Product Data Sheet

Product Name: T7 Peptide TFA
Cat. No.: GC79141

Chemical Properties

Cas. No.			
Formula	$C_{137}H_{189}N_{33}O_{39}S_3.xC_2HF_3O_2$	M.Wt	3018.36
Solubility	DMSO: 100 mg/mL (Need ultrasonic)	Storage	Sealed storage, away from moisture
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			

Thr-Met-Pro-Phe-Leu-Phe-Cys-Asn-Val-Asn-Asp-Val-Cys-Asn-Phe-Ala-Ser-Arg-Asn-Asp-Tyr-Ser-Tyr-Trp-Leu (Disulfide bridge: Cys7-Cys13) (TFA salt)

Background

T7 Peptide TFA is a protein synthesis inhibitor and anti-angiogenic agent, with a K d of 10 nM for human transferrin receptor. T7 Peptide TFA inhibits the phosphorylation of focal adhesion kinase, the activation of phosphatidylinositol 3-kinase and Akt, the kinase activity of mTOR, as well as the phosphorylation of 4E-BP1 in endothelial cells. T7 Peptide TFA induces G0/G1 cell cycle arrest, apoptosis and protective autophagy in hepatocellular carcinoma cells, and suppresses tumor growth in mouse models. T7 Peptide TFA is applicable to research related to cancer, glioblastoma,

hepatocellular carcinoma and glioma [1] [2] [3] [4].

In Vivo, T7 peptide TFA (2.5-5 mg/kg; i.p.; every other day) dose-dependently suppresses Hep3B xenograft tumor growth in nude mice, achieving a ~27% tumor cell apoptotic rate at the 5 mg/kg dose via pathways involving reduced Akt/mTOR phosphorylation, increased Bax expression, and decreased Bcl-2 expression[3]. T7 peptide TFA (4% molar ratio; 0.5 mg/kg; intravenous tail vein injection) conjugation to LDL particles enhances accumulation in intracranial glioma tissue in female ICR mice bearing C6 glioma[4].

In Vitro, T7 peptide TFA (4.5 μM; 21 h) specifically inhibits cap-dependent translation in C-PAE cells without affecting cap-independent translation[1]. T7 peptide (4.5 μM) inhibits total protein synthesis in MLEC-wt cells[1]. T7 peptide TFA (4.5 μM) does not inhibit total protein synthesis in MLEC-β3 null cells, indicating dependence on αVβ3 integrin for this activity[1]. T7 peptide TFA (4.5 μM) does not inhibit total protein synthesis in MEF-wt cells, indicating αVβ3 integrin expression is essential but not sufficient for this activity[1]. T7 peptide TFA (4.5 μM) does not inhibit total protein synthesis in non-endothelial cell lines, demonstrating endothelial cell specificity for this activity[1]. The T7 peptide TFA (0.25-2 μM; 6-24 h) significantly reduces viability of Huh-7 and Hep3B human HCC cells in a concentration- and time-dependent manner, but has minimal effect on normal human liver L-02 cells[3]. The T7 peptide TFA (0.25-1 μM; 24 h) induces significant apoptosis (both early and late) in Huh-7 and Hep3B human HCC cells[3]. The T7 peptide TFA (0.25-1 μM; 24 h) induces G0/G1 cell cycle arrest in Huh-7 and Hep3B human HCC cells[3]. The T7 peptide TFA (0.5-1 μM; 24 h) upregulates pro-apoptotic Bax, Fas, and FasL and downregulates anti-apoptotic Bcl-2 in a concentration-dependent manner in Huh-7 and Hep3B human HCC cells[3]. The T7 peptide TFA (0.5-1 μM; 24 h) induces autophagy in Huh-7 and Hep3B human HCC cells by upregulating Beclin-1, Atg5, and LC3-II in a concentration-dependent manner[3]. The T7 peptide TFA (1 μM; 24 h) has enhanced apoptotic effect in Huh-7 and Hep3B human HCC cells when autophagy is inhibited[3]. The T7 peptide TFA (0.5-1 μM; 24 h) induces autophagy in Huh-7 and Hep3B human HCC cells via inhibition of the Akt/mTOR signaling pathway, and co-treatment with Akt/mTOR inhibitors enhances this autophagic response[3]. T7 peptide (5 μM; 2 h at 37 °C) modified LDL shows enhanced cellular uptake in bEnd.3 and C6 cells via synergistic mediation by TfR and LDLR[4]. T7 peptide TFA (0.5-

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6% molar ratio; 4 h at 37 °C) modification enhances BBB penetration and subsequent C6 glioma cell uptake, with optimal efficacy observed at a 4% molar ratio of T7 to LDL[4].

References:

[1]. Maeshima Y, et al. Tumstatin, an endothelial cell-specific inhibitor of protein synthesis. Science. 2002 Jan 4;295(5552):140-3.
[2]. Liang M, et al. Enhanced blood-brain barrier penetration and glioma therapy mediated by T7 peptide-modified low-density lipoprotein particles. Drug Deliv. 2018;25(1):1652-1663.
[3]. Liu F, et al. T7 peptide cytotoxicity in human hepatocellular carcinoma cells is mediated by suppression of autophagy. Int J Mol Med. 2019;44(2):523-534.
[4]. Kim G, et al. Systemic delivery of microRNA-21 antisense oligonucleotides to the brain using T7-peptide decorated exosomes. J Control Release. 2020;317:273-281.

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