



Program SPECIFICATION FOR Master Degree in Immunology δ allergy

Code: 1708700

University: Alexandria

Faculty: Medical Research Institute

Program Specification

A- Basic information

1- Program title: Master Degree in Immunology δ allergy

2- Program type: single Double multiple

3- Department(s): Immunology δ allergy

4- Coordinator: Prof .Dr Zakia Abdel Rahman

5- External evaluator(s): Prof. Dr Mona Gamal El-Din

6- Last date of program specification approval: 8/1/2017

B- Professional Information

1- Program aims:

By the end of this program the students should:



Provide the students with a framework for understanding the role of immunology in medicine and provide the knowledge, skills and critical awareness that are essential for contributing to the research and services offered by the department.

By end of the program, the student should:

- 1- Acquire and integrate a knowledge in all areas of Immunology to enable students to understand the immune system in health and disease and to understand mechanisms combating diseases.
- 2- Have comprehensive knowledge on immunoglobulins and TCR.
- 3- Understand the fundamental concepts of basic of MHC and their genetics, gene generating polymorphism and the genes encoding Ig and T cell receptor.
- 4- Understand the mechanisms of antigen-antibody interactions, different methods of immunodiagnosis and correlate immunodiagnostics with clinical data.
- 5- Have a comprehensive knowledge on T and B cell activation. Ag presentation, primary and secondary immune response, immunologic memory, specific and non specific effector mechanisms and mucosal immune response.
- 6- Understand apoptosis regarding its mechanism, pathways, control, and its role in immune regulation. In addition to describe the methods of evaluation of apoptosis and its relation to human diseases
- 7- To develop the interactive abilities of the students, to process scientific data and developing their capabilities in presenting them.
- 8- Develop skills for critical reading of the scientific literature, allowing the current literature be available to the students as well as provide significant opportunities for students to show their presentation skills.
- 9- Have a comprehensive knowledge on the immune response of the host to different types of infections
- 10- Understand the concept of allergic reactions and discuss different types of the reactions.
- 11- Have comprehensive knowledge on the immune response to tumors; oncogenesis and escape (immunological factors favoring tumors growth), tumors of the immune system and immunotherapy.
- 12- Understand the concept of autoimmunity, including etiology, effector mechanisms of autoimmune diseases, clinical examples, diagnosis, tolerance and breakdown and immunotherapy.
- 13- Acquire and integrate knowledge on concepts of immunology to organ and stem cell transplantation guidelines through the understandings of the roles of different immunological and environmental factors affecting graft acceptance or rejection, immunological monitoring of graft survival, donor screening tests and their validity for graft survival, value of immune-modulation in control of graft acceptance, graft versus host disease, and current understanding of transplantation research.
- 14- Have a comprehensive knowledge on the concepts of immunology as regards to blood banking procedures using the national guidelines, together with knowledge on antigen-antibody reactions, immunoglobulin structures and functions, complement interaction, clinically significant blood group systems, antibody detection and identification, immunologic disease of the newborn, compatibility testing and component therapy.
- 15- Develop skills in information technology, problem solving, scientific research, oral presentation and team working.

2- Intended learning outcomes (ILOs)



a- knowledge and understanding:

- a1-** - Recall the general description of immune system and describe different molecules that share in immunological cellular interaction.
- a2-** Recall the basic structure of immunoglobulin molecule, describe the complement system, the organization and expression of immunoglobulin genes
- a3 -** Recall the MHC genes regarding their types, structure, and organization, the structure and functions of HLA types, the genes generating polymorphism and the genes encoding T cell receptors
- a4-** Discuss the different modalities of immunodiagnosis, types of immunodiagnostic techniques e.g. ELISA, RIA, immunofluorescence, etc. and tests for molecular immunology.

