

Collagen-Trip20G

Halal
certified

GMP
certified



Fish collagen tripeptide

- 1 Body structure** | Strengthens skin, hair, nail, corneas, cartilage, bones, blood vessels, gut, intervertebral discs, and the dentin in teeth
- 2 Anti-aging** | Prevents and improves any signs of skin aging : Inhibition of wrinkle formation, better moisture retention, smoothness and suppleness
- 3 Wound healing** | Promotes repairing the damaged tissue in skin or joint

What is it?

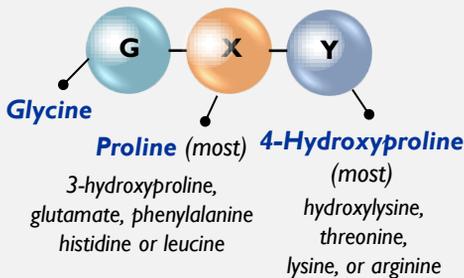
Collagen tripeptide

approx. 3,000 amino acids

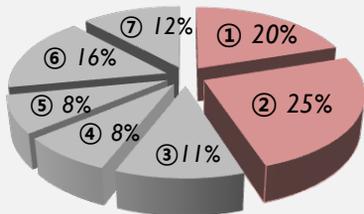


3 amino acids

Collagen tripeptide



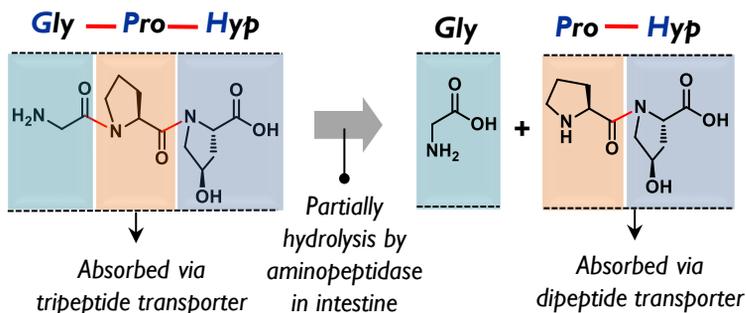
Collagen amino acids composition



- ① **Glycine**, ② **Proline & hydroxyproline**
- ③ Glutamic acid, ④ Arginine, ⑤ Alanine,
- ⑥ Essential amino acids, ⑦ Others

- Structure of collagen is in the form of a **triple helix**, a set of three polypeptide strands with the same axis, held together in a helical conformation by hydrogen bonds.
- A **minimum unit** of collagen is **tripeptide**, composed of **3 amino acids**, sized 1/1000 of collagen
- The most abundant amino acids in collagen are **Glycine (Gly, G)**, **Proline (Pro, P)** and **Hydroxyproline (Hyp)**.
- The most common primary motifs in the amino acid sequence of collagen are **glycine-proline-X** and **glycine-X-hydroxyproline**, where X is any amino acid other than glycine, proline or hydroxyproline.

Gly-Pro-Hyp hydrolysis and absorption



: Orally supplemented **GPH** passes through the stomach, reaches the intestine and then is absorbed into the body in the form GPH itself or as dipeptide, **PH**.

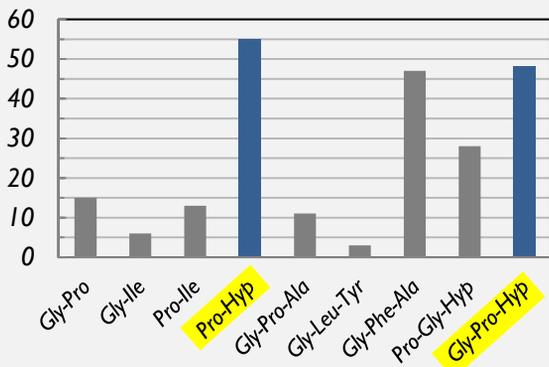
— : Amide bond

Gly-Pro-Hyp

The crucial role of GPH and PH

► Proc.Natl. Acad. Sci. 1978; 75(2): 871-875

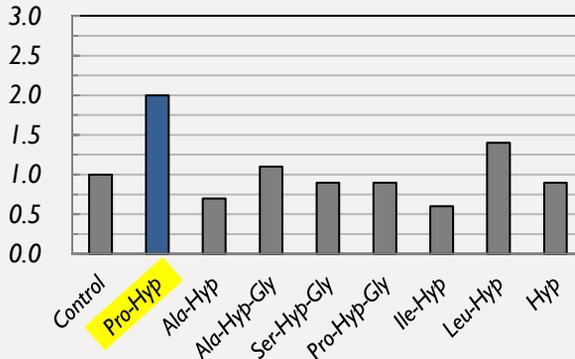
Chemotactic activity of fibroblasts



: **GPH** and **PH**, dipeptides hydrolysed from tripeptide functions as **chemotactic stimuli for fibroblasts in skin to repair the damaged tissue**.

