Module: 01071 – VIROLOGY
(2 CFU; 22 hours: 18 hours of academic lectures and 4[×4] hours of practicals)
Component of the C.I. MICROBIOLOGY AMD PARASSITOLOGY
Single cycle degree in Veterinary Medicine
Dr Andrea Balboni

Objectives of the course: to know the basic priciples of virus structure, classification, replication, growth, pathogenesis and recovery. To comprehend the basic principles of viral taxonomy, to be able to describe in outline each veterinary family and its important members with regard to viral characteristics, host-range, pathogenesis, clinical signs, diagnosis and control with the use of veterinary examples.

ACADEMIC LECTURES

Chapter's objective	Specific topic	Contents	Hours
Opening lecture		Course contents and objectives as well as the final exam procedures.	0,5
1. GENERAL VIROLOGY **(TOT. 14 HOURS)** 1. KNOWLEDGE RELATING TO THE STRUCTURE AND CHEMICAL COMPOSITION TO SET A PROPER PLAN OF PROPHYLAXIS 2. KNOWLEDGE ON THE TAXONOMY AND GENETICS OF THE VIRUS TO SET A CORRECT DIAGNOSTIC APPROACH 3. KNOWLEDGE ABOUT TRADITIONAL AND NEW GENERATION VACCINES AVAILABLE FOR THE INDIRECT PROPHYLAXIS 4. KNOWLEDGE OF THE AVAILABLE ANTIVIRAL MOLECULES FOR THE TREATMENT OF VIRAL DISEASES	***Morphology***	Viral structures and symmetries will be explained.	1
	Chemical composition	The different chemical components will be illustrated: nucleic acids, proteins and viral membranes.	0,5
	Taxonomy	The basis of viral classification will be illustrated with special reference to the International Committee on Taxonomy of Viruses (ICTV) classification.	1
	Viral genetics and evolution mechanisms	The main feature of the viral genome and the mechanisms of viral evolution will be explained.	2
	Virus-host interactions: replication cycle	The different phases of the replication cycle will be explained: attachment, penetration, nucleic acid replication, protein synthesis, viral assembly and release.	3
	Pathogenesis of viral diseases	The mechanisms of viral infection and dissemination will be explained with veterinary examples.	2
	Diagnosis of viral diseases	A description of the specimens collection will be given and the methods used for viral identification and serologic diagnosis will be explained.	2
	Control, prevention and therapy strategies	Direct and indirect prophylactic strategies against viral diseases will be explained. In particular, the different vaccines will be described. Furthermore, the principal antiviral molecules available and their mechanisms of action will be illustrated.	2
2. VETERINARY VIRUSES ***(TOT 4 HOURS)*** 1. KNOWLEDGE OF THE	***DNA viruses***	The principal DNA viruses responsible of animal diseases will be illustrated with particular emphasis to their structure, replication strategies and pathogenetic mechanisms.	2

PRINCIPAL FAMILIES OF VIRUSES OF VETERINARY INTEREST	***RNA viruses and viruses with RT***	The principal RNA viruses and viruses with RT responsible of animal diseases will be illustrated with particular emphasis to their structure, replication strategies and pathogenetic mechanisms.	2
PRACTICALS			
3. PRACTICALS ***(TOT 4 HOURS)*** A) TO LEARN THE CORRECT APPROACH TO THE PROBLEMS OF DIAGNOSTIC VIROLOGY B) TO ACQUIRE THE ELEMENTS FOR AN APPROPRIATE DIAGNOSTIC PROTOCOL TO REACH AN ETIOLOGIC DIAGNOSIS	***Computer lab: problem solving***	This practical exercise, carried out in the computer lab in small groups with tutors, aim to identifying the viral agents responsible for an epidemic in an animal population through the recognition of the causative agent in the electron microscope and using genomic characterization.	2
	Virology lab: diagnostic virology	This practical exercise, carried out in the laboratory in groups is designed to assess the methods of pathological samples collection and learn how to prepare the sample to be used for several diagnostic procedures, in particular for the viral isolation.	2