
Program SPECIFICATION FOR Ph.D Degree in Immunology δ allergy

Code: 1708800

University: Alexandria

Faculty: Medical Research Institute

Program Specification

A- Basic information

1- Program title: Ph.D. Immunology and allergy

2- Program type: single Double multiple

3- Department(s): Immunology δ allergy

4- Coordinator: Prof . Dr. Soheir Rizk Demian

5- External evaluator(s): Prof.Dr. Mohamed Abbas Elbarawy

6- Last date of program specification approval 5/6/2014

B- Professional Information

1- Program aims:

By the end of this program the students should:

1. Recognize the molecular cell biology with emphasis on genetic model, transcription, protein synthesis, structural cell biology and cell signaling.
2. Acquire and add knowledge on various approaches of experimental design including concepts like appropriate number of animals, proper control, applicable design types and good clinical practice.
3. Review molecular Immunology including molecular components of the immune response and contribution of molecular immunology to current developments in the field.
4. Discuss genome structure, mitochondrial DNA, modes of inheritance as well as the genetics of MHC as regards structure, function, variability and role in transplantation.
5. Acquire a comprehensive view of modern immunology at the molecular and cellular level. disorders, bioinformatics, and the ethical, social and legal issues in genetic medicine.
6. Acquire knowledge on the diagnosis and investigation of clinical cases which have underlying immunopathology.
7. Develop interactive abilities.
8. Acquire and add knowledge on hypersensitivity reactions, Gell and Coombs classification of hypersensitive reactions, the mechanism of action of the different types of allergens, the different types of hypersensitivity reactions and how to manage them.
9. Discuss immune response to tumors; oncogenesis and escape.

10. Know the HLA genetics, polymorphism and nomenclature, understand HLA typing methods, Ab screening and cross matching as well as the procedures and work ups for solid organ and BM transplantation.
11. Describe concepts of immunology to blood banking procedures.
12. Integrate concepts and relate ideas covered in different parts of the degree programme.
13. Proficient in conducting research.
14. Use information technology to increase the immunology knowledge.
15. Use systematic approaches to design and conduct scientific research.
16. Conduct research studies that add to the existing specialty knowledge.

2- Intended learning outcomes (ILOs)

a- knowledge and understanding:

- a1- Recognize the development of cells and cellular functions at the molecular level.
- a2- Understand research methodology and evidence based medical research.
- a3- Explain the mechanisms for the generation of antibody diversity.
- a4- Recall genome structure and function.
- a5- Comprehend how the immunological cells and molecules interact in defending the body against invading microorganisms.
- a6- Recognize immune mediated diseases.
- a7- Review scientific information through different medical search engines.
- a8- Understand the build-up of scientific paper.
- a9- Recall different molecules that share in immunological hypersensitivity reactions.
- a10- 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.
- a11- List the evidence for use, and limitations of, the common procedures used in the diagnosis and management of patients and donors
- a12- Understand the different mechanisms of haemolytic diseases, haemolytic disease of newborn and drug induced haemolytic anaemia, 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.
- a13- 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.
- a.14- Design, conduct and explore publishing of scientific research.

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.
- 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.
- b5- Interpret immunodiagnostic tests in correlation with clinical data.

- b6-** Compare different cellular immunological techniques, interpret data derived from laboratory techniques to understand underlying cellular functions of the immune system.
- b7-** Illustrate the role of apoptosis in immune regulation.
- b8-** Develop the ability to use scientific and systemic thinking in topics presented and improve interactive proficiency.
- b9-** Illustrate thinking skills through demonstrating logical and critical thinking on reading scientific literature within the area of Immunology .
- b10-** Distinguish between protective and hazards defense mechanisms.
- b11-** Illustrate inter-relation between allergic reactions and discuss differential diagnosis based on clinical signs.
- b12-** Distinguish 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.
- b16.** Prepare scientific articles/papers to be published in indexed journals.
- b17.** Conduct research studies that add to the existing specialty knowledge through thesis and assignments.

c- professional and practical skills:

- c1-** Implantation of the concept of applying high advanced levels of lab safety procedures and personal protective measures.
- c2-** Acquiring advanced skills of immunoassay performance in lab diagnosis of inflammatory autoimmune disorders as well as infectious diseases
- c3-** Application of quality control measures in immunodiagnostic assays.
- c4-** Acquisition of advanced skills for data interpretation of serological and cellular immunoassays of diagnostic relevance
- c5-** Cases studies having underlying immunopathogenesis
- c6-** Gain of essential skills to discriminate different allergic, autoimmune and immune deficiency disorders
- c7-** Plan and execute safely a series of transplantation experiments and analyze experimental transplantation results and determine their strength and validity
- c8-** Perform and interpret blood grouping and development of skills needed to resolve ABO discrepancies and promoting excellence in diagnosing immune-hematological disease.
- c9-** Awareness with automated immunoassays

d- General and transferable skills:

