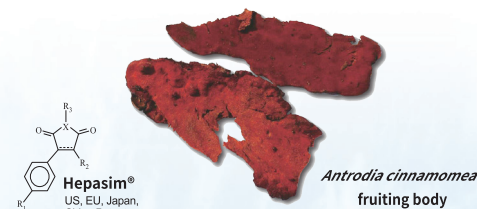


SimpsonPure™ Bioactive Natural Ingredients

发酵专家 生技原料/OEM

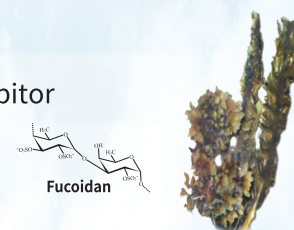
① Fermented *Antrodia cinnamomea* & Hepasim®

- Supports liver health at nM level !
- Skin whitening & wrinkle reducing
- Clinical and animal studies confirmed
- US,EP,CN, JP, TW Patents



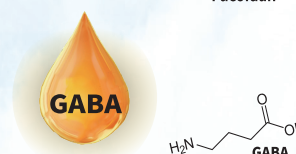
② Fucoidan & Enzymatic Hydrolyzed Seaweed

- Reduces food glycemic index : StarchMate®, α-amylase & α-glucosidase inhibitor
- Supports immune function
- Male reproductive health
- Supports joint health



③ Lactobacillus fermented GABA

- Helps improve sleep and supports healthy blood pressure



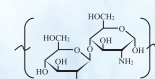
④ Probiotics Formulation & Fermented Prebiotics Ingredients

- Fermented grains & vegetable concentrate with postbiotics

⑤ Super Antimicrobial Agent from Chitosan

Water soluble chitosan (COS-LM)

- Inhibits Gram(+) / Gram(-) & yeast under 100 ppm
- Chitobiose / Chitotriose (COS-600) - easily absorbed
- Helps with blood sugar management
- Iron/Calcium absorption



Material from Animal & Fungus

⑥ Collagen & Hydrolyzed Dipeptides & Tripeptides

Ultra low MW & low bitterness protein hydrolysis platform

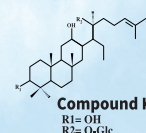
- Fish scale collagen peptides
- Soy peptides



⑦ Compound K & Fermented Ginseng

The final active metabolite of ginsenosides in the body

- Helps improve memory
- Strong korean ginseng taste enhancer
- Modulates immune response

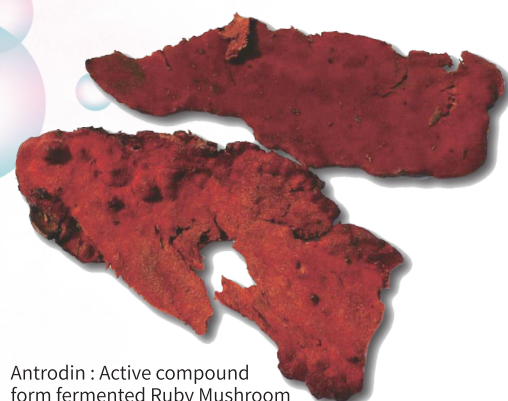


Brightening

Wrinkle Smoothing • Anti-Aging
New Ingredient • Novel Mechanism

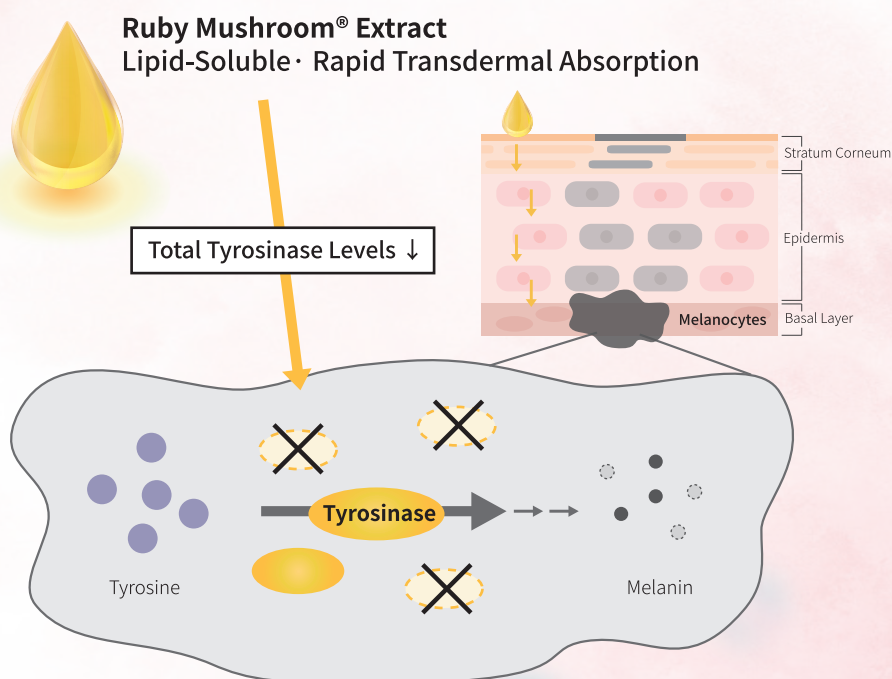
INCI name : Antrodia Cinnamomea Mycelium Extract

Ruby Mushroom® Extract

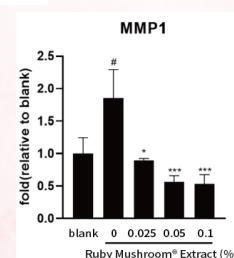
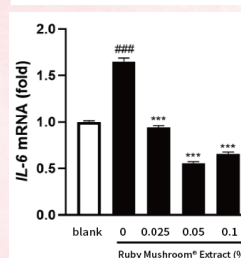
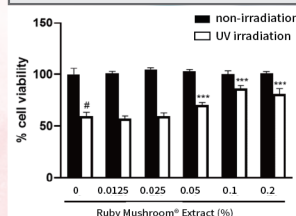


Antrodin : Active compound
form fermented Ruby Mushroom
mycelium

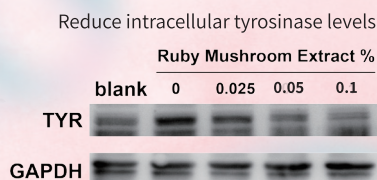
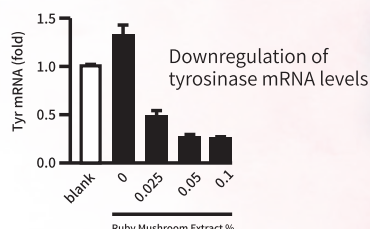
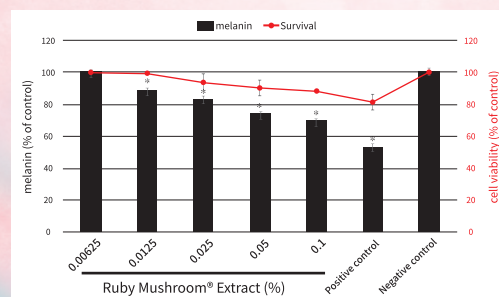
Directly Reduces Tyrosinase More Than Just Activity Inhibition



Maintain skin elasticity



Reduce intracellular melanin accumulation



Academic Research Cooperation

- In Collaboration with NTHU (National Tsing Hua University):
Unveiling the molecular mechanisms of active ingredients.
- Contracted Research by ITRI (Industrial Technology Research Institute): Safety, Efficacy Testing, and INCI Registration.



