Course title	ECTS code
Molecular biology of nucleic acids (lecture)	13.1.0177

Name of unit administrating study

Teaching staff

prof. dr hab. Igor Konieczny

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	2

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

3

The academic cycle

2013/2014 summer semester

Type of course

obligatory

Language of instruction

english

Teaching methods

- wykład (to translate)
- wykład problemowy (to translate)

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

Final evaluation

Egzamin (to translate)

Assessment methods

- egzamin pisemny testowy (to translate)
- egzamin pisemny (dłuższa wypowiedź pisemna / rozwiązanie problemu) (to translate)
- egzamin pisemny z pytaniami (zadaniami) otwartymi (to translate)

The basic criteria for evaluation

The following components will be assessed:
- understanding by the student of the complex processes connected with nucleic acids and their significance in biotechnology
- knowledge concerning issues of molecular biology of nucleic acids presented during lectures and currently discussed in specialist literature
- knowledge of English and specialist terminology allowing students to understand the discussed issues

The final grade will result from the above elements. The student must obtain a passing grade for each of the mentioned elements. Assessment will be performed on the basis of an examination, where questions will concern the above elements

Required courses and introductory requirements

A. Formal requirements

B. Prerequisites

The learning outcomes for the basic courses Molecular Biology, Biochemistry and Genetics are required

Aims of education

The aim of the course is to let students understand the molecular basis of metabolism of nucleic acids, acquire

knowledge allowing to interpret and analyze the results of contemporary research concerning nucleic acids. Get acquainted with complex issues connected with the processes of transcription, replication, repair, recombination, transposition, and the significance of these processes in biotechnology (K_W01)
Students will acquire knowledge concerning the newest research connected with the metabolism of nucleic acids (K_W03)
Students will perfect their English to the extent that will allow them to understand utterances and read, with understanding, scientific literature concerning molecular biology of nucleic acids (K_U03)

Course contents

History of research on metabolism of nucleic acids - key experiments
Notions of replicon and operon
DNA replication initiation in bacterial chromosomes and extrachromosomal genetic elements
DNA replication initiation in eukaryotic cells
Structure of Rep proteins
Helicases - structure, the role in the process of DNA replication
Primosom complex - synthesis of DNA replication starters
RNA and DNA dependent polymerases - structure, properties, molecular basis of the synthesis of nuclear acids
Structure of the E. coli Pol III holoenzyme complex
Mechanism of synthesis of leading and lagging strands in prokaryotic and eukaryotic cells
DNA repair - kinds of DNA repair, enzymes taking part in repair
Topology and dynamics of chromosomes and extrachromosomal genetic elements
Mobile genetic elements
Molecular basis of transposition process

Bibliography of literature

Genes VIII – by Benjamin Levin, Essential cell biology – by Bruce Alberts at all, Molecular Biology of the cell by Alberts at all.

The learning outcomes

K_W01
K_W03
K_U03

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_W03 Possesses knowledge in the field of selected issues currently discussed in biotechnological literature and problems concerning related scientific areas and disciplines significant for biotechnology

Skills

K_U03 Knows the English language to an extent that allows him/her to understand an utterance and read with understanding scientific literature and simple reviews in the fields of science and scientific disciplines connected with biotechnology; can prepare a short written review and an oral presentation in English, concerning particular issues of biotechnology and related scientific areas and disciplines.

Social competence

Contact

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