UANL
UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

FACULTAD DE MEDICINA

MODULE DESCRIPTION (Analytical Program)

1. Module Information Code:	
Name of the Institution and School	Universidad Autónoma de Nuevo León, School of Medicine
Name of the Learning Unit	Immunology
Total classroom hours for theory and/or practice.	46 hrs.
Total extra classroom hours	44 hrs.
Course Modality	Schooled
Type of academic period in which the module is offered	4° Semester
Type of Learning Unit in the Curriculum	Compulsory
Curriculum area:	ACFB
UANL credit points	3
Date of module creation:	29/09/2014
Date of last amendment:	14/08/2020
Person(s) responsible for the module design and amendments:	Dr. Mario C. Salinas Carmona, Dr. Carlos Eduardo Medina De La Garza, Dra. Alma Yolanda Arce Mendoza, Dr. Adrian G. Rosas Taraco, Dra. Anna Velia Vázquez Marmolejo, Dr. Alberto Yairh Limón Flores y Dra. María de los Ángeles Castro Corona.

2. Introduction

The Immunology Learning Unit is constituted by 4 phases. In the first phase the components of the immune system are described, its anatomical structure, functioning and cell elements maturation. The second phase encompasses the study process and mechanisms of the innate acquired immune response. The third stage details the participation of immune response to infections by different pathogens. The fourth stage details and

integrates knowledge of the immune response to understand mechanisms involved in the loss of homeostasis, immunopathology production, immunotherapy and laboratory tests that evaluate or use immune system elements. At the end of the UA the Course Integrative product (CIP) includes the development of a scheme illustrating the immunopathology of a disease.

3. Purpose(s)

In this LU the immune system neoplastic mechanisms and its role and dysfunction of autoimmune allergic diseases and malignancies are analysed. It analyses the bases for selecting donors in transplants the rejection mechanisms and immune bases for therapeutic immunomodulation.
. The immune system consists of cells and molecules that function in a balanced manner to maintain homeostasis in the life and health of humans. The abnormal functioning of one of the components of this system results in diseases. In some diseases certain elements of the immune system are responsible for the production of injury and damage, which is why this LU provides the immune basis that explains the maintenance of health or disease development. It also provides the basis for understanding and integrating immunology-based diagnosis and therapeutic into medical practice.

The immunology LU is part of the curriculum of Medical surgeon and obstetrician degree and is located in the fourth semester of the career. In the curriculum chart, the immunology LU requires its students prior knowledge of biochemical anatomy, histology and molecular biology
In line with the importance of the formation of MSO, this LU precedes the medical LU of Surgical Sciences I,II, and III, Proporciona las bases para Provides the basis for understanding the preventive and diagnostic processes to be used in pediatric learning and obstetrics this LU provides knowledge of immunological physiopathology for understanding of allergy and clinical Rheumatology and and clinical immunology units as well as infectology.
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It contributes to the proper use of oral and written expression by promoting effective communication with patients through critical analysis of scientific information and the correct form of decisions in the diagnostic and therapeutic process by making them accessible to patients and the general population in aclear and ethical manner, and also promotes interest in research and continuing education.

4. **Competences of the graduate profile**

a. General competences contributing to this learning unit.

Instrumental skills:
3.-Use the information and communication technologies as access tools to information and its transformation in knowledge, as well as for learning and collaborative work with cutting-edge techniques that allow its constructive participation in society.

4.- Dominate their native language in oral and written form with correctness, relevancy, opportunity and ethics adapting its message to the situation or context, in order to transmit ideas and scientific findings.

Personal and social interaction skills

11.- 11. Practice the values promoted by the UANL: truth, equality, honesty, liberty, solidarity, respect for life and anyone's, peace, respect for
nature, integrity, ethics, behavior and justice, within their personal and professional environment in order to make a sustainable society.

