Glucosamine Chondroitin MSM + Hyaluronic Acid

INGREDIENTS
Glucosamine Chondroitin MSM + Hyaluronic Acid features a comprehensive suite of reliable ingredients to support joints and connective tissue in the body. The patented, award-winning ingredient BioCell Collagen® is derived from a naturally occurring matrix of constituents that is standard-ized to 20% chondroitin sulfate (CS) and 10% hyaluronic acid (HA), with approximately 60% Collagen Type II. Our formula also includes 1,500 mg of glucosamine sulfate (GS) and 1,000 mg of additional CS (above and beyond what is provided by the BioCell Collagen® ingredient), quantitatively matching or exceeding dosage amounts used in landmark clinical studies that have revealed the utility of these two pivotal ingredients towards joint health. Furthermore, Glucosamine Chondroitin MSM + Hyaluronic Acid features patented OptiMSM® methylsulfonylmethane, MSM distilled to be 99.9% pure. MSM is a naturally occurring nutrient that provides sulfur, used by the body to maintain normal connective tissues.

EXTENDED BENEFITS
• Promotes Healthy Joint Structure
• Enhances Joint Comfort and Mobility
• Helps Maintain Youthful Skin

BENEFITS
Superior Ingredients with an Outstanding Record
Glucosamine Chondroitin MSM + Hyaluronic Acid provides an all-in-one formula that brings together joint and skin health ingredients in substantial amounts. Glucosamine sulfate (GS) and chondroitin sulfate (CS) have been the topics of intense and fruitful research into joint health over the past few decades. Levels of GS & CS seen in the most acclaimed research are offered in this complete formula. Also in the formula are two vital structural components of the joint and skin that decline as we age: collagen type II and hyaluronic acid. The formula’s BioCell Collagen® furnishes these to help replenish the body’s natural supply, which in turn can support joint function and healthy skin.

BioCell Collagen® is hydrolyzed and denatured to low molecular weight compounds that increase the bioavailability and absorption of its components. In an absorption study of BioCell Collagen®, measurements revealed a gradual and significant increase of active total Hyaluronic Acid (HA) in the blood of test subjects after a single dose. In the same study, subjects taking BioCell Collagen® for 28 days maintained elevated blood levels of HA compared to initial levels. Glucosamine and chondroitin sulfates are often discussed together in scientific literature. In a recent meta-analysis of six studies involving 1,502 volunteers, it was determined that long-term daily supplementation with glucosamine sulfate (at 1,500 mg for at least 3 years) or chondroitin sulfate (at 800 mg for at least 2 years) supported maintenance of knee joint structure over the years, compared to placebo. In a recent report, a British physician and joint health specialist concluded that, “Glucosamine, chondroitin, and the combination of these two agents have stood the test of time.”

Glucosamine/methylsulfonylmethane combo formulations have also been successfully used to support joint function. In one study using a GS/MSM combination, a total of 118 subjects were randomized into one of four groups for 12 weeks: glucosamine (500 mg three times daily), MSM (500 mg three times daily), the combination of glucosamine and MSM, or a placebo treatment. Glucosamine alone and MSM alone were shown to enhance joint function, while the combination was found to be even more effective in supporting joint comfort and mobility, by both subjective and objective measurements.

Promotes Healthy Joint Structure
Enhances Joint Comfort and Mobility
Glucosamine Sulfate
Glucosamine sulfate (GS) supports joint function by supplying the body with dietary ingredients (glucosamine and sulfur) to help maintain healthy joints. Glucosamine, a monosaccharide that is essential to the formation of proteoglycans. These building blocks contribute to the maintenance of joints. Glucosamine, a monosaccharide that is essential to the formation of proteoglycans. These building blocks contribute to the maintenance of joints. Glucosamine, a monosaccharide that is essential to the formation of proteoglycans. These building blocks contribute to the maintenance of joints.

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sound joint structure, ultimately enhancing healthy joint function. Additionally, glucosamine inhibits unhelpful catabolic enzymes and can aid in the balance of interleukin-1β levels in synovial fluid. A recent in vitro investigation examining the molecular biology of chondrocytes found 18 different proteins that were modulated by glucosamine sulfate. In conjunction with other studies, this new evidence suggests that GS fights cytokine-mediated oxidative stress in chondrocytes.

In Europe, implementation of glucosamine for joint health has been studied for more than four decades, including some of the most comprehensive clinical trials on this ingredient. A 3-year, randomized, placebo-controlled and double-blind study of 202 subjects concluded that glucosamine sulfate is safe and effective in both promoting joint function and maintaining joint structure.

In addition to its value in influencing joint structure, research also backs the ability of GS to influence joint comfort. A short-term (4-week) randomized, double-blind, parallel-group study of 200 subjects showed that GS taken orally can indeed promote comfortable joint function. Similar results were obtained from a multicenter, randomized, placebo-controlled, double-blind, parallel-group study of 252 subjects, where joint comfort in the knee was found to be higher in the GS group. More recently, a study of 318 subjects found 1,500 mg of GS daily to be more effective than placebo in enhancing joint comfort. Key among findings from these types of studies is the reoccurring theme of a good safety profile for glucosamine sulfate; reported “side effects” of GS were essentially no different than placebo.

