



**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>	
The molecular basis of the amyloidogenic diseases		13.3.1226	
<b>Name of unit administrating study</b>			
null			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	second tier studies (MA)
Faculty of Chemistry	Chemical Business	<b>form</b>	full-time
		<b>specialty</b>	all
		<b>specialization</b>	all
Faculty of Chemistry	Chemistry	<b>type</b>	second tier studies (MA)
		<b>form</b>	full-time
		<b>specialty</b>	all
Faculty of Chemistry	Environmental Protection	<b>specialization</b>	all
		<b>type</b>	second tier studies (MA)
		<b>form</b>	full-time
		<b>specialty</b>	all
		<b>specialization</b>	all
<b>Teaching staff</b>			
prof. dr hab. Sylwia Rodziewicz-Motowidło; dr hab. Aneta Szymańska, profesor uczelni			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		2	
Lecture		classes - 15 h	
<b>The realization of activities</b>		tutorial classes - 15 h	
lectures in the classroom		student's own class - 20 h	
<b>Number of hours</b>		TOTAL: 50 h - 2 ECTS	
Lecture: 15 hours			
<b>The academic cycle</b>			
2022/2023 winter semester			
<b>Type of course</b>		<b>Language of instruction</b>	
an elective course		english	
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
Lecture with multimedia presentation of basic issues in the drug discovery process		<b>Final evaluation</b>	
		Graded credit	
		<b>Assessment methods</b>	
		- participation in classes, - a multimedia presentation prepared (optionally in groups of several people): its content (factual correctness of the presented information) and the manner of presentation (clarity and clarity).	
		<b>The basic criteria for evaluation</b>	
		Performance of presentation (The topics will be prepared by the academic teacher), positive note from presentation. Assessment criteria in accordance with the University of Gdansk Study Regulations.	
<b>Method of verifying required learning outcomes</b>			

The following will be verified:

- does the student use the vocabulary and knowledge acquired during the lecture in discussions
- does the student work with the group during the final presentation and diligently perform the assigned tasks
- does the student use the acquired knowledge in the prepared presentation, linking the structure and type of protein that creates amyloid fibril with specific amyloidoses
- does the student correctly recognize the role of conformational factors in the development of various types of amyloidosis in the discussions during the lecture as well as in the prepared presentation

### Required courses and introductory requirements

#### A. Formal requirements

lack

#### B. Prerequisites

– knowledge of basic issues in the field of organic chemistry: functional groups occurring in organic compounds, structure of amino acids, peptides and proteins, influence of external factors on conformational changes of peptides and proteins, knowledge of basic physico-chemical techniques used in peptide and protein chemistry

### Aims of education

- To acquaint students with the definition of amyloid and its formation
- To acquaint students with information on the mechanisms of amyloid fibril formation
- To acquaint students with physico-chemical techniques used in research on amyloid fibrils
- The role of amyloid fibrils in the development of amyloid diseases
- Make students aware of the importance of environmental factors in the development of amyloid diseases

### Course contents

The lecture will cover the following issues: classification of amyloidogenic diseases; structure of amyloid fibril; folding of amyloid proteins; the role of post-translational modifications in the formation of amyloid fibrils; the role of lipid modulators in the formation of amyloid; the mechanism of formation of amyloid fibrils; amyloidogenic proteins, structure and function (eg. b-amyloid, prion protein, immunoglobulin, transthyretin, gelsolin, lysozyme, fibrynogen, b-microglobulin, cystatin C, amyloid-forming hormones), amyloid diseases (amyloidosis).

### Bibliography of literature

Literature required to pass the course  
Monographic materials provided by the teacher  
Scientific texts indicated by the teacher

#### Extracurricular readings

1. Amyloid, prions and other protein aggregates / ed. By Ronald Wetzel. Methods in Enzymology vol. 309, San Diego, Calif.,: Academic Press, cop. 1999
2. Protein misfolding diseases: current and emerging principles and therapies / ed. By Marina Ramirez-Alvarado, Jeffrey W. Kelly, Christopher M. Dobson, Wiley Series in Protein and Peptide Science, Hoboken: Wiley, A. John Wiley & Sons, cop. 2010
3. Studies of human plasma amyloid A protein fibrillization and its short N-terminal fragments / Marta Sosnowska; University of Gdansk. Faculty of Chemistry. Sosnowska, Marta (biochemistry). PhD thesis, Gdańsk, 2015
4. Amyloid structure, function, and molecular mechanisms. Fri. 2 / guest eds.: Sheena Radford and Jonathan Weissman., JMB Journal of Molecular Biology, vol. 421, iss. 4/5, Amsterdam [etc.]: Elsevier, 2012.
5. Amyloid structure, function, and molecular mechanisms. Fri. 1 / guest eds.: Shenna Radford and Jonathan Weissman. JMB Journal of Molecular Biology, vol. 421, iss. 2/3, Amsterdam [etc.]: Elsevier, 2012.
6. Characterization of the complex of human cystatin C (hCC) with serum amyloid A protein (SAA) / Marta Spodzieja; University of Gdansk. The chemistry department. Department of Medical Chemistry Spodzieja, Marta Marcelina. PhD thesis, Gdańsk 2011.
7. Synthesis, studies of conformation and aggregation of  $\beta$ -amyloid peptides / Paulina Juszczuk. Juszczuk, Paulina. PhD thesis, Gdańsk 2005.
8. Research on  $\beta$ -amyloid peptide and its fragments / Kornelia Wiśniewska. Wiśniewska, Kornelia. PhD thesis, Gdańsk 2003.

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

Chemistry:  
K\_W05: has extended knowledge in the field of the specialization studied  
K\_W11: demonstrates in-depth knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field  
K\_U04: applies acquired knowledge of chemistry and related scientific disciplines  
K\_U10: reads with understanding scientific and popular

#### Knowledge

Student:  
- knows the mechanisms of the formation of amyloid fibrils  
- knows the structure of various amyloid fibrils  
- knows the causes of amyloid diseases at the molecular level

#### Skills

Student:  
- uses the acquired knowledge about the molecular basis of the formation of amyloid diseases.

#### Social competence

<p>science chemical texts in English K_K05: understands the need for independent search of information in scientific literature and popular science magazines</p> <p>Chemical Business: K_BChII_W01: knows and understands in-depth complex physicochemical processes and is able to analyse their course in connection with other fields of science K_BChII_U03: is able to present, based on the current state of knowledge, scientific discoveries and the results of own research in the field of chemical and economic sciences, through skilful debate and public speeches K_BChII_K03: is willing to critically assess the level of his/her own knowledge in the light of the achievements of the studied scientific discipline K_BChII_K09: is willing to conduct research and develop his/her scientific and creative achievements in the studied field</p> <p>Environmental Protection: K_OŚII_W01: describes in an in-depth manner complex phenomena and processes occurring in nature, including those related to the spread of anthropogenic pollution K_OŚII_U06: defines her/his interests and develops them within the chosen specialisation and themes of her/his master's thesis while implementing the process of self-education and planning of own future career K_OŚII_K05: critically assesses her/his own knowledge and the knowledge of the teams in which s/he works, can critically assess the content received</p>	<p>Student:</p> <ul style="list-style-type: none"> <li>-understands the role of environmental factors in the development of amyloid diseases and the importance of appropriate pro-health behaviors in reducing the risk of amyloidosis</li> <li>- knows how to work in a group</li> </ul>
<p><b>Contact</b></p> <p>s.rodziewicz-motowidlo@ug.edu.pl</p>	