I**ntegrative skills**
12.- Make innovative proposals based on the holistic understanding of reality to help overcome the challenges of the interdependent global environment.

b. Specific competences of the graduate profile that contributes to the learning unit

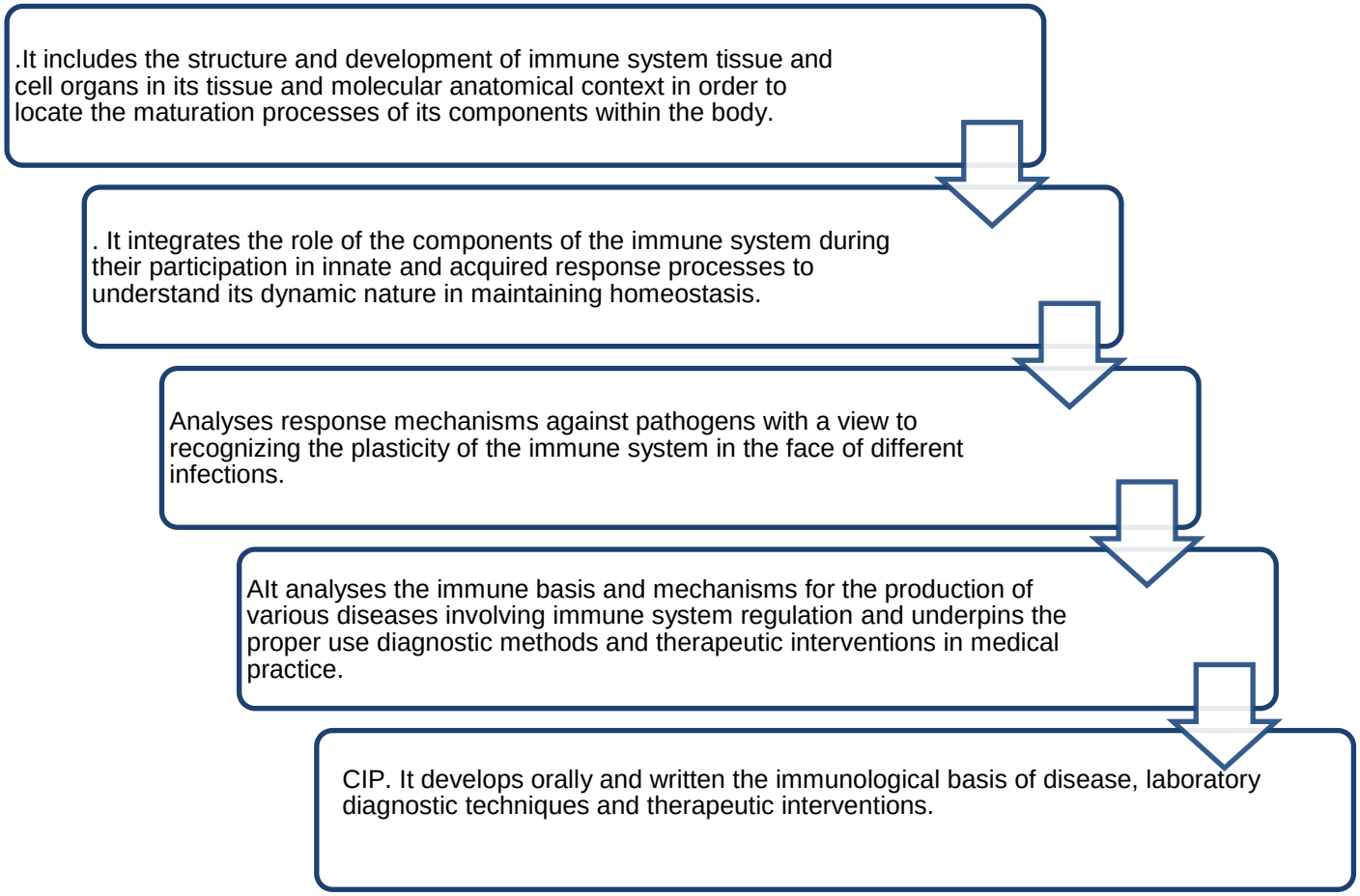
1.- Use the medicine scientific fundamentals considering economical, psychological, social, cultural and environmental factors which contribute to the development and evolution of a disease for decision-making and medical actions.