Global Patents



善笙生物科技股份有限公司
SIMPSON BIOTECH CO., LTD.

1-1, Wen Min 2nd Street, Kuei Shan, Taoyuan, 333 Taiwan
台灣 333 桃園市龜山區文明二街1-1號 (林口工三工業區)
電話: +886-3-396-3466 傳真: +886-3-396-3407
http://www.simpsonbiotech.com E-mail: service@simpsonbiotech.com

Hepatoprotective Ruby Mushroom Mycelia

Hepasim® for Fatty Liver & NAFLD

Anti-fibrosis & Anti-inflammation compounds from medicinal fungus

抗氧化、抗纤维化、改善非酒精性脂肪肝

Hepasim® improves NAFLD 改善非酒精性脂肪肝

1 Reduce liver oil accumulation

Health Liver



over diet

NAFLD



~ 40%



NASH

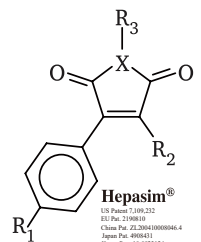


~ 20%
35%

Cirrhosis Carcinoma



2 Control the progression of NASH Anti-inflammation, anti-fibrosis, anti-oxidation

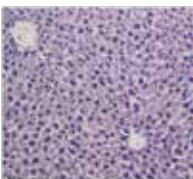


Patents granted

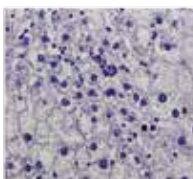


Hepasim® prevents liver oil accumulation 降低肝脏油脂堆积

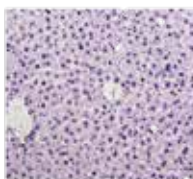
Healthy Liver



Fatty liver (High fat diet)

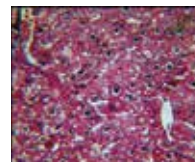


Fatty liver + Hepasim®

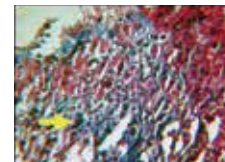


Anti-fibrosis of Hepasim® 抗纤维化

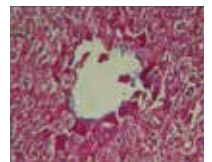
Normal



TGF-β1 induced liver fibrosis

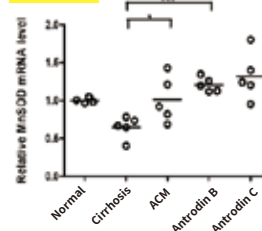


TGF-β1 + Hepasim®

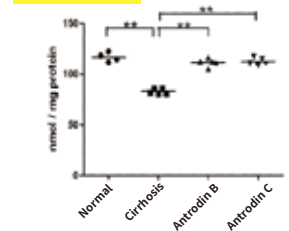


Hepasim® Anti-oxidation & Anti-inflammation 抗氧化 & 抗炎

MnSOD

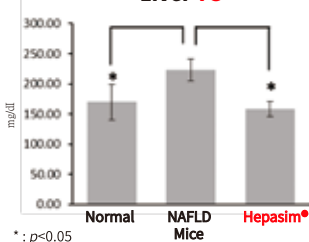


Glutathione



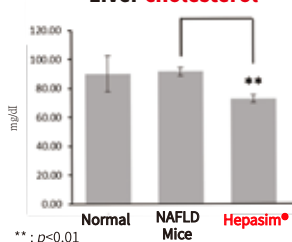
Hepasim® reduces liver TG & cholesterol 降低肝脏三酸甘油酯与胆固醇

Liver TG



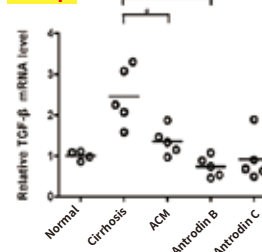
*: p<0.05

Liver cholesterol

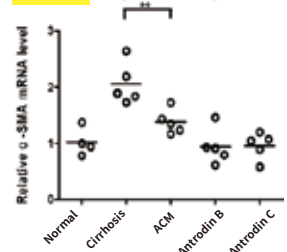


** : p<0.01

TGF-β



α-SMA



GABA - Help Improve Sleep & Maintain Normal Blood Pressure

- Superior Lactobacillus Strain
- Extremely Cost-effective
- Made in Taiwan

Key Features of Simpson Biotech GABA :

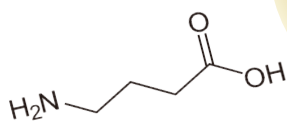
- Bulk supply : liquid & powder form with various specifications
- Animal feeds grade also available
- Partially purified : contains beneficial amino acids, oligopeptides from fermented broth

Stable at pH 2-11

Water-soluble

GABA

High stability



Ideal for:



Those with irregular routines



Individuals under high work stress



The senior population

Encourage relaxation & enhance mood for high-stress lifestyles and seniors

- ✓ >80 years of experience in fermentation technology
- ✓ Collaboration with the National Chung Hsing University, Taiwan
- ✓ Factory certified with ISO 22000 & HACCP



Recombinant Protein OEM/ODM

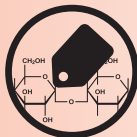
Proprietary Yeast Platform

PATENTED

Starch Binding Tag

One-step purification
for food & agriculture

World's 1st
Industrial Grades



IN HOUSE

FOOD GRADE INDUCER

Non-methanol Promoter

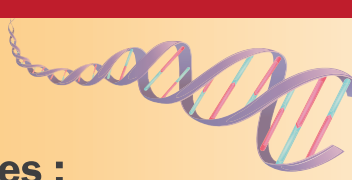
Compares to AOX1



Antibiotic-free Selection

Eco-friendly *Pichia* Strains



- 
- **Success cases :**
Industrial enzymes, food proteins,
cytokines, growth factor
 - Turnkey licensed to global
feed company
 - HACCP/ISO22000 Approved

Process

Phase I

Strain construction

- vector construction with designed elements
- high expression strain selection
- expression & purification test (flask)

Phase II

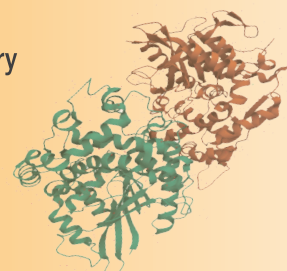
Pilot plant scale-up

- 20L to 100L fermentors
- yield & cost assessment
- establish downstream process

Phase III

Mass production

- 1.5T to 8T fermentors
- assistance with regulatory
applications



Brown Seaweed Extract (Fucoidan-WPF)

Fucoidan is a mucopolysaccharide isolated from the outer layer of brown seaweeds as Mozuku, Kombu, Limumoui, Bladderwrack, Wakame and Hijiki. It belongs to the family of sulfated polysaccharides composed of fucose, galactose, mannose, or xylose. Numerous studies have demonstrated that fucoidan provides various health benefits, including healthy blood glucose maintenance, immune modulation, anti-inflammation, and anti-oxidation.