- a5-** Recall proper understanding of functions of different immune cells in relation to primary and secondary immune response and immunological memory and the relationship between mucosal immune system and different immune cells.
- a6-** Understand the difference between the peripheral and central apoptosis, pathways of apoptosis and how the immunological cells and molecules interact in defending the body against invading microorganisms & role of apoptosis in this.
- a7-** Develop the interactive abilities of the students, to process scientific data and developing their capabilities in presenting them.
- a8-** Develop skills for critical reading of the scientific literature, allowing the current literature be available to the students as well as provide significant opportunities for students to show their presentation skills.
- a9-** Recall the immune response to infections, the different mechanisms of immune damages and the evasions of the different organisms to the immune response.
- a10-** Define the concept of hypersensitivity reactions and demonstrate different types of allergic reactions.
- a11-** Understand immune response to tumors, the different mechanisms of oncogenesis, evasions of the different tumors to the immune response and the diagnosis and investigations of clinical cases which have underlying immunopathology
- a12-** Describe mechanisms for induction of autoimmunity and tolerance and approaches to autoimmune conditions and immunotherapy.
- a13-** Understand the scientific principles of immunology, microbiology, haematology and medical technology which underlie the practice of transplantation, the evidence for use, and limitations of, the common procedures used in the diagnosis and management of patients and donors.
- a14-** Describe characteristics of common blood group systems, the appropriate pre- and post-transfusion testing associated with components, the pathophysiology and laboratory investigation of transfusion reactions and hemolytic disease of the newborn.

b- Intellectual skills:

- b1-** Interpret, analyze and evaluate basic immunologic information to solve problems



- b2-** Illustrate the basis of immune system and demonstrate the innate immune mechanisms.
 - b3-** Relate immunoglobulin structure with its function, illustrate the origin of antibody diversity and the role of adhesion molecules in immune response.
 - b6--** Illustrate the types, structure and organization of MHC genes, relate structure of HLA to function and illustrate the concept of polymorphism with regards to genes encoding T cell receptors.
 - b7-** Interpret immunodiagnostic tests in correlation with clinical data.
 - b8-** Compare different cellular immunological techniques, interpret data derived from laboratory techniques to understand underlying cellular functions of the immune system.
 - b9-** Illustrate the role of apoptosis in immune regulation.
 - b10-** Develop the ability to use scientific and systemic thinking in topics presented and improve interactive proficiency.
 - b11-** Illustrate thinking skills through demonstrating logical and critical thinking on reading scientific literature within the area of Immunology .
 - b12-** Distinguish between protective and hazards defense mechanisms.
 - b13-** Illustrate inter-relation between allergic reactions and discuss differential diagnosis based on clinical signs.
 - b14-** Distinguished between oncogene and protooncogenes and hazards defense mechanisms and illustrate the diagnostic procedures which utilize the immune response to reach the final diagnoses of different types of tumours.
 - b13-** Construct the algorithm to diagnose and evaluate autoimmune diseases.
 - b14-** Illustrate evidence based medical approach to issues related to donor-recipient matching and demonstrate when a process or test is out of control, suggest possible reasons for this and select an appropriate solution from a range of alternatives.
 - b15-** Relate immunologic theory to performance of procedures in the blood bank and serology laboratory.
- c- professional and practical skills:**
- c1-** Initiate the use of safety procedures and personal protective equipment in the laboratory, outline the procedure for labeling, handling and disposing of potentially infectious material.
 - c2-** Gain skills to perform different tests in immunodiagnosis and apply quality control standards in immunodiagnostic tests.
 - c3-** Develop skills to perform and interpret results of different cellular immunological techniques.
 - c4-** Gain skills to diagnose and investigate clinical cases which have underlying immunopathology.
 - c5-** Gain skills to differentiate between different allergic reactions .
 - c6-** Outline the procedure for labeling, handling tumor specimens. Initiate the use of safety procedures and personal protective equipment in the laboratory to make stained slides from tumor specimen
 - c7-** Acquire skills for performing tests of autoimmunity



c8- Plan and execute safely a series of transplantation experiments and analyze experimental transplantation results and determine their strength and validity
c9- Perform and interpret ABO blood grouping and Rh typing and resolve ABO discrepancies and promoting excellence in diagnosing immunohematological disease.