► J Dermatol. 2010; 37, 330-338

Relative HAS2 mRNA expression (fold increase)



: **PH**, increased the expression of hyaluronan synthase 2 (HAS2) by 2.3-fold, the indicator of **skin moisture content**.

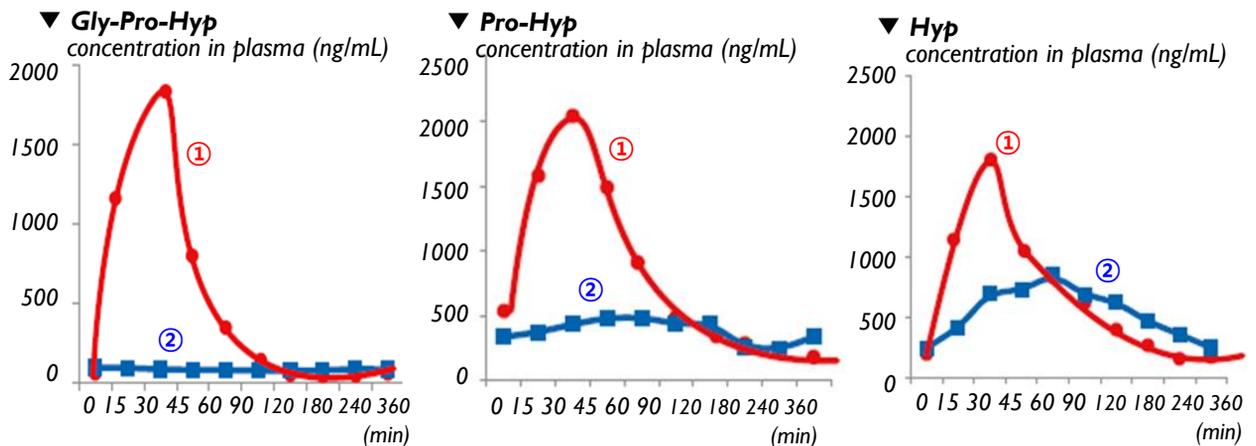
Collagen-Trip20G

Competitiveness

Collagen-Trip20G has **great and fast absorption**

- ▶ J. Agric. Food Chem. 2016; 64:7127-7133
- ▶ Orally available collagen tripeptide: tripeptide dramatically increased the stability, intestinal permeability, and absorption of Gly-Pro-Hyp and Pro-Hyp

Animal test | ① Collagen-Trip20G (MW <500Da, GPH content >3.2%) 500mg/kg (rat, n=12)
② Collagen peptide (MW <500Da, GPH content none) 500mg/kg (rat, n=12)



GPH, PH, and Hyp were better absorbed and reached higher plasma levels after the oral administration of **Collagen-Trip20G** in rats compared to **Collagen peptide**.

Higher and faster absorption of ① **Collagen-Trip20G** than other ② **Collagen peptide**

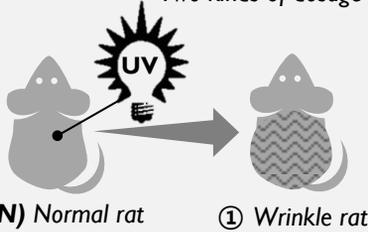
► Researches in progress by the Amicogen, Inc.

