

Title: The synthesis of enantiopure 5a-carbasugars and their derivatives using the stereoselective carbon-carbon bond formation methods

Since many years, in the research laboratories on the whole world, scientists are doing research on the compounds, whose resemble a natural products. Those kind of compounds we can call a mimetics.

The structure of 5a-carbasugars can mimic a natural and non-natural available aldohexoses. The structure of carbapyranose is similar as natural monosaccharide except that, the oxygen atom in the ring was replaced by the methylene group (fig. 1). Those compound we call a pseudosugars.

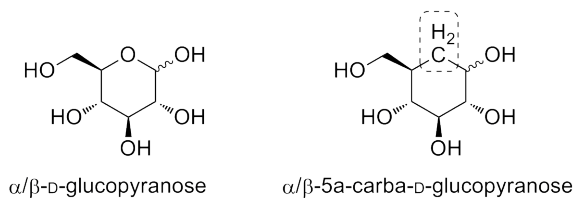


Figure 1. Common monosaccharide and its carbamimic derivative.

There are many natural compounds containing polyhydroxylated cyclohexane fragments in their structure, but still there is no general method of 5a-carbasugars synthesis (fig. 2).

The main goal of this project is a synthesis of optically pure 5a-carbasugars. One of the most important example of natural products based on carbasugar structure is (-)-shikimic acid. This compound is being used as a starting material in the Oseltamivir synthesis – a common and extremely important antiviral drug.

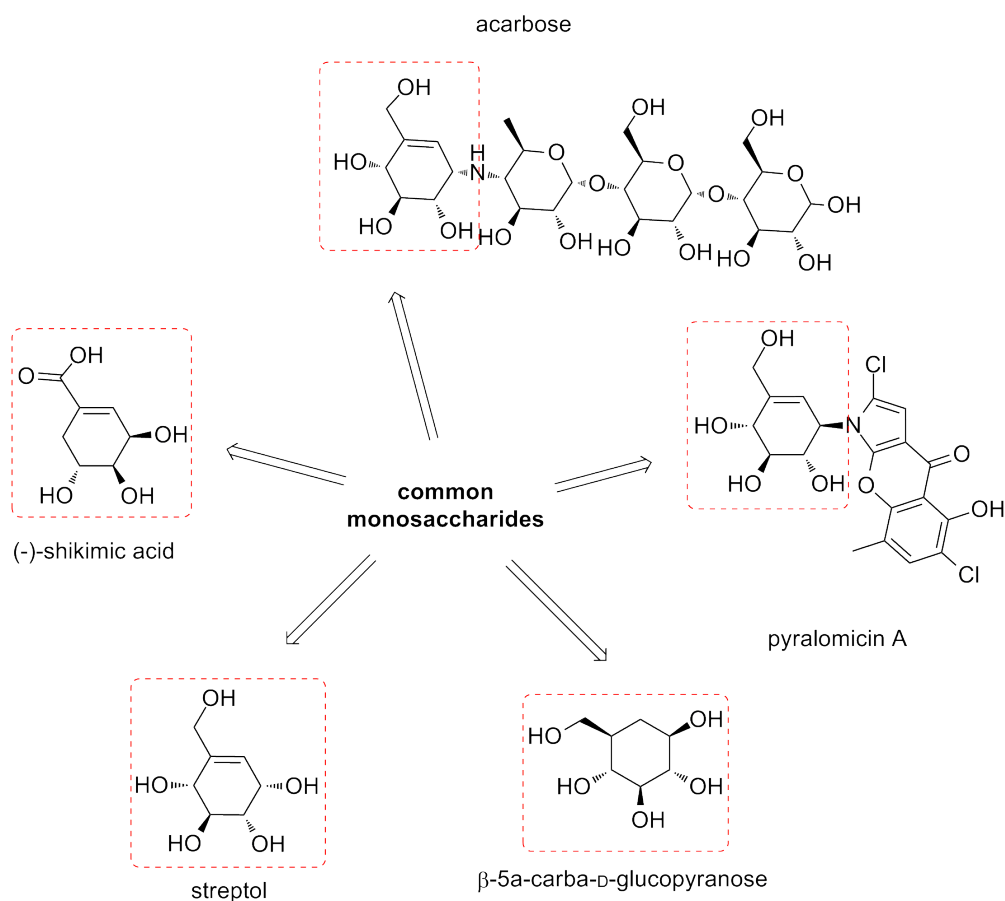


Figure 2. The examples of carbasugar derivatives occurring in the Nature.

In this project we will combined well known reactions in organic synthesis such as Wittig reaction with newest discoveries in asymmetric aldol reaction. The proposed strategy will allow us to elaborate a general method of carbasugar synthesis. Our research will contribute to expand knowledge of stereoselective method of carbon-carbon bond formation.