GLYCOMIMETICS: NEW SYNTHESES, IMPROVED BIOLOGICAL ACTIVITIES

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In the epoch of glycobiology the need for synthetic analogues of natural carbohydrates and glycoconjugates as well as for their counterparts with similar stucture and/or biological effects appears among the major challenges of preparative carbohydrate chemistry. Exploration of glycomimetics is also fuelled by carbohydrate based drug design offering new therapeutic solutions for widespread diseases like AIDS, cancer, diabetes, etc.

The lecture will focus on the consecutive formation of carbon-carbon and carbon-nitrogen bonds at the anomeric centre. These investigations, among others, led to new informations in the field of the anomeric effects, to new methods for radical-mediated brominations of carbohydrate derivatives and for the synthesis of oligopeptides incorporating anomeric α-aminoacids, as well as to a novel deprotection of 2,2,2-trichloroethyl based protecting groups. Furthermore, improved and new syntheses for known and unprecedented classes of inhibitors of glycogen phosphorylases as potential antihyperglycemic agents were elaborated. Results of biological tests and peculiarities of enzyme-inhibitor complexes will also be presented.