

STRUCTURAL ANALYSIS OF UNUSUAL HEPARINOIDS FROM CRUSTACEANS

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Heparinoids, polymers with structural similarities of heparin and/or heparan sulfate, have been described in many invertebrates. Now, the fine structural characterization of heparinoids purified from different crustacean species and their anticoagulant/antithrombotic effects are reported. Structural analysis of these heparinoids, performed by its enzymatic depolymerization, as well as mono- and two-dimensional nuclear magnetic resonance (NMR) spectroscopy revealed some structural peculiarities. The most distinguished features were the high amount of 2-O-sulfated glucuronic acid and N-sulfated glucosamine residues for crab heparinoid and the high content of the unusual 3-O-sulfate on the glucosamine residues in addition to the high level of glucuronic acid for the shrimp heparin. The occurrence of these unusual components in crustacean heparinoids is appealing since it accounts for an "unique" sequence that may be recognized by specific proteins. Shrimp and crab heparinoids display lower anticoagulant activity when compared to mammalian heparin. Besides these differences, crab heparinoids exhibit a potent antithrombotic activity. Thus, the search for new heparin analogs in invertebrates is an attractive alternative and it might open a wide variety of new therapeutic applications.

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