

## **Modules: Epidemiological Surveillance and Risk Analysis; Major and Endemic Zoonoses**

**Module coordinator: Marga Martín**

### **Module outline**

The first block in this module provides a brief introduction to the most common epidemiological and risk assessment concepts and tools. Then, the general concepts of zoonosis and the evolutionary mechanisms of infectious agents for persisting despite the attack of the immune system and the current and future therapeutic agents or strategies will be introduced. The relevance and the final impact in the public health of these pathogens' escape and resistance mechanisms will be also evaluated. The biological, epidemiological, pathogenic, diagnose and control mechanisms of the most relevant zoonoses in the world will be presented from One Health concept perspective.

### **Topics**

Epidemiology: Basic epidemiological concepts, surveillance, risk assessment and geographic information systems.

Introduction to zoonoses and etiological agents: history of zoonoses; definitions, pathogens' mechanisms to avoid immune system.

Antimicrobial Resistance: multi-resistant zoonotic bacteria; use of antibiotics in animal production and MDR; consume and self-medication in human medicine and MDR; impact of multi-resistance in nosocomial infection; evolution and impact of *Clostridium difficile*; evolution and impact of multi-resistance; resistance against antiparasitic and antifungal products; the role of wild animals as reservoirs.

Major Bacterial Zoonoses: mycobacterias' molecular epidemiology; tuberculosis in humans and animals, new vaccine strategies and sanitation campaigns, control and communication; human and animal health actions against brucellosis; rickettsiosis; Lyme disease and other borrelias; Q fever; zoonoses of companion animals; tularaemia; leptospirosis.

Major Viral Zoonoses: ecology and evolution of viruses; evaluation, control and communication of rabies; influenza A and the role of domestic and wild animals, the surveillance programme, antiviral resistances and new treatments; Coronavirus, MERSCo, SARS.

Major Parasitic and mycotic Zoonoses: Toxoplasmosis (control in cats, wild reservoirs, in pregnant women; leishmaniasis (in dog, in humans, new vaccines, management of a outbreak in Madrid); hydatidosis/ *Echinococcus multilocularis*; other parasitistic zoonoses from companion animals; mycotic zoonoses in domestic animals; mycrocines and probiotics.

### **Learning : 9 ECTS**

Lectures: 30h

Practices: 10h

Seminars: 30h

Independent work: 155h

### **Assessment**

50% Test

25% Review of a research paper

25% Resolution of practical exercises