• Effect of oral Collagen-Trip20G supplementation on skin wrinkle and hydration

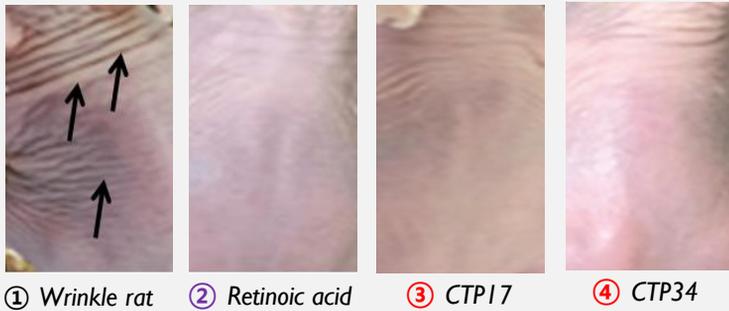
I. Animal test | By irradiation of ultraviolet B on rats, wrinkles were formed.

Retinoic acid was treated via peritoneal injection as positive group.

Two kinds of dosage of Collagen-Tripep20S were administered orally.

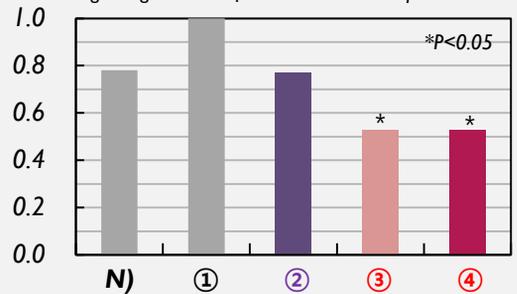


- ① Control: UVB-induced
- ② Positive: UVB-induced+ Retinoic acid 0.5mg/kg
- ③ CTP17: UVB-induced +Collagen-Trip20G 17mg/kg for 14 weeks
- ④ CTP34: UVB-induced+Collagen-Trip20G 34mg/kg for 14 weeks

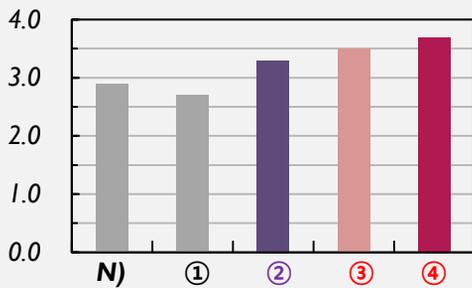


▼ MMP-1/GAPDH

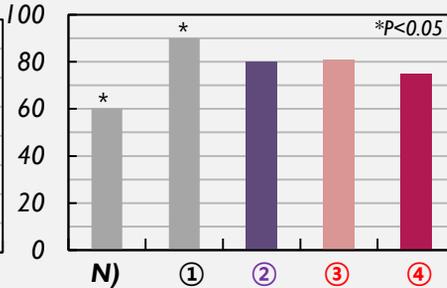
: which reflects the activity of matrix metalloprotease degrading all kinds of extracellular matrix proteins



▼ Skin Moisture index



▼ Transepidermal water loss (g/nm² per hour)



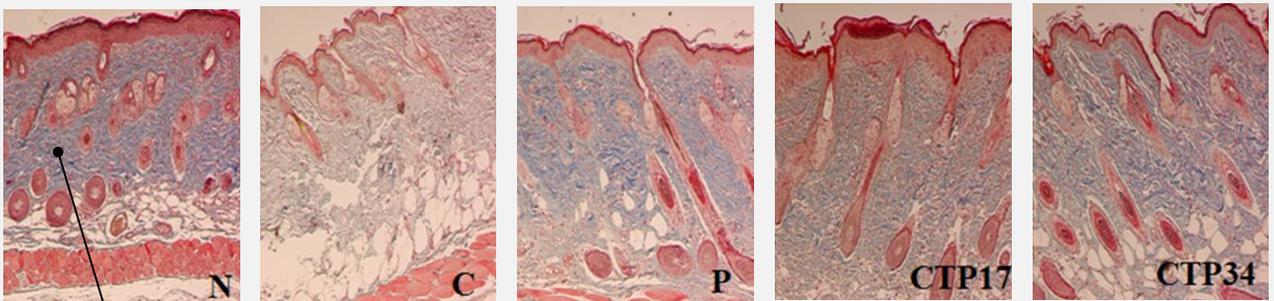
Collagen-Trip20G

1. Wrinkles on skin reduced
2. MMP-1 activity reduced which means degradation of extracellular matrix reduced
3. Skin moisturized
4. Loss of water reduced

II. Histological observation | on Balb/C mouse and NC/Nga Tnd mouse skin

after treatment of Collagen-Trip20G ③ 17mg/kg and ④ 34mg/kg (Masson's trichrome, X100)