OptiMSM® Methylsulfonylmethane
Results from a randomized, double-blind, placebo-controlled pilot trial examining the effect of MSM supplementation on joint comfort in 50 men and women are promising. Subjects were administered OptiMSM® methylsulfonylmethane for 12 weeks, ramping up to 6 grams per day by the end of the first week (for the duration of the study). Those taking OptiMSM® experienced greater joint comfort than those taking placebo, suggesting potential for MSM as a joint support nutrient that warrants further investigation in larger clinical trials. MSM also produced statistically significant changes in urinary malondialdehyde (a marker of oxidative stress), suggesting a potential support role for MSM in metabolic processes requiring methylation, such as antioxidant capacities.

BioCell Collagen®
Components of BioCell Collagen® (collagen type II, chondroitin sulfate, and hyaluronic acid) can enhance the normal production of proteoglycans in the joint matrix, thereby helping maintain healthy joint structure. In a randomized, double-blind, placebo-controlled pilot study exploring the safety and effectiveness of BioCell Collagen® towards joint health, 16 subjects were enrolled to receive 2 grams of BioCell or placebo daily for 8 weeks. The subjects who were administered BioCell demonstrated significantly greater joint comfort, mobility, and quality of life over time, compared with placebo.

Chondroitin Sulfate
Chondroitin has been extensively researched for its effects on joint health. In a 6-month multicenter randomized, double blind, placebo-controlled trial of 146 volunteers, 400 mg of CS was administered three times daily (totaling 1,200 mg per day) for 3 months and changes in joint comfort were measured according to several clinical parameters. Significant improvements in comfort were noted after the first month, and they were maintained for three months after the subjects stopped taking the chondroitin sulfate. A subsequent study (similar in design) found that 1,200 mg of CS taken daily also improved subjective measurements of comfort and mobility among the 127 study volunteers; this study also determined that taking CS in a single daily dose of 1,200 mg granted the same benefits as taking three 400 mg doses daily.

Collagen Type II
The benefits of collagen type II in supporting healthy joint and skin function have been extensively researched in both animal and clinical studies. A randomized controlled trial conducted on 60 volunteers found that oral administration of chicken collagen type II for 3 months led to a significant increase in healthy joint structure, as compared to no measurable improvement in the placebo group. In another double-blind, placebo-controlled trial, 274 individuals were given collagen type II orally for 24 weeks. The supplement was shown to support healthy joint function, and no adverse effects were observed during this comprehensive clinical trial. Other studies have shown that hydrolyzed collagen provides a substantial advantage in bioavailability over non-hydrolyzed collagen, thereby having the potential to enhance healthy joint structure more efficiently.

Hyaluronic Acid
Hyaluronic Acid (HA) is a type of building block called a glycosaminoglycan, and it plays an important role in supporting the structural strength of joint tissue and the skin dermis. The physiological role of HA is underscored by its remarkable capability of retaining water molecules, which generates viscoelastic properties. HA plays dual roles for joint health. First, it is an essential structural component of proteoglycans such as aggrecans in the cartilage matrix. Second, HA is highly concentrated in synovial fluid, where it serves to enhance joint lubrication and the viscoelastic structural and functional characteristics of the joint. A clinical study in 2007 with 98 participants determined that a healthy concentration of HA in synovial fluid is a strong indicator of joint health. Since the body’s supply of HA naturally decreases with age, Glucosamine Chondroitin MSM + Hyaluronic Acid was formulated to help maintain healthy HA levels, allowing for the extended maintenance of joint and skin.

Helps Maintain Youthful Skin*
HA also plays an important role in maintaining the health and natural beauty of the skin. The compound enhances the structure and volume of the skin by promoting healthy connective tissues that interact with the skin. HA plays a direct role in the attraction and maintenance of moisture in the skin. As HA concentrations naturally decrease in the elderly, it may become difficult for the skin to retain moisture, leaving the skin dry and uncomfortable. Researchers have performed comparative measurements of hyaluronic acid levels in the skin of young and elderly individuals. Results indicate that there is a normal and progressive reduction in the number of hyaluronic acid granules in human skin with age—so much of a reduction, in fact, that a complete absence of these granules was seen in healthy individuals 60 years or older. These variations in HA levels with age may account for the decreased turidity, wrinkled appearance, and altered elasticity of skin tissue. Recent in-vitro laboratory studies are now indicating that HA not only provides moisture retention and structural support to the skin, but also promotes cellular vitality. The results of one such study indicate that HA given to human epidermal (skin) cells induces cell signaling that promotes normal cell repair and tissue renewal.

The BioCell Collagen II® in Glucosamine Chondroitin MSM + Hyaluronic Acid provides a safe, natural, standardized source of building blocks useful for maintaining joint structure and function, as well as promoting the integrity of healthy skin.

SAFETY
BioCell Collagen® achieved GRAS (Generally Recognized As Safe) self-affirmation, meaning that a consensus on safety was reached by an independent expert panel of qualified scientists who carried out an extensive review of all available scientific safety data on this ingredient.

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OptiMSM® achieved GRAS status supported by a successful notification to the FDA—the most distinguished safety status currently available for this type of ingredient.

**SCIENTIFIC REFERENCES**


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