**Level**: master

**Course title:** Carbohydrate chemistry (IHO-506)

**Status**: elective

**ECTS**: 6

**Requirements**: none

**Learning objectives**

Obtaining bioactive sugar molecules using methods of organic chemistry and chemo-enzymatic transformations. Introduce students to the biological mechanism of action of selected natural and synthetic derivatives of monosaccharides and oligosaccharides.

**Learning outcomes**

Biological roles of carbohydrates and glycoconjugates. Overcome knowledge about types of modified carbohydrates. Synthesis and mechanism of action of selected modified sugar and nucleoside analogues of biomedical interest. Mastering the nomenclature of natural monosaccharides and modified sugars.

**Syllabus**

*Theoretical instruction*

Ways of presentation the structure of monosaccharides. Preparation of modified carbohydrates and use of modern protecting group strategies and the selective functionalisation of saccharides. The mechanism of action of selected biologically active derivatives of monosaccharides (glycosidases and glycosyltransferases inhibitors, antiviral agents etc.). Nucleoside analogues with a modified base as drugs. Chemical glycobiology. Glycocode. Glycoproteins. Lectins. Carbohydrates in inflammation. Proteoglycan and selected mimetic. Nomenclature of monosaccharides and derivatives of monosaccharides.

*Practical instruction*

In accordance with theoretical instruction.

| **Weekly teaching load** | | | | Other: |
|---|---|---|---|---|
| Lectures: 2 | Exercises: 3 | Other forms of teaching: 1 | Student research: | |