- d1-** Communicate through group discussion.
- d2-** Work as a part of team.
- d3-** Develop skills in information technology.
- d4-** Develop skills for oral presentation.
- d5-** Develop skills in reading and research.

d6- 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)

Adopted at MRI council 12/02/2014 and re-adopted at 15/01/2023

Last date of Academic Reference standards (ARS) approval by Institute

Council: 15/01/2023

3b Comparison of provision to selected external references

Generic Academic Standards	PhD of Immunology
A1-Basic facts, theories, of the specialty and related subjects/ fields	<p>a1- Recognize the development of cells and cellular functions at the molecular level.</p> <p>a3- Explain the mechanisms for the generation of antibody diversity.</p> <p>a4- Recall genome structure and function.</p> <p>a5- Comprehend how the immunological cells and molecules interact in defending the body against invading microorganisms.</p> <p>a6- Recognize immune mediated diseases.</p> <p>a9- Recall different molecules that share in immunological hypersensitivity reactions.</p>
A2- Mutual relation between professional practice and effects on environment	<p>a2- Understand research methodology and evidence based medical research.</p> <p>a10- 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.</p> <p>a12- Understand the different mechanisms of haemolytic diseases, haemolytic disease of newborn and drug induced haemolytic anaemia.</p>
A3- Recent advances in the field of practice	a7- Review scientific information through different medical search engines.
A4-Details of ethical & legal practice A5-Quality standards of the practice	a11- List the evidence for use, and limitations of, the common procedures used in the diagnosis and management of patients and donors.
A6- Design, conduction & publishing of scientific research	<p>a8- Understand the build-up of scientific paper.</p> <p>a14- Design, conduct & explore publishing of scientific research.</p>

<p>A7- Ethical considerations in different types of scientific research</p>	<p>a8- Understand the build up of scientific paper. a13-Recognize Ethical considerations in different types of scientific research through thesis.</p>
<p>B1- Analyze, deduce, extrapolate & evaluation of information</p>	<p>b1- Interpret, analyze and evaluate basic immunologic information to solve problems b2- Illustrate the basis of molecular cell biology b3- Illustrate the basics of the use of new technologies in the area of immunology b4 Illustrate the isotyping switching and its importance in immune system b5- Differentiate the various modes of inheritance b6- Differentiate between specific and non-specific response b7- Illustrate the non-specific immunopathology of the different diseases. b10- Illustrate the basis of hypersensitivity.</p>
<p>B2- Solve the majority of problems in the specialty according to the available data (complete or incomplete)</p>	<p>b1- Interpret, analyze, and evaluate basic immunologic information to solve problems. b8- Illustrate the use scientific and systemic thinking in topics presented.</p>
<p>B3- Conduct research studies that add to the existing specialty knowledge</p>	<p>b17. Conduct research studies that add to the existing specialty knowledge through thesis and assignments.</p>
<p>B4- Publish scientific articles/papers (In indexed journals)</p>	<p>b16. Publish scientific articles/papers (In indexed journals) through thesis.</p>
<p>B5- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice</p>	<p>b9- Identify scientific problems within the area of immunology and design strategies for investigating the problems. Also through student questionnaire</p>
<p>B6- Take decisions in various professional situations (Including dilemmas & controversial issues)</p>	<p>b9- Identify scientific problems within the area of immunology and design strategies for investigating the problems b11- 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. b12- Evaluate disciplines related to transfusion and transplantation science in order to be able to integrate information into a wider context.</p>
<p>B7- Add to the specialty field through creativity & innovation</p>	<p>b9- Identify scientific problems within the area of immunology and design strategies for investigating the problems. Add to the specialty field through creativity & innovation through thesis</p>
<p>B8- Manage discussions on basis of evidence and proofs</p>	<p>b5- Differentiate the various modes of inheritance b13- Demonstrate knowledge of immune-hematological principles and procedures.</p>

