



### Proteoglycan is Extracted from Nasal Cartilage of Natural Salmon



Salmon is very popular and eaten widely in the world. Proteoglycan are extracted from the nasal cartilage of natural salmon.

Nasal cartilage of salmon called “Hizu”(Icy head), because it looks clear and beautiful, is eaten traditionally in Hokkaido and Tohoku region.

The ingredient is extracted from natural salmon of Hokkaido that is very familiar with Japanese people, so it has very reliable image.

Not only the image, from the catching the fishes to processing, all the process is done in Japan, so it have a strong traceability.

#### Expected Function & Recommended Dosage

For Beauty	5mg/day
For Joint Health	10mg/day

Improving skin conditions, Moisturising skin, Beautiful skin effect, Activating dermal papilla cell, Activating fibroblast and epidermal cell, Promoting collagen & hyaluronic acid generation, Reducing joint pain, Anti-inflammation effect

#### Uses

- ◎ Joint supplements, drinks and processed foods
- ◎ Beauty supplements, drinks and processed foods
- ◎ Ingredient for cosmetics (Keeping skin more moistured, supple, whitened)

#### Production Process



#### Display Name Example

- ◎ Salmon Nasal Cartilage Extract
- ◎ Salmon Nasal Cartilage Extract(contains proteoglycan)

#### Indication for Cosmetics

INCI	Indicated Name
Soluble Proteoglycan	Soluble Proteoglycan
Butylene Glycol	BG
Water	Water

#### Quality Standard Composition

	Proteoglycan Powder	Proteoglycan Solution
Material	Nasal cartilage of salmon	
Property	Light yellow powder with its original scent	Light yellow liquid with its original scent
Molecularweight (HPLC)	900,000 – 1,400,000 Dalton	
Proteoglycan	More than 93%	0.7~1.3%
pH	7.0~8.5	7.0~8.5
Heavy metal (Pb)	Less than 20ppm	Less than 20ppm
Arsenic	Less than 2ppm	Less than 2ppm
Viable count for bacteria	Less than 3,000 pcs/g	Less than 300 pcs/g
Coliform bacteria	Negative	Negative
Mold·Yeast	Less than 300 pcs/g	—

#### Other

Quantity	Proteoglycan Powder: 100g, 1kg Proteoglycan Solution: 1kg, 5kg
Shelf life	2 years from the production date
Storage condition	Keep in cool dry place, and avoid direct sunlight.

#### Company Information

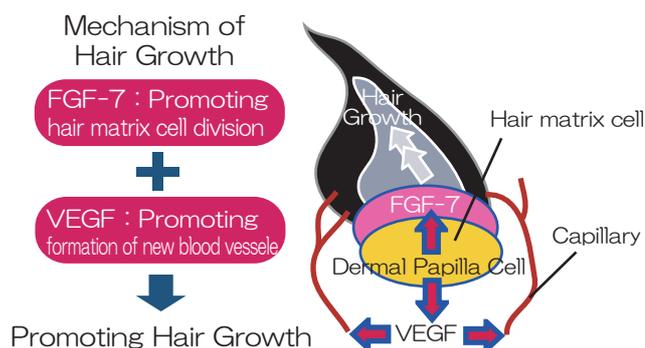
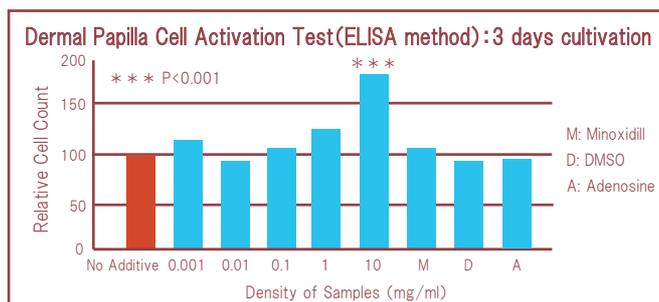
### ■ What is Proteoglycan?

