## What Is Chitosan Oligosaccharide

Although chitosan is known to have various beneficial biological properties, it is poorly soluble in acidic medium of above pH 6.5. Therefore, a lot of interest and many studies has focused on converting chitosan into chitosan oligosaccharides / Chito-oligosaccharide (COS). COS, relative to its parent biomaterials (chitin and chitosan) and other available polysaccharides, possesses following properties:

## **Chitosan Oligosaccharide Properties**

- Low Molecular Weight (Mw)
- Higher Degree of Deacetylation (DDA%)
- Less Viscosity/Viscous Relatively Small Molecular Size

- Higher Degree of 100% Water Soluble Polymerization (DP)
- Readily Absorbable in In Vivo Systems



With these functional properties, COS has made a big impact in the biomedical, pharmaceutical, and agricultural sectors. Innovations into COS derivatization has further broadened its application areas in cosmeceutical, nutraceutical, water treatment, and environmental safety.

Chitosan oligosaccharide is a major degradation product of chitosan and chitin through chemical hydrolysis (acid or physical) or enzymatic degradation involving deacetylation and depolymerization processes. (Lodhi et al., 2014). The

Hypocholesterolemia

weak glycosidic bonds in chitosan facilitate cleavage in the presence of hydrolyzing agents to generate chitosan oligomers incorporating various monomer units (Kim and Rajapakse, 2005). COS (also termed chitosan oligomers or chitooligomers) have an average molecular weight (MW) under 3.9 kDa and contains less than 20 monomer units per polymer chain.

Besides its basic properties of biocompatible, biodegradable, non-toxic, and being cationic with a positive charge, it possesses significant biological properties such as those in the following:

## Chitosan Oligosaccharide Biological Properties

- Antimicrobial
- Antioxidant
- Anti-inflammatory Antihypertensive
- Drug Delivery

- Calcium Absorption
- Hemostatic
- DNA Delivery Anti-obesity
- Antidiabetic

Cellular transduction

- Anti-Tumor
- Immuno-Stimulating
  - Disease

 Absorbable via intestinal epithelium

- Anti-Alzheimer's

Anti-HIV-1

## Sources:

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