Carmustine

Cat. No.: HY-13585

CAS No.: 154-93-8

Molecular Formula: $C_5H_9Cl_2N_3O_2$

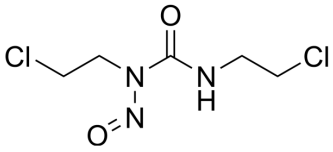
Molecular Weight: 214.05

Target: DNA Alkylator/Crosslinker

Pathway: Cell Cycle/DNA Damage

Storage: -20°C, protect from light

* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

H_2O : 100 mg/mL (467.18 mM; Need ultrasonic)

DMSO : ≥ 35 mg/mL (163.51 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	4.6718 mL	23.3590 mL	46.7181 mL
	5 mM	0.9344 mL	4.6718 mL	9.3436 mL
	10 mM	0.4672 mL	2.3359 mL	4.6718 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (467.18 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (9.72 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (9.72 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (9.72 mM); Clear solution

BIOLOGICAL ACTIVITY

Description	Carmustine is an antitumor chemotherapeutic agent, which works by akylating DNA and RNA.
IC_{50} & Target	DNA Alkylator[1]
In Vitro	Carmustine is an antitumor chemotherapeutic agent. Carmustine (8, 80, and 800 μM) decreases N-acetyltransferase (NAT)

	activities for 2-aminofluorene (AF) and p-aminobenzoic acid (PABA) in rat glial tumor cytosol and intact cells. In rat glial tumor cells, the DNA-AF adduct increases, and carmustine decreases the formation of DNA-AF adduct[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Carmustine (BCNU; 25 mg/kg, i.p.) causes higher levels of the rhe ratio of liver weight to body weight and plasma conjugated bilirubin, and lower biliary flow, oxidised glutation levels (GSSG) and reduced glutation (GSH)/GSSG values compared with control rats[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [1]	The determination of Acetyl-CoAdependent N-acetylation of 2-aminofluorene (AF) and p-aminobenzoic acid (PABA) are performed. Incubation mixtures in the assay system consists of a total volume of 90 µL: glial tumor cells cytosols, diluted as required, in 50 µL of lysis buffer (20 mM Tris/HCl, pH 7.5, 1 mM DTT and 1 mM EDTA), 20 µL of an Acetyl-CoA recycling mixture of 50 mM Tris-HCl (pH7.5), 0.2 mM EDTA, 2 mM DTT, 15 mM acetylcamitine, 2U/mL carnitine acetyltransferase, and AF or PABA at specific concentrations. The reactions are started by addition of 20 µL of Acetyl-CoA. The control reactions have 20 µL distilled water in place of Acetyl-CoA. For the single point activity measurements, the final concentration of AF or PABA is 0.1 mM and AcCoA is 0.5 mM. The reaction mixtures with or without specific concentrations of Carmustine and lomustine are incubated at 37°C for 10 min and stopped with 50 µL of 20% trichloroacetic acid for the PABA reactions, and 100 µL of acetonitrile for the AF reactions. All of the reactions (experiments and controls) are run in triplicate[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Rats[2] Individual rats are weighted prior to enter the study; their weights are recorded, and they are randomLy assigned to four groups. Group I (saline group); This group consists of 12 rats. These rats are injected with 2 mL/kg of saline intraperitoneally (IP) 48 h before the study, being included by the study 48 h later. Group II (corn oil group) consists of 15 rats. These rats are injected with 2 mL/kg of corn oil (vehicle) IP 48 h before the study. Group III (Carmustine group) consists of 16 rats. These rats are injected with 1 mL per day of saline IP, administered at the same hour of the day as a single-dose for 3 days. Twelve hours after the first dose of saline, corn oil 2 mL/kg + Carmustine 25 mg/kg IP are injected, and the rats are included in the study 48 h after the administration of corn oil + Carmustine. Group IV (trimetazidine group) consists of 12 rats. These rats are injected with 2.5 mg/kg per day of trimetazidine (TMZ) IP, administered at the same hour of the day as a single-dose for 3 days. 12 h after the first dose of TMZ, corn oil 2 mL/kg + Carmustine 25 mg/kg IP are injected, and the rats are included in the study 48 h after the administration of corn oil + Carmustine[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Ann Rheum Dis. 2020 Aug;79(8):1111-1120.
- Biomaterials. 2022 May;284:121533.
- Acta Pharmacol Sin. 2021 Jan;42(1):108-114.
- J Drug Deliv Sci Technol. 9 September 2022, 103770.
- J Mol Med (Berl). 2019 Aug;97(8):1183-1193.

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REFERENCES

[1]. Hung CF. Effects of carmustine and lomustine on arylamine N-acetyltransferase activity and 2-aminofluorene-DNA adducts in rat glial tumor cells. Neurochem Res. 2000 Jun;25(6):845-51.

[2]. Demir A, et al. The effect of trimetazidine on intrahepatic cholestasis caused by carmustine in rats. Hepatol Res. 2001 May 1;20(1):133-143.

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