


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Monographic lecture - Chemical synthesis of peptides		13.3.0503	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	drugiego stopnia
Wydział Chemii	Chemia	form	stacjonarne
		specjalty	chemia biomedyczna, chemia i technologia środowiska, analityka i diagnostyka chemiczna, chemia obliczeniowa
		specialization	wszystkie
Teaching staff			
prof. dr hab. Piotr Rekowski			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		3	
Lecture		lecture 30 hours	
The realization of activities		consultation 10 hours	
classroom instruction		student's own work 35 hours	
Number of hours		TOTAL: 75 hours - 3 ECTS credits	
Lecture: 30 hours			
The academic cycle			
2023/2024 winter semester			
Type of course		Language of instruction	
obligatory		polish	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
multimedia-based lecture		Final evaluation	
		Graded credit	
		Assessment methods	
		(mid-term / end-term) test	
		The basic criteria for evaluation	
		Positive grade received in written exam composed of 3-5 open questions covering issues listed in the course contents; answers to these questions will require solving tasks specified in educational outcomes; the grading scale would be adjusted to the range of all rated exams. classes	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
The student should have completed a graduate study lecture: "Physicochemical properties of amino acids and their derivatives"			
B. Prerequisites			
none			
Aims of education			
introduction students with all issues listed in the lecture program content,			
<ul style="list-style-type: none"> • discussion of the nomenclature used in amino acid and peptide chemistry • describe the structure of a peptide bond, • familiarizing students with the basic methods of peptide bond synthesis • teaching students how to design peptide synthesis 			
Course contents			

Lecture topics: Nomenclature used in amino acid and peptide chemistry. Peptide bond - introduction and characterization. Protective groups of amine and carboxyl, alcohol, guanidine, thiol, imidazole, indole, amide functions, introducing and removal protecting groups from these groups, orthogonality of protecting groups. Advantages and disadvantages of these protective groups. Peptide bond synthesis methods: azide, anhydride, active esters, carbodiimide, with phosphorus, uronium, enzymatic compounds. Tactics and strategy of chemical peptide synthesis. Tactics of Boc / Bzl and Fmoc / But (Trt) synthesis. Side reactions and adverse processes during peptide synthesis - prevention methods. Peptide synthesis on a solid support (Merrifield synthesis). Racemization during peptide synthesis, methods for preventing racemization.. Automation of the peptide synthesis process. Trends and news in peptide synthesis. New condensing agents, carrier resins and functional group covers. Synthesis of phosphopeptides and glycopeptides, unnatural amino acids in peptide synthesis, chemical modifications leading to more rigid peptide conformations.

Bibliography of literature

Literature required to pass the course

Sewald N., Jakubke H., "Peptides: chemistry and biology", (A.J. Kerstin, ed.) Elsevier 2006, M.

Wiley-VCH Verlag

Jones J. Amino Acid and Peptide Synthesis, Oxford University Press, 2002

Some topics will be discussed on monographic publications

B. Extracurricular readings

other monographic works presenting issues contained in the lecture content of the subject

The learning outcomes (for the field of study and specialization)

Knowledge

1. defines the basic issues of peptide chemistry
2. names amino acid derivatives, peptides and their derivatives
3. explains the mechanisms of racemization in peptide synthesis
4. characterizes methods of peptide bond formation
5. lists protective groups used in peptide synthesis
6. presents principles of solid-peptide synthesis

Skills

Social competence

1. understands the need for continuous education,
2. appreciates the usefulness of discussions and consultations
3. is aware of the need for critical analysis of own work
4. shows creativity in searching for alternative solutions

Contact

piotr.rekowski@ug.edu.pl