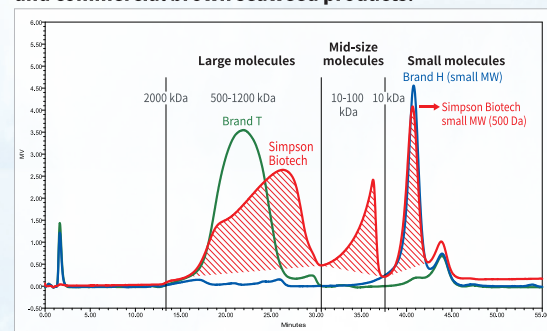
The glycan structure of fucoidan and its sulfate groups are highly correlated with its bioactivities. Conventional chemical extraction methods (acid/alkali extraction) cause significant damage to both the structure and the sulfate groups of fucoidan (Tutor Ale et al., 2011). In contrast, gentle enzymatic extraction process can yield fucoidan closer to its natural state, thereby preserving its bioactivity.



Enzymatic Extracted Whole Profile Fucoidan- Fucoidan-WPF Wider molecular weight, more bioactivities

Most commercially available fucoidan products contain only large molecules (100 ~ 2000 kDa) (Figure 1, Brand T) or exclusively small molecules (~500 Da) (Figure 1, Brand H). In contrast, Simpson Biotech Fucoidan-WPF contains large, mid-size (10–100 kDa), and small molecules, providing a wide range of bioactivities simultaneously.

Figure 1. Molecular weight distribution of Fucoidan-WPF and commercial brown seaweed products.



Maintains healthy blood glucose·reduces blood lipid and anti-oxidation

In animal studies, four weeks of Fucoidan-WPF administration reduced blood glucose by approximately 25%(Figure 2), lowered blood lipids (TG, TC, LDL-C) by about 20%(Figure 3),reduced peroxides (Figure 4a) by around 25% and brought inflammatory markers back to near-normal levels(Figure 4b). In addition, it helped reduce inflammation-related damage to the body, such as joint swelling (Figure 5) and decreased male reproductive capacity(Figure 6).

Figure 2. Changes in blood glucose levels (a) after 4 weeks of Fucoidan-WPF administration in rats.

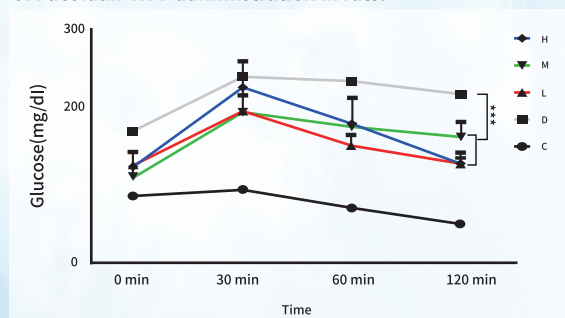


Figure 3. Changes in TC and TG (a) after 4 weeks of Fucoidan-WPF administration in rats, and changes in HDL-C and LDL-C (b).

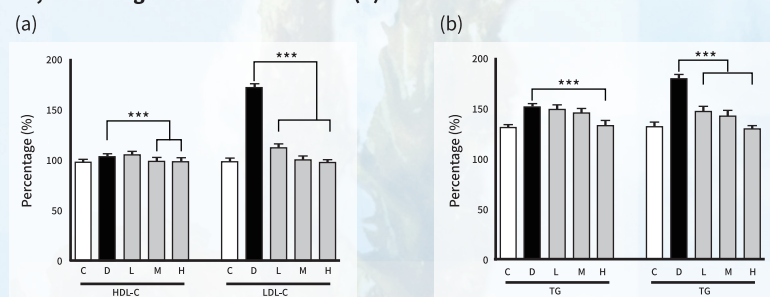


Figure 4. Changes in peroxide levels (a) and changes in inflammatory markers (b) after 4 weeks of Fucoidan-WPF administration in rats.

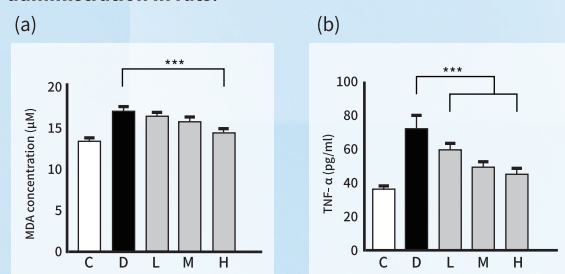


Figure 5. Improvement of joint swelling in rats after 4 weeks of Fucoidan-WPF administration.

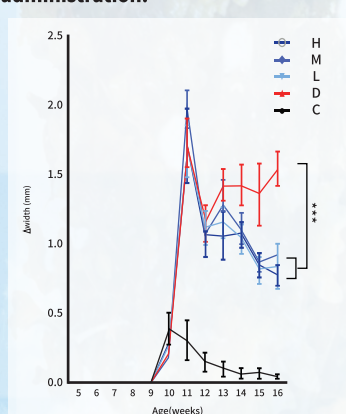
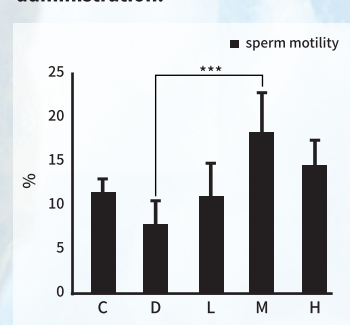


Figure 6. Changes in sperm motility in rats after 4 weeks of Fucoidan-WPF administration.



Brown Seaweed Polysaccharide (Fucoidan-PS)

Fucoidan is a mucopolysaccharide isolated from the outer layer of brown seaweeds as Mozuku, Kombu, Limumoui, Bladderwrack, Wakame and Hijiki. It belongs to the family of sulfated polysaccharides composed of fucose, galactose, mannose, or xylose. Numerous studies have demonstrated that fucoidan provides health benefits, including healthy blood glucose maintenance, immune modulation, anti-inflammation, and anti-oxidation.

The glycan structure of fucoidan and its sulfate groups are highly correlated with its bioactivities. Conventional chemical extraction methods (acid/alkali extraction) cause significant damage to both the structure and the sulfate groups of fucoidan (Tutor Ale et al., 2011). In contrast, gentle enzymatic extraction process can yield fucoidan closer to its natural state, thereby preserving its bioactivity.



Enzymatic Extracted Fucoidan Polysaccharide- Fucoidan-PS

Simpson Biotech Fucoidan-PS is comprised of high molecular weight fractions (100–2000 kDa) (Figure 1), with particular emphasis on the immune-modulating functions.