<p>C1- Competent in all basic and all required advanced professional skills (To be determined according to the specialty board/ department)</p>	<p>c1- Implantation of the concept of applying high advanced levels of lab safety procedures and personal protective measures. c2- Acquiring advanced skills of immunoassay performance in lab diagnosis of inflammatory autoimmune disorders as well as infectious diseases c3- Application of quality control measures in immunodiagnostic assays. c4- Acquisition of advanced skills for data interpretation of serological and cellular immunoassays of diagnostic relevance c6- Gaining of essential skills to discriminate different allergic, autoimmune and immune deficiency disorders. c7- Plan and execute safely a series of transplantation experiments and analyze experimental transplantation results and determine their strength and validity.</p>
<p>C2- Write and appraise reports</p>	<p>c6- Gain of essential skills to discriminate different allergic, autoimmune and immune deficiency disorders c9- Awareness with automated immunoassays.</p>
<p>C3- Evaluate and improve methods and tools used in specialty</p>	<p>c7- Plan and execute safely a series of transplantation experiments and analyze experimental transplantation results and determine their strength and validity c8- Perform and interpret blood grouping and development of skills needed to resolve ABO discrepancies and promoting excellence in diagnosing immune-hematological disease.</p>
<p>C4- Use technology to advance practice</p>	<p>c1- Implantation of the concept of applying high advanced levels of lab safety procedures and personal protective measures. c5- Cases studies having underlying immunopathogenesis</p>
<p>C5- Plan professional development courses to improve practice and enhance performance of juniors</p>	<p>c8- Perform and interpret blood grouping and development of skills needed to resolve ABO discrepancies and promoting excellence in diagnosing immune-hematological disease.</p>
<p>D1- Communicate effectively using all methods</p>	<p>d1- Communicate through group discussion.</p>
<p>D2- Use information technology to improve his/her professional practice</p>	<p>d3- Develop skills in information technology.</p>
<p>D3- Teach and evaluate others</p>	<p>d4- Develop skills for oral presentation.</p>
<p>D4- Perform self appraisal & seek continuous learning</p>	<p>d5- Develop skills in reading and research.</p>
<p>D5- Use different sources of information to obtain data</p>	<p>d3- Develop skills in information technology. d5- Develop skills in reading and research.</p>
<p>D6- Work in teams as well as a member in larger teams</p>	<p>d2- Work as a part of team.</p>
<p>D7- Manage scientific meetings and appropriately utilize time</p>	<p>d4- Develop skills for oral presentation</p>

4- curriculum structure and contents:

4.a program duration

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	7	
Second semester	5	2
Third semester	2	5
Fourth semester	1	2

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

Compulsory Elective Optional

4.b.iii- No. of credit hours of specialized courses No. %

4.b.vi- No. of credit hours of other courses No. %

4.b.V- 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
1708801	Molecular Cell Biology	2	1	2
1708802	Research Topics in Biomedical Science	1	1	-
1708803	Molecular Immunology II	3	1	2
1708804	Immunogenetics	2	2	-
1708805	Cellular and molecular immunology	2	1	2
1708806	General Clinical Immunology II	3	2	2
1708807	Interactive immunology	1	1	-
1708808	Journal Club	1	1	-
		15	8	11

5.2- Elective I (6CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1708809	Hypersensitivity reactions II	2	1	2
1708810	Tumor Immunology II	2	1	2
1708811	Specific Autoimmunity II	2	1	2
1708812	Transplantation II	2	1	2
1708813	Immunoheamatology II	2	1	2

5.3- Elective II (3CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1701820	biochemistry	3	2	2
1705820	Hematology	3	2	2
1706820	Bacteriology	3	2	2
1712820	Medical biophysics	3	2	2
1721821	Computer	3	2	2
1717820	Chemical pathology	3	2	2
1713820	Genetics	3	2	2
171820	Medical Statistics	3	2	2

5.4- Optional – (none)

6- Program admission requirements

Admission Requirements: Postgraduate students with a M.Sc in Immunology and Allergy or an equivalent M.Sc

with immunological thesis and complementary courses

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,

7.1 Complete 24 credit hours with CGPA of at least C+ through courses

7.2 Complete 24 credit hours through thesis

7.3 Submit a thesis validity report by an examination committee approved by the department council and their members include at least two external examiners.

8. Teaching and learning methods

- Lectures
 - Practical/clinical
 - Brainstorming
 - Discussion groups
 - Problem-solving
 - projects
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8- Evaluation of Students enrolled in the program.

