UCLouvain

lbio1237

2024

Immunology : basis and applications in biology

3.00 credits	25.0 h + 15.0 h	Q1

Teacher(s)	Dehoux Jean-Paul ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	To follow this course, it is necessary to master the knowledge and skills developed in the course LBIO1111
Main themes	Module A (30 hours) : biology students and veterinary students. The objective of this module is to describe the basic notions of immunology: immune system organs, immunocompetent cells, immunoglobulins, major histocompatibility complex, T receptor, complement system and inflammation, tolerance, regulation of the immune response, immunity in the fetus and newborne, mucosal immunity. Resistance to viruses and bacteria, immunity to parasites as well as vaccines and vaccination, hypersensitivity (types I to IV) and their treatment, immunity to transplant and different diagnostic applications and immunological tests will be covered . Module B (15 hours) : Agronomy students. The objective of this module is to give the essential notions of the immune system: natural immunity and acquired immunity, antigens, structure of antibodies and the classes of immunoglobulin, main interactions between humoral and cellular responses. Besides, the module shows the technological applications of fundamental immune knowledge : monoclonal antibodies, immunological techniques of detection and dosage and vaccinology. Practical work (15 hours) The practical work realizes the main tests in immunology : isolation of mononuclear blood cells, determination of different immuno-competent cells after coloration on blood smears, immunodetections by enzymatic technique (ELISA) and realization of numerous hemato-immunologicat tests (ABO group and rhesus).
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 The immunology course aims to give a fundamental formation carrying on the main mechanisms used in immune response. They cover the necessary knowledge to the immuno-pathological comprehension as well as their treatment. Besides, the main applications of immunology in the field of biotechnology are seen. The course is divided in two modules adapted for students in veterinary and biology (A) and, on the other side, for agronomy students (B).
Evaluation methods	Written examination (5 main questions with many sub-questions - 2 hours)
Teaching methods	Lectures
Content	This course consists of lectures and practical works. Its first objective is to describe the basic notions of the immune system: the organs and cells of the immune system, immunoglobulins, molecules of major histocompatibility complex and T-receptor, complement, tolerance, regulation of the immune response. The immunity of the newborn, of the MALT, to the viruses, bacteria and parasites will be discussed to highlight the first achievements. Vaccination, Hypersensitivities and transplant immunity as well as the various immunological tests will end the matter. Sixteen chapters make up the course. Practical works: The practical works realize the main tests in immunology : isolation of mononuclear blood cells, determination of different immuno-competent cells after coloration on blood smears, immunodetections by enzymatic technique (ELISA) and realization of numerous hemato-immunologicat tests (ABO group and rhesus).
Inline resources	Moodle: Power point and PDF files
Bibliography	• Cours Moodle • Optionnel : Roitt's Essential Immunology (2016) Ivan M. Roitt, Jonathan Brostoff, David Male et Veterinary Immunology: An Introduction by Ian R. Tizard (2017).
Other infos	The immunology course aims to provide basic training on the main mechanisms involved in the immune response. It also addresses the knowledge needed to understand immuno-pathologies and their treatment. In addition, the main applications of immunology in biotechnology are discussed.
Faculty or entity in charge	BIOL

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Veterinary Medicine	VETE1BA	4		🔍
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	3		🔍
Additionnal module in Biology	APPBIOL	3		🔍
Minor in Biology	MINBIOL	4		🔍
Bachelor in Biology, Anthropology and Archaeology	BABA1BA	4		🔍