



NOT ALL COLLAGENS ARE ALIKE!™

BIOCELL COLLAGEN® WHITE PAPER

EXECUTIVE SUMMARY

BioCell Collagen® is a scientifically backed dietary supplement ingredient that addresses the age-related physiological degradation of connective tissue and the associated age-related loss of their structurally essential molecules. This is achieved because of BioCell Collagen's unique synergistic ingredient composition of naturally occurring, hydrolyzed collagen type II peptides, chondroitin sulfate and hyaluronic acid. BioCell is not a blend of individual ingredients, but a bioavailable collagen matrix derived from chicken sternal cartilage. Seven human clinical trials support the safety, functionality, and bioavailability of BioCell Collagen®. BioCell Collagen is non-GMO and free of gluten, soy, shellfish, fish, egg, milk, peanuts, and sugar. A daily serving of 1-gram BioCell Collagen helps with facial lines and wrinkles and skin elasticity by promoting skin collagen & hyaluronic acid. A 2-gram daily serving helps with joint pain from Osteoarthritis by promoting joint comfort and mobility. In addition to the foregoing, preliminary data suggests that BioCell Collagen promotes post-workout recovery (3-gram daily serving).

Aging is an innate process producing physiological changes which affect how we perceive and feel about our bodies. Aging depends, at least in part, upon the organizational integrity of the connective tissue which binds all organs and tissues of the body. Aging slowly weakens this matrix of collagen, glycosaminoglycans (GAGs), and proteoglycans collectively called the

connective tissue or the extracellular matrix (ECM) by depleting these components over time. Ultraviolet light-initiated photo-damage and certain lifestyle risk factors such as smoking or chronic exposure to environmental pollutants are some of the factors which hasten the process of aging.

The progression of aging and the steady deterioration of the connective tissue results from decreased synthesis and increased degradation of essential molecules of the ECM such as collagen, GAGs such as chondroitin sulfate (CS) and hyaluronic acid (HA) as they

are key molecules essential for healthy structure and function of the dermal matrix. Both the natural and photo-aging processes entail the degradation of the skin's collagen (types I & III) and HA, causing the dermal layer to deteriorate and to exhibit visible effects of aging such as wrinkles, fine lines, skin dehydration, and scaling (Figure 6). However, it is possible to counteract these effects and revitalize the skin with BioCell Collagen supplementation, by promoting collagen production in the skin.

The replenishment of these important components could help counteract various

undesirable effects of aging. These effects include age-related loss of muscle tone and vulnerability to injury, and visible facial changes.*

Nutraceuticals have been used for several decades to promote healthy aging. However, very few science backed dietary supplements on the market address the age-related physiological degradation of connective tissue and the associated age-related loss of their structurally essential molecules. Among these nutraceuticals is a healthy aging dietary supplement ingredient trademarked BioCell Collagen®, developed and distributed by BioCell Technology, LLC of Irvine, CA USA. Multiple human clinical trials, including safety, functionality, and bioavailability studies, have demonstrated that oral ingestion of BioCell Collagen® helps with joint pain associated with Osteoarthritis while also promoting skin beauty.*

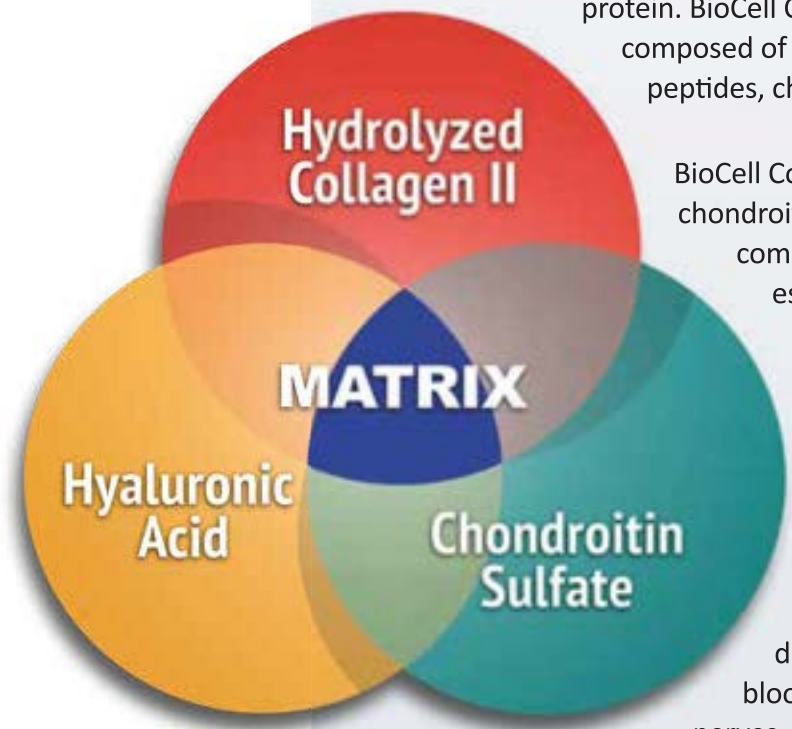


UNIQUE MOLECULAR NATURE

“NOT ALL COLLAGENS ARE ALIKE!™”

