Department of Biology

College of Science

University of Salahaddin

Subject: Immunology

Course Book: Fourth Class/General

Lecturer's name: Taban K. Rasheed, PhD

Academic Year: 2023/2024

Course Book

1. Course name	Immunology
2. Lecturer in charge	Theory/ Dr.Taban K. Rasheed
3. Department/ College	Biology/Science
4. Contact/ E-mail	taban.rasheed@su.edu.krd
5. Time (in hours) per week	Theory: 2hr./week
6. Office hours	To be return to the schedule on the office door of the instructors
7. Course code	SBIO404
8. Teacher's academic profile	**Dr.Taban Rasheed:**I graduate from Salahaddin University in 1991(Ranked 5th in collage) worked as assistant biology for three years. In 1997 I finished my MSc degree in HBV and start as Assistant Lecturer Teaching Practical Immunology, Practical Virology, Practical Mycology, Practical Medical Microbiology, and Practical Invertebrate Biology. In 2008 I get my PhD degree in Micro-immunology and from that time, I am in charge in teaching Immunology theory for 4th class students, teaching Virology theory for 3rd class students, Supervising Immunology and Virology Practical Laboratory, Teaching Advanced Immunology for Graduate student. In 2010 I was honored to be among the 25 Iraqi university staff that have been selected to visit USA through Fulbright Visiting Program for faculty development and capacity building. In 2011, I was accepted as a research fellow in George Mason University-Prince William Campus in Molecular and Microbiology Laboratory in USA to study HIV virus.
9. Keywords	History of Immunology, Specific and non-specific Immunology, Lymphoid Organ, Antigen, Antibody, Immune Response, Complement System, and Cytokines.
10. Course overview: Our immune system not only protects us from viruses, bacteria, and parasites, it can prevent the growth of tumors. Sometimes our immune system can be the cause of diseases like multiple sclerosis, Type 1 diabetes and rheumatoid arthritis. If you are interested in studying how our immune system works to keep us alive, then Immunology course is for you. This course of study will provide an overview of the immune system and	

the essential features of immune responses an introduction to the nature of the cells and molecules involved in the immune response, Phagocytosis, lymphoid organs, cells and receptors, Recognition of pathogens; antigen processing and presentation.

The study of the immune system ultimately provides us with a fascinating insight into the relationship between animals, and the organisms that infect them (not only bacteria & viruses, but also protozoans and parasites). Evolutionary science has demonstrated how the life we see around us is the product of millions and millions of years of development – and part of this process has been the development of the immune system itself, as a consequence of the long and ongoing relationship between the organisms already mentioned. There is a value, and excitement, to discovering how the immune system in different organisms works, merely for its own sake. However, understanding the immune system also gives us the potential to develop therapies that control infectious disease (this includes vaccines, of which a great many have now been developed), cancer, and other diseases resulting from the malfunction of the immune system.

11. Course objective:

The objective of this course is to learn about the Immunity, Types of immunity, Subject and immunology tasks, History and development of immunology, Hematopoiesis-Localization of hematopoiesis, Innate Immunity (Innate immunity-Factor influencing level of innate immunity-Mechanism of innate immunity-Humoral factor-Cellular factor-Mode of intracellular killing), and Acquired Immunity (Acquired Immunity- Active immunity-Passive immunity-Difference between active and passive immunity). Localization of the immune system in the body and Lymphoid Organ [Lymphoid Organ-A/Primary lymphoid tissue (Bone marrow-Bursa of fabricius-Thymus) B- S(Johnson & Clarke, 2005)secondary lymphoid tissue (Lymphatic circulation-Lymph node-Spleen) C/Tertiary lymphoid tissue (Mucosal associated lymphoid tissue-Intraepithelial lymphocyte), Different structure and shape of immunoglobulin (Structure of Ig-Type of Ig-Function of Ig), Properties of the immunogen-Antigen presenting cell-Ag processing pathway, and Immune Response, Complement System (Definition-Function-Path way of activation –Regulation of complement activation), and the Source-Type-Function of cytokine.

12. Student's obligation

***Exam policy:** Student Should take 2 exam(Midterm and Final) during the course There will be no make-up exams for absences students without medical report.

***Classroom polices:**

1- Attendance: You are strongly encouraged to attend class on a regular basis, as participation is important to your understanding of the material. This is your opportunity to ask questions. **You are responsible for obtaining any information you miss due to absence**

2-Lateness: Lateness to class is disruptive

3-Electronic devices: Allcell phones are to be turned off at the beginning of class and put away during the entire class.

4-Talking: During class please refrain from side conversations. These can be disruptive to your fellow students and your professor

5- **NoDisrespectful to both the professor and to your fellow students**.

13. Forms of teaching

Face-to-Face (Lectures and PowerPoint)

Moodle system

14. Assessment scheme

Component	Date	Percent
Midterm Exam	00/00/2024	10%
Activities (Seminar, Assignments, and Quizzes)	00/00/2024	5%
Total		15%

15. Student learning outcome:

Theory: After completion of this course, you will be able to:

- Define common terms used in immunology and the history of immunology.
- Localization of the immune system in the body
- Different structure and shape of immunoglobulin
- Analyze serological test as a tool for diagnosis of different human disease.
- Difference between active and passive immunity
- Properties of the immunogen-Antigen presenting cell-Ag processing pathway
- Structure of Ig-Type of Ig-Function of Ig
- Mechanism of immune response-Primary and secondary immune response.
- Complement System (Definition-Function-Path way of activation –Regulation of complement activation)
- Source-Type-Function of cytokine.

