


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


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

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

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