

Course title Wykład specjalizacyjny - Synteza peptydów/Graduate study lecture - Synthesis of peptides		ECTS code 13.3.0449	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemistry	Master	Full-time studies	
Teaching staff dr hab. Sylwia Rodziewicz-Motowidło, prof. UG			
Forms of classes, the realization and number of hours		ECTS credits	
A. Forms of classes, in accordance with the UG Rector's regulations lecture		classes 30 h tutorial classes 10 h student's own work 35 h TOTAL: 75 h - 3 ECTS	
B. The realization of activities In-class learning			
Number of hours lecture 30 h			
The academic cycle First year, summer semester			
Type of course obligatory		Language of instruction Polish	
Teaching methods Lecture with multimedial presentation		Form and method of assessment and basic criteria for evaluation or examination requirements	
		A. Final evaluation, in accordance with the UG study regulations Course completion (with a grade)	
		B. Assessment methods -written test with open type questions	
		C. The basic criteria for evaluation or exam requirements • For a positive grade, achievement of 51% of the maximum number of points is required	
Required courses and introductory requirements			
<p>a. Formal requirements General chemistry nad organic chemistry</p> <p>b. Prerequisites Student should possess knowledge concerning fundamental mechanisms of reactions in organic chemistry, basic types of organic compounds, functional groups of organic compounds and ways of their interconversion, terms of acidity/basicity of organic compounds, electronic effects (inductive, mesomeric/resonance hyperconjugation effects), conformation, hydrophobicity, hydrogen bonding, van der Waals and hydrophobic interactions.</p>			
Aims of education The main objective of this course is familiarization of students with properties of amino acids and peptides, fundamental protecting groups used in peptide synthesis, methods of peptide bond formation, strategy and tactics of peptide synthesis.			

Course contents

Physicochemical properties of amino acids. Coded (proteinaceous) and uncoded amino acids. Structure and properties of a peptide bond. Protection of a carboxylic group. Protection of an amino group. Protection of side chains functional groups. Formation of a peptide bond. Preactivation and activation *in situ*. Classic synthesis of peptides (in solution). Step-by step and fragment condensation synthesis methods. Full protection and minimal protection strategies. Solid phase peptide synthesis (SPPS). Boc and Fmoc chemistry of peptide synthesis. Structure and characteristics of the most frequently used solid supports. Typical amino acid derivatives used in SPPS. Choice of a solid support. Manual, semiautomatic and automatic solid phase peptide synthesis. Acylation reaction monitoring during SPPS. Cleavage of the peptide from a solid support, its isolation and purification. Side reactions in peptide synthesis. „Difficult” peptide sequences and „difficult” amino acid residues. Design of peptide synthesis. Resolving of fundamental problems encountered during synthesis. Fundamental analytical techniques applied for amino acid composition, sequence and purity determination.

Bibliography of literature

A. Literature required to pass the course

A.1. Literature used during classes:

Kasprzykowski F., Unpublished materials prepared by the teacher, available during the course

A.2. Literature for individual studies

Jakubke H.D, Jeschkeit H.: "Aminokwasy, peptydy białka" (1989) wydanie drugie PWN, Warszawa

B. Extracurricular readings

Shawn Doonan: "Białka i peptydy" (2008), PWN Warszawa.

Knowledge

1. Student can describe and characterize fundamental protective groups, methods of their introduction and removal and methods of synthesis of a peptide bond.
2. Student can describe fundamental side reactions occurring during introduction of protective groups and cleavage of the peptide from a solid support, characteristic for certain amino acid residues or for certain amino acid sequences
3. student can characterize fundamental analytical techniques applied in peptide synthesis.

Skills

Student can critically assess results of performed experiments and observations.

Social competence

Student can think and act creatively.