In cell-based studies, Simpson Biotech Fucoidan-PS significantly enhanced the cytotoxic activity of natural killer cells against abnormal cells (Figure 2a) and increased the phagocytic activity of macrophages toward abnormal substances (Figure 2b). It also promoted the secretion of IgM antibodies by immune cells (Figure 3c). These findings demonstrate that Fucoidan-PS provides a remarkable boost to the body's key innate immune system, aiding in the elimination of exogenous or endogenous abnormal substances.

Figure 1. Molecular weight distribution of commercial brown seaweed products.

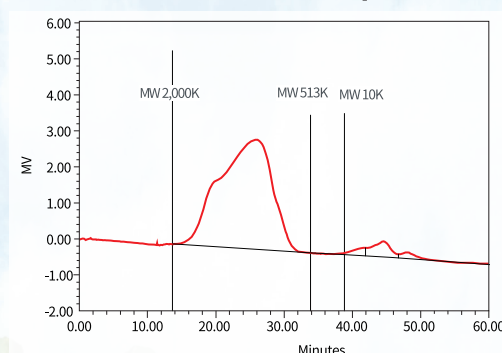
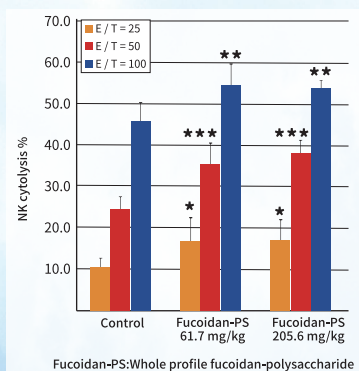
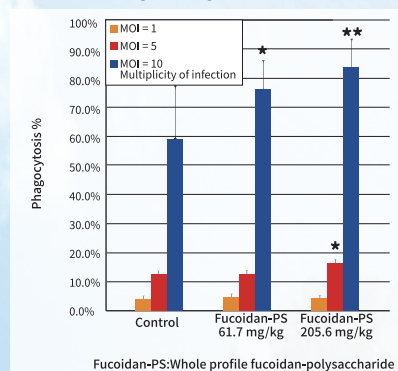


Figure 2. Fucoidan-PS support immune functions.

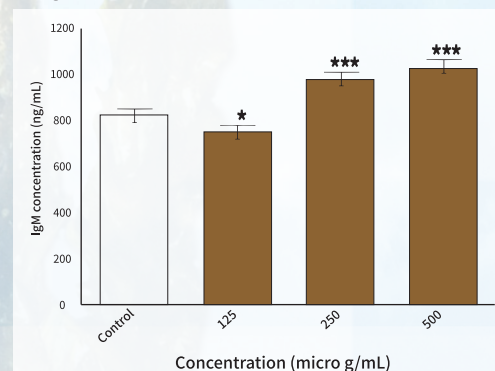
(a) Natural killer cell activity



(b) Macrophage phagocytosis activity



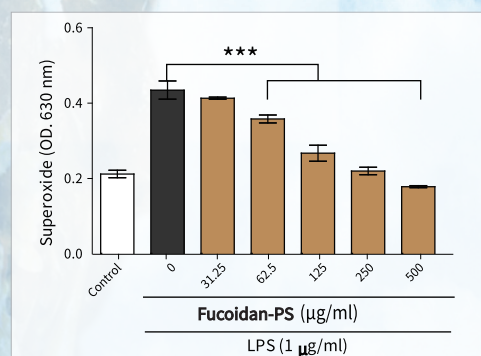
(c) IgM secretion activity



Protecting against oxidative damage and enhancing immune cell function

During extensive activation, immune cells accumulate oxidative stress. For example, LPS-induced infection responses lead to high oxidative stress, which damages immune cells and impairs their function. In cell experiments, Fucoidan-PS was shown to effectively enhance the ability of immune cells to eliminate peroxides (Figure 3), thereby supporting their survival and functionality.

Figure 3. Anti-oxidation activities of Fucoidan-PS.



“StarchMate®” Cooking Powder

Natural seaweed extract perfect for cooking!

Polyphenol-rich brown seaweed extract reduces the digestion of starch to glucose

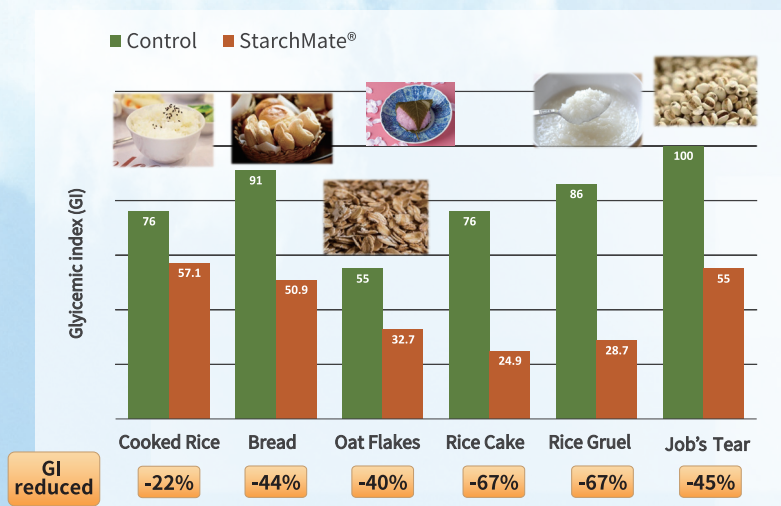


Easy application: blend with cooking water before cooking

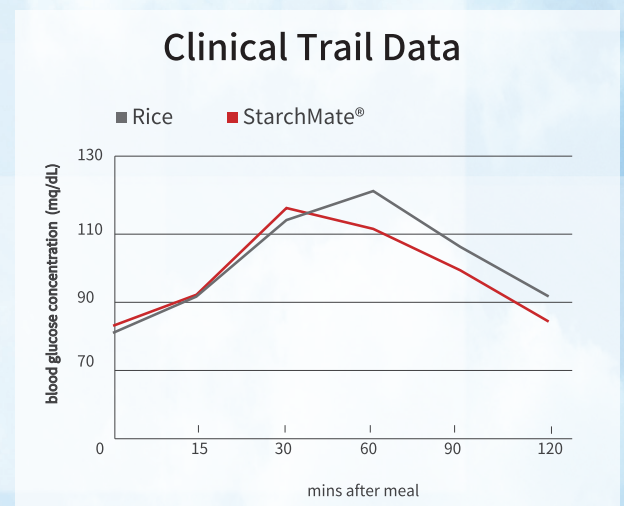
Dosage: 0.25g/serving (~160g cooking rice/pasta)

- Helps with blood sugar management after meal
- Reduces food GI
- Less glucose/calories uptaken

Sample	α -amylase (IC ₅₀)	α -glucosidase (IC ₅₀)
StarchMate®	240.62µg/ml	83.9µg/ml
Commercial Product A	284.13µg/ml	75.0µg/ml
Acarbose 50	339.68µg/ml	ND



*In vitro test



*This human clinical trial was conducted by Professor Dr. Jen-Fang Liu's lab at CGUST

- **α -Amylase & α -Glucosidase inhibition** in a smooth & natural way!
- Reducing the Glycemic Index(GI) of most starch products

Anti-Yeast/Bacteria Chitosan

Inhibits Most Yeast/Bacteria at 15~62 ppm

- Water soluble
- Nature origin
- Labeled as "Chitosan" (food), Not an Additive
- Generally recognized as safe ingredient

- Applications :
 - Agriculture/Aquaculture/Food package/Beverage
 - Fabrics/Nonwoven fabrics coating
 - Cosmetics/Personal hygiene
 - Water sanitation/Management
 - Medical devices/Wound dressing

Chitosan is a natural polysaccharide of deacetylated chitin from the shells of crustacean or fungus cell wall. With high safety, chitosan has been applied in health food for many years. The antimicrobial activity of chitosan also arouses interests¹⁻⁴. However, there are some disadvantages of chitosan: 1. Poor solubility causes precipitation and therefore loses antimicrobial activity; 2. High working concentration (>500 ppm) increase cost and has a strong astringency. These disadvantages limit the possibility of using chitosan as a natural antimicrobial material in food and cosmetic industry.



