

## Product Information

### Chondroitin sulfate A sodium salt from porcine rib

Product Number **C 7571**

Storage Temperature 2-8 °C

#### Product Description

Synonyms: CHS-A, chondroitin-4-sulfate

Chondroitin sulfate A (CHS-A) is an acidic mucopolysaccharide present in cartilage, skin, cornea, and umbilical cord. This product is considered a member of the glycosaminoglycan (GAG) family since it is a unbranched polysaccharide chain composed of repeating sugar heterodimers.

A GAG is defined as a unbranched polysaccharide heterodimer containing N-acetylglucosamine or N-acetylgalactosamine as one of the two sugar residues present. In most cases, this residue is sulfated. The second sugar is typically uronic acid, but can vary depending on the specific GAG.<sup>1</sup> The sulfation of GAGs in chondroitin sulfate chains is usually regular, with one sulfate per disaccharide throughout the chain.

Chondroitin sulfate A contains D-glucuronic acid, N-acetylgalactosamine, and sulfate residues in equimolar quantities. The sulfate ester is on the 4 position of N-acetylgalactosamine. In contrast, chondroitin sulfate C has the sulfate on the 6 position, and chondroitin sulfate B contains L-iduronic acid instead of glucuronic acid.<sup>2</sup> Therefore, these molecules are highly negatively charged and hydrophilic. Since they are too inflexible to fold into any compact globular structure, they tend to adopt highly extended conformations that occupy a large volume relative to their mass and they tend to form gels, even at very low concentrations.

The amount of chondroitin sulfate found in connective tissue is usually less than 10% by weight of the amount of fibrous proteins. Because of their size and charge, chondroitin sulfate molecules form porous

hydrated gels, providing mechanical support to tissue, while still allowing rapid diffusion of water-soluble molecules and migration of cells. GAG deficiencies lead to severe genetic disease states.

This product can be fractionated and identified from a mixture of heparin and other acidic mucopolysaccharides by a discontinuous electrophoretic method.<sup>3</sup> CHS-B has slower mobility, and CHS-C has faster mobility, compared with that of CHS-A.<sup>4</sup>

#### Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

#### Preparation Instructions

This product is soluble in water (100 mg/ml).

#### References

1. Molecular Biology of the Cell, 3rd ed., Alberts, B., et al., Garland Publishing (New York, NY: 1994), p. 973-974.
2. Saito, H., et al., Enzymatic methods for the determination of small quantities of isomeric chondroitin sulfates. *J. Biol. Chem.*, **243(7)**, 1536-1542 (1968).
3. Bianchini, P., et al., Fractionation and identification of heparin and other acidic mucopolysaccharides by a new discontinuous electrophoretic method. *J. Chromatogr.*, **196**, 455-462 (1980).
4. Seno, N., et al., Improved method for electrophoretic separation and rapid quantitation of isomeric chondroitin sulfates on cellulose acetate strips. *Anal. Biochem.*, **37(1)**, 197-202 (1970).

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