



Icahn  
School of  
Medicine at  
Mount  
Sinai

# COURSE INFORMATION SHEET

**Title of Course: Immunology**

**Academic Year:** 2017-2018

**Duration of Course:** 4 weeks

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## **Mission Statement of Course:**

To introduce fundamental aspects of the organization, components and function of the immune system so as to be able to understand the role of the immune system in health and disease.

## **Goals of Course:**

The goal of the course is to provide the fundamental knowledge in immunology required for physicians to care for patients and for understanding and medically relevant research in immunology. Upon successful completion of this course, students will know the major organs and cells that comprise the immune system, will understand how the cells and the molecules of the immune system interact to maintain homeostasis and prevent pathological infection, and will understand how immune system disturbances result in pathological processes including immune deficiency, autoimmunity disease, allergy, and organ rejection. After initially learning the organ, cellular and molecular components of the immune system, the course will emphasize concepts and interactions among components that result in health and or disease.

## **Objectives of Course:**

- Describe and differentiate innate immunity from adaptive immunity
- List the components of the complement cascade including activation steps, regulation/amplification steps and effector mechanisms
- Explain the clonal selection model

## COURSE INFORMATION SHEET

- Describe mechanisms through which innate immune cell activation links to adaptive immunity
- Describe and differentiate how B cells and T cells recognize antigens
- Describe the various mechanisms that confer T cell and B cell receptor diversity
- List the various types of antibodies and how they are differentiated
- Describe an antigen presenting cell and list mechanisms of antigen processing to class I and class II MHC (HLA) pathways
- Discuss the mechanisms used by innate immunity, antibodies and T cells that are involved in mediating effector mechanisms of pathogen destruction and clearance
- Understand processes that differentiate and the individual functions of various types of effector T cells including Th1, Th2, Th17, regulatory T cells and cytotoxic lymphocytes
- Explain interactions between T cells and B cells
- List and differentiate the 4 types of hypersensitivity responses
- Define Immunological tolerance and list central and peripheral mechanisms that result in tolerance
- Define autoimmune diseases and provide examples of diseases mediated by auto antibodies or autoreactive T cells
- Describe processes that result in transplant rejection
- Differentiate memory from naive immune responses and list 2 vaccine strategies
- List the molecular mechanisms and consequences of the major immunodeficiency syndromes
- Describe a monoclonal antibody and list 3 different methods that use them for diagnostic purposes
- Interpret 2 color flow cytometry plots
- Describe the distinct features of mucosal immune system
- Describe mechanisms of allergic responses including food allergies, asthma and anaphylaxis
- Describe how the immune system interacts with cancer