There are at least 28 different types of collagens found in the body. Much diversity exists between ingredients in the collagen space that can impact effectiveness depending on many factors, including type, source, molecular composition, molecular weight, and manufacturing process. BioCell

Collagen® is much more than an isolated or purified collagen protein. BioCell Collagen® is a unique synergistic ingredient composed of naturally occurring hydrolyzed collagen type II peptides, chondroitin sulfate, and hyaluronic acid.



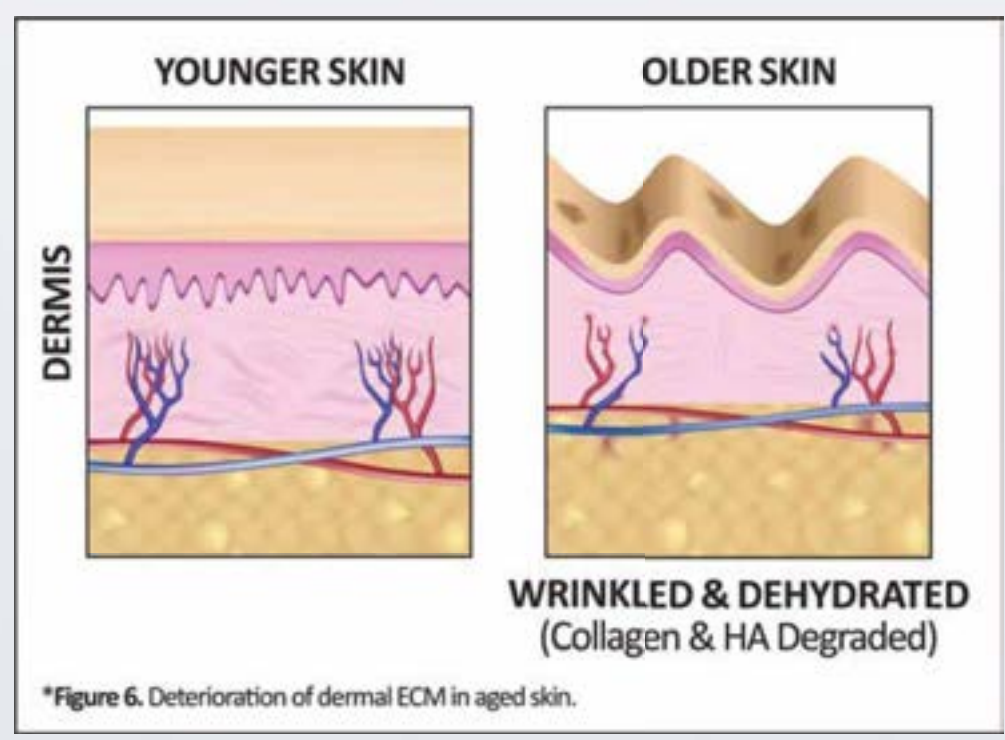
BioCell Collagen® is not a blend of isolated collagen, chondroitin, and hyaluronic acid. The utility of the complex matrix of molecules has been clinically established. One cannot expect the same results from using isolated molecules or ingredient blends.* BioCell Collagen® is derived exclusively from hormone and antibiotic-free chicken sternal cartilage, a rich source of type II collagen, hyaluronic acid, and chondroitin sulfate, which closely mirrors the composition of human articular cartilage. Chicken cartilage is a clean and desirable source because it is free from the blood supply and devoid of lymphatics and nerves, unlike other parts of the carcasses of fish, cows, pigs, or chicken used to manufacture most collagen ingredients on the market, including gelatin. Gelatin products may also be referred to as hydrolyzed

