

Structure of sulfated polysaccharides from sea urchins: biological versus physiological activity

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Sea urchin egg jelly coat (EJC) possesses sulfated polysaccharides that are responsible for inducing sperm acrosome reaction. This is an obligatory event for sperm binding to, and fusion with, the egg. Sea urchin EJC sulfated polysaccharides usually have simple, well defined repeating structures with particular pattern of sulfate substitutions. Previous results from our laboratory have shown that the sulfation pattern and glycosidic linkage are determinant to induce the acrosome reaction. The subject of the present work is to elucidate the structure from the sulfated polysaccharides from the sea urchin species *Hemicentrotus pulcherrinus* and *Pseudocentrotus depressus*. Furthermore, we will correlate the sulfated polysaccharide structure with its physiological and biological activity. In this last case, we want to observe the anticoagulant potential of these sulfated polysaccharides, comparing to the previous described in our laboratory. Our attempt is to understand the correlation between the sulfated polysaccharide structure and biological activity. Preliminary results indicated that the sea urchin species *H. pulcherrinus* contains two distinct sulfated polysaccharides composed exclusively with fucose. In contrast, *P. depressus* experiments indicated the presence of a single sulfated fucan with a unique structural pattern, as observed by NMR. After which, the biological and physiological activity of such polymer will be tested. Our first experiments, with the purified sulfated polysaccharides from three other species (*Lytechinus variegates*, *E. lucunter* and *A. lixula*) showed us that the monosaccharide residue and the sulfate in the 4 position is relevant to an anticoagulant activity. Further NMR structural analyses will be conducted in order to elucidate the chemical structure from the three new sulfated fucans, and other anticoagulant tests will be done with all the sea urchins sulfated polysaccharides that we already have in our laboratory.

Key words: sea urchins, sulfated fucans, anticoagulant

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