SYNTHESIS OF HYDROPHOBIC GROUP-CONTAINING AMINOGLYCOSIDES OF SULFATED OLIGOSACCHARIDES: A NEW CLASS OF CARBOHYDRATE-BASED ANTIVIRAL AGENTS

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Aminoglycosides are molecules that interact with several kinds of proteins, being particularly useful as antibiotics and glycosidase inhibitors. Antibiotic aminoglycosides usually bind to bacterial ribosomal RNA, inhibiting protein synthesis. Glycosidase inhibitors can modify or block biological processes, having many potential applications as agrochemicals or therapeutic agents. Hydrophobic group-containing ether glycosides of sulfated oligosaccharides are potential antiviral agents, which could act through carbohydrate-protein interaction. In this work, we propose synthetic routes for the preparation of *O*-sulfated hydrophobic group-containing aminoglycosides. The first step of the synthesis consisted in the production of amino sugars by reductive amination of reducing oligosaccharides. As starting materials, we utilized lactose and oligosaccharides derived from a sulfated algal polysaccharide (*kappa*-carrageenan oligosaccharides). Different conditions of reductive amination were performed: (a) NH_3 followed by addition of $NaBH_4$ under pressure, (b) NH_4Cl in the presence of $NaCNBH_3$ and (c) $(NH_4)_2CO_3$ in the presence of $NaCNBH_3$; being the latter the most effective. The amino sugars were then alkylated in the presence of alkyl bromides (benzyl bromide and cholesteryl chloride) in DMF. The alkylation reactions gave mono- and dialkylated compounds, as determined by NMR spectroscopy and ESI-MS. Tests for antiviral activity of these alkylated aminoglycosides are currently in progress.