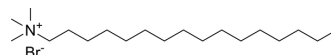


## Cetrimonium bromide

<b>Cat. No.:</b>	HY-B1260
<b>CAS No.:</b>	57-09-0
<b>Molecular Formula:</b>	C <sub>19</sub> H <sub>42</sub> BrN
<b>Molecular Weight:</b>	364.45
<b>Target:</b>	Biochemical Assay Reagents; MMP; Apoptosis; TGF-β Receptor
<b>Pathway:</b>	Others; Metabolic Enzyme/Protease; Apoptosis; TGF-beta/Smad
<b>Storage:</b>	4°C, sealed storage, away from moisture and light * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : 10 mg/mL (27.44 mM; Need ultrasonic)  
H<sub>2</sub>O : 4.55 mg/mL (12.48 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	2.7439 mL	13.7193 mL	27.4386 mL
	5 mM	0.5488 mL	2.7439 mL	5.4877 mL
	10 mM	0.2744 mL	1.3719 mL	2.7439 mL

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

#### In Vivo

- Add each solvent one by one: PBS  
Solubility: 50 mg/mL (137.19 mM); Clear solution; Need ultrasonic
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
Solubility: ≥ 1 mg/mL (2.74 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 1 mg/mL (2.74 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 1 mg/mL (2.74 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Cetrimonium bromide (CTAB), a quaternary ammonium, is an orally active cationic surfactant. Cetrimonium bromide has toxicity and anticancer effect. Cetrimonium bromide inhibits cell migration and invasion through modulating the canonical and non-canonical TGF-β signaling pathways. Cetrimonium bromide can be used for DNA extraction<sup>[1][2][3][4]</sup>.

#### IC<sub>50</sub> & Target

MMP-9

MMP-2

**In Vitro**

Cetrimonium bromide (1-5  $\mu\text{M}$ , 24 h) cannot affect growth of SK-HEP-1 cells<sup>[1]</sup>.

Cetrimonium bromide (5  $\mu\text{M}$ , 16-24 h) attenuates cellular migration and invasion of SK-HEP-1 cells<sup>[1]</sup>.

Cetrimonium bromide (5  $\mu\text{M}$ , 24 h) inhibits the protein expression of MMP-2 and MMP-9, increases the protein expression of TIMP-1 and TIMP-2 and restrain the protein expression of Rac1, cdc42 and RhoA in SK-HEP-1 cells<sup>[1]</sup>.

Cetrimonium bromide (5  $\mu\text{M}$ , 12-72 h) induces apoptosis in human Head and neck cancer (HNC) cells<sup>[2]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay<sup>[1]</sup>

Cell Line:	SK-HEP-1 cells
Concentration:	1 $\mu\text{M}$ , 2.5 $\mu\text{M}$ , 5 $\mu\text{M}$
Incubation Time:	24 h
Result:	Retained more than 90% cell viability at 24 hours.

Cell Cycle Analysis<sup>[2]</sup>

Cell Line:	HNC cells
Concentration:	5 $\mu\text{M}$
Incubation Time:	12 h, 24 h, 48 h, 72 h
Result:	Induced caspase activation. Observed the activation of the caspase cascade and increased in a time-dependent manner.

Western Blot Analysis<sup>[1]</sup>

Cell Line:	SK-HEP-1 cells
Concentration:	1 $\mu\text{M}$ , 2.5 $\mu\text{M}$ , 5 $\mu\text{M}$
Incubation Time:	24 h
Result:	Significantly down-regulates MMP-2 and MMP-9 expressions in SK-HEP-1 cells in a dose-dependent manner. Significantly increased the protein expression of TIMP-1 and TIMP-2. Negatively affects the protein levels of Rac1, cdc42 and RhoA in SK-HEP-1 cells.

**In Vivo**

Cetrimonium bromide (5 mg/kg, Intraperitoneal injection, once a day for five consecutive days) ablated tumor-forming capacity of FaDu cells and delayed growth of established tumors in FaDu cells tumor-bearing mice<sup>[2]</sup>.

Cetrimonium bromide (10-45 mg/kg, Supplemented in drinking water, once a day for 1 year) has subacute and chronic toxicity in the rat<sup>[3]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	FaDu cells tumor-bearing mice <sup>[2]</sup>
Dosage:	5 mg/kg
Administration:	Intraperitoneal injection (i.p.)
Result:	Induced a modest reduction in tumor development. Delayed the mean time to reach a tumor-plus-leg diameters (TLD) of 14mm by ~3.7 days.

Animal Model:	Sprague-Dawley rats <sup>[3]</sup>
Dosage:	10 mg/kg, 20 mg/kg, 45 mg/kg
Administration:	Supplemented in drinking water
Result:	Showed lower body weight at highest concentration within 3 weeks. Reduced the body weight throughout the experimental in males and skeletal growth at highest dose level in both males and females. Significantly decreased efficiency of food conversion in male rats receiving the highest dose.

## CUSTOMER VALIDATION

- Acta Biomater. 2018 Oct 1;79:317-330.

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## REFERENCES

- [1]. Wu T K, et al. Cetrimonium bromide inhibits cell migration and invasion of human hepatic SK-HEP-1 cells through modulating the canonical and non-canonical TGF- $\beta$  signaling pathways [J]. Anticancer research, 2019, 39(7): 3621-3631.
- [2]. Ito E, et al. Potential use of cetrimonium bromide as an apoptosis-promoting anticancer agent for head and neck cancer [J]. Molecular pharmacology, 2009, 76(5): 969-983.
- [3]. Isomaa B, et al. The subacute and chronic toxicity of cetyltrimethylammonium bromide (CTAB), a cationic surfactant, in the rat [J]. Archives of toxicology, 1976, 35: 91-96.
- [4]. Allen G C, et al. A modified protocol for rapid DNA isolation from plant tissues using cetyltrimethylammonium bromide [J]. Nature protocols, 2006, 1(5): 2320-2325.

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

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