucleoside analogue, a modified form of deoxyuridine, similar enough to be incorporated into viral DNA replication, but the -CF3 group added to the uracil component blocks base pairing. It is a component of the experimental anti-cancer drug TAS-102.

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	56.33	190.18
Water	59.0	199.19
Ethanol	59.0	199.19
DMF	16.0	54.02
PBS (pH 7.2)	5.0	16.88

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	3.38 mL	16.88 mL	33.76 mL
5 mM	0.68 mL	3.38 mL	6.75 mL
10 mM	0.34 mL	1.69 mL	3.38 mL
50 mM	0.07 mL	0.34 mL	0.68 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study
In vitro study

1. Limagne E, Thibaudin M, Nuttin L, Spill A, Derangère V, Fumet JD, Amellal N, Peranzoni E, Cattan V, Ghiringhelli F. Trifluridine/Tipiracil plus Oxaliplatin Improves PD-1 Blockade in Colorectal Cancer by Inducing Immunogenic Cell Death and Depleting Macrophages. Cancer Immunol Res. 2019 Dec;7(12):1958-1969. doi: 10.1158/2326-6066.CIR-19-0228. Epub 2019 Oct 14. PMID: 31611243.

In vivo study

1. Limagne E, Thibaudin M, Nuttin L, Spill A, Derangère V, Fumet JD, Amellal N, Peranzoni E, Cattan V, Ghiringhelli F. Trifluridine/Tipiracil plus Oxaliplatin Improves PD-1 Blockade in Colorectal Cancer by Inducing Immunogenic Cell Death and Depleting Macrophages. Cancer Immunol Res. 2019 Dec;7(12):1958-1969. doi: 10.1158/2326-6066.CIR-19-0228. Epub 2019 Oct 14. PMID: 31611243.

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7. Bioactivity

Biological target: Trifluridine is an irreversible thymidylate synthase inhibitor.

In vitro activity

The cytotoxic effect of trifluridine/tipiracil (FTD/TPI) or oxaliplatin alone or in combination was tested in vitro on murine colon carcinoma CT26 cells (MSS and Kras-mutant cell line). Both viability (crystal violet staining) and cell death (Annexin-V/DAPI labeling) assays showed a synergistic effect for the FTD/TPI and oxaliplatin combination after 24 hours of treatment. Treatment with FTD/TPI alone induced expression of all immunogenic cell death (ICD) markers in CT26 cells at 5 or 50 μmol/L, except for Ifnα1 and Cxcl9 mRNA expression (Fig. 1). In contrast, oxaliplatin alone induced ICD only at 50 μmol/L (Fig. 1). The combination of the drugs was synergistic and significantly enhanced ICD induction as compared with control or monotherapies (Fig. 1).

Reference: Cancer Immunol Res. 2019 Dec;7(12):1958-1969. https://cancerimmunolres.aacrjournals.org/content/7/12/1958.long

In vivo activity

The in vivo capacity of the drugs to induce ICD and thus act on tumor growth by this mechanism was assessed by treating CT26 tumor–bearing mice with FTD/TPI or oxaliplatin alone or the combination of the two drugs. Only the combination of FTD/TPI and oxaliplatin was able to induce HMGB1 cytoplasmic relocalization, similar to that observed after treatment with doxorubicin, used as a positive control (Fig. 3A and B). Similarly, only the FTD/TPI plus oxaliplatin combination induced the phosphorylation of the reticulum stress marker EIF2α in vivo (Fig. 3C and D). A comparison of tumor growth in immunodeficient and immunocompetent mice showed that the antitumor effect only occurred in immunocompetent mice with higher activity of the combination therapy. Despite the absence of HMGB1 cytoplasmic relocalization and EIF2α activation, FTD/TPI or oxaliplatin monotherapy had an antitumor effect in immunocompetent mice. These observations suggest an ICD-independent immune effect, such as depletion of an immunosuppressive population by FTD/TPI or oxaliplatin (Fig. 3E and F).

Reference: Cancer Immunol Res. 2019 Dec;7(12):1958-1969. https://cancerimmunolres.aacrjournals.org/content/7/12/1958.long