

Project 2.2 Novel glycomimetics as DC-SIGN receptor ligands

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Institute: Institute of Organic Chemistry

www: <https://www.icho.edu.pl/en/>

Background:

The PhD student will focus on synthesis and characterization of organic compounds as well as investigation of ligand-receptor binding properties using nuclear magnetic resonance (NMR) and isothermal titration calorimetry (ITC) methods. The work will be carried out in close collaboration with other PhD students, post-docs, and other co-investigators from IOC PAS and collaborative Polish and foreign institutions.

Aim:

The main goal of the project is to create effective DC-SIGN receptor ligands that can be used as antivirus drugs. This goal will be carried out by:

1. A virtual screen of a large library of carbohydrate derivatives.
2. Synthesis and characterization of selected compounds.
3. Research of the interactions of synthesized glycomimetics with DC-SIGN receptor.

The synthetic part, the most labor-intensive, will include the development of a general and efficient method for obtaining new DC-SIGN receptor ligands, using simple monosaccharides as substrates (glucose, mannose, galactose).

Basic knowledge in the field of glycomimetic chemistry will be extended during the implementation of the project. In addition, the obtained molecules may have practical use as potential antiviral drugs.

Requirements:

- Master's degree in chemistry, pharmacy, or biotechnology (or close to degree date),
- good knowledge of organic chemistry,
- experience in an organic synthesis,
- ability to interpret analytical data (NMR, MS, IR),
- good communication in English,
- high motivation and willingness to learn new things,
- experience in synthesis of heterocyclic compounds and/or carbohydrate derivatives, as well as familiarity with computational methods, especially molecular docking, will be an added advantage.