7.-Applies the scientific method for the resolution of medical problems with an innovative, analytic and self-critical attitude for preventing, diagnosing and treating diseases.

8.- Integrates professional values and ethics into his medical practice, making no difference due to gender, race, political or sexual preference, religious beliefs, activities developed, disabilities or socioeconomic level, promoting social inclusion and contributing to the population's well-being, their life quality and human development.

11.- Applies effective communication principles, establishing a respectful and sympathetic relationship with the patient, relatives, the community and other health professionals in order to use the information properly.

5. Course roadmap:



6. Structuring into stages or phases

Phase 1: Structure and development of immune system-tissue organs and cells.

Component(s) of the competence:
Understand the structure and development of immune system tissue and cells organs in its anatomic-histologic and molecular context, in order to locate the organism maturation processes of the immune system components.

Evidence of student learning	Performance criteria	Learning activities	Contents	Resources
Written report on structure and development of immune system tissue and cell organs.	The organs: -Are correctly identified by name. Identifying their anatomical lotion correctly. Explains the histology correctly. The cells: -Identifies them properly by name. -Identifies them properly at the right histological site. They are in the right order within the process that it describes. -Describes the correct morphology- -They are referenced and illustrated with the correct molecular details.	El alumno realiza la lectura correspondiente en libros y artículos recomendados. Proyección de material audiovisual y discusión dirigida, tanto conceptual como procedimental. El profesor proporciona el marco para la creación del reporte escrito. El profesor dirige la discusión y corregir errores en el desarrollo de las evidencias. The student elaborates the manuscript report including conceptual maps, tables or schematics on; morphology location and function of the immune system organ and tissue cells.	**Conceptual Content** The structure of the immune system: -Anatomy and histology of primary and secondary organs. The functions of primary and secondary organs The maturation of immune system cells: -Myeloid Serie: Granulocytes (Neutrophils, Basophils, Eosinophils) Mononuclears (monocytes, macrophages, dendritic cells) -Lymphoid series: T-lymphocytes, B-lymphocytes, NK cells, plasmacytoid dendritic cells, innate lymphoid cells (ILCs) -Other series: Erythrocytes, Platelets.	Medical school classrooms Virtual educational platforms. textbooks Specialized magazines. Internet. Graphic and audiovisual material. Evidence format.

		It Performance an analysis of content through image review. Class exposition of development and role of elements of the immune system. Analysis of immune techniques discussed and presented to the group. Self evaluation by the text website.	Important molecules for immune functions: Cellular integral, soluble. **Procedural Content:** Written and graphic expression of structures and process. Acquisition of medical terminology of tissue and cells organs as well as anatomical and functional correlation in the physiological state. Explains and justifies the basis and interpretation of immune testing results. **Attitudinal content:** Truth Honesty Equity Freedom Solidarity Equanimity Integrity Ethical behaviour Justice Respect for life and others. Respect for the environment Punctuality	

Phase 2: Immunity mechanisms

Component(s) of the competence:
Integrate the role of the components of the immune system during their participation in innate and acquired response processes to understand the dynamic nature of the immune response in maintaining homeostasis.

