

THE INFLUENCE OF PLANT GLYCOSAMINOGLYCANS ON ERYTHROCYTE MEMBRANES

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Sulphated polysaccharides – glycosaminoglycans (GAGs) - occur in many plant and animal species and tissue types; the extensive range of their physiological functions has only recently begun to be appreciated and explored [1]. The primary function of these endogenous polyanions is believed to be as cell - cell communication mediators. They are formation of the barrier between tissues and form. They form a natural barrier against pathogens [2, 3]. In plants these polyanions have as a number of structural and protective roles. For example, fucoidin, a homopolymer of sulphated L-fucose, isolated from the tissue of plants (*Stichopus japonicus*, *Ludwig-othurea grisea*), has been reported to have antithrombotic and anti-infective activities [1, 3]. The higher plants also contain GAGs, which have activity heparin-like, and were isolated from *Filipendula ulmaria* and *Paeonia anomala*, *Paeonia suffruticosa* [4, 5, 6].

A large number of macromolecules can bind to GAGs. The majority of ligands are proteins or protein conjugates. It has been also postulated that GAGs are capable of inter chain binding. In addition, on cell surfaces for example, they are believed to mediate certain observed biological effects of GAGs. Their binding is generally electrostatic in nature although other types of interaction can also occur [7].

In this study the influence of GAG from higher plant extract (PE) (*Compositae*) on the properties of red blood cells (RBC) was investigated. The aim was to describe its molecular interaction with RBC membranes. The studies performed concerned the degree of hemolysis, osmotic resistance and fluidity of the RBC membrane and the degree of membrane lipid oxidation.

It was found that the plant extract studied did not change the osmotic resistance and did not induce hemolysis of erythrocytes in the concentration range studied. However, some changes in membrane fluidity were observed. Also, the PE studied was found to protect red blood cells against oxidation induced by UV irradiation. Since we concluded that our PE did not induce hemolysis, we assume we it probably does not incorporate deeply into the membrane bilayer. On the other hand, the changes in fluidity indicate that the PE interacts with

membranes. The obvious conclusion is that this interaction must take place at the polar part of the membrane, thus enabling the PE to act as an antioxidant.

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