Proteoglycan is a kind of glycoprotein in a broad sense that sulfated polysaccharide called glycosaminoglycan such as chondroitin sulfate, dermatan sulfate, heparan sulfate, heparin and keratan sulfate covalently bonded to the protein. Proteoglycan is present in the extracellular matrix and cell surfaces of animals. It is also present in the fibrous matrix and the cell surface of hyaluronic acid and collagen, and forming a fibrous matrix proteins and complex of hyaluronic acid and collagen.

### ■ Promoting Hair Growth and Inhibiting Hair Loss



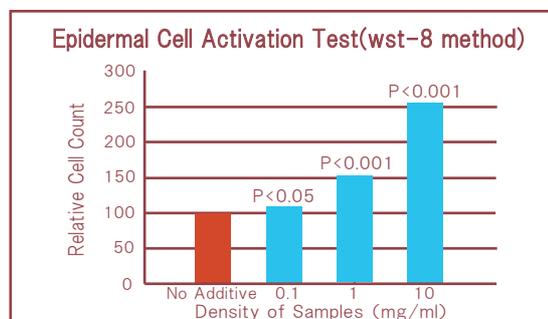
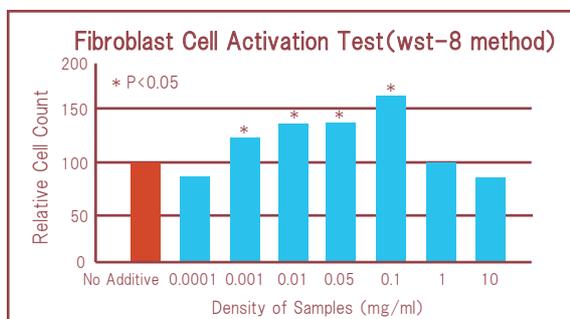
Derma papilla cell activation test is performed with proteoglycan addition group and non-addition group by using normal human derma papilla cells. As a result of the test, high cell activation in the addition group is observed. From the above, high skin regeneration effect with proteoglycan is assumed. VEGF (vascular endothelial growth factor) production, FGF-7 (fibroblast growth factor) production and TGF-β2 (hair loss factor) production test are performed. As a result of the test, promoting cell division and inhibiting hair loss factor are observed in the addition group. From the above, hair growth promoting effect and hair loss inhibiting effect with proteoglycan are assumed.



### ■ Regeneration of Skin



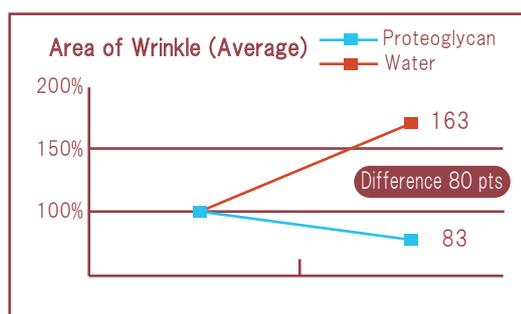
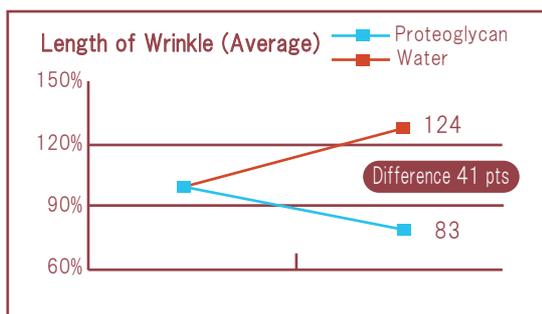
Cell activation test is performed with proteoglycan addition group and non-addition group by using normal human epidermal cells and normal human fibroblast cells. As a result of the test, high cell activation in the addition group is observed. From the above, high skin regeneration effect with proteoglycan is assumed.



### ■ Evaluation of Skin Symptom Improvement



Application of an aqueous solution of 1% proteoglycan solution resulted in an improvement in skin wrinkle, sebum moisture transpiration, and skin elastic return rate. As a result of the test, it is assumed that water-soluble proteoglycan has an effect of improving skin symptoms.



### Company Information