Level: bachelor

Course title: X-rays and the structure of biomolecules

Status: obligatory

ECTS: 6

Requirements:

Learning objectives

To enable students to master the content related to X-rays and their application in determining the structures of biomolecules, particularly the steroid hormones.

Learning outcomes

Upon completion of the course, students should have developed:

- General skills: ability to apply the acquired knowledge to concrete examples for determining the structure of biomolecules, and learning the role and importance of biomolecules in the human body.
- Specific skills: students are trained to work on specific computer programmes that are used to determine the structure of biomolecules.

Syllabus

Theoretical instruction

Biosynthesis of biomolecules. Properties of biomolecules. Conformational analysis of cyclic hydrocarbons. Regulation of biosynthesis and secretion of hormones. Hormone metabolism. The mechanism of action of hormones. The structure and bonding of molecules to the receptor. The relationship between structure and biological activity. Determining the structure of biomolecules. Diffraction methods. X-rays. X-ray structure analysis. X-ray diffraction in crystals. Single-crystal structure determination. Refinement of crystal structures. Crystal packing and intermolecular interactions: hydrogen bonds.

Practical instruction

Practical work on single crystal diffractometer. Application of computer programmes for solving the monocrystalline structure of biomolecules.

Weekly teaching load				Other:
Lectures: 2	Exercises: 0	Other forms of teaching: 1	Student research:	