HEPARINOIDS FROM CRUSTACEANS: STRUCTURAL PECULIARITIES AND BIOLOGICAL POTENTIAL

Chavante, S.F.[1]; Andrade,G.P.V.[1,3]; Brito,A.S[1]; Lima,M.A[1]; Oliveira,F.W.[1]; Santos,E.A.[1]; Moura,C.P[1]; Leite,E.L[1]; Guerrini,M[2]; Torri,G[2]; Bisio,A[2]; Nader,H.B[3].

[1]Depto de Bioquímica, UFRN, Natal, [2]Istituto di Ricerche Chimiche e Biochimiche G.Ronzoni, Milan, Italy, [3]Depto de Biologia Molecular, UNIFESP, SP

Heparin, a sulfated polysaccharide, is the major drug used in prevention of thromboembolic diseases. However, concerns related to its animal source have carried out the search for heparin analogues. New natural sulfated polysaccharides with anticoagulant and/or antithrombotic activities seem to be an attractive alternative to substitute heparin. Heparinoids, polymers with structural similiarities of heparin and/or heparan sulfate, have been described in many invertebrates. Now we describe structural peculiarities of heparinoids from crustaceans and their anticoagulant/antitrombotic activities. Using a structural approach involving enzymatic depolimerization and nuclear magnetic resonance (NMR) spectroscopy some heparinoids had their structures well-defined. 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 and the high level of glucoronic 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. In fact, some of these heparinoids have anticoagulant and/or antithrombotic activity. Shrimp and crab heparinoids display low anticoagulant activity, however crab heparinoids exhibit a potent antitrhombotic activity. These structural peculiarities contribute to delineate a closer relationship between structure/function of sulfated polysaccharides, becoming interesting models to study the necessary requirement to display certain pharmacological actions.

Supported by: CNPq, CAPES, Istituto "G. Ronzoni".
Key Words: Heparinoids, crustacean, anticoagulant activity

In honor of Prof. Carl P. Dietrich