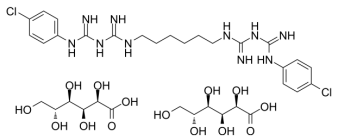
Chlorhexidine (digluconate)

Cat. No.:	HY-B0608
CAS No.:	18472-51-0
Molecular Formula:	$C_{34}H_{54}Cl_2N_{10}O_{14}$
Molecular Weight:	897.76
Target:	Bacterial; Antibiotic; Apoptosis; Necroptosis
Pathway:	Anti-infection; Apoptosis
Storage:	Solution, -20°C, 2 years



SOLVENT & SOLUBILITY

In Vitro	H_2O : 100 mg/mL (111.39 mM; Need ultrasonic) DMSO : ≥ 38 mg/mL (42.33 mM) * "≥" means soluble, but saturation unknown.
In Vivo	1. Add each solvent one by one: PBS Solubility: 100 mg/mL (111.39 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Chlorhexidine digluconate is a chlorophenyl biguanide with broad antibacterial action against both Gram (+) and (-) bacteria and fungi. Chlorhexidine digluconate is a broad-spectrum antiseptic and disinfectant. Chlorhexidine digluconate is effective to prevent and control infectious diseases of the mouth by killing bacteria in saliva and tongue. Chlorhexidine digluconate is a cytotoxic agent and induces cell necrosis and apoptosis[1][2][3].

In Vitro

Chlorhexidine digluconate (0.00001%, 0.00005%, 0.0001%, 0.0005%; 1-4 h) demonstrates a cytotoxic effect on CHO cells. Chlorhexidine digluconate reduces the activity of dehydrogenase of CHO cells in a dose-dependent and a time-dependent manner[2].

Chlorhexidine digluconate (0.00005%, 0.0001%, 0.0005%; 1 h) causes the amount of cell apoptosis of about 1.62%, 5.51%, and 5.47%, respectively. The amount of cell necrosis was 2.38%, 8.62%, and 22.50%, respectively[2].

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

Cell Cytotoxicity Assay[2]

Cell Line:	Chinese hamster ovary cells
Concentration:	0.00001%, 0.00005%, 0.0001%, 0.0005%
Incubation Time:	1, 2, 4 h
Result:	Demonstrated a cytotoxic effect on CHO cells.

Apoptosis Analysis[2]

Cell Line:	Chinese hamster ovary cells
Concentration:	0.00005%, 0.0001%, 0.0005%
Incubation Time:	1 h
Result:	After a 1 hour treatment, the amount of cell apoptosis was about 1.62%, 5.51%, and 5.47%, respectively. The amount of cell necrosis was 2.38%, 8.62%, and 22.50%, respectively.

In Vivo

Chlorhexidine gluconate (0.05%, 0.025%; One-time intraperitoneal injection) with 0.05% lavage has significantly lower incidence of postoperative intra-abdominal abscesses compared with the mice that had saline lavage only[1].

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Animal Model:	Male Imprinting Control Region (ICR) mice at 6 to 8-wk-old (body weight, 25g)[1]
Dosage:	Chlorhexidine gluconate 0.05% and 0.025%
Administration:	One-time intraperitoneal injection
Result:	With 0.05% lavage had significantly lower incidence of postoperative intra-abdominal abscesses compared with the mice that had saline lavage only.

CUSTOMER VALIDATION

- Nat Commun. 2021 Mar 29;12(1):1940.
- Cell Death Dis. 2022 Apr 22;13(4):396.
- Mol Oncol. 2020 Feb;14(2):373-386.
- Front Cell Dev Biol. 30 March 2021.
- Cell Signal. 2021 Apr 3;110002.

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REFERENCES

[1]. Hon-Yeung Cheung, et al. Differential actions of chlorhexidine on the cell wall of Bacillus subtilis and Escherichia coli. PLoS One. 2012;7(5):e36659.

[2]. Wael E Shams, et al. Peritoneal Lavage Using Chlorhexidine Gluconate at the End of Colon Surgery Reduces Postoperative Intra-Abdominal Infection in Mice. J Surg Res. 2015 May 1;195(1):121-7.

[3]. Yi-Ching Li, et al. Assessment of the cytotoxicity of chlorhexidine by employing an in vitro mammalian test system. Journal of Dental Sciences. Volume 9, Issue 2, June 2014, Pages 130-135.

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

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