



## Clinical Applications

- Supports Joint Structure and Function\*
- Supports Proteoglycan Synthesis for Healthy Connective Tissue\*
- Helps Protect Cartilage Cells\*
- Contributes to Muscle Recovery Following Exercise\*

*Pure Joint features methylsulfonylmethane (MSM) blended with naturally occurring, clinically researched glucosamine sulfate and chondroitin sulfate. Combined, these three ingredients provide targeted support for healthy joint structure and function.\**

All PureCell Formulas Meet or Exceed cGMP Quality Standards

## Discussion

Healthy joints can help us move freely, exercise comfortably, and recover effectively. Nourishing and maintaining the flexible connective tissue (cartilage) in our joints are essential to maintaining our own flexibility. This formula combines three high-quality ingredients that target joint health and assist with recovery from temporary joint discomfort due to occasional overexertion or intensive activity.\*

**CS BiO-ACTIVE®** Chondroitin sulfate (CS) is the most abundant glycosaminoglycan (GAG) in the body. CS is required for the formation of proteoglycans in joint cartilage. GAGs are the principal components of cartilage and synovial fluid; they bind with core proteins to form the proteoglycans that provide structure to and support the function of connective tissue. CS is thought to enhance joint health by supporting endogenous synthesis and preventing degradation of other joint GAGs. Oral administration of CS (800-1200 mg/d) has proven to positively influence joint space width, joint comfort, and fluid accumulation.<sup>[1-4]</sup> Pure Joint provides 1,200 mg of CS in the recommended four-capsule-per-day dosage.\*

The pharmaceutical grade, low-molecular-weight CS in CS BiO-ACTIVE has demonstrated higher bioavailability<sup>[5]</sup> and greater biological activity<sup>[6]</sup> than other CS sources. CS BiO-ACTIVE is the reference CS for the European Union Pharmacopoeia, and it was selected by the US National Institutes of Health for their glucosamine/chondroitin trial.<sup>[7]</sup> In fact, most of the clinical research performed using CS has employed CS BiO-ACTIVE; and in all clinical trials and over 10 years of pharmacovigilance, CS BiO-ACTIVE has shown an excellent safety profile.\*

Glucosamine Sulfate Glucosamine is a naturally occurring amino saccharide (glucose with a nitrogen-containing amino group attached) that is a principle substrate for cartilage synthesis.<sup>[8]</sup> Research suggests that glucosamine stimulates chondrocytes (cartilage cells), supports GAG synthesis, incorporates sulfur into cartilage tissue, induces hyaluronic acid (HA) production, and modulates prostaglandin (e.g., PGE2) synthesis.<sup>[9-11]</sup> Prostaglandins (specialized hormone-like fatty acids produced in the body) regulate a wide variety of bodily functions, including cytokine production and balance. Glucosamine sulfate was found to inhibit the release of PGE2, the activity of NF-kappaB, and the synthesis of COX-2 enzymes in human chondrocytes.\*<sup>[12]</sup>

Most of the scientific research done on glucosamine has been performed using glucosamine sulfate. Oral doses of 1,500 mg/d have shown clinical benefits in joint mobility and comfort.<sup>[9,13]</sup> Four capsules per day of Pure Joint provide 1,500 mg of glucosamine sulfate. It is postulated that even lower doses may nourish joint tissues, especially in combination with chondroitin sulfate.\*

Several studies have confirmed that the benefits of combining glucosamine sulfate with chondroitin sulfate outweigh taking them alone.<sup>[14-16]</sup> During a randomized, double-blind, placebo-controlled clinical trial that followed 605 participants for two years, all study groups who had received glucosamine sulfate (1,500 mg/d), chondroitin sulfate (800 mg/d), or a combination of the two experienced an improvement in joint comfort. However, only the group that received a combination of glucosamine sulfate and chondroitin sulfate experienced a significant reduction in joint space width.\*<sup>[17]</sup>

**Methylsulfonylmethane (MSM)** As an organosulfur compound, MSM is thought to primarily benefit joint tissues by delivering sulfur. Sulfur helps maintain the strength and structure of connective tissue by forming cross-linkages through disulfide bonds—such as those found in GAGs.<sup>[18]</sup> Research suggests that MSM may reduce joint tissue damage triggered by free radicals.<sup>[19]</sup> One joint study shows that glucosamine and MSM achieve better results when combined than when administered individually.\*<sup>[20]</sup>

MSM's effect on free radicals also appears to support muscle recovery after exercise. Studies suggest that the significant increase in total antioxidant capacity observed subsequent to MSM supplementation was the key factor responsible for reducing muscle soreness and breakdown, which can occur after rigorous exercise. Though relatively high levels of MSM were used in the studies—1.5-3 grams total per day in Kalman's study<sup>[21]</sup> and 50 milligrams per kilogram per day in Barmaki's study<sup>[22]</sup>—the one gram of MSM provided in two servings of Pure Joint can contribute to MSM dosing for exercise recovery.\*

**\*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.**



# Supplement Facts

Serving Size: 2 Capsules  
Servings Per Container: 60

	Amount Per Serving	%Daily Value
Glucosamine Sulfate (as glucosamine sulfate sodium chloride)	750 mg	**
Chondroitin Sulfate (as chondroitin sulfate sodium)(CS BIO-ACTIVE®)	600 mg	**
Methylsulfonylmethane (MSM)	500 mg	**

\*\* Daily Value not established.

**Other Ingredients:** HPMC (capsule), ascorbyl palmitate, silica, and medium-chain triglycerides.

**Contains:** Shellfish.

**CS BIO-ACTIVE**® CS BIO-ACTIVE is a registered trademark licensed by Bioiberica, S.A.



## Directions

Take two capsules twice daily, or as directed by your healthcare practitioner.

Consult your healthcare practitioner prior to use. Individuals taking warfarin or other medication should discuss potential interactions with their healthcare practitioner. Do not use if tamper seal is damaged.

## References

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## Does Not Contain

Wheat, gluten, corn, yeast, soy, dairy products, fish, peanuts, tree nuts, egg, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, or preservatives.

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