Algal fucoidan have been the subject of numerous scientific studies due to their diverse biological functions and possible therapeutic properties including anti-tumor, immunomodulatory, anti-inflammatory, antithrombotic, and anticoagulant effects. Some findings also indicate that the antitumor activity of fucoidan is associated with a significant enhancement of the cytolytic activity of natural killer (NK) cells augmented by increased production of macrophage-mediated immune response signaling molecules namely interleukins (IL)-2, IFN-γ and IL-12. It is generally believed that the molecular weight of the polysaccharides is critical for the absorption and the bioactivities in human body. In USA, Japan, Korea and UK, fucoidan is already commercially available as health supplements in the form of beverages and tablets/powder. Low molecular weight fucoidan, without a doubt, will be the next generation fucoidan for its superior easy-absorption and consistent quality.

Small Molecular Weight Fucoidan - The Next Generation Sulfated Polysaccharides

Fig.2: The molecular weight distribution (HPLC/GPC) profile of commercial fucoidan products (1. T-brand, 2. H-brand) vs. Simpson Biotech’s (3, using brown seaweed as raw material) crude polysaccharide product.

Fig.3: The molecular weight distribution (HPLC/GPC) profile of commercial hi-purity fucoidan (Control: L-brand) and Simpson Biotech’s (Treatment 3: using L-brand’s fucoidan as raw material) enzymatic hydrolysis small molecular weight fucoidan product.

Reference:
2. Fitoterapia 83 (2012) 6–12
4. RSC Adv., 2013, 3, 8131–8141
5. Mar. Drugs 2011, 9, 1731-1760
Seaweeds (Macroalgae) have been used in traditional medicine since pre-historic times and can be classified into brown, red, and green algae. They are rich in soluble dietary fibers, minerals, vitamins, polyunsaturated fatty acids and bioactive components including: polyphenols (phlorotannins), carotenoids (fucoxanthin), functional peptides and notably, the large amounts (up to 76 %) of polysaccharides. Polysaccharide is the most important single ingredient isolated from seaweed because of its biological and functional activities. Some significant industrial applications for seaweed polysaccharide products are stabilizers, thickeners, and emulsifiers. Current research has revealed that sulfated polysaccharides (SPS, i.e. Fucoidan) and alginic acid derivatives from brown seaweed are known to exhibit immunomodulatory, anticoagulant, anti-inflammation, antioxidant, antihypertensive, antiviral, anti-diabetic, anti-inflammatory, antihyperlipidemic, anti-obesity, anti-estrogenic, thyroid stimulating, neuroprotective, antifungal, antibacterial and tissue healing properties.

Hydrolyzed Seaweed Polysaccharides & Low MW Fucoidan
Drinks, Dietary Supplements and Cosmetics

- Immunomodulatory/Anti-tumor
- Anticoagulant
- Anti-inflammatory
- Antioxidant
- Antihypertensive
- Anti-viral
- Skincare: Anti-aging
- Anti-irritant
- Anti-wrinkle

1. Perfect & Balanced polysaccharides allocation: Contains all 3 sizes of
   - Regular (2000~800Kd), Small (50~10Kd) PS &
   - Oligosaccharides (<10Kd) for all kind of bioactivities
2. Minimum batch-to-batch molecular weight variation – Consistent quality
3. Unique & all food-grade extraction techniques – Best bioactivity & Safety
4. Low “algae-taste” – excellent for drink ingredient & direct oral applications
5. Provide OEM service for all kinds of seaweed raw materials

Seaweeds (Macroalgae) have been used in traditional medicine since pre-historic times and can be classified into brown, red, and green algae. They are rich in soluble dietary fibers, minerals, vitamins, polyunsaturated fatty acids and bioactive components including: polyphenols (phlorotannins), carotenoids (fucoxanthin), functional peptides and notably, the large amounts (up to 76 %) of polysaccharides. Polysaccharide is the most important single ingredient isolated from seaweed because of its biological and functional activities. Some significant industrial applications for seaweed polysaccharide products are stabilizers, thickeners, and emulsifiers. Current research has revealed that sulfated polysaccharides (SPS, i.e. Fucoidan) and alginic acid derivatives from brown seaweed are known to exhibit immunomodulatory, anticoagulant, anti-tumor, anti-inflammatory and anti-viral activities. Other therapeutic properties of seaweed polysaccharides include anti-diabetic, antioxidant, anti-hyperlipidemic, anti-obesity, anti-estrogenic, thyroid stimulating, neuroprotective, antifungal, antibacterial and tissue healing properties.

Consistent Polysaccharides Quality
by Simpson Biotech’s Enzymatic Hydrolysis Technology

Since the physical and chemical barrier of seaweed tissue restrains an effective extraction of the bioactive components from the tissue, the enzymatic hydrolysis is now becoming very attractive. Not only does it improve the extraction yield, but it also retains better biological activities when compared to the traditional hot water and organic extract counterparts. Many seaweed bioactive components such as SPS are vulnerable to traditional harsh extraction, therefore more gentle enzymatic hydrolysis extraction techniques which used shorter extraction times, lower temperatures, and acid levels will ensure extraction of distinct structures for those SPS. In addition to being consistent, enzymatic hydrolysis normally is more cost-effective and eco-friendly, especially for the requirements of solvent use. For example, the anti-cancer activity of fucoidan is not just a function of a single specific structural trait, but a combination of many factors such as the amount of sulfate groups, the monosaccharide composition, the types of linkages of sugar residues and the molecular weight distribution.