



Universitat de Lleida

DEGREE CURRICULUM
GENERAL PHARMACOLOGY

Coordination: FRAILE SAUCE, LORENZO JOSE

Academic year 2022-23

Subject's general information

Subject name	GENERAL PHARMACOLOGY			
Code	100357			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	4	COMPULSORY	Attendance- based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA		TEORIA
	Number of credits	2.4		3.6
	Number of groups	1		1
Coordination	FRAILE SAUCE, LORENZO JOSE			
Department	ANIMAL SCIENCE			
Important information on data processing	Consult this link for more information.			
Language	Language (%): Catalan: 20% Spanish: 50% English: 30%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
FRAILE SAUCE, LORENZO JOSE	lorenzo.fraile@udl.cat	6	

Subject's extra information

Compulsory subject of the fourth year of the veterinary degree with a study load of 6 ECTS credits. Students will integrate and apply the knowledge of previously studied subjects such as general and propedeutic pathology and zoonoses for the understanding and execution of pharmacological treatments applied to each veterinary species.

Learning objectives

Know the general pharmacological bases and study of the different types of drugs and chemical substances. Know the possibilities and applications of pharmacotherapy

Competences

The competencies of this subject will be detailed for the degree in Veterinary Medicine (GVET) and for the degree in Animal Science and Production (GCPA):

BASIC SKILLS (GVET and GCPA).

CB1: Possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of your field of study (GVET and GCPA). CB2: Apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study. (GVET and GCPA).

CB3: Ability to gather and interpret relevant data (usually within their study area) to make judgments that include a reflection on relevant social, scientific or ethical issues (GVET and GCPA).

CB4: Being able to transmit information, ideas, problems and solutions to both a specialized and non-specialized audience. (GVET and GCPA).

CB5: Know how to develop those learning skills necessary to undertake further studies with a high degree of autonomy (GCPA).

CB9: Use the basic work methodologies referring to the disciplines indicated (GCPA).

CB10: Recognize and know how to apply the basic techniques of livestock experimentation and know how to interpret their results.

GENERAL COMPETENCES (GVET).

CG2: Individual or collective prevention, diagnosis and treatment, as well as the fight against animal diseases, be they considered individually or in groups, particularly zoonoses. (GVET).

CG5: Knowledge and application of the legal, regulatory and administrative provisions in all areas of the veterinary

profession and public health, understanding the ethical implications of health in a changing world context. (GVET).

CG6: Development of professional practice with respect to other health professionals, acquiring skills related to teamwork, the efficient use of resources and quality management. (GVET).

CG7: Identification of emerging risks in all areas of the veterinary profession

SPECIFIC COMPETENCES (GVET).

CE17. Know and apply the clinical study of the sick individual and the medical, surgical or hygienic-dietetic treatments that it requires, as well as sporadic diseases that affect groups (GVET).

CE20. Know the general pharmacological bases and study of the different types of drugs, pharmacotherapy, identify natural and synthetic toxins and apply the principles of animal and environmental toxicology (GVET).

CE45. Recognize when euthanasia is necessary and carry it out humanely using the appropriate method.

TRANSVERSAL COMPETENCES (GVET and GCPA).

CT1: Acquire an adequate oral and written comprehension and expression of Catalan and Spanish (GVET and GCPA).

CT2: Acquire a significant command of a foreign language, especially English (GVET and GCPA).

CT3: Acquire training in the use of new technologies and information and communication technologies (GVET and GCPA).

CT4: Acquire basic knowledge of entrepreneurship and professional environments (GVET and GCPA).

CT5: Acquire essential notions of scientific thought (GCPA).

CT6: Analyze specific situations, define problems, make decisions and implement action plans in search of solutions. (GCPA).

CT7: Apply acquired knowledge to real situations, adequately managing available resources. (GCPA).

CT8: Interpret studies, reports, data and analyze them numerically. (GCPA).

CT9: Select and manage the written and computerized sources of information available related to the professional activity. (GCPA).

CT11: Manage individual and team work (GCPA).

CT12: Acquire comprehensive training. (GCPA).