UNIQUE SYNERGISTIC INGREDIENT

collagen, collagen hydrolysate, gelatine hydrolysate, hydrolyzed gelatine, collagen type I, collagen type I & III, multi-collagen, and collagen peptides after it has undergone hydrolysis to enhance bioavailability. These products, including bone broth powders, typically contain high protein content (>90%) and are predominantly Type I collagen since it is the most abundant collagen in the body. The effective daily amounts of collagen peptides typically range from 2.5 to 15-gram. On the other hand, Type II collagen is valuable due to the scarcity of its source and unique molecular composition. Type II collagen comes from cartilage, making up most of the protein content, and coexists with GAGs CS and HA. BioCell Collagen® has a clinically established daily use of 1 to 2-gram.*

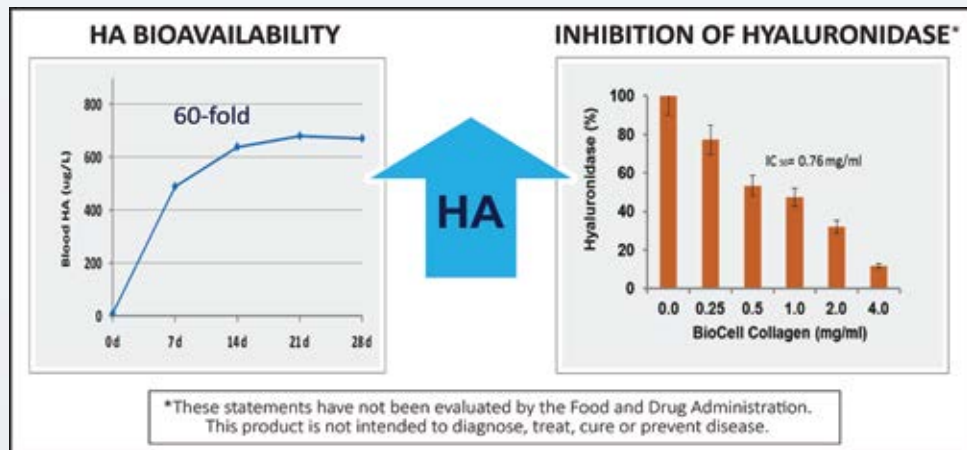
EVIDENCE-BASED SCIENTIFIC RESEARCH

Clinical studies suggest that ingestion of BioCell Collagen® stimulates production of fibroblasts which have a pivotal role in skin renewal and of chondrocytes which play a key role in the renewal mechanism of cartilage, thus supporting all three major collagen types (I, II, and III). Moreover, BioCell Collagen® demonstrated concentration-dependent inhibition of hyaluronidase, the enzyme that degrades hyaluronic acid, contributing to signs of aging on the skin and loss of viscoelasticity of joint synovial fluid. BioCell Collagen® also attenuates deleterious changes in biomarkers including creatine kinase, lactate



dehydrogenase, and C-reactive protein, adding further clues into its mechanism of action (Lopez et al., 2014).* In a published randomized, double-blind, placebo-controlled clinical trial, 500 mg of BioCell Collagen®, taken twice daily, was found to help reduce the signs of skin aging. This study evaluated the use of BioCell Collagen® among 128 women aged 39-59 (Schwartz et al. Altern Ther Health Med. 2019 Sep;25(5):12-29.). A measurable improvement in signs of aging in women, represented by the appearance of increased skin elasticity, and improvement in depth and number of fine lines and wrinkles was seen in these women within 12 weeks of daily use of 1-gram of BioCell Collagen®. These results corroborated the results of an earlier study that found ingestion of BioCell Collagen® enhanced blood microcirculation and reduced facial aging signs. (Schwartz, Park J, 2012).*

