

2023/2024. ACADEMIC YEAR							
PROGRAM OF STUDY (FOR STUDENTS OF 2ND YEAR)							
Full (Hungarian) name of the subject: Immunológia alapjai							
Program: Undivided program (pharmaceutical)							
Schedule: full-time							
Short name of the subject: Immunológia							
English name of the subject: Basic Immunology (theory)							
German name of the subject: Grundlagen der Immunologie							
Type of registration: obligatory/obligatory elective/elective/criteria requirement							
Neptun code of the subject: GYKGEN070E1A							
Responsible Department: Department of Genetics, Cell- and Immunbiology							
Responsible tutor Prof. Edit Buzas Contact information: - phone: 06-30-7444918 - email: buzas.edit@med.semmelweis-univ.hu				Title, academic degree: MD, DSc, Member of Hungarian Academy of Sciences			
Name of the persons responsible for the teaching of the subject: Buzás, Edit Falus, András Holub, Marianna Komlósi, Zsolt Molnár-Érsek, Barbara Pállinger, Éva				Title, academic degree: Professor, MD, DSc, Member of Hungarian Academy of Sciences Professor Emeritus, MD, DSc, Member of Hungarian Academy of Sciences Associate Professor, PhD Associate Professor, PhD Senior research associate, PhD Associate Professor, PhD			
Class per week: 2 lecture(s) 0 practice(s)				Credit point(s): 2			
Professional content, intent of acquirement and it's function in order to implement the goals of the program: This course provides a basic knowledge of the structure and mechanisms of the immune system, immunological responses in health and disease, in order to understand the theoretical basis of the mechanisms of targeted biological therapies							
Short description of the subject: The course discusses the construction of the human immune system: organs, cellular and molecular components involved in the immune response; the development of genetic diversity of antigen receptors, and the role of diversity in an efficient immune response. It introduces the processes of immunological regulation in healthy organism, including the immunology of pregnancy. It also discusses the course and alteration of immunological processes in certain pathological conditions, such as infections, tumors, hypersensitivity reactions, autoimmunity, immunodeficiency and transplantation.							
Course data							
Recommend ed term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individu al lectures	Total number of contact hours/sem ester	Normal course offer	Consult ations
..3.. semester	28	0			28	Autumn semester* Spring semester Both semesters (* Please underline)	7

Program of semester**

Topics of theoretical classes (pro week):

Topics of theoretical classes (pro week):

Lectures

1. The role, processes, organs and cells of the immune system
2. Principles of natural immunity
3. The complement system
4. Inflammation and acute phase reaction
5. Antigen presentation and MHCs
6. Antigen receptors and their formation
7. T lymphocytes and cell-mediated immune response
8. B lymphocytes and humoral immune response
9. Immune response in infections; immunodeficiencies
10. Hypersensitivity reactions
11. Immunological tolerance; natural and pathological autoimmunity
12. Antitumor and pregnancy immunity
13. Immunology of transplantation
14. Immunotherapies, Immunopharmacology

Topics of practical classes (pro week):

-

Schedule of consultations: 1 hour weekly in the examination period

Course requirements

Prerequisites:

Biology II

Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:

No make-up for lectures

The grading method; the conditions for getting the signature; the number, topic(s) and date(s) of the mid-term assessments-(reports, term tests), and the process in which they contribute to the final grade; and the possibility of their retake or their upgrading retake (as provided in §§ 25-28 of the STUDY AND EXAMINATION REGULATIONS):

For passing (Grade 2-5), students have to reach 50 % of the total scores. (Total scores 60 points).

Score table:

Scores/Points	Grade
0-29	1
30-39	2
40-46	3
47-53	4
54-60	5

Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results*:**

Requirements of signature(as provided for in STUDY AND EXAMINATION REGULATIONS § 29):

-

Number and type of projects students have to perform independently during the semester and their deadlines:

-

Type of the semester-end examination: signature*/practical grade*/semi-final*/final* (* Please underline)

Examination requirements: as published by the education-research department on the MOODLE interface by the start of the academic term.

The written exam score must reach a sufficient level (>50%) to obtain credit points.

It is possible to earn bonus points at the lectures.

Students who achieve the appropriate bonus points can take a simplified exam during the exam period.

Form of the semester-end examination: written*/oral*/combined examination/**practical examination/the assessment of completing project work (according to STUDY AND EXAMINATION REGULATIONS 30.§)*** (* Please underline)

The possibility and conditions for offering grades:

-

A list of the basic notes, textbooks, resources and literature that can be used to acquire the knowledge necessary to master the curriculum and to complete the assessments, **with exact description about which of them is required to acquire which part of the syllabus (e.g. description based on topics)), as well as the main technical and other aids and study aids that can be used:**

Abbas, Lichtmann, Pillai, Basic Immunology 6th Edition, Elsevier, 2019 (A19)

(For Students studied Basic Immunology before 2022: Abbas, Abul K., Basic immunology: functions and disorders of the immune system

Fifth edition. 2016. ISBN 978-0-323-39082-8 (A16))

Immunology seminars (e-book): <http://gsi.semmelweis.hu/> (The user name and password is on course datasheet of the Neptun.)

