STRUCTURE-ACTIVITY RELATIONSHIP OF CARBOHYDRATE-BASED ANTIVIRAL AGENTS: THE RELATIVE IMPORTANCE OF HYDROPHOBIC, ANIONIC AND SUGAR MOIETIES.

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Our research group has been working on the synthesis and antiviral activity determination of a number of carbohydrate-based antiviral agents. These molecules are essentially synthesized through steps of regioselective long-chain *O*-alkylation and sulfation of methyl galactopyranosides and neutral agarose-derived oligosaccharides. Direct alkylation of naturally sulfated *kappa*-carrageenan-derived oligosaccharides has also been performed. In this work, we demonstrated the relative importance of the three chemically relevant portions of the glycosides for the antiviral activity: hydrophobic, anionic and sugar moieties. For this purpose, glycosides containing different proportions of long-chain and sulfate groups were tested against HSV (herpes simplex virus). In these assays the IC50 was determined by comparison of non-treated and treated infected-cell cultures. In this study we found that the isolated presence of the alkyl chain appears to be more relevant than the sulfate group. However, the introduction of an additional alkyl chain is deleterious for the activity. Compounds containing one or two monosaccharide units were more active than those presenting four units. The most active compounds were the simultaneously alkylated/sulfated ones. We also found that the positioning of the sulfate groups drastically affects the activity, being more relevant than the simple increase in the sulfate groups number.

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