CT14: Know and apply the scientific method in professional practice

Subject contents

Block 1.- GENERAL PHARMACOLOGY

1.- Introduction to pharmacology. Pharmacology concept. Subdivision and relationship with other disciplines. Goals. Therapy.

2.- Drug transport across the membrane. General principles. General mechanisms of transport across the cell membrane. Transport through intercellular clefts.

3.- Pharmacokinetics I. absorption and distribution. I. Mechanisms of absorption. Administration routes. II.

Distribution concept. Binding to plasma proteins. Blood-brain and placental barriers. Distribution modifying factors. Volume of distribution.

4.- Pharmacokinetics II. drug metabolism. Pharmacological significance of metabolism. Places of metabolic transformation of drugs. Metabolic pathways: synthetic and non-synthetic. Modification of biotransformation processes: physiological, pathological and pharmacological factors.

5 Pharmacokinetics III. drug elimination. General mechanisms of drug elimination and factors that modify them. Renal elimination. Biliary elimination. Other routes of elimination.

6 Pharmacokinetics IV. Basic description of compartmental analysis. Concepts of the most characteristic parameters.

7 Mechanism of action of drugs. Pharmacodynamics concept. Receptor concept. Drug-receptor interaction. Affinity, intrinsic activity and potency of a drug. Dose effect curves. Agonist and antagonist.

8 Drug Interactions. Concept. Modifications induced by drug interactions. Synergy and antagonism concept. Interactions at the pharmacokinetic and pharmacodynamic level.

9 Undesirable effects of drugs. General aspects of drug toxicity: iatrogenic pathology. Classification of undesirable effects according to their origin: overdose, collateral effects, side effects, idiosyncrasy, sensitization, resistance, tolerance.

10 Pharmacy. General concepts. Types of medications. Technopharmaceutical operations: Spraying, sieving, powder mixing, dispersed systems. Pharmaceutical forms: For oral, parenteral, topical, other administration. Presentation of pharmaceutical forms. Selection criteria for a pharmaceutical form: Bioavailability and Bioequivalence.

Block 2.- SPECIAL PHARMACOLOGY

Pharmacology of infectious and parasitic processes

11 Introduction. General concepts. Potential targets of chemotherapeutic agents and mechanisms of action. Bacterial resistance. Antimicrobial Associations. Toxicity and undesirable effects of antimicrobials. Use of chemotherapy drugs. NOTE: In each of the following topics, the study of: Chemical structure, classification, mechanism of action, spectrum of activity, resistance, pharmacokinetics, toxicity and undesirable effects, interactions and indications will be included for each group.

12 Sulfamides and diaminopyridines.

13 Antimicrobial drugs that affect the synthesis of the bacterial wall. I. Beta-lactam antibiotics: Penicillins, cephalosporins, monobactams, carbapenems, beta-lactamase inhibitors. II. Others: Vancomycin, Bacitracin.

14 Antimicrobial Drugs Affecting Bacterial Protein Synthesis. I. Aminoglycosides. II. Tetracyclines. III. Phenicolins IV Macrolides. V. Lincosamides.

15 Antimicrobial Drugs That Inhibit Nucleic Acid Function. I. Quinolones. II. Nitrofurans. III. Nitroimidazoles.

16 Other antibacterial drugs. Polymyxins, Novobiocin.

17 Antifungal Drugs. I. Topical antifungals. II. Antifungals for systemic use.

18 Anthelmintic Drugs. I. Active anthelmintics against Nematodes. II. Active anthelmintics against Cestodes. III. Active anthelmintics against Trematodes. Active drugs against coccidia Pharmacology of inflammation

19 Antihistamines: Pharmacological Properties Therapeutic Applications. Prostaglandins: general bases. Therapeutic applications. Airway pharmacology

20 Airway Pharmacology: Cough Sedatives, Mucolytics, and Bronchodilators. Classification. Mechanism of action, pharmacological properties, toxicity, therapeutic applications. General aspects of the pharmacology of respiration.