Evidence of student learning	Performance criteria	Learning activities	Contents	Resources
Description and presentation of antigens and processing scheme. Written report of understanding of the text: Role of immune system, components processes of innate and acquired immune response.	Illustrates; -Antigenic capture with histological and molecular anatomical details. -The proper antigenic processing -La activación de linfocitos T cooperadores incluyendo las tres señales: MHC-TCR, moléculas co-estimuladoras y citocinas en un contexto tisular. Activation of T cooperating lymphocytes including all 3 signals MCH-TCR co-stimulatory molecules and cytokines in a tissue context -The antigenic capture by B lymphocytes through BCR and antigenic processing in a tissue context.	The student reads books and recommended articles. The teacher supplies the framework for the creation of the scheme. Performs an analysis of content through image review. Process class exposure in the processing and presentation of antigens. The student illustrates the process. The audiovisual material is projected. The professor runs the discussion and corrects errors in the development of evidence. The student conducts the analysis of immune techniques which he	**Conceptual Content** The mechanisms of innate immunity: -Passive: Physical, chemical, biological. -Active: The inflammatory response (local and systemic), its cellular and molecular components The complement system (classic, alternative and lecithin pathways). The activation of NK cells. The maintenance of harmless microbial flora. The mechanisms of acquired immunity: -Inductive mechanisms: Primary responses: Activation of dendritic cells, induction of tolerance and induction of immunity Activation of T-lymphocytes. Activation of B-lymphocytes (thymo- and thymo-independent pathways). T-B cooperation	Medical school classrooms Virtual educational platforms. textbooks Specialized magazines. Internet. Graphic and audiovisual material. Evidence format.

	-Cooperation between T and B lymphocytes with complete molecular details; MCH-TCR, CD40-CD40L, cytokines, in a tissue context.	discusses and presents before the group. Self-evaluation by the text website.	for maturation of antibody response -Secondary responses: Activation of antigen-presenting cells (non-dendritic). Activation of memory T and B lymphocytes. Effector mechanisms: Antibodies: Structure and functions (neutralization, complement activation and Fc receptor mediated functions) Cellular mechanisms: Cooperation with macrophages, regulation of inflammation (Th1, Th2, Th17 and Treg profiles), direct cytotoxicity. **Procedural Content:** Graphic and written exposure of structures and processes. Understanding the process of recognition processing and presentation of antigen.	

			Acquisition of the medical and immunological nomenclature. **Attitudinal content:** Truth Honesty Equity Freedom Solidarity Equanimity Integrity Ethical behaviour Justice Respect for life and others. Respect for the environment Punctuality	

Phase 3: Anti-infectious immune response.

Component(s) of the competence:
Analyse response mechanisms against pathogens to know the adaptability of the immune system to different infections.

Evidence of student learning	Performance criteria	Learning activities	Contents	Resources
Written report of the text: mechanisms of response to pathogenic microorganisms.	Identifies: -Soluble and membrane recognition molecules. -Main early control mechanism.. -Antigen presentation routes.	The student reads books and recommended articles. The teacher supplies the framework for the creation of the scheme. Performs an analysis of content through image review.	**Conceptual Content** Effects of the acquired immune response. Mechanisms of activation of the innate immune response	Medical school classrooms Virtual educational platforms. textbooks Specialized magazines. Internet.

	-Rol of antibodies in infection control -Granulocytes roll -Cells role NK, lymphocytes CD4+ and CD8+	Process class exposure in the processing and presentation of antigens. The student illustrates the process. The audiovisual material is projected. The professor runs the discussion and corrects errors in the development of evidence. The student conducts the analysis of immune techniques which he discusses and presents before the group. Self-evaluation by the text website.	Mechanisms of activation of the acquired immune response Mechanisms of damage. Mechanisms of control and immunoprophylaxis of the response: Anti-bacterial (extra and intracellular), anti-viral (HIV and non-HIV), antiparasitic (micro and macro parasites), antifungal. **Procedural Content** Recognize clinical manifestations in the infectious process. Correlation to clinical manifestations with the immune mechanism responsible for clinical manifestations. Identify the participation of immune elements in the development of infectious disease as well as in homeostasis. Classify information in the form of comparative tables. **Attitudinal content**	Graphic and audiovisual material. Evidence format.