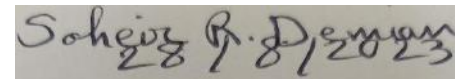
Tool evaluation	Intended learning outcomes being assessed
Written	ILOs a &b
Practical	ILOs c
Oral	ILOs a ,b &d
Semester Work	ILOs b &d

Evaluation of the Program

Evaluator	Tool	Sample
1- Senior students	Questionnaire	At least 50 %
2- Alumni	Questionnaire	Representative sample
3- Stakeholders (Employers)	Meeting	Representative sample
4- External Evaluator(S) or External Examiner (s)	Reports	Dr /Mohamed Abbas Elbarawy
5- Other		

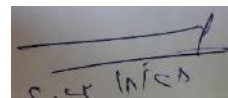
Program coordinator:

Name: Prof. Dr. Soheir Rizk Demian Signature:



Department Head:

Name: Prof. Dr Hossam Ghoneim Signature:



Date of Department Council Approval: 28/8/2023





Program Aims vs Graduate Attribute matrix

Generic Graduate Attributes of NAQAAE	Graduate Attributes of PhD in Immunology and Allergy	Program Aims
	By the end of this program, graduate should be able to	
Master the basics and methodologies of scientific research.	Master the basics and methodologies of scientific research.	<p>Recognize the molecular cell biology with emphasis on genetic model, transcription, protein synthesis, structural cell biology and cell signaling.</p> <p>Acquire and add knowledge on various approaches of experimental design including concepts like appropriate number of animals, proper control, applicable design types and good clinical practice.</p> <p>Review molecular Immunology including molecular components of the immune response and contribution of molecular immunology to current developments in the field.</p> <p>Discuss genome structure, mitochondrial DNA, modes of inheritance as well as the genetics of MHC as regards structure, function, variability and role in transplantation.</p> <p>Acquire a comprehensive view of modern immunology at the molecular and cellular level. disorders, bioinformatics, and the ethical, social and legal issues in genetic medicine.</p>



<p>Apply the analytical and critical approach to knowledge in the field of specialty and related fields.</p>	<p>Apply the analytical and critical approach to knowledge in the field of immunology</p>	<p>Acquire and add knowledge on hypersensitivity reactions, Gell and Coombs classification of hypersensitive reactions, the mechanism of action of the different types of allergens, the different types of hypersensitivity reactions and how to manage them.</p>
<p>Integrate knowledge in the field of specialty with related knowledge, deduce and develop relationships between them.</p>	<p>Integrate knowledge in the field of immunology with related knowledge, deduce and develop relationships between them.</p>	<p>Integrate concepts and related ideas covered in different parts of the degree programme.</p>
<p>Demonstrate a deep awareness of current problems and modern theories in the field of specialty.</p>	<p>Demonstrate a deep awareness of current problems and modern theories in the field of immunology</p>	<p>Acquire and add knowledge on various approaches of experimental design including concepts like appropriate number of animals, proper control, applicable design types and good clinical practice.</p>
<p>Master a wide range of professional skills in the field of specialty.</p>	<p>Master a wide range of professional skills in the field of immunology</p>	<p>Acquire knowledge on the diagnosis and investigation of clinical cases which have underlying immunopathology.</p>
<p>Use appropriate technological means to serve his professional practice</p>	<p>Use appropriate technological means to serve his professional practice</p>	<p>Use information technology to increase the immunology knowledge.</p>
<p>Work continuously to add to his/her knowledge in the field of specialty.</p>	<p>Work continuously to add to his/her knowledge in the field of immunology</p>	<p>Discuss immune response to tumors, oncogenesis and escape Know the HLA genetics, polymorphism and nomenclature, understand HLA typing methods, Ab screening and cross-matching as well as the procedures and work ups for solid organ and BM transplantation.</p>
<p>Act in a manner that reflects a commitment to integrity, credibility, and professionalism.</p>	<p>Act in a manner that reflects a commitment to integrity, credibility, and professionalism</p>	<p>Develop interactive abilities.</p>



Department of Immunology & Allergy

Take Decision in light of available data.	Take Decision in light of available data	
Employ and develop available resources efficiently and work to find new resources.	Employ and develop available resources efficiently and work to find new resources related to immunology	
Show awareness of his/her role in community development and environmental preservation.	Show awareness of his/her role in community development and environmental preservation	Proficient in conducting research.
Commit to continuous self-development and transfer his/her knowledge and experiences to others.	Commit to continuous self-development and transfer his/her knowledge and experiences to others	Use systematic approaches to design and conduct scientific research. Conduct research studies that add to the existing specialty knowledge.

