

# Basic techniques of genetic engineering - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Basic techniques of genetic engineering
Kod przedmiotu	13.9-WB-P-BTGE-S21
Wydział	Wydział Nauk Ścisłych i Przyrodniczych
Kierunek	WNB - oferta ERASMUS
Profil	-
Rodzaj studiów	Program Erasmus
Semestr rozpoczęcia	semestr zimowy 2024/2025

Informacje o przedmiocie	
Semestr	1
Liczba punktów ECTS do zdobycia	6
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	• dr Elżbieta Heger

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Laboratorium	45	3	-	-	Zaliczenie na ocenę
Wykład	15	1	-	-	Zaliczenie na ocenę

## Cel przedmiotu

The lecture on Basic Genetic Engineering Techniques is designed to introduce students to issues in the field of techniques used to manipulate genetic material, various DNA cloning techniques and recombinant DNA techniques. Laboratory classes are designed to introduce students to the principles of safe work in a molecular biology laboratory and to provide practical knowledge of basic genetic engineering techniques. The student should acquire the ability to perform the cloning experiment and develop the ability of critical analysis and proper interpretation of the results.

## Wymagania wstępne

Knowledge of the biochemistry, general and molecular genetics and microbiology courses.

## Zakres tematyczny

Lecture: Goals and tasks of genetic engineering. Benefits and risks of gene manipulation. Genetic engineering in the light of moral and ethical issues. Methods of introducing DNA into prokaryotic and eukaryotic cells. Restriction enzymes as a basic tool in genetic engineering. Other enzymes used in genetic engineering and DNA analysis. Cloning - vectors used for cloning and their selection. Cloning strategies. Creating genomic and cDNA libraries. Selection and screening of positive clones.

Laboratory classes: Preparation of the plasmid vector, isolation and purification of plasmid DNA. Preparation of competent cells for DNA cloning. Transformation of competent cells. Selection and analysis of clones. Restriction analysis of recombinant plasmids.

## Metody kształcenia

Lecture in the form of multimedia presentations. Laboratory classes in the classroom equipped with the appropriate analytical apparatus and equipment.

## Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
Can properly analyze and interpret the results of experiment and draw conclusions.		<ul style="list-style-type: none"><li>• kolokwium</li><li>• wykonanie sprawozdań laboratoryjnych</li></ul>	<ul style="list-style-type: none"><li>• Laboratorium</li></ul>
Can use the available English literature within the range of genetic engineering techniques.		<ul style="list-style-type: none"><li>• egzamin - ustny, opisowy, testowy i inne</li><li>• kolokwium</li><li>• wykonanie sprawozdań laboratoryjnych</li></ul>	<ul style="list-style-type: none"><li>• Wykład</li><li>• Laboratorium</li></ul>
He practices the known techniques of genetic engineering, he can plan and perform unassisted the simple experiment. He performs more complicated experiments under the control of teacher.		<ul style="list-style-type: none"><li>• bieżąca kontrola na zajęciach</li></ul>	<ul style="list-style-type: none"><li>• Laboratorium</li></ul>

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
The student appreciates the importance of acquired knowledge in solving problems in the field of basic genetic engineering techniques.		<ul style="list-style-type: none"> <li>egzamin - ustny, opisowy, testowy i inne</li> <li>kolokwium</li> </ul>	<ul style="list-style-type: none"> <li>Wykład</li> <li>Laboratorium</li> </ul>
The student can work in a team, he is responsible for entrusted equipment and materials.		<ul style="list-style-type: none"> <li>bieżąca kontrola na zajęciach</li> </ul>	<ul style="list-style-type: none"> <li>Laboratorium</li> </ul>
The student knows and understands the rules of using the equipment of molecular biology classroom.		<ul style="list-style-type: none"> <li>bieżąca kontrola na zajęciach</li> <li>kolokwium</li> <li>wykonanie sprawozdań laboratoryjnych</li> </ul>	<ul style="list-style-type: none"> <li>Laboratorium</li> </ul>
The student performs a thorough analysis of their own competence in the field of genetic engineering techniques. He understands the need for continuous learning and improve their skills in this area.		<ul style="list-style-type: none"> <li>egzamin - ustny, opisowy, testowy i inne</li> <li>kolokwium</li> </ul>	<ul style="list-style-type: none"> <li>Wykład</li> <li>Laboratorium</li> </ul>
The student understands issue concerning the genetic recombination, he describes basic techniques of genetic engineering, he realizes the connection between structure and organization of genome and possibility of using particular techniques.		<ul style="list-style-type: none"> <li>bieżąca kontrola na zajęciach</li> <li>egzamin - ustny, opisowy, testowy i inne</li> <li>kolokwium</li> <li>wykonanie sprawozdań laboratoryjnych</li> </ul>	<ul style="list-style-type: none"> <li>Wykład</li> <li>Laboratorium</li> </ul>

## Warunki zaliczenia

The lectures – the requirement of the assessment is to get pass mark credit of written examination, which lasts 60 minutes. The examination test contains 30 questions (open and closed), 60% of all of the points are required to get the pass mark credit. Laboratory classes - the requirements of the assessment criteria refer to the attendance at classes, the active participation in laboratory experiments and to get the pass mark credit of written tests with open and closed questions (above 60% of all of the points are required to get the pass mark credit) and credit of all written reports from performed laboratory experiments. The final mark consists of the average sum of all of the pass partial marks.

## Literatura podstawowa

- Nicholl D., An Introduction to Genetic Engineering, Cambridge University Press, 2008.
- White M.R.H., Turner P.C., McLennan A.G. & Bates A.D, Instant Notes in Molecular Biology, Bios, Oxford, 2012.
- Primrose S.B., Twyman R. Principles of Gene Manipulation and Genomics, Wiley-Blackwell, 2006.

## Literatura uzupełniająca

- Selected current research and review articles.

## Uwagi

Zmodyfikowane przez dr Elżbieta Roland (ostatnia modyfikacja: 06-04-2024 12:56)

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