Chitosan (MW 30000)

Cat. No.: HY-B2144B

CAS No.: 9012-76-4

Molecular Formula: $C_{18}H_{35}N_3O_{13}$

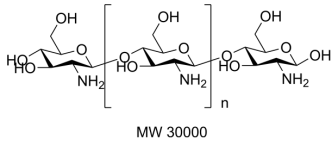
Molecular Weight: 501.48

Target: Bacterial; Fungal

Pathway: Anti-infection

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



MW 30000

SOLVENT & SOLUBILITY

In Vitro

0.1 M HCL : 5 mg/mL (9.97 mM; ultrasonic and warming and heat to 60°C)

H_2O : < 0.1 mg/mL (insoluble)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.9941 mL	9.9705 mL	19.9410 mL
5 mM	0.3988 mL	1.9941 mL	3.9882 mL
10 mM	---	---	---

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

BIOLOGICAL ACTIVITY

Description

Chitosan (MW 30000) (Deacetylated chitin (MW 30000)) is a polycationic linear polysaccharide derived from chitin with the molecular weight of 30000. Chitosan is an versatile biomaterial because of its non-toxicity, low allergenicity, biocompatibility and biodegradability. Chitosan also has antitumor, antibacterial, antifungal, and antioxidant activities[1][2].

In Vitro

Chitosan (2 mg/mL; 48 hours; SKMEL28 and RPMI7951 cells) treatment presents a reduced growth potential[1].

Chitosan (2 mg/mL; 48 hours; RPMI7951 cells) treatment shows potent pro-apoptotic effects against RPMI7951 through the mitochondrial pathway[1].

Chitosan (2 mg/mL; 48 hours; RPMI7951 cells) treatment induces an up regulation of pro-apoptotic molecules such as Bax and a down regulation of anti-apoptotic proteins like Bcl-2 and Bcl-XL[1].

Low-molecular-weight chitosan can penetrate bacterial cell walls, bind with DNA and inhibit DNA transcription and mRNA synthesis, while high-molecular-weight Chitosan can bind to the negatively charged components on the bacterial cell wall. It forms an impermeable layer around the cell, changes cell permeability and blocks transport into the cell. Chitosan also can be used in water treatment, wound-healing materials, pharmaceutical excipient or drug carrier, obesity research and as a scaffold for tissue engineering[2].

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

Cell Viability Assay[1]

Cell Line:	SKMEL28 and RPMI7951 cells
Concentration:	2 mg/mL
Incubation Time:	48 hours
Result:	Presented a reduced growth potential.

Apoptosis Analysis[1]

Cell Line:	RPMI7951 cells
Concentration:	2 mg/mL
Incubation Time:	48 hours
Result:	Had potent pro-apoptotic effects against RPMI7951.

Western Blot Analysis[1]

Cell Line:	RPMI7951 cells
Concentration:	2 mg/mL
Incubation Time:	48 hours
Result:	Induced an up regulation of pro-apoptotic molecules such as Bax and a down regulation of anti-apoptotic proteins like Bcl-2 and Bcl-XL.

In Vivo

In chemical-induced colonic precancerous lesions in ICR mice, in the 2 weeks preventive experiments, mice fed with a diet containing high molecular weight Chitosan (HMWC) had significant fewer aberrant crypt foci formation than those fed with control diet. As the treatment extended to 6 weeks, both low molecular weight Chitosan (LMWC)- and HMWC-fed mice contained less aberrant crypt foci when compared to control[3].

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CUSTOMER VALIDATION

- J Biomed Mater Res A. 2021 Nov 1.

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REFERENCES

[1]. Laure Gibot, et al. Anticancer properties of chitosan on human melanoma are cell line dependent. Int J Biol Macromol. 2015 Jan;72:370-9.

[2]. Randy Chi Fai Cheung, et al. Chitosan: An Update on Potential Biomedical and Pharmaceutical Applications. Mar Drugs. 2015 Aug 14;13(8):5156-86.

[3]. Shyr-Yi Lin, et al. Chitosan prevents the development of AOM-induced aberrant crypt foci in mice and suppressed the proliferation of AGS cells by inhibiting DNA synthesis. J Cell Biochem. 2007 Apr 15;100(6):1573-80.

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

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