COS-LM: The Best Antimicrobial Chitosan in Its Own Category!

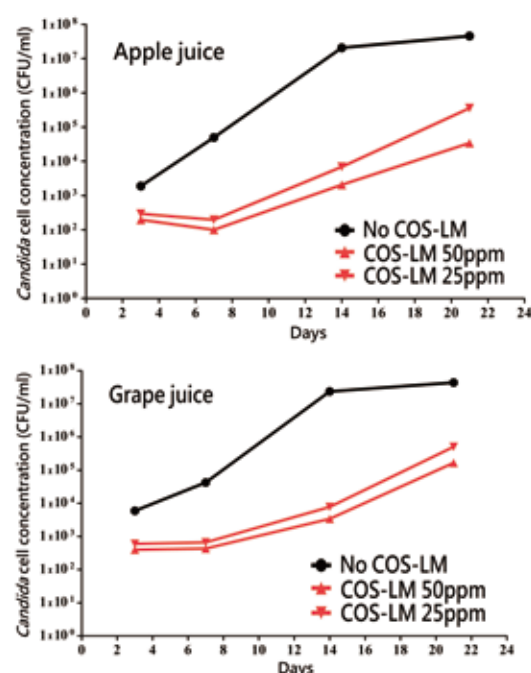
Simpson Biotech produces a new generation water-soluble chitosan, COS-LM, by the unique hydrolysis platform technology. The solubility of COS-LM is extremely high and it can completely inhibits growth of most bacteria or yeast at 15-62 ppm (Table 1)! These properties promise that COS-LM can be used as a **natural antimicrobial material in food** with reasonable cost and **no astringent**. Current tests indicate COS-LM can inhibit growth of *Candida* in juice (Figure 1) or *E. coli* in medium (Figure 2).

Table 1. The MIC of COS-LM for yeast or bacteria

Microbes	MIC (ppm)	Microbes	MIC (ppm)
Infective Pathogens		<i>Pichia pastoris</i> ; Yeast	25
<i>Candida albicans</i> ; Yeast	62	<i>Vibrio anguillarum</i> ; G-	50
<i>Pseudomonas aeruginosa</i> ; G-	50	<i>Escherichia coli</i> ; G-	25
<i>Klebsiella pneumoniae</i> ; G-	50	<i>Shigella flexneri</i> ; G-	15
<i>Legionella pneumophila</i> *; G-	71% (200ppm)	<i>Vibrio parahaemolyticus</i> ; G-	15
<i>Streptococcus mutans</i> (dental); G+	99.9% (200ppm)	<i>Salmonella enterica</i> *; G-	94% (50ppm)
Food/Foodborne Pathogens		<i>Staphylococcus aureus</i> ; G+	50
Baker's yeast; Yeast	62	<i>Listeria monocytogenes</i> ; G+	25
		<i>Bacillus cereus</i> ; G+	50

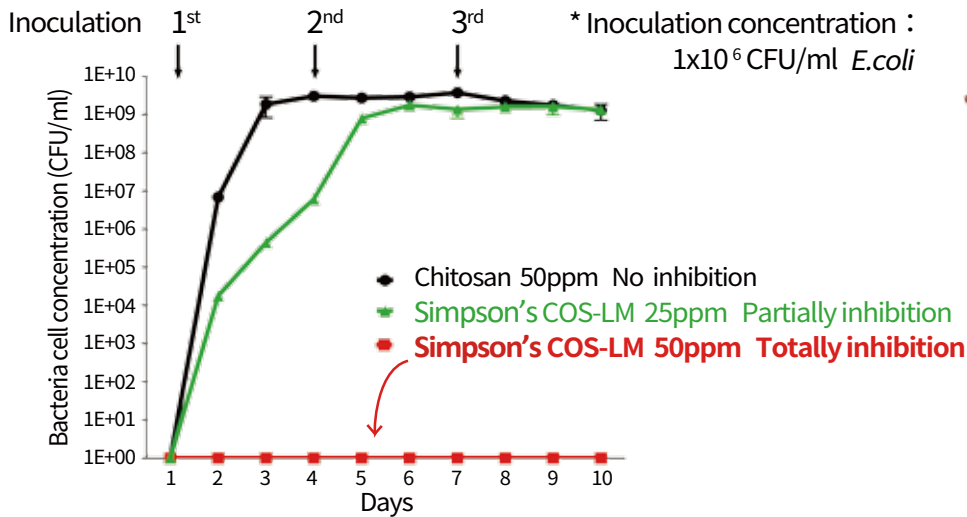
*Inhibition% at 50 or 200ppm

Figure 1. COS-LM inhibits *Candida* growth in refrigerated juice



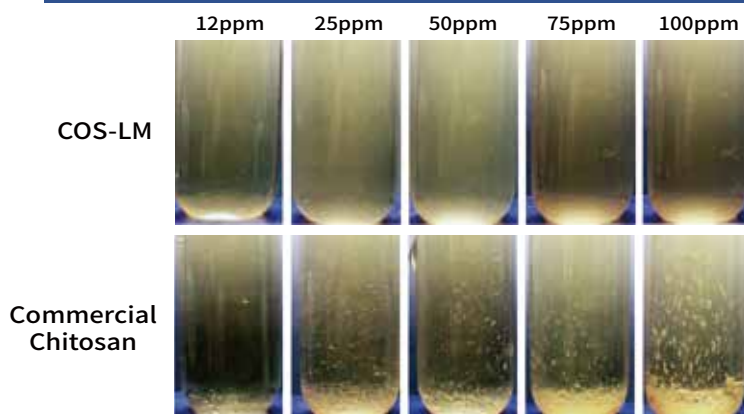
Candida utilis (1 × 10³ CFU/ml) were seeded in juice samples with 0, 25 or 50 ppm COS-LM at day 0. Samples were static incubated in 6°C. COS-LM could significantly inhibit growth of *Candida* at 25 or 50 ppm with long-term effect.