d- General and transferable skills:

d1- Develop skills in information technology

d2- Develop skills for oral presentation

d3- Develop skills in reading and research

d4- Develop skills to work safely in a laboratory environment

3- Academic standards

3a External references for standards (Benchmarks)

Generic Academic Reference Standards of the National Authority for Quality Assurance and Accreditation of Education (NAQAAE)

Date of Academic Reference standards (ARS) approval by Institute Council: 5/6/2014

3b Comparison of provision to selected external references



Generic Academic Standards	ARS of M.D of Immunology
A1-Basic facts , theories, of the specialty and related subjects/ fields	a1- Recognize the basic knowledge of immune systems a2- List the basic techniques in Immunology a3 - Recognize the principals of molecular biology ,immunology
A2- Mutual relation between professional practice and effects on environment	a4- Recall different immunological disorders and tests needed to diagnose them.
A3- Recent advances in the field of practice	a5- Recognize the recent advances in the field of Immunology
A4-Details of ethical & legal practice A5 -Quality standards of the practice	a5- Recognize the recent advances in the field of Immunology, the details of ethical and legal practice and quality standards of the practice.



A6- Design, conduction & publishing of scientific research	Design, conduction & publishing of scientific research Through student assignments and thesis
A7- Ethical considerations in different types of scientific research	Ethical considerations in different types of scientific research Through thesis
B1- Analyze, deduce, extrapolate & evaluation of information	b1- Investigate a case of immunodeficiency b2- Evaluate the values of different Immunological lab techniques. b3- Analyze the basic concepts of molecular biology, immunology
B2- Solve the majority of problems in the specialty according to the available data (complete or incomplete)	b4- Solve problems in management of different immunological diseases. Take decisions in various professional situations on the basis of evidence and proofs
B3- Conduct research studies that add to the existing specialty knowledge	Conduct research studies that add to the existing specialty knowledge Through thesis
B4- Publish scientific articles/papers (Publish scientific articles/papers Through thesis



in indexed journals)	
B5- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice	C4 determine the diagnosis of a case of immunodeficiency and design treatment plan for it
B6- Take decisions in various professional situations (including dilemmas & controversial issues)	b4- Solve problems in management of different immunological diseases. Take decisions in various professional situations on the basis of evidence and proofs C4- determine the diagnosis of a case of immunodeficiency and design treatment plan for it
B7- Add to the specialty field through creativity & innovation	Add to the specialty field through creativity & innovation Through thesis
B8- Manage discussions on basis of evidence and proofs	b4. Take decisions in various professional situations on the basis of evidence and proofs
C1- Competent in all basic and all required advanced professional skills (to be determined according to the specialty board/ department)	c1- Perform different Immunological tests and improve methods and tools used



C2- Write and appraise reports	c2- Write and appraise reports of immunological tests
C3- Evaluate <i>and improve</i> methods and tools used in specialty	Evaluate <i>and improve</i> methods and tools used in specialty Through student questionnaire
C4- Use technology to advance practice	c3-. Use technology to advance practice.
C5- Plan professional development courses to improve practice and enhance performance of juniors	Plan professional development courses to improve practice
D1- Communicate effectively using all methods	d4- Develop skills in communication using all methods
D2- Use information technology to improve his/her professional practice	d3- Use information technology to improve professional practice and use different sources of information to obtain data
D3- Teach and evaluate others	d1- Develop skills in self appraisal and seek continuous learning d4- Develop skills in communication using all methods.



	Manage scientific meeting and appropriately utilize time.
D4- Perform self appraisal & seek continuous learning	d1- Develop skills in self appraisal and seek continuous learning
D5- Use different sources of information to obtain data	d3- Use information technology to improve professional practice and use different sources of information to obtain data.
D6- Work in teams as well as a member in larger teams	d2-- Develop team work skills ,work as team leader as well as a member in larger teams.
D7- Manage scientific meetings and appropriately utilize time	d4- Develop skills in communication using all methods. Manage scientific meeting and appropriately utilize time.