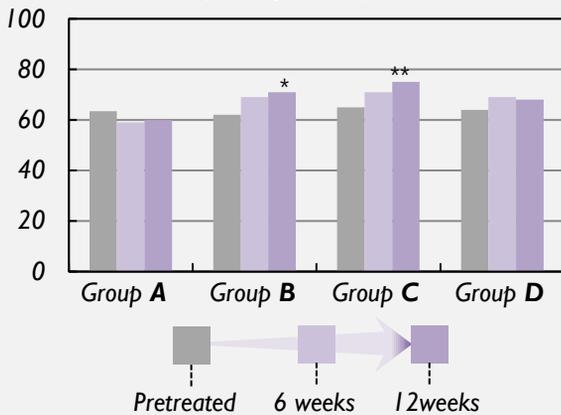
N: normal Balb/C mice, **C:** NC/Nga Tnd mouse model for atopic dermatitis, **P:** positive control, N-acetyl-glucosamine 17mg/kg, **CTP17:** Collagen-Tripep20S 17mg/kg, **CTP34:** Collagen-Tripep20S 34mg/kg, feeding duration: 4 weeks



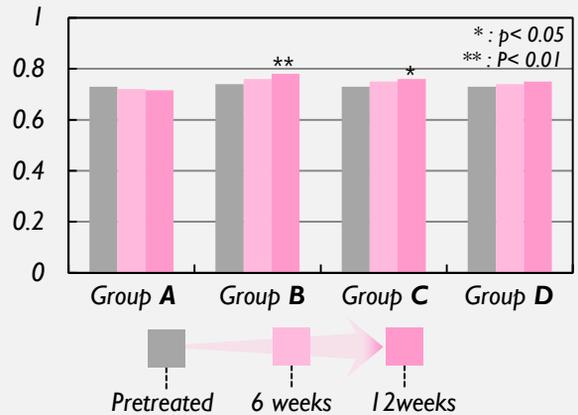
Blue stained parts indicate collagen, disrupted collagen structure in (C) recovered by taking Collagen-Trip20G in a dose-dependent manner showing the thick blue staining

• Effects of collagen tripeptide supplementation on skin properties: A prospective, randomized, controlled study

▼ Corneometer (skin hydration)



▼ Cutometer (elasticity)



Clinical trial | 32 healthy volunteers were oral treated either A, B, C, or D daily for 12 weeks. Skin properties evaluated including hydration and elasticity by corneometer and cutometer, respectively

- Group A: no collagen
- Group B: collagen tripeptide 3 g
- Group C: collagen tripeptide 3 g + vitamin C 500 mg
- Group D: vitamin C 500 mg

- Significant changes between control group and collagen tripeptide-supplemented group
- Daily collagen tripeptide supplementation improves skin hydration and elasticity.

Effect on hair growth

▶ Researches in progress by the Amicogen, Inc.

Animal test |

- ① Control mice: hair removed in degenerative status
- ② Drug for treatment of androgenic alopecia
- ③ Orally treated Collagen-Trip20G for 17 days



- ① Control
- ② Minoxidil (Positive control)
- ③ Collagen-Trip20G

Application

1 Skin beauty: Prevents and improves any signs of skin aging

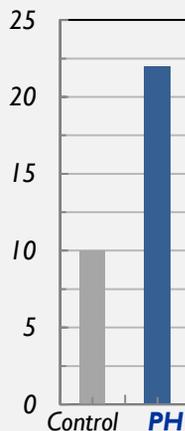
2 Joint health: Improves joint comfort

3 Hair & nail care: Promoting regeneration

Effect on joint health

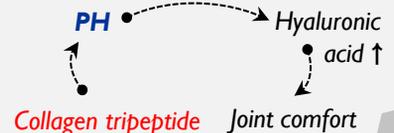
▶ J Dermatol. 2010; 37(4), 330-338

▼ Hyaluronic acid (µg/well)



• Collagen-derived dipeptide, PH (proline-hydroxyproline) stimulates hyaluronic acid synthesis at a dose of 50 µg/mL for 48min in the synovium cell

• In patients with degenerative arthritis, hyaluronic acid synthesis factor of joint synovial membrane decreased, while hyaluronidase 2 increased



▼ Available dosage form



And can be used as food & beverage additives

▶ Recommended dosage | 1.0~1.5g/day