Pharmacology of the digestive system

21 Gastric Pharmacology: Appetite Stimulants and Anorexic Agents. Stimulating drugs and inhibitors of secretions and motility. Antacids Emetics

22 Intestinal Pharmacology: Laxatives and Laxatives. Modulators of intestinal activity. Protective, adsorbent and astringent. Classification. Mechanism of action, pharmacological properties, therapeutic applications. Therapeutics of enteric and colic processes. Hormonal pharmacology

23 Drugs that act on the reproductive system: steroidal hormones. Gonadotropins. Prostaglandins. Oxytocic drugs and uterine relaxants.

24 Phytotherapy

Methodology

Theoretical activities program You have 36 hours to deal with the 24 theoretical topics. Therefore, the estimated time per topic is approximately 1.5 hours.

Topics are organized to be covered in 1 to 2 hours. Therefore, the estimated mean closely approximates the time available.

PRÀCTIQUES PROGRAM

Seminars: 4 hours

Seminar 1.- Practical case of treatments in pigs. 2 hours

Seminar 2.- Practical case of treatments in birds and calves. 2 hours

Due to the health situation of the COVID19 pandemic, teaching can be done in person, blended in person or virtually. The teacher has the methodology adapted to each of these possibilities. Whenever possible, the evaluation will be in person.

Development plan

The detailed calendar by weeks will be published on the virtual campus and on the ETSEA website so that students can organize themselves more efficiently.

Evaluation

Activity	Goals	Observations	Score weight (%)

Exams	Evaluate general competences of the subject	Four exams (two teorics and two practics) following the oficial calendar of the university. Each exam will suppose a 22,5% of the final note of the student	90%
Presentation of clinical cases	Evaluation of specific competences of the subject	During the academic course	10%
Total			100%

The evaluation is continuous. There will be two theoretical exams and two practical exams throughout the course coinciding with the scheduled evaluation weeks.

10% of the grade will be determined by an oral exposition of a clinical case that will be agreed with the teacher on its selection.

The rubrics for the presentation of clinical cases will be available on the virtual campus so that students can consult them.

Bibliography

BASIC BIBLIOGRAPHY

Textbooks represent the basic bibliography that must be used by a student taking the pharmacology course in the science and animal health degree.

The books will be available in the library for your consultation. Below is a list of recommended textbooks that, to a greater or lesser degree, have been used in the development of this program:

BOTANA, LANDONI, MARTÍN-JIMÉNEZ. *Veterinary Pharmacology and Therapeutics*. 2002. Ed. McGraw Hill. Madrid.

This book is our first choice to recommend to students because, from our point of view, it is the most complete as it covers practically all the topics included in the proposed program for the subject.

ADAMS. *Veterinary Pharmacology and Therapeutics*. 2003. Ed. Acribia. Saragossa. It is a very comprehensive book on veterinary pharmacology. It is an option as suitable for the course to be developed as the first

RIVIERE. *Veterinary Pharmacology and Therapeutics*. 2009. Ed. Wiley-Blackwell It is a very complete text but perhaps inaccessible to most of the students because it does not have a version translated into Spanish.

HOWARD & SMITH. *Current Veterinary Therapy. Food animal practice*. 1999. Ed. WB Saunders Co. Philadelphia. Finally we mention this classic book, although its level is somewhat high for students who are new to pharmacology and, therefore, it is not recommended as a routine reference book. However, we believe that it should be known to students, especially as a reference book.

FURTHER READING

BARRAGRY, T.B. *Veterinary Drug Therapy*. 1994. Ed. Lea & Febiger. London.

GIGUERE. Antimicrobial Therapy in veterinary medicine. 2006. Blackwell. Iowa.

GOODMAN & GILMAN'S. The Pharmacological Basis of therapeutics. Tenth edition. 2002. Ed. McGraw Hill. New York.

GUARDABASSI. Guide to Antimicrobial Use in Animals. 2008. Blackwell. Oxford HSU.

Handbook of Veterinary Pharmacology. 2008. Ed. Amazon.

Merck Veterinary Manual

PRESCOTT, BAGGOT. Antimicrobial Therapy in veterinary medicine. 2000. Ed. Blackwell Sci. Pub. Iowa.

RANG, DALE, RITTER, MOORE. Pharmacology. 6 ed. 2008. Ed. Elsevier. Barcelona.

VELASCