Course title	ECTS code
Structural protein biochemistry (lecture)	13.6.0014

Name of unit administrating study

Teaching staff

dr Szymon Ziętkiewicz

Studies

faculty	field of study	type	form	specialty	specialization	semester
Intercollegiate Faculty of Biotechnology UG-MUG	Biotechnology	second tier studies (MA)	full-time	all	all	1

Forms of classes, the realization and number of hours

Forms of classes

Wykład (to translate)

The realization of activities

lectures in the classroom

Number of hours

Wykład (to translate): 30 hours

ECTS credits

2

The academic cycle

2013/2014 winter semester

Type of course

elective (to translate)

Language of instruction

polish

Teaching methods

- individual consultations with course tutor
- wykład z prezentacją multimedialną (to translate)

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

Zaliczenie na ocenę (to translate)

Assessment methods

- egzamin pisemny testowy (to translate)
- egzamin pisemny z pytaniami (zadaniami) otwartymi (to translate)

The basic criteria for evaluation

The assessment is performed on the basis of the overall number of obtained points in compliance with the percentage index presented in the Rules and Regulations for Studies at the UG, where test questions are credited 1 point, open questions – 2 points, written statement 'Decision about selection of the course' – 2 points and where the maximum number of points is 30.
Written assessment requires acquisition of the material presented during the lectures, including demonstration of the ability to interpret qualitative parameters of macromolecule structures, to understand the methods of graphical representation of structures and their identification, acquaintance with techniques of structural studies and their limitations, as well as the knowledge of mechanisms of protein functioning presented during lectures. The criterion of assessing the written 'Decision about selection of the course' is based on verification of attitude K_K03.

Required courses and introductory requirements

A. Formal requirements

B. Prerequisites

Knowledge of the courses: General Chemistry, Organic Chemistry, Physics

Aims of education

The aim of the course is to acquaint the student with basic notions concerning protein structures and introduce issues connected with structural studies of protein as well as analysis of structure – function dependence.
Students will acquire knowledge concerning the mechanisms of the functioning of proteins on molecular level, interactions determining the process of folding. (K_W01). Students will also acquire knowledge concerning the ways of applying physical and computational methods of protein structure determination and modeling, and the role of physical phenomena and impacts on the structure and functioning of proteins (K_W02).

Students will get to know the ways of obtaining and interpreting structural data, they will get acquainted with the potential problems and limitations of applied methods and with the on-going progress in research techniques (K_K01).

Course contents

1.Role of structural aspects in biochemistry, protein conformation and conformational space, Affinsen's paradox.
2.Protein amino acids and peptide bonds, physical-chemical basics of interactions involved in creation and stabilization of peptide structures.
3. Levels of protein structures, dynamics and thermodynamics of protein folding
4.Studies of protein structure, empirical and computational methods
5.Structural elements of proteins, helices, beta-sheet structures, structural motifs, domains
6.Protein dynamics, conformational changes
7.Review of selected examples of protein functioning and their structure - function dependence

Bibliography of literature

Complementary bibliography
1. Biofizyka dla biologów, red. M. Bryszewska, W. Leyko,
2. Introduction to Protein Structure, Branden C, Tooze J
3. Introduction to Protein Architecture, Lesk A

The learning outcomes

K_W01
K_W02
K_K01
K_K03

Knowledge

K_W01 Understands complex biological phenomena on the molecular level, knows their significance for biotechnology and their relationships with other areas and disciplines of science
K_W02 Possesses a deepened knowledge in the field of related scientific areas and disciplines allowing him to see connections and dependencies in nature, in particular those essential for biotechnology

Skills

Social competence

K_K01 Knows limitations of his/her knowledge, is willing to constantly upgrade and update his/her knowledge and raise qualifications within the field of biotechnology and related scientific areas and disciplines
K_K03 Effectively plans his/her work, professional career, organizes his/her work, in particular in the lab or concerning reviews in the field of biotechnology and related scientific areas and disciplines

Contact

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