Figure 2. Long-term bacterial inhibition of COS-LM



In YM broth, the dispersibility of COS-LM is significantly better than that of commercial chitosan, which is already precipitated at 12 ppm (Figure3). The great solubility makes COS-LM **easily applied in industrial process**. For example, COS-LM coated non-woven fabrics has **outstanding antibacterial activity** (Figure 4). With **high safety**, COS-LM has high potential to be **a natural antimicrobial ingredient in cosmetics**. This property makes COS-LM a key of antimicrobial activity in complex sample. The unique physical microbicide mechanism of COS-LM is more suitable for long-term surface cleaning (CIP, cleaning in place) than chemical reagent. Customers look for natural antimicrobial material for years. Undoubtedly, **COS-LM is definitely a new choice for food, cosmetics, personal hygiene and industrial cleaning**.

Figure 3. The dispersibility of COS-LM in YM broth



The COS-LM dispersibility in complex samples (YM broth) is significantly better than that of most the general commercial chitosan.

Figure 4. Antimicrobial activity in COS-LM coated non-woven fabrics.

	Control	Commercial Chitosan	Simpson's COS-LM
<i>P. aeruginosa</i>			
<i>E. coli</i>			
<i>S. aureus</i>			

Chitobiose/Chitotriose as Prebiotics

● Biofunctions :

- Maintain Healthy Blood Glucose
- Support Healthy Cholesterol Level
- Support Weight Management
- A perfect prebiotics

● Features :

- The only high purity, mass-produced supplier (purity between 80~90%)
- Avg. molecular weight less than 600 Da
- Rapid absorption through skin/oral
- No astringency, Great water solubility

● Applications :

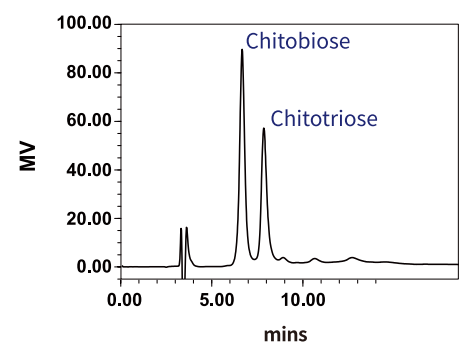
- Dietary supplement
- Drinks
- Cosmetics
- Organic mineral chelators



Animal & Botanical Sources

Chitosan oligosaccharides (COS) is hydrolyzed chitosan oligomers composed of 2~20 glucosamine (degree of polymerization: 2-20; molecular weight: 0.4-4kDa). With various bioactivities and high safety, many medical and food researchers have paid a lot of attention to chitosan oligosaccharide. Especially, chitobiose and chitotriose, the dimer and trimer of glucosamine, are the only two COS those can be rapidly absorbed through oral or skin. **Simpson Biotech provides a series of unique low molecular weight chitosan oligosaccharides: "COS-600 Plus" (chitobiose/triose>80%) for health food and "COS-600 Super" (chitobiose/triose>90%) for medicine.**

HPLC/GPC profile of Simpson Biotech's COS-600



COS-600 supports normal blood glucose, blood lipid and body weight

One animal test conducted in 2018 by the group of National Tsing Hua University and National Chiao Tung University compared the biofunctions of COS-600 with that of commercial COS (KRCOS, degree of polymerization:2-6) via oral administration in mice with abnormal blood sugar. They prove that COS-600 significantly changes the body weight (Figure1), blood glucose (figure2) and triglyceride in liver & blood (Figure3) but KRCOS does not. This results indicate that **COS-600 has better efficacy than commercial chitosan-oligosaccharide on helping with blood sugar management and supporting healthy triglyceride without changing diet.** Those facts show the potential of COS-600 as a dietary supplement for health benefits.

Figure 1. Body weight change

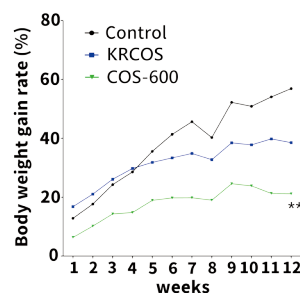
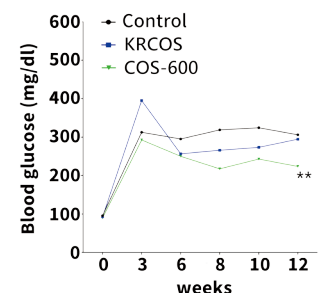


Figure 2. Blood glucose change



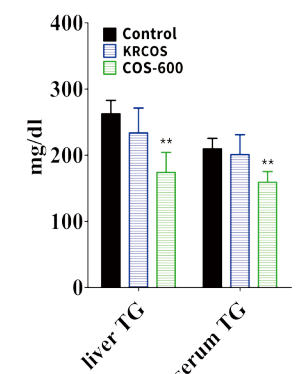
Chitosan oligosaccharide promotes growth of *Lactobacillus*, *Bifidobacterium* and *Akkermansia muciniphila* (gut microbe helps with blood glucose management) in human gut

Many studies have proved that chitosan oligosaccharide has many prebiotic functions :

1. Promote *Bifidobacterium* growth in gut¹;
2. Complete gut microbiota to improve the immune system²;
3. Promote the growth of *Akkermansia muciniphila*, a probiotic helps blood glucose management³.

All these researches indicate that chitosan oligosaccharide as a prebiotic can promote growth of certain probiotics in human gut and therefore increases body beneficial metabolites.

Figure 3. Liver & blood triglyceride change



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Tri-peptides & Di-peptides Ingredients With Low Bitterness And OEM Services

- Cutting-edge enzymatic hydrolyzation & de-bitterness technology
- For Soy, Collagen, Whey, Algae, Casein and Others Proteins
- Tri-peptides + Di-peptides > 65% (collagen >30%)



Low-Bitterness & Small Peptides Hydrolyzation System (LBSPHS)

