

## SYLLABUS – A COURSE DESCRIPTION

### I. General information

1. Course name: **Molecular Therapies**
2. Course code: **01-BTA-MOLTHER**
3. Course type (compulsory or optional): **compulsory**
4. Study programme name: **Biotechnology**
5. Cycle of studies (1st or 2nd cycle of studies or full master's programme): **2nd cycle of studies**
6. Educational profile (general academic profile or practical profile): **general academic profile**
7. Year of studies (if relevant): **II**
8. Type of classes and number of contact hours (e.g. lectures: 15 hours; practical classes: 30 hours):  
**lectures: 15 hours**  
**practical classes: 20 hours**  
**conversations: 10 hours**
9. Number of ECTS credits: **4**
10. Name, surname, academic degree/title of the course lecturer/other teaching staff:  
**prof. dr hab. Johannes Bluijssen, h.bluyss@amu.edu.pl**  
**prof. dr hab. Joanna Wesoly, j.wesoly@amu.edu.pl**  
**dr Arkadiusz Kajdasz**
11. Language of classes: English
12. Online learning – yes (partly – online / fully – online) / no: **Traditional classroom methods will be combined with computer-mediated activities.**

### II. Detailed information

1. Course aim (aims)  
 To provide insight in the current state of the art therapy-based technologies, concepts and biotechnological applications in modern medicine.  
 Technologies include:  
 C1. Personalized Medicine, Molecular Diagnostics  
 C2. Cell therapy and stem cell therapy  
 C3. Nanotechnology  
 C4. Small compound inhibitors  
 C5. Novel generation cancer therapies  
 C6. RNA interference technology  
 C7. Immune therapy/antibody  
 C8. CRISPR-directed therapies  
 C9. Tissue engineering/Xenotransplantation
2. Pre-requisites in terms of knowledge, skills and social competences (if relevant)  
 To attain a working knowledge of current state of the art therapy-based technologies, concepts and biotechnological applications in modern medicine. Wherever possible e-learning will be incorporated.  
 Furthermore, students will extend and solidify their understanding of the presented principles through critical readings from the primary research literature, as well as student-prepared presentations of individual topics during journal clubs.  
 Finally, practising theoretical design of small drug-able compounds and applying virtual screening to identify novel pharmaceuticals.
3. Course learning outcomes (EU) in terms of knowledge, skills and social competences and their reference to study programme learning outcomes (EK)

Course learning outcome symbol (EU)	On successful completion of this course, a student will be able to:	Reference to study programme learning outcomes (EK)
EU_01	Creatively utilize current state of the art therapy-based technologies, concepts and biotechnological applications in modern medicine.	BT_W01, BT_W09, BT_K01, BT_K02
EU_02	Reading, understanding and presenting principles of the primary research literature applied to molecular therapeutics.	BT_U03, BT_U04, BT_U05

EU_03	Practising theoretical design of small drug-able compounds and applying virtual screening to identify novel pharmaceuticals.	BT_W05, BT_W06, BT_U01, BT_K04
-------	--	--------------------------------

4. Learning content with reference to course learning outcomes (EU)

Course learning content	Course learning outcome symbol (EU)
Personalized Medicine, Molecular Diagnostics	EU_01, EU_02
Cell therapy and stem cell therapy	EU_01, EU_02
Nanotechnology	EU_01, EU_02
Small compound inhibitors	EU_01, EU_02, EU_03
Novel generation cancer therapies	EU_01, EU_02, EU_03
RNA interference technology	EU_01, EU_02
Immune therapy/antibody	EU_01, EU_02
CRISPR-directed therapies	EU_01, EU_02
Tissue engineering/Xenotransplantation	EU_01, EU_02
Literature knowledge	EU_01, EU_02, EU_03
Practicals	EU_02, EU_03

5. Reading list

III. Additional information

1. Teaching and learning methods and activities to enable students to achieve the intended course learning outcomes (please indicate the appropriate methods and activities with a tick or/and suggest different methods)

Teaching and learning methods and activities	
Lecture with a multimedia presentation	X
Interactive lecture	X
Problem – based lecture	
Discussions	X
Text-based work	X
Case study work	
Problem-based learning	
Educational simulation/game	
Task – solving learning (eg. calculation, artistic, practical tasks)	X
Experiential work	X
Laboratory work	
Scientific inquiry method	
Workshop method	X
Project work	X
Demonstration and observation	
Sound and/or video demonstration	
Creative methods (eg. brainstorming, SWOT analysis, decision tree method, snowball technique, concept maps)	
Group work	X

1. Assessment methods to test if learning outcomes have been achieved (please indicate with a tick the appropriate methods for each LO or/and suggest different methods)

Assessment methods	Course learning outcome symbol		
	EU_1	EU_2	EU_3
Written exam			
Oral exam			
Open book exam			
Written test			
Oral test			
Multiple choice test	X		
Project			X
Essay			
Report			
Individual presentation		X	
Practical exam (performance observation)			
Portfolio			

### 3. Student workload and ECTS credits

Activity types	Mean number of hours spent on each activity type
Contact hours with the teacher as specified in the study programme	45
Preparation for classes	20
Reading for classes	10
Essay / report / presentation / demonstration preparation, etc.	10
Project preparation	10
Term paper preparation	
Test preparation	15
Total hours	110
Total ECTS credits for the course	4

### 4. Assessment criteria according to AMU in Poznan grade system

Very good (bdb; 5,0): Clear attainment of the course outcomes, showing complete and comprehensive understanding of the course content, with development of relevant skills and intellectual initiative to an extremely high level.

Good plus (+db; 4,5): Substantial attainment of the course outcomes, showing a high level of understanding of the course content, with development of relevant skills and intellectual initiative to a high level.

Good (db; 4,0): Sound attainment of the course outcomes, showing good understanding of the course content, with development of relevant skills and intellectual initiative to good level.

Satisfactory plus (+dst; 3,5): Some attainment of the course outcomes, showing some understanding of the course content, with development of relevant skills and intellectual initiative to rather good level.

Satisfactory (dst; 3,0): Weak attainment of the course outcomes, showing acceptable understanding of the course content, with development of relevant skills and intellectual initiative to acceptable level.

Unsatisfactory (ndst; 2,0): Very weak attainment of the course outcomes, showing not passable understanding of the course content, with development of relevant skills and intellectual initiative to not acceptable level.