4- curriculum structure and contents

4.a program duration:4 years

**4.b program structure :****4.b.i- No. of hours per week in each year/semester:**

Semester	Core Courses	Elective Courses
	No. of hours	No. of hours
First semester	5	
Second semester	5	4
Third semester	3	4
Fourth semester	3	2

4.b.ii- No. of credit hours Lectures Practical Total

Compulsory Elective Optional

4.b.iii- No. of credit hours of basic science courses
(elective from other departments except for computer
and statistics)

No. %

4.b.iv- No. of credit hours of courses of social sciences
and humanities.

No. %

4.b.v- No. of credit hours of specialized courses

No. %



4.b.vi- No. of credit hours of other courses (e.g. statistics, computer)

No. %

4.b.vii- Field Training

No. %

4.b.viii- Program levels (in credit-hours system)

Student is required to pass at least 12 credit hours with CGPA not less than C+ before submitting a thesis proposal.

5- Program Courses

5.1- Compulsory (15CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1708601	Elementary Immunology I	2	2	-
1708701	Molecular immunology I	1	1	2
1708702	Immunogenetics	1	1	-
1708703	Diagnostic immunology II	1	1	2
1708704	Cellular immunology II	2	3	2
1708705	Apoptosis	1	1	-
1708706	Interactive immunology	2	2	-
1708707	Journal club	1	1	-
1708605	General clinical immunology I	3	4	2
1708607	Hypersensitivity I	1	2	2

**5.2- Elective I (6CH)**

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1708708	Tumor immunology I	1	2	2
1708709	Specific autoimmunity	1	2	2
1708710	Transplantation I	1	2	2
1708711	Immunohematology I	1	2	2

5.3- Elective II (4CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1705720	Hematology	2	1	2
1706720	Bacteriology	2	1	2
1717720	Chemical pathology	2	1	2
1713720	Genetics	2	1	2
1712720	Medical biophysics	2	1	2
1701720	Biochemistry	2	1	2
1721720	Medical statistics	2	1	2

5.4- Optional – (none)



6- Program admission requirements

Students with MSc immunology, In case of an equivalent degree the student should sit for a supplementary course (4 courses 12 credit hours) before being illegible to register to PhD in immunology and allergy.

7- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of Ph.D. in Immunology and allergy, the student must complete 24 credit hours with CGPA of at least C+ and submit a thesis validity report.

For the progression and completion of the program to obtain the degree of Msc the student must:

- 1- Complete 24 credit hours with CGPA of at least C+.
- 2- Submit a thesis validity report by an examination committee approved by the department council and their members include at least two external examiners.



8- Evaluation of Students enrolled in the program.

Tool evaluation	Intended learning outcomes being assessed
Written	<p>a1- Recall the general description of immune system and describe different molecules that share in immunological cellular interaction.</p> <p>a2- Recognize the basic structure of immunoglobulin molecule, describe the complement system, the organization and expression of immunoglobulin genes.</p> <p>a3- Recall the MHC genes regarding their types, structure, and organization, the structure and functions of HLA types, the genes generating polymorphism and the genes encoding T cell receptors.</p> <p>a4- Discuss the different modalities of immunodiagnosis, types of immunodiagnostic techniques e.g. ELISA, RIA, immunofluorescence, etc. and tests for molecular immunology.</p> <p>b1- Interpret, analyze and evaluate basic immunologic information to solve problems</p> <p>b2- Illustrate the basis of immune system and demonstrate the innate immune mechanisms.</p> <p>b3- Relate immunoglobulin structure with its function, illustrate the origin of antibody diversity and the role of adhesion molecules in immune response.</p> <p>b4- Illustrate the types, structure and organization of MHC genes, relate structure of HLA to function and illustrate the concept of polymorphism with regards to genes encoding T cell receptors.</p>