16. Course Reading List and References:

Theory

- Ivan Roitt,I. Brostoff,J. and Male,D. (2002) Immunology (6th Ed.) Ediburgh, Mosby.
- Parslow,T.G. , Stites,D.P. , Terr,A.I. , Imboden,J.B. (2001) Medical Immunology(10th Ed.) NY, McGraw Hill
- Brooks, G.F., Carroll, K.C., Butel, J.S. &Morse, S.A. (2007) Medical Microbiology (24th Ed.) NY, McGraw Hill.

17. Theory Topics:	2 hr./week
Basic Immunology (Immunology-Hematopoiesis-Localization of hematopoiesis)	22/01/2024
Innate Immunity (Innate immunity-Factor influencing level of innate immunity-Mechanism of innate immunity-Humoral factor-Cellular factor-Mode of intracellular killing).	29/01/2024
Acquired Immunity (Acquired Immunity-Active immunity-Passive immunity-Difference between active and passive immunity).	05/02/2024

Phagocytosis and inflamation	12/02/2024
Lymphoid Organ A/Primary lymphoid tissue (Bone marrow-Bursa of fabricius-Thymus)	19/02/2024
B/Secondary lymphoid tissue (Lymphatic circulation-Lymph node-Spleen) C/Tertiary lymphoid tissue (Mucosal associated lymphoid tissue-Intraepithelial lymphocyte).	26/02/2024
Antigen Processing and Presentation (Properties of the immunogen-Antigen presenting cell-Ag processing pathway).	4/03/2024
Immune response (Mechanism of immune response-Primary and secondary immune response)	11/03/2024
Immunoglobulin (Structure of Ig-Type of Ig-Function of Ig)	18/03/2024
Complement System (Definition-Function-Path way of activation –Regulation of complement activation).	25/03/2024
Cytokines Source and Types	01/04/2024
Function of cytokine	08/4/2024
Midterm Examination	15/4/2024

19. Examinations: <u>Some samples of questions</u>

1. Compositional(Explain),True or false type of exams, Multiple choices, and Fill the blanks

Q1/ Define

1. T-dependent Antigen
2. C4b binding protein
3. Diageorge Syndrome
4. Secondary immune response

Q2/ Fill in the blanks

1- Precursor T cells must migrate to thymus where they undergo differentiation into tow type of T cells _____ and _____.

2-Chemotactic factor for attracting phagocytic cells to site of inflammation includes _____, _____, and _____.

3- Fixation of first complement (C1) needed for immune complex and binding with Ig requires _____ and _____ ions.

4- _____ blocks the association of factor-B complement with C3b in alternative pathway.

5- NK cells are capable of killing _____ and _____ cells.

6- IgA has a _____ which mad in _____ cells as its passes into secretions.

7- Thymic nurse cells secreted _____, _____, and _____ hormones to promote maturation of T cell in thymus.

Q3/ Explain with drawing the early events in Antibody production in lymph node.

Q4/ Explain A- The classical pathway for complement activation.

B- Detoxification reaction in PMN and Macrophage.

Q5/ explain the oxygen dependant mechanism of killing by phagocyte cell

Q/6 show by a diagram the effect of some cytokines on the response between NK cell, Macrophage, and T cell

Q/7 Describe this statement (T cell activation, eosinophil inflammation)

Q/8 choose the correct answer(s)

1- Found (s) in chronic inflammations
2- Inhibit (s) one arm of Arachidonic acid pathway
3- Increase (s) blood vessel constriction
4- Cause (s) MAC production
5- Cytokine (s) that cause production of IgE
6- Cytokine (s) that has role in killing parasite
7- Cytokine (s) that cause production of IgA
8- Example (s) 0f Anti-inflammatory cytokines

(IL-10, C9, IL-5, IL-4, TNF-α, IgG, IL-2, C5b6789, IgM, fibroblast, C5b6789(n), MBL, neutrophilia, macrophage, C5a, paracetamole, Prostaglandin, C5b67, granuloma, NSAID, none of them)

Good Luck/Dr.Taban Rasheed

20. Extra notes:

We want to be supportive to everyone. This "Course Book" will help you understand how College of Science/Biology Department environment works, what to do first, and who to contact if you need help. We appreciate the participation and sharing from all students related to classroom activities for the first time.

Whenever you have some questions or concerns about virology and the course book, ask any questions you may have about your concern. Sometimes a quick question at time can save a lot of frustration later!

Our discussion goal in the classroom is to be collaborative, not combative. This is important to your success in the course and as a professional. Experience shows that even an innocent remark in the class environment can be easily misconstrued. Please re-think your responses carefully before you react with others in order not to be conceder as personal attacks. Be positive to others and diplomatic with your words. We will try our best to do the same. Be careful when using sarcasm and humour. Without face-to-face communications your joke may be viewed as criticism. Remember you are not competing with each other for grades, but sharing information and learning from one another.

The College of Science, Department of Biology, expects that all students exhibit professional behaviour.

21. Peer review

We have read this course book and we see that it is contains the most necessary subjects

Dr.Taban K.Rasheed and Dr. Fikry Ali Qadir.