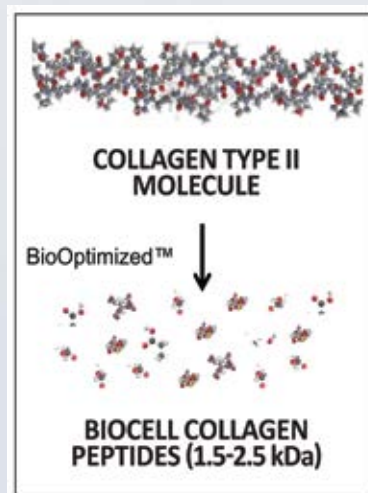
THE MANUFACTURING PROCESS

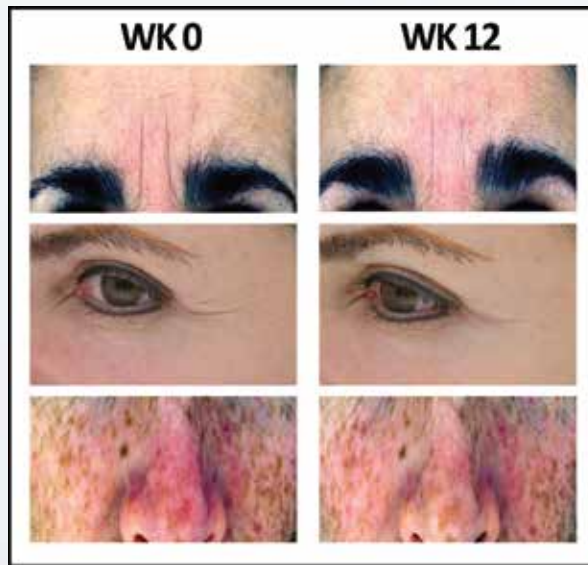


The manufacturing process of BioCell Collagen uses strict procedures that subject the chicken sternal cartilage through various processes, including filtration, purification, concentration, hydrolysis, sterilization, and testing to ensure consistent quality before distribution. BioCell Collagen is non-GMO and free of gluten, soy, shellfish, fish, egg, milk, peanuts, and sugar.

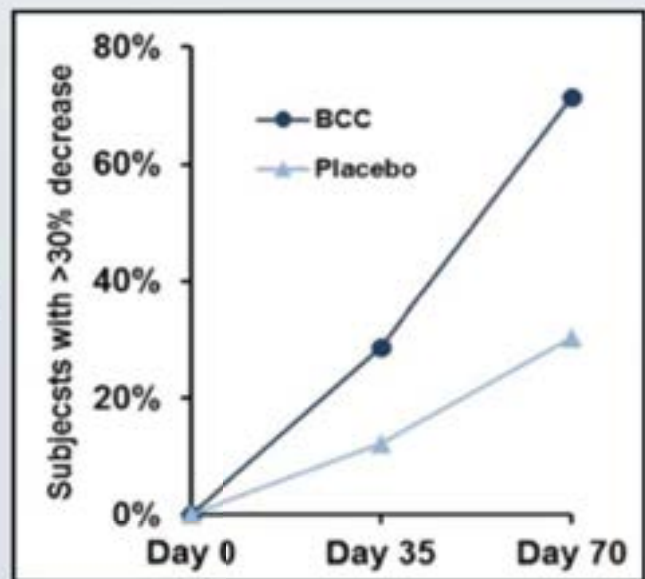
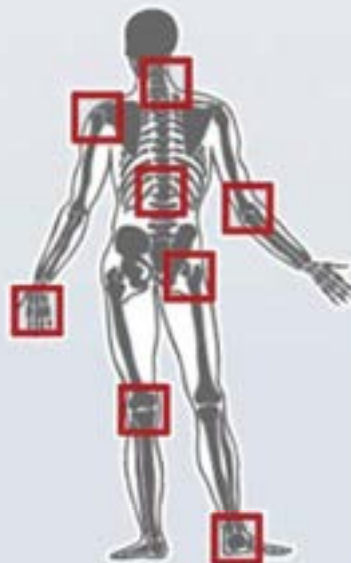
Bioavailability-Low Molecular weight

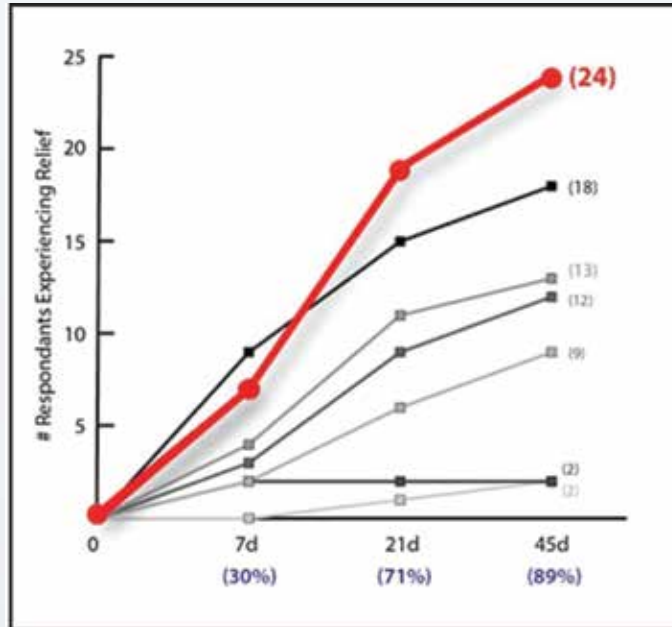
The native forms of collagen and GAGs are too large to be absorbed by our bodies. However, BioCell's innovative BioOptimized™ hydrolysis manufacturing process reduces them into very low molecular weight forms to ensure fast and effective absorption into the small intestine. A bioavailability study in human subjects showed that ingestion of BioCell Collagen (1500 mg/ day) elevated blood HA levels by sixty times at steady state when compared to the baseline levels (Figure 2).





