

SYLLABUS

1. 1. Information regarding the programme

1.1 Higher education institution	Babeş-Bolyai University
1.2 Faculty	Faculty of Biology and Geology
1.3 Department	Department of Molecular Biology and Biotechnology
1.4 Field of study	Biology
1.5 Study cycle	Master
1.6 Study programme / Qualification	Medical Biology

2. Information regarding the discipline

2.1 Name of the discipline (en) (ro)	Molecular Immunology Imunologie moleculară						
2.2 Course coordinator	Lecturer Emilia Licarete, PhD						
2.3 Seminar coordinator	Lecturer Emilia Licarete, PhD						
2.4. Year of study	2	2.5 Semester	3	2.6. Type of evaluation	E	2.7 Type of discipline	SD
2.8. Code of the discipline	BME1301						

3. Total estimated time (hours/semester of didactic activities)

3.1 Hours per week	4	Of which: 3.2 course	2	3.3 seminar/laboratory	2
3.4 Total hours in the curriculum	56	Of which: 3.5 course	28	3.6 seminar/laboratory	28
Time allotment:					hours
Learning using manual, course support, bibliography, course notes					60
Additional documentation (in libraries, on electronic platforms, field documentation)					33
Preparation for seminars/labs, homework, papers, portfolios and essays					33
Tutorship					24
Evaluations					4
Other activities:					
3.7 Total individual study hours					126
3.8 Total hours per semester					182
3.9 Number of ECTS credits					7

4. Prerequisites (if necessary)

4.1. curriculum	-
4.2. competencies	-

5. Conditions (if necessary)

5.1. for the course	<ul style="list-style-type: none"> • Beamer • Online meeting platform
5.2. for the seminar /lab activities	<ul style="list-style-type: none"> • Attendance of a minimum of 90% of practical/ seminar classes

6. Specific competencies acquired

Professional competencies	<ul style="list-style-type: none"> • basic knowledge of the cellular and molecular mechanisms necessary to understand and describe complex immunologic interactions in the living organisms; • cunoașterea modului în care patogenii interacționează cu organismul uman; • knowledge of the immune system malfunctioning (autoimmunity, immunodeficiency) cunoștințe privind anomalii ale funcționării sistemului uman (autoimunitate, iminodeficiente) as well as the therapeutic approaches used for its treatment. • Understanding the principle and way of functioning of some medical devices and instruments as well as of the ability to use some laboratory techniques absolutely essential in knowing the physiological processes at the level of living cells; • the ability to perform certain immunological tests and to interpret the obtained results; • development of the capacity for analysis, synthesis and communication of specialized scientific information
Transversal competencies	<ul style="list-style-type: none"> • Development of the ability to use theoretical concepts to solve practical problems; • The ability to perform the duties required by the job with efficiency and professionalism.

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	<ul style="list-style-type: none"> • Understanding the mechanisms by which the immune system fulfills its function of defending the body against pathogens as well as those of regulating the immune response.
7.2 Specific objective of the discipline	<ul style="list-style-type: none"> • To Know the stages of the immune response to pathogens; • Defining and understanding the structural bases of the immune response; • Understanding the basic principles and genetic mechanisms that govern the specificity of the adaptive immune system; • Defining and understanding some basic notions in immunopathology; • Notions about targeted cancer therapy by modulating the immune system.

8. Content

8.1 Course	Teaching methods	Remarks
1. Introductory course on cells and organs of the immune system, immune responses mediated by B and T lymphocytes.	frontal lecture, with the stimulation of interactivity through problematization.	2 h
2. Antigens, immunogens, haptens.	frontal lecture, with the stimulation of interactivity through problematization.	2 h
3. Molecular mechanisms underlying the generation of B-lymphocyte/antibody and T-lymphocyte receptor diversity. Affinity maturation, immunoglobulin class switching.	frontal lecture, with the stimulation of interactivity through problematization.	4 h

4. Development of lymphocytes. Mechanisms of central and peripheral tolerance. Immunological memory.	frontal lecture, with the stimulation of interactivity through problematization.	4 h
5. Cell signaling through immune system receptors.	frontal lecture, with the stimulation of interactivity through problematization.	6 h
6. Immunity to pathogens (viruses, bacteria and fungi, protozoa and parasitic worms).	frontal lecture, with the stimulation of interactivity through problematization.	3 h
7. Molecular mechanisms of autoimmunity. Autoimmune diseases	frontal lecture, with the stimulation of interactivity through problematization.	3 h
8. Tumor immunology: tumor antigens, tumor microenvironment, anti-tumor immune responses, immunotherapies used in cancer.	frontal lecture, with the stimulation of interactivity through problematization.	6 h
References:		
<p>1. Murphy, K and Weaver, C., Janeway's Immunobiology, Garland Science, 9th edition, 2016</p> <p>2. Janeway C et al., <i>Immunobiology</i>, Garland Science New-York; 7th edition, 2007</p> <p>3. Mak, T. and Saunders, M., The immune response: basic and clinical principles, Elsevier Academic Press, 2006</p> <p>4. Abbas <i>et al.</i> – Cellular and Molecular Immunology – 6th ed. Elsevier, 2010</p> <p>5. Scientific journals in the field</p>		
8.2 Seminar / laborator	Teaching methods	Observații
1. Labor protection measures in the laboratory. - labor protection measures, protective equipment, hazardous waste - manipulation of biological material	Practical class	2h
2. Antibodies purification from sheep serum by affinity chromatography, concentration by Amicon filters - the principle of the method - work technique - concentration determination	Practical class	4h
3. Antibodies isolation from sheep serum by precipitation with ammonium sulfate - the principle of the method - concentration determination.	Practical class	3h
4. Purification of antibodies from sheep serum after precipitation by gel filtration - the principle of the method - work technique - concentration determination	Practical class	3h
5. Purification of antibodies from egg yolk by the water dilution method - the principle of the method - work technique - concentration determination	Practical class	4h
6. Seminar-case studies, journal club	Seminar class problematization	4h
7. Activation of granulocytes with immune complexes	Practical class	2h

- the principle of the work - work technique - interpretation of the results		
8. Seminar-case studies, journal club	Seminar frontal în care se evaluează capacitatea studenților de a înțelege și prezenta informația științifică precum și utilizarea cunoștințelor teoretice pentru a rezolva probleme practice.	2h
9. Practical class-recuperation	Practical class	4h
References: Freshney I., <i>Culture of Animal Cells, A manual of basic technique</i> , 4 th ed., Wiley-Liss, New-York, 2000. Janeway C et al., <i>Immunobiology</i> , Garland Science New-York; 7th edition, 2007 Short Protocols in Immunology - JOHN WILEY & SONS INC, 2009		

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

<ul style="list-style-type: none"> The course promotes the gaining of theoretical knowledge and practical skills required for teamwork in the field of research and development in academic entities, but also in R&D units in private companies; The course is listed in the curriculum of similar specializations at Romanian and foreign Universities.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the grade (%)
10.4 Cours	Knowledge of concepts and methods from the topics of the course	Written exam (combined test)	50%
	The ability to use information in a new context	Written exam (combined test)	25%
10.5 Seminar/lab activities	The ability to synthesize and present scientific information	Oral presentation	25%
10.6 Minimum performance standards			
<ul style="list-style-type: none"> Students should know 50% of the information contained in the course Students should know 60% of the information from the laboratory 			

Date	Signature of course coordinator	Signature of seminar coordinator
11.07.2024	lecturer Emilia Licărete	lecturer Emilia Licărete

Date of approval	Signature of the head of department
16.07.2024	Lecturer Beatrice Kelemen