

Summary of the Ph.D. Thesis by Grzegorz Witkowski entitled:

„Stereocontrolled synthesis of the polyhydroxylated carba- and hetero-bicyclic compounds from simple sugars”

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The main purpose of this work was to broaden the knowledge about the synthesis of polyhydroxylated compounds based on carbabicyclic and heterobicyclic scaffolds.

In the „*Introduction*” to this work, the biological importance of sugars and their derivatives together with the properties of glycomimetics used in pharmacy are briefly presented. In the end of this chapter, detailed targets of this dissertation are presented.

„*Literature Review*” is divided into two parts. In the first one, the Diels-Alder reaction is discussed with particular emphasis on the intermolecular approach. The second part presents the methods of the synthesis of carbabicyclic precursors used by far and approaches for their functionalization towards carbabicyclic glycomimetics.

The chapter entitled „*Results and discussion*” begins with the presentation of a method of the selective synthesis of the *E*- and *Z*-dienes, derivatives of D-glucose. Further part of this chapter presents the work towards the synthesis of direct precursors of polyhydroxylated bicyclic compounds. These efforts did not provide the desired carbobicyclic derivatives, however, these precursors were successfully used in the synthesis of heterobicyclic derivatives. The carbabicyclic compounds were prepared by other approach which was described at the end of this chapter.

„*Experimental procedures*” covers all procedures of the synthesis of compounds described in “*Results and discussion*”. All derivatives were characterized by standard analytical methods used in the organic chemistry.

The last chapter entitled „*Literature*” is a list of all scientific papers cited in this dissertation.