Chondroitin sulfate (CS) is a polyanionic sulfated glycosaminoglycan that displays anti-arthritic, antioxidative, and anti-inflammatory activities. CS is an endogenous component of the extracellular matrix of connective tissues and is responsible for their resistance and elasticity. CS is often used as a dietary supplement, although its oral bioavailability is quite low (10-20%). In vivo, CS decreases synovitis and levels of IL-6, TNF-α, IL-1β, and myeloperoxidase. CS may act on toll-like receptor 4 (TLR4), preventing activation of NF-κB and inhibiting TNF receptor association factor 6 (TRAF6). In cellular and animal models, CS increases synthesis of collagen, proteoglycan, and hyaluronic acid; it also downregulates expression of matrix metalloproteinases 1, 3, and 13. In vitro, CS increases levels of glutathione and superoxide dismutase and inhibits activation of caspases 3 and 7, decreasing levels of ROS.

References


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