

## TECH OFFER

### A Cost-Effective, Plant-based Collagen Precursor for Skin Vitality and Immune Defense



#### KEY INFORMATION

TECHNOLOGY CATEGORY:

**Foods** - Ingredients

**Materials** - Bio Materials

**Healthcare** - Pharmaceuticals & Therapeutics

**Sustainability** - Sustainable Living

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175298**

#### OVERVIEW

Collagen is the body's most abundant protein, making up 25-35% of all proteins. It's a vital component of connective tissues in skin, bones, tendons, ligaments, and cartilage.

Primarily composed of amino acids—30% glycine, 20% proline, and 10% hydroxyproline—collagen's unique triple-helix structure delivers exceptional strength, elasticity, and flexibility. It supports skin, nail, and hair health, boosts bone density, reduces osteoporosis risk, and enhances gut health.

Common sources of collagen include meat, bone broth, fish, gelatin, and dairy. However, traditional collagen products often rely on animal or marine sources, using harsh chemical extraction methods that risk contamination, pose health hazards, and contribute to environmental destruction through waste and animal cruelty.

This plant-based collagen precursor powder offers a clean, functional, sustainable, eco-friendly alternative (no e number ingredients).

The formulation is enriched with amino acids, vitamins, and antioxidants, vital for collagen synthesis and stability, supporting muscle structure, and reducing collagen breakdown.

Rigorously tested for functionality and safety, it avoids harmful chemicals and animal exploitation, significantly reducing environmental impact. The technology owner seeks to work with the OEMs of FMCG/CPGs to incorporate the functional blend in varied foods.

## TECHNOLOGY FEATURES & SPECIFICATIONS

- The innovation is a plant-only collagen precursor that enhances the absorption of immune-boosting compounds and promotes collagen synthesis, as evidenced by in-house cell line analysis. It effectively reduces collagen breakdown while being cost-efficient compared to other market options.
- Uniquely, it is 100% water-soluble, allowing for easy incorporation into food products without altering taste. This comprehensive formulation provides essential amino acids that support the body's natural collagen production.
- Fortified with Vitamin C, which catalyses crucial enzymatic processes for collagen metabolism, it also features a plant extract blend rich in antioxidants, silica, and Vitamin C. Silica stimulates fibroblast proliferation and growth factor release (like TNF- $\alpha$  and TGF- $\beta$ ), aiding collagen synthesis.

These blends offer anti-photoaging and anti-inflammatory benefits, enhancing wound healing and supporting collagen production. Some studies suggest that liquid collagen may be absorbed more rapidly into the bloodstream than capsules, making this technology a compelling choice for those seeking optimal collagen support.

## POTENTIAL APPLICATIONS

This collagen Precursor Powder can be used in a variety of products -

- Confectionery
- Sports Beverages
- Protein shakes
- Energy drinks
- Bars/Gummies

## MARKET TRENDS & OPPORTUNITIES

- The collagen market was valued at approximately **\$4.5 billion** and was projected to grow at a compound annual growth rate (CAGR) of around **6-8%** over the next several years.
- While smaller, the plant-based collagen market has gained traction rapidly, driven by increasing consumer interest in vegan and sustainable products. Due to rising health consciousness and demand for clean-label ingredients, it is expected to grow at a similar or even higher CAGR.

## UNIQUE VALUE PROPOSITION

- Sustainable and Clean: The functional blend is a 100% plant-based collagen precursor with no E-number ingredients, offering a functional and sustainable solution for collagen synthesis.
- Proven Efficacy: In-house cell line studies demonstrate a 5-fold increase in collagen levels compared to untreated cells and traditional animal-based products.
- Enhanced Absorption: The functional blend ensures superior collagen precursor amino acids absorption, effectively supporting muscle structure and reducing breakdown.
- Rich Nutrient Profile: Enriched with essential amino acids, antioxidants, and Vitamin C, it promotes collagen metabolism and overall skin health.
- Versatile and Flavorless: 100% water-soluble and without off-taste, the functional blend can be easily incorporated into various foods and beverages, catering to diverse dietary preferences.
- Regulatory compliance - Ingredients used in the formulation are considered as GRAS. The ingredients incorporated into the formulations are approved by the regulatory bodies of the following countries: the US, Singapore, Europe, and India^^.

A dossier and support can be provided if required for any specific approvals.

^^Internal reports on the ingredient approval will be provided if requested during the advanced stages of the project.