MMAF hydrochloride

Cat. No.: HY-15579A

CAS No.: 1415246-68-2

Molecular Formula: $C_{39}H_{66}ClN_5O_8$

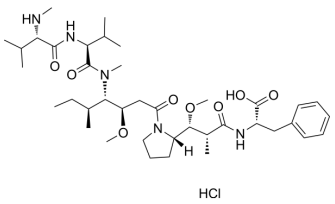
Molecular Weight: 768.42

Target: Microtubule/Tubulin; ADC Cytotoxin

Pathway: Cell Cycle/DNA Damage; Cytoskeleton; Antibody-drug Conjugate/ADC Related

Storage: 4°C, sealed storage, away from moisture

* The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro

DMSO : 25 mg/mL (32.53 mM; Need ultrasonic)

H_2O : < 0.1 mg/mL (ultrasonic;warming;heat to 60°C) (insoluble)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.3014 mL	6.5069 mL	13.0137 mL
5 mM	0.2603 mL	1.3014 mL	2.6027 mL
10 mM	0.1301 mL	0.6507 mL	1.3014 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (3.25 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (3.25 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (3.25 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

MMAF (Monomethylauristatin F) hydrochloride is a potent tubulin polymerization inhibitor and is used as a antitumor agent. MMAF hydrochloride is widely used as a cytotoxic component of antibody-drug conjugates (ADCs) such as Vorsetuzumab mafodotin and SGN-CD19A[1][2][3].

IC_{50} & Target

Auristatin

In Vitro

MMAF inhibits anaplastic large cell lymphoma Karpas 299, breast carcinoma H3396, renal cell carcinoma 786-O and Caki-1 cells with IC_{50}s of 119, 105, 257 and 200 nM in vitro cytotoxicity assay[4].

	MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	The maximum tolerated dose in mice of MMAF (>16 mg/kg) is much higher than MMAE (1 mg/kg). cAC10-L1-$MMAF_4$ has an MTD of 50 mg/kg in mice and 15 mg/kg in rats. The corresponding cAC10-L4-$MMAF_4$ ADC was much less toxic, having MTDs in mice and rats of >150 mg/ kg and 90 mg/kg in rats, respectively[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]	Cells are treated with serial dilutions of test molecules and incubated 4-6 days depending on cell line. Assessment of cellular growth and data reduction to generate IC50 values is done using Alamar Blue dye reduction assay[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [1]	Mice: When subcutaneous Karpas 299 tumor size reaches 300 mm^3, three animals per group receives one injection of 10 mg antibody component/kg body weight of either cAC10-L1-$MMAF_4$ or cBR96-L1-$MMAF_4$ intravenously. Tumors are then removed and placed in optimal cutting temperature compound, and 5 μm-thin frozen tissue sections are stained using immunohistochemistry evaluation[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- J Control Release. 2018 May 10;277:48-56.
- Mol Ther Nucleic Acids. 2018 Mar 2;10:227-236.
- Mol Cancer Ther. 2023 Jan 31;MCT-22-0440.
- Target Oncol. 2019 Oct;14(5):577-590.
- Oncol Rep. 2020 Dec 9.

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REFERENCES

[1]. Doronina SO, et al. Enhanced activity of monomethylauristatin F through monoclonal antibody delivery: effects of linker technology on efficacy and toxicity. Bioconjug Chem. 2006 Jan-Feb;17(1):114-24.

[2]. Lee JW, et al. EphA2 targeted chemotherapy using an antibody drug conjugate in endometrial carcinoma. Clin Cancer Res. 2010 May 1;16(9):2562-70.

[3]. Lee JJ, et al. Enzymatic prenylation and oxime ligation for the synthesis of stable and homogeneous protein-drug conjugates for targeted therapy. Angew Chem Int Ed Engl. 2015 Oct 5;54(41):12020-4.

[4]. Kim EG, et al. Strategies and Advancement in Antibody-Drug Conjugate Optimization for Targeted CancerTherapeutics.

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