In another randomized, double-blind, placebo-controlled human clinical trial, 80 subjects, who suffered joint pain from Osteoarthritis, were divided into 2 groups. One group ingested two grams of BioCell Collagen®, while the other ingested a placebo, daily for ten weeks. The subjects ingesting BioCell Collagen experienced statistically significant improvement in their joint pain and ability to engage in physical activities on days 35 and 70 (Schauss, Stenehjem, Park, Endres, Clewell, 2012). These results corroborated the results of another earlier double-blind placebo-controlled trial tested on sixteen people. (Kalman et al., 2004).* In a pilot randomized, double-blind placebo-controlled study of BioCell Collagen® on healthy recreationally active subjects, participants ingested three grams of BioCell Collagen® daily over six weeks before an upper-body muscle damaging resistance exercise challenge. Participants experienced favorable improvements in stress resilience and recovery after bouts of intense resistance exercise without any reported side effects (Lopez et al., 2014).* This preliminary data suggests that BioCell Collagen (3-gram/day) promotes workout recovery.





A published laboratory study found that daily ingestion of BioCell Collagen® reduced common signs of UVB-induced photoaging compared to the group that did not receive the supplement. The study found that oral supplementation with BioCell Collagen®, with controlled UVB exposure, resulted in reduced signs of photoaging, including significant decreases in wrinkles and transepidermal water loss, and significant increases in skin elasticity and hyaluronic acid (HA) content. (Phipps et al., 2020).*

CONCLUSIONS

Multiple human clinical studies have demonstrated that BioCell Collagen is bioavailable, safe, and functional for helping with Osteoarthritis joint pain, mobility and comfort as well as promoting skin health. These studies, together with the recent study on sports nutrition applications have demonstrated that BioCell Collagen provides a unique and comprehensive nutraceutical solution for rejuvenating healthy connective tissue throughout the body, thereby facilitating the activities of sportsmen, athletes, and people of active lifestyle.

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

CLINICALLY VALIDATED STRUCTURE-FUNCTION CLAIMS

Dietary supplements that contain a daily serving of 1-gram of BioCell Collagen® can help with:

- The reduction of facial lines and wrinkles*
- Improved skin elasticity*
- Promoting an increase in skin collagen after 12 weeks*
- Promoting healthy collagen production*

Dietary supplements that contain a daily serving of 2-grams of BioCell Collagen® can help with:

- Increasing hyaluronic acid*
- Promotes joint comfort and mobility*



NOT ALL COLLAGENS ARE ALIKE AND EVEN FEWER ARE HALAL CERTIFIED!

BioCell Collagen® now has a version that is halal certified by the IIDC (Islamic Information Documentation and Certification GmbH). IIDC is a globally renowned halal certifying agency which follow all protocols permissible according to Islamic law. This prestigious certification is accepted in nearly all Islamic countries. For those seeking top-quality halal-certified ingredients, including the 1.6 billion Muslims in the world, this certification provides consumers with transparency and trust in BioCell Collagen®.



BIOCELL TECHNOLOGY, LLC
20 TRUMAN STREET, SUITE 105
IRVINE, CA 92620 USA
PH: 714-632-1231

BIOCELL TECHNOLOGY INTERNATIONAL GMBH
GROTHWISCH 6 B
25482 APPEN GERMANY
PH: +49 (0) 4101 58 777 22

info@biocelltechnology.com | www.biocelltechnology.com

DISCLAIMER: BioCell Technology, LLC ("BioCell") makes no representations or warranties, express or implied, of the accuracy, reliability, or completeness of the information concerning this product or brochure, or its use or fitness for any purpose. BioCell disclaims all liability for any use of the information presented in this brochure. It is your responsibility to comply with all laws, rules and regulations regarding the manufacture, marketing, sale and/or use of the product. BioCell Collagen is available via a no-fee licensing agreement. See licensing agreement for more details.

BioCell Collagen®, Not All Collagens Are Alike™, and Lifetime Wellness™ variously in name and/or design, are trademarks of BioCell Technology, LLC, and are registered/protected in various jurisdictions.

©2024 BioCell Technology, LLC All rights reserved.