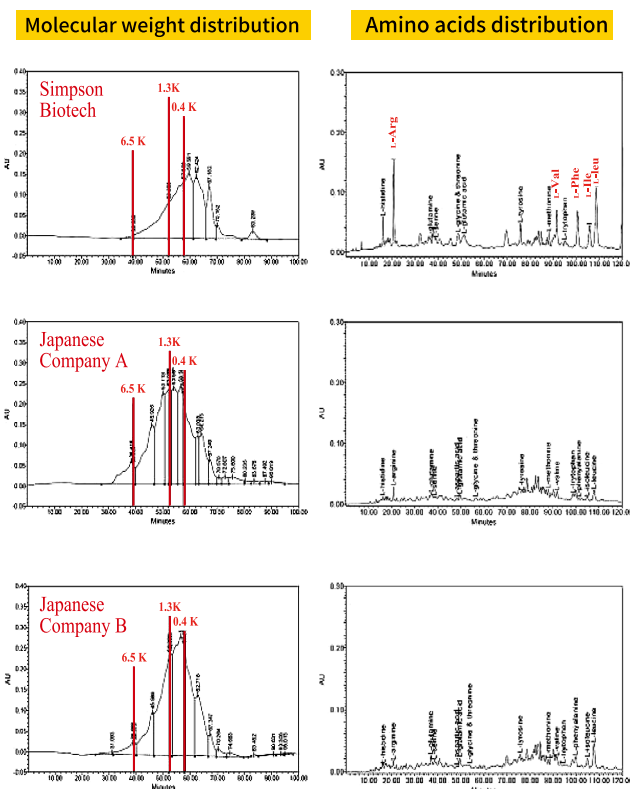
Using commercially available proteases combined with proprietary GRAS microbial fermentation techniques, Simpson Biotech is able to produce all kinds of low molecular weight and low-bitterness peptides from many proteins, such as soy, collagen, and casein. When proteins are hydrolyzed into smaller peptides, certain peptides with specific amino acid sequences can exhibit unique bioactivities (for example, small soy peptides can help maintain normal blood pressure). However, the hydrolysis process also increases bitterness, making the peptides too bitter for use in food and beverage ingredients(9). Simpson Biotech has developed **LBSPHS** that not only hydrolyzes most soluble proteins into either di-peptides or tri-peptides, but also minimizes the bitter taste caused by small peptides which contain non-polar amino acid residues (BCAA: leucine, isoleucine, valine; phenyl-alanine) and arginine located in their ends. The key is that **LBSPHS** can selectively hydrolyze such amino acid residues into free (single) amino acids which has even been reported to mask bitter taste (6) so that arginine and BCAA has become a popular ingredient for sport or energy drinks(1, 5). Traditionally, the bitterness of peptide limited its formulation to capsules or tablets and the low bitterness and low molecular weight peptides produced by **LBSPHS** is ideal for energy drink due to the higher absorption efficiency and improved flavor. Moreover, **LBSPHS** digests most (>65%) of the proteins into either di-peptides or tri-peptides, without completely hydrolyzing these peptides into “single” amino acids.

- **Only di-peptides and tri-peptides can be absorbed directly** Reports indicate that di-peptides and tri-peptides are the only peptides small enough to be directly absorbed through the mouth or skin, whereas most proteins must be broken down into single amino acids and absorbed in the small intestine. Moreover, the absorption efficiency of di-peptides/tri-peptides have been proven to be better than “single” amino acids (3, 8). Smaller hydrolyzed peptides are also reported to reduce the allergic response more effectively than regular proteins during infancy and early childhood (10). Other than our existing small peptides ingredients, Simpson Biotech also provides OEM service to hydrolyze the selected protein raw materials provided by clients.
- **Bio-activities of small peptides** The Angiotensin Converting Enzyme Inhibitor (ACEI) activity and anti-oxidation activity was detected in some hydrolyzed peptide which may help maintain normal blood pressure. There are many other biological functions investigated for soy peptides including supporting normal cholesterol, modulate immune response and anti-oxidation (2, 4, 7).

Simpson Biotech Soy Peptide (SBSP) – for energy drinks & nutrition

Simpson Biotech's soy peptide (SBSP) uses defatted soybean meal as raw material, which has high protein contents and valuable polysaccharides. During the hydrolysis process, these proteins and polysaccharides are converted into small peptides and bioactive oligosaccharides with prebiotic properties. The SBSP contains higher content of easily-absorbed low molecular weight peptides than other commercial products and released the bitterness presenting amino acids (BCAA, Phe, Arg) from peptides (Fig. 1 & Table 1). A comparative analysis of ACE inhibitory activity (ACEI, which helps maintain blood pressure), DPPH radical scavenging activity (anti-oxidation index), acid-soluble protein, and salt content of soy peptide products revealed that SBSP exhibited superior anti-oxidation activity and similar ACEI effectiveness compared to a Japanese peptide product (Table 2). Additionally, the significantly lower salt content in SBSP helps minimize the risk of blood pressure associated with excessive salt intake.

Figure 1. Comparison of molecular weight and amino acids distribution of soy peptide product from Simpson Biotech and other commercial products.



Who needs Simpson Biotech Soy Peptide

1. Children and sports enthusiasts for muscle growth
2. Sportsmen for muscle recovery and soreness relief
3. Patients requiring nutrition with good absorption
4. Post-partum women

Who needs Simpson Biotech Soy Peptide

1. Sport drink for energy and muscle building
2. Healthy drink for maintaining normal blood pressure
3. Powder or capsule dietary supplement
4. Cereal
5. Yogurt or milk
6. Juice

Characteristics

- Low bitterness taste by proprietary de-bitterness technique
- High percentage of low molecular functional peptides
- Bitterness taste masking for drink/food industry
- Low salt content
- Seasoning: Yeast extract-like flavor
- No artificial additives

Table 1. Comparison of the molecular weight (MW) and free amino acids of soy peptide from Simpson Biotech and Japanese companies by HPLC. (Di-peptides & Tri-peptides are both 400Da (0.4kDa); Avg. Amino Acid MW is 110~125 Da)

Product	Total area	Percentage of area (%)					Free amino acid
		>6.5 kDa	6.5~1.3 kDa	1.3~0.4 kDa	<0.4 kDa	<1.3 kDa(~12AA)	
Simpson	16.2*10 ⁷	0.40	14.40	20.10	65.10	85.20	14.0
Japan-A	27.3*10 ⁷	5.70	36.10	27.10	31.20	58.30	1.60
Japan-B	26.2*10 ⁷	3.40	29.20	32.60	34.80	67.40	2.65

Table 2. Comparison of the ACEI, DPPH, acid-soluble protein and salt content of soy peptide products from Simpson Biotech and Japanese company.

Product	ACEI IC50 (mg/ml) (blood pressure)	DPPH IC50 (mg/ml) (anti-oxidation)	Acid-soluble protein (%)	Salt content (%)
Simpson	0.631	29~44	50.30	<0.6
Japan	0.626	>100	66.48	4.85

Simpson Biotech Collagen Peptide (SBCP) – best for cosmetics & cosmetic drinks

Simpson Biotech collagen peptide (SBCP) uses fish scale collagen as the raw material. Fish scales contain much less (off-flavor) fat and have more collagen than those in fish skin or even in pig or cattle skin. Besides, the biohazard of human diseases and viruses from fish scale is much less when compared with those from pig or cattle. Hydrolyzing collagen into small peptides is even more difficult than hydrolyzing soy and other proteins. The market-leading product contains only about 15% di-peptide/tri-peptide while SBCP leads the market as the only commercial product with >30% di-peptide / tri-peptide (Fig. 2 & Table 3). The collagen di-peptides and tri-peptides are able to penetrate and be absorbed by human skin, which is particularly critical for cosmetic application. For cosmetic drink purpose, low bitterness taste is especially important because large quantities (5 g/day/adult) are needed for effectiveness.

Figure 2. Comparison of molecular weight distribution of fish scale collagen peptide product from Simpson Biotech and Japanese companies.