			Truth Honesty Equity Freedom Solidarity Equanimity Integrity Ethical behaviour Justice Respect for life and others. Respect for the environment Punctuality	

Phase 4: Clinical application of immunology

Component(s) of the competence:

Analyses the immune base and production mechanisms for various diseases involving a deterioration of the immune system and underpins the proper use of diagnostic methods and therapeutic interventions in medical practice.

Analyses the immunological basis of various pathologies for appropriate diagnosis treatment and use of laboratory techniques in medical practices,

Evidence of student learning	Performance criteria	Learning activities	Contents	Resources
Resolution of clinical cases in writing. Written report of immune mechanisms involved in the development of diseases.	-Identify the mechanisms involved in different pathologies. -Substantiates based on immune knowledge-based medical decisions. -Recognizes alarm signs suggesting immunodeficiency.	Projection of audiovisual material and directed discussion, both conceptual and procedural. The professor provides the framework for the creation of the written report.	**Conceptual Content** Immunopathology: Hypersensitivity (Type I, II, III, IV), Immunodeficiencies (primary and secondary), Allergy, Autoimmunity, Cancer. Immunotherapy: Vaccination, antibody-based therapy, cytokine	Medical school classrooms Virtual educational platforms. textbooks Specialized magazines. Internet.

	-It is aware of the clinical characteristics of phagocytic immunodeficiency diseases by complement, humoral, cellular and combined. -Use of appropriate laboratory tests for disease assessment. -It corresponds to the presence of some HLA and autoimmune diseases. -Recognizes the usefulness of vaccination in the prevention of infectious and neoplastic diseases. -Justifies the use of antibodies for the treatment of infectious, autoimmune diseases as well as transplant.	The professor runs the discussion and corrects errors in the development of evidence. The professor conducts discussion of daily clinical cases in the practice of the general doctor. Performs an analysis of content through image review. Class of pathologies with impairment of immune system dysregulation. The student draws up the manuscript report. The student conducts the analysis of immune techniques which he discusses and presents before the group. Self-evaluation by the text website. Written assessment of a clinical case. Peripheral venous puncture (PVP) practice, haemagglutination test.	based therapy, immunosuppression (in autoimmune diseases, in transplants). Laboratory techniques: Tests that evaluate the function of the immune system, tests that use immunological tools. **Procedural Content** Clinical data analysis for diagnosis of diseases with immune dysregulation. Universal precautions. Biological/Infectious hazardous handle and other safety measures in the laboratory. . Identifies the antigen antibody reaction Application of the correct technique for venous puncture, patient-medical relationship. **Attitudinal content** Truth Honesty Equity	Graphic and audiovisual material. Evidence format.

			Freedom Solidarity Equanimity Integrity Ethical behaviour Justice Respect for life and others. Respect for the environment Punctuality Organisation Team work	

7. **Summative Evaluation:**

Evidence 1 Written statement of understanding of the text (1 to 30) ….……..……....10%

Evidence 2. Scheme and description of the antigen presentation process…….. ……..... ….…2%

First written examination ….....……..……30%

Evidence 3. Resolution of a clinical case... ……..…….3%

Second written examination..…….....……..……30%

Course Integrative Product (CIP): Develops orally and written the immunological basis for laboratory diagnostic techniques and therapeutic forms…….....……5%

Final written evaluation …….....……20%

8. **Course Integrative Product**

Develop orally and in writing the immunological basis for disease, laboratory diagnostic techniques and/or therapeutic forms.
For the summary assessment of the course integrative product, it is a requirement to accredit with 70% each written evaluation including the final.

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9. **References**

Reference books:
La Inmunología en la Salud y en la Enfermedad. Salinas Carmona M. C. 2ª ed. 2017. Panamericana
Inmunología, Male, Brostoff, Roth y Roitt. 8ª edición 2014. Elsevier-Saunders.

Inmunología celular y molecular. Abul K Abbas, Andrew H. Lichtman, Shiv Pillai. 8ª ed. 2015. Elsevier.
Histología Texto y Atlas color con Biología Celular y Molecular. Ross H. Michael & Pawlina Wojciech 6ª ed. 2012. Panamericana.

