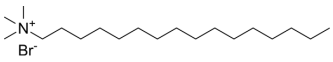
# Cetrimonium bromide

**Cat. No.:** HY-B1260

**CAS No.:** 57-09-0

**Molecular Formula:** $C_{19}H_{42}BrN$

**Molecular Weight:** 364.45



**Target:** Biochemical Assay Reagents; MMP; Apoptosis; TGF-β Receptor

**Pathway:** Others; Metabolic Enzyme/Protease; Apoptosis; TGF-beta/Smad

**Storage:** 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)
$H_2O$ : 4.55 mg/mL (12.48 mM; Need ultrasonic)

| Preparing Stock Solutions | Solvent / Mass / Concentration | 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**

1. Add each solvent one by one: PBS
   Solubility: 50 mg/mL (137.19 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 1 mg/mL (2.74 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 1 mg/mL (2.74 mM); Clear solution
4. 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 surfaetant. 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[1][2][3][4].

| $IC_{50}$ & Target | MMP-9 | MMP-2 |
|---|---|---|

**In Vitro**

Cetrimonium bromide (1-5 μM, 24 h) cannot affect growth of SK-HEP-1 cells[1].
Cetrimonium bromide (5 μM, 16-24 h) attenuates cellular migration and invasion of SK-HEP-1cells[1].
Cetrimonium bromide (5 μM, 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-1cells[1].
Cetrimonium bromide (5 μM, 12-72 h) induces apoptosis in human Head and neck cancer (HNC) cells[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[1]

| | |
|---|---|
| Cell Line: | SK-HEP-1 cells |
| Concentration: | 1 μM, 2.5 μM, 5 μM |
| Incubation Time: | 24 h |
| Result: | Retained more than 90% cell viability at 24 hours. |

Cell Cycle Analysis[2]

| | |
|---|---|
| Cell Line: | HNC cells |
| Concentration: | 5 μM |
| Incubation Time: | 12 h, 24 h, 48 h, 72 h |
| Result: | Induced caspase activation.<br>Observed the activation of the caspase cascade and increased in a time-dependent manner. |

Western Blot Analysis[1]

| | |
|---|---|
| Cell Line: | SK-HEP-1 cells |
| Concentration: | 1 μM, 2.5 μM, 5 μM |
| Incubation Time: | 24 h |
| Result: | Significantly down-regulates MMP-2 and MMP-9 expressions in SK-HEP-1 cells in a dose-dependent manner.<br>Significantly increased the protein expression of TIMP-1 and TIMP-2.<br>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[2].
Cetrimonium bromide (10-45 mg/kg, Supplemented in drinking water, once a day for 1 year) has subacute and chronic toxicity in the rat[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

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

| | |
|---|---|
| Animal Model: | Sprague-Dawley rats[3] |
| 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.<br>Reduced the body weight throughout the experimental in males and skeletal growth at highest dose level in both males and females.<br>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-β 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.





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