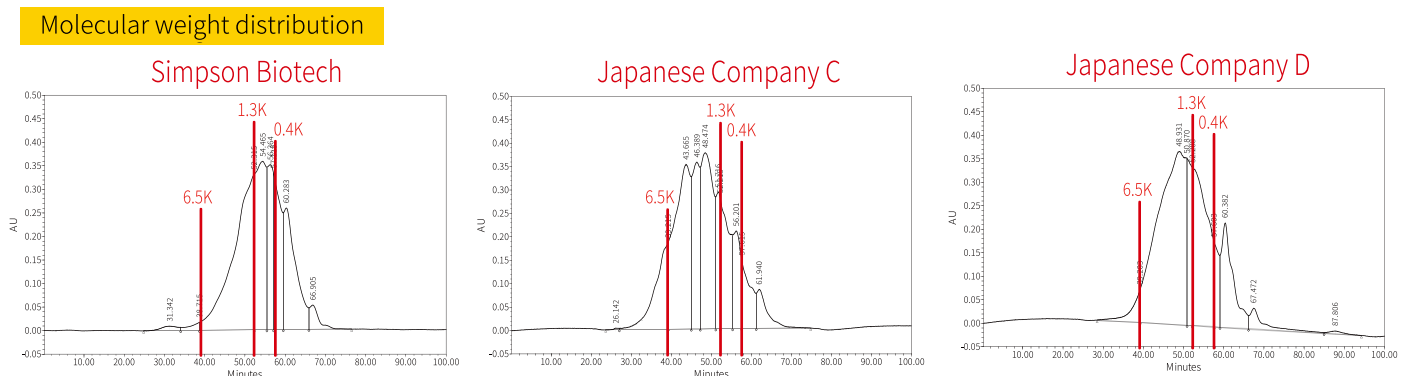


Table 3. Comparison of the molecular weight and free amino acids of fish scale collagen peptide products from Simpson Biotech and Japanese companies by HPLC.

Product	Total area	Percentage of area (%)					Free amino acid
		>6.5 kDa	6.5~1.3 kDa	1.3~0.4 kDa	<0.4 kDa	<1.3 kDa(~12AA)	
Simpson	27.6*10 ⁷	0.50	18.10	32.50	48.90	81.40	13.51
Japan-C	38.8*10 ⁷	10.60	62.20	17.70	9.50	27.20	3.04
Japan-D	37.6*10 ⁷	2.70	54.80	23.20	19.30	42.50	13.78

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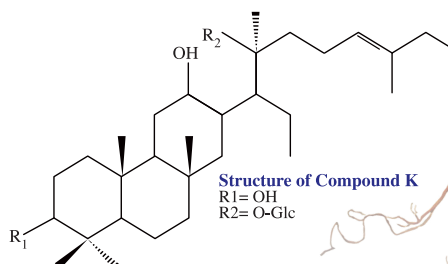
Natural Functional Ingredients by Fermentation

Ginsenoside Compound K & Fermented Ginseng

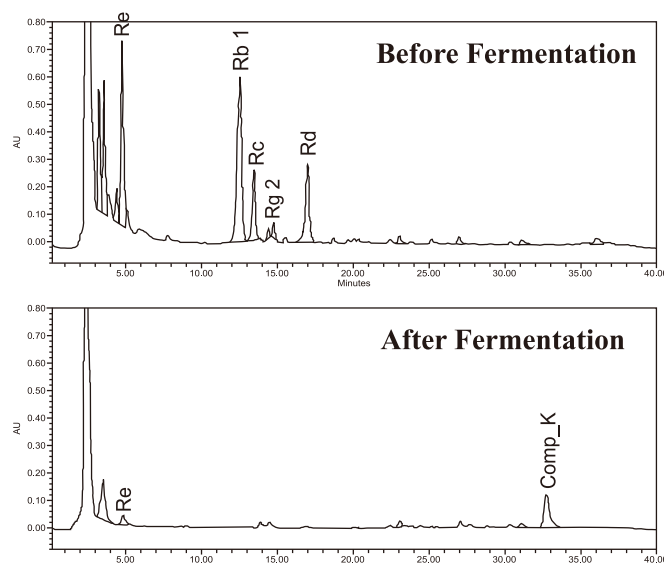
- Helps improve memory
- Immune function support
- Reduce the appearance of wrinkle
- Neurological health
- Ginseng flavor enhancer
- Moisture retaining cosmetic
- Healthy cell growth

Ginseng is the king of Traditional Chinese Medicine. Ginsenosides have long been reported to be the most important active ingredients of ginseng. Ginseng belongs to the genus *Panax* of the family Araliaceae which includes eleven different species in the world. Among them, *Panax ginseng* (Asian ginseng), *Panax quinquefolius* (American ginseng) and *Panax notoginseng* (三七) are the three major specie for commercial applications. American ginseng has a relatively high protopanaxadiols to protopanaxatriols ratio and is reported to have a better effect on acute post-prandial glycemic indices in healthy humans compared to Asian ginseng.

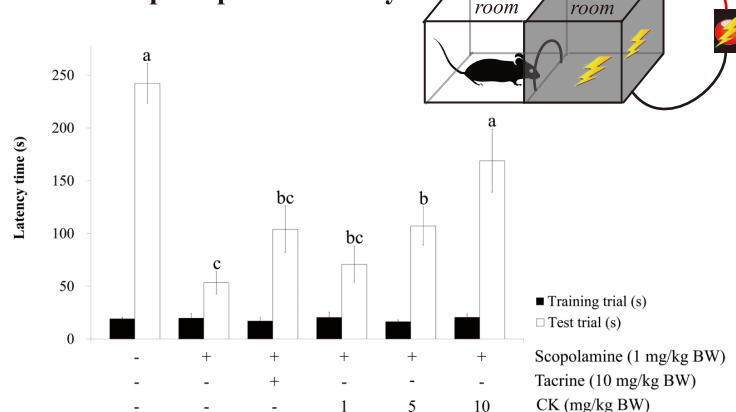
In the last 30 years, scientists finally concluded that Compound K (CK), the ginsenoside active form of intestinal bacteria metabolite after oral administration, is the most important ginsenoside metabolite with numerous healthy benefits such as immune function support for healthy cell growth, improve cognitive function and neurological health. Due to the metabolic biotransformation of native protopanaxadiols (ginsenosides such as Rb1, Rb2, Re, etc.), which involves the removal of three out of four specific glucose side chains to form compound K (CK), replicating this natural process is both difficult and slow. It is generally believed that CK can only be found in ginseng's flower and fruit and that natural microbial biotransformation must be involved in the formation of CK. Recently, fermentation processes are more and more popular to produce CK-enriched ginseng. However, the price of CK is still extremely high (> 4,000,000 USD/kg, retail) and only a few suppliers exist due to the complicated fermentation process, expensive raw material, the difficulty of chemical synthesis, and the low bio-conversion rate.



HPLC profiles of ginsenosides of Simpson Biotech's Compound K product, before and after fermentation (American Ginseng Extract as Raw Material)



CK helps improve memory



J. Agric. Food Chem. 2016, 64, 2855-2864

Ginsenoside CK Products

CK-30: Powder with >30% CK

The highest CK content bulk product available in the market. Specially designed for cosmetic moisture, skin care and pharmaceutical application

CK-1.5: Powder with >1.5% CK

CK-0.15: Powder with >0.15% CK

Cost-effective bulk product as functional ingredient for dietary supplement

CK-0.15L: Liquid with >1.5% CK in alcohol

Designed with strong "Ginseng Flavor" boost for functional drinks