

**Innovative Antimicrobial Approaches in Veterinary Medicine** (opcional)

**Study Cycle:** Integrated Master in Veterinary Medicine

**Curricular Year – 5º Semester - 10º**

**Credits - 2,5 ECTS**

**Lecturer(s):** Luís Tavares (CCP); Manuela Oliveira (R); Solange Gil; Luís Lamas; Eva Cunha; Frederico Aires-da-Silva

**1. Contact hours:** Theoretical - 20, Practical - 6, Evaluation – 2

**2. Objectives**

Students should acquire the following concepts: Know the phenomenon of antimicrobial resistance in the context of “One Health”; Know the various innovative alternative approaches to conventional antibiotic therapy available for the prevention, control and treatment of bacterial infectious diseases in veterinary medicine, including phage therapy, bacterins, autovaccins, antimicrobial peptides, bacteriocins, probiotics, natural compounds and biocides; Characterize the most relevant innovative antimicrobial therapies in veterinary medicine, including mechanisms of action and resistance; Know the National and European legislation concerning these agents; Know the options currently available for application in the different areas of Veterinary Medicine, namely at Companion Animals Clinic, Clinic of Livestock Species, Clinic of Equines, Aquaculture and Food Safety.

**3. Programme**

**Theoretical**

Evolution of bacterial infectious diseases in veterinary medicine promoted by multiresistant strains; Impact of bacterial resistance on human medicine, veterinary medicine, food safety, agriculture and the environment; National and European legislation on innovative antimicrobial therapies; Review of mechanisms of action of antimicrobial agents; Bacteriophages: taxonomy, particle structure, lytic and lysogenic multiplication cycle, advantages and disadvantages of phage therapy, applications in veterinary medicine; Bacterines and autovaccins: definition, immunity and effect of vaccination, National and European legislation, production, transport, storage and application methodologies, applications in veterinary medicine; Antimicrobial peptides and bacteriocins: structure and mechanisms of action, antimicrobial, antiviral, antitumor, antioxidant, cardioprotective, immunomodulatory, analgesic

and neuroprotective properties, lantabiotic resistance mechanisms, applications in veterinary medicine; Probiotics: functional foods, probiotics, prebiotics, symbiotics; selection of strains with probiotic potential; mechanisms of action, applications in veterinary medicine, fecal transplantation; Natural compounds: identification, isolation and evaluation of natural compounds with antimicrobial properties, National and European legislation, applications in veterinary medicine; Biocides: Main classes, factors influencing their effectiveness, resistance mechanisms, European legislation, applications in veterinary medicine

### **Practical**

Presentation and discussion of a clinical case by the students, which should include one of the innovative therapies presented.

### **4. Bibliography**

- Frontiers in Antimicrobial Agents – The challenging of antibiotic resistance in the development of new therapeutics. 2016. Eds. M Oliveira, I Serrano. Bentham Science Publishers.
- Scientific papers provided by the teachers.

### **5. Assessment**

Written test (rated on a scale from 0 to 20).

The evaluation of the practical component will be performed through the mandatory presentation of a Clinical Case and its discussion by the students (reted on a scale from 0 to 20).

The final grade will correspond to the weighted average of the grade obtained in the written test (70%) and in the presentation of a clinical case (30%). Students must obtain a grade higher than 9.5 in each of the evaluation components.