Diccionario de la Real Academia Española. www.rae.es/ Also available in IOS and Android.

Diccionario Médico Lite. Available in IOS and Android.

Diccionario médico-biológico, histórico y etimológico. https://dicciomed.usal.es/

Other dictionaries may also be consulted:

Web-based web sites
UANL data base
http://www.dgb.uanl.mx/?mod=bases_datos

Cochrane Library
http://www.cochranelibrary.com/

MEDLINE / PubMed
https://www.ncbi.nlm.nih.gov/pubmed

SpringerLink
http://link.springer.com/

Jeffrey Modell Foundation
http://www.info4pi.org/

Immune Deficiency Foundation
https://primaryimmune.org/

Fundación Mexicana para Niños y Niñas con Inmunodeficiencia
http://fumeni.org.mx/
Centers for Disease Control and Prevention
http://www.cdc.gov

LISTADO DE REVISTAS DE INMUNOLOGIA
http://www.immunologylink.com/

FREE MEDICAL JOURNALS
http://www.freemedicaljournals.com/

MEDLINE
http://www.ncbi.nlm.nih.gov/PubMed/

SOCIEDAD MEXICANA DE INMUNOLOGÍA
http://www.sminmunologia.org

REVISTA MEDICINA UNIVERSITARIA (Revista de la Facultad de Medicina)
Hasta 2017 http://www.elsevier.es/es-revista-medicina-universitaria-304
Desde 2018 http://medicinauniversitaria.org/frame_eng.php?id=1

Revista CIENCIA UANL *(Revista de divulgación de la UANL)*
http://www.cienciauanl.uanl.mx

The Journal of Allergy and Clinical Immunology
http://www.jacionline.org

Annual Review of Immunology
http://www.annualreviews.org/

Clinical and Diagnostic Laboratory Immunology
http://cdli.asm.org/

European Journal of Immunology
http://www.onlinelibrary.wiley.com/journal/10.1002/(ISSN)1521-4141

International Archives of Allergy and Immunology
http://www.karger.com/journal/Home/224161

Journal of Immunology
http://www.jimmunol.org/

Scientific American
http://www.sciam.com/

American Society for Microbiology
http://www.asm.org

British Society for Immunology
http://immunology.org/

Clinical Immunology Society
http://www.clinimmsoc.org/

APPENDIX.

ASSESSMENT AND WORKLOAD

Module workload		Number of hours	Percentage
Contact hours	Class-based instruction	35 h (76.08%)	41.4% = 46 horas
	Written statement of understanding of the text	5h (10.86%)	
	Scheme and description of the antigen presentation process	1 h (2.17%)	
	Resolution of a clinical case	1 h (2.17%)	
	Exam taking	3 h (6.52%)	
	Course integrative producto (CIP)	1 h (2.17%)	
Independent study	Study	39 h (88.63%)	39.6% = 44 horas
	Exam preparation	5 h (11.36%)	
Total hours of the workload: 30 hours X 3 credits UANL/ECTS*		90 h	

*European Credit Transfer and Accumulation System
1 UANL credit = 30 hours

NOTE: Rubrics, checklists and evaluation formats are elaborated by using the performance criteria described in each stage of the module.

SUPLEMENTO COVID-19

Siguiendo las recomendaciones de la Secretaría de Salud del país y la Rectoría de la Universidad, ante la coyuntura de salud COVID-19, la organización de la docencia desde marzo del 2020, seguirá un modelo híbrido, donde la docencia se ajustará a los horarios aprobados por la Secretaría de Salud siguiendo un modelo de Presencialidad / No presencialidad en la medida en que las circunstancias sanitarias y la normativa lo permitan. Los estudiantes asistirán a las clases de manera no presencial mediante la transmisión de las mismas de manera síncrona/asíncrona vía “on line”.