Ppt Presentations: <http://gsi.semmelweis.hu/>

- | | |
|--|--|
| <p>1. Introduction: The concept of immunity, Components (primary, secondary immune organs, cells, molecules) of the immune system. Principles of the immune response: antigen specificity, sensitivity, memory, clonal selection based operation. Features of innate and adaptive, cell-mediated and humoral, primary and secondary response. The immune homeostasis. Migration of immune cells and adhesion molecules; Cytokines and cytokine receptors. Chemokines and chemokine receptors.</p> | <p>ABBAS (Textbook)
 A19: Ch(apter) 1 pp 1-21
 (A16: Ch(apter) 1 pp(pages) 1-21; 24-25)
 and lecture ppt</p> |
| <p>2. The natural immunity: Fc-receptors; PAMP, DAMP, Pattern recognition receptors. Phagocytes and phagocytosis. Role of neutrophils, eosinophils and basophils/mast cells. Types and role of dendritic cells. Inflammasome/inflammasomopathies. Innate lymphoid cells.</p> | <p>A19: Ch 2: pp23-39, 45-46, 47-49
 (A16: Ch 2 pp 27-43; 45-50; 53)
 and lecture ppt</p> |
| <p>3. The complement system: The activation pathways and the regulation of the complement system; Complement receptors; Complement genetics; the biological role of complement activation.</p> | <p>A19: Ch2 p 39; Ch8: pp164-172
 (A16: Ch8, pp176-184)
 and lecture ppt</p> |
| <p>4. Inflammation and the acute phase reaction
 The inflammation and the acute phase response, the provoking factors and mechanisms, periods; The acute phase plasma proteins.</p> | <p>A19: Ch2:41-45
 (A16: Ch 2 pp 43-48)
 and lecture ppt</p> |
| <p>5. Antigen, antigen presentation, MHC: The major histocompatibility complex; The ways of antigen processing and presentation.</p> | <p>A19: Ch 3: pp51-72
 (A16: Ch 3 pp 56-78)</p> |

<p>6. Antigen receptors and their formation: Types and structures of antigen receptors; The immunoglobulin and TCR genes, the sources of antigen receptor diversity; Expression and production of antigen receptors.</p>	<p>and lecture ppt A19: Ch 4 pp73-78, 80-92 (A16: Ch 4 pp 79-102)</p>
<p>7. T cells and the cell mediated immunity: Differentiation and activation of T cells, types of the T cells, the cell mediated immunity.</p>	<p>and lecture ppt A19: Ch4: pp92-95; Ch5: pp96-106, 109-113, 116-117; Ch6: 119-132, p136 (A16: Ch5, pp 103- 113; 117-121; 126-127 Ch6, pp 129-143; 146)</p>
<p>8. B cells and the humoral immunity: The activation and differentiation of B cells, types of the B-cells, the humoral immunity.</p>	<p>and lecture ppt A19: Ch4 p78, Ch7: pp137-157, Ch8: pp158-164, 174-176 (A16: Ch 7: pp 147-168; Ch 8 pp 169-176; 188-189)</p>
<p>9. Immune response in infections Antimicrobial immune response.</p>	<p>and lecture ppt A19: Ch2 pp46-47, Ch6: pp132-135, Ch8 p174 (A16: Ch6, pp143-145; Ch1 pp21-24, Ch2, pp45-53; Ch8 p186)</p>
<p>10. Hypersensitivity reactions Type 1-4 reactions (See also the practical presentations)</p>	<p>and lecture ppt A19: Ch11 pp218-234 (A16: Ch 11 pp231-247)</p>
<p>11. Immunology of transplantation Immunological background of transplantation and GVH.</p>	<p>and lecture ppt A19: Ch10 p196, pp207-217 (A16: Ch10 pp219-230)</p>

	and lecture ppt
12. Immunological tolerance and autoimmunity Mechanisms of immune tolerance. The natural autoimmunity. Idiotypic regulation and network. Pathological autoimmunity.	A19: Ch4 p92, Ch9 pp177-194 (A16: Ch9, pp191-203, 203 -210) and lecture ppt A19: Ch12 pp235-250 (A16: Ch12 pp249-250; Fig. 12-3. 12-4. 12-5; pp258-264; 265-266) and lecture ppt A19: Ch10 pp 196-207; Ch8 p173; 189; (A16: Ch10 pp 211-219; 228-229) and lecture ppt
13. Immune deficiencies Primer and acquired immune deficiencies.	
14. Anti-tumor-immunity and pregnancy immunity Tumor antigens. Anti-tumor immunity. Escape strategies of tumor cells. Possibilities of anti-tumor immune-therapy. Neonatal immunity. Tolerance to fetal antigens.	
In the case of a subject lasting more than one semester, the position of the teaching/research department on the possibility of parallel enrolment and the conditions for admission****: yes*/no*/on and individual assesment basis* (<i>Please underline</i>)	
The course description was prepared by: Marianna Csilla Holub, PhD, Associate Professor, Course coordinator of Immunology	