<p>Practical</p>	<p>c1-Initiate the use of safety procedures and personal protective equipment in the laboratory, outline the procedure for labeling, handling and disposing of potentially infectious material.</p> <p>c2- Gain skills to perform different tests in immunodiagnosis and apply quality control standards in immunodiagnostic tests.</p> <p>c3- Develop skills to perform and interpret results of different cellular immunological techniques.</p> <p>c4- Gain skills to diagnose and investigate clinical cases which have underlying immunopathology.</p> <p>c5- Gain skills to differentiate between different allergic reactions .</p> <p>c6- Outline the procedure for labeling, handling tumor specimens. Initiate the use of safety procedures and personal protective equipment in the laboratory to make stained slides from tumor specimen</p> <p>c7- Acquire skills for performing tests of autoimmunity</p> <p>c8- Plan and execute safely a series of transplantation experiments and analyze experimental transplantation results and determine their strength and validity</p> <p>c9- Perform and interpret ABO blood grouping and Rh typing and resolve ABO discrepancies and promoting excellence in diagnosing immunohematological disease.</p>
<p>Oral</p>	<p>a5-Recall proper understanding of functions of different immune cells in relation to primary and secondary immune response and immunological memory and the relationship between mucosal immune system and different immune cells.</p> <p>a6- Understand the difference between the peripheral and</p>



	<p>central apoptosis, pathways of apoptosis and how the immunological cells and molecules interact in defending the body against invading microorganisms & role of apoptosis in this.</p> <p>b5- Interpret immunodiagnostic tests in correlation with clinical data.</p> <p>b6- Compare different cellular immunological techniques, interpret data derived from laboratory techniques to understand underlying cellular functions of the immune system.</p> <p>b7- Illustrate the role of apoptosis in immune regulation.</p> <p>b8- Communicate through group discussion</p> <p>d2- Work as a part of team</p> <p>d3- Develop skills in information technology</p>
Semester Work	<p>b8- Develop the ability to use scientific and systemic thinking in topics presented and improve interactive proficiency.</p> <p>b9- Illustrate thinking skills through demonstrating logical and critical thinking on reading scientific literature within the area of Immunology .</p> <p>b10- Distinguish between protective and hazards defense mechanisms.</p> <p>b11- Illustrate inter-relation between allergic reactions and discuss differential diagnosis based on clinical signs.</p> <p>b12- Distinguished between oncogene and protooncogenes and hazards defense mechanisms and illustrate the diagnostic procedures which utilize the</p>



	<p>immune response to reach the final diagnoses of different types of tumours.</p> <p>b13- Construct the algorithm to diagnose and evaluate autoimmune diseases.</p> <p>b14- Illustrate evidence based medical approach to issues related to donor-recipient matching and demonstrate when a process or test is out of control, suggest possible reasons for this and select an appropriate solution from a range of alternatives.</p> <p>b15- Relate immunologic theory to performance of procedures in the blood bank and serology laboratory.</p> <p>d1- Communicate through group discussion</p> <p>d2- Work as a part of team</p> <p>d3- Develop skills in information technology</p> <p>d4- Develop skills for oral presentation</p> <p>d5- Develop skills in reading and research</p> <p>d6-Develop skills to work safely in a laboratory environment</p>
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Evaluation of the Program

Evaluator	Tool	Sample
1- Senior students	Interview	At least 50 %
2- Alumni	Interview	Representative sample
3- Stakeholders (Employers)	Interview	Representative sample
4- External Evaluator(S) or External Examiner (s)	Reports	Dr /Mona Gamal El-Din
5- Other		



Dates of Previous editions/revisions:

Editions/Revisions Number	Date
Edition no.1	2009
Edition no. 2	2011
Edition no.3	5/6/2014
Edition no.3, revision no.1	12/2014
Edition no.3, revision no.2	10/2016

Program coordinator:

Name: ... Prof. Dr **Zakia ahmed abdelrahman**

Signature:

Department Head:

Name:....Prof. Dr Eman Aly Rashwan

Signature:

Date of Department Council Approval: 6/9/2017



Courses vs program ILO Matrix



Medical Research Institute

Department Of: Immunology & Allergy