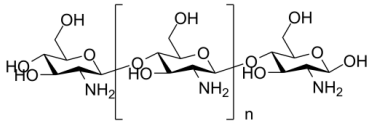
Data Sheet

Product Name:	Chitosan
Cat. No.:	CS-6228
CAS No.:	9012-76-4
Molecular Formula:	$C_{18}H_{35}N_3O_{13}$
Target:	Bacterial; Endogenous Metabolite; Fungal
Pathway:	Anti-infection; Metabolic Enzyme/Protease
Solubility:	H2O : 0.67 mg/mL (ultrasonic and adjust pH to 3 with HCl); H2O : < 0.1 mg/mL (insoluble); DMSO : < 1 mg/mL (insoluble or slightly soluble)



BIOLOGICAL ACTIVITY:

Chitosan (Deacetylated chitin) is a polycationic linear polysaccharide derived from chitin. 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]. **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].

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].

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.

CAIndexNames:

Chitosan

SMILES:

OC[C@H]1O[C@@H](O[C@H]2[C@H](O)[C@@H](N)[C@H](O[C@H]3[C@H](O)[C@@H](N)[C@H](O)O[C@@H]3CO)O[C@@H]2CO)[C@H](N)[C@@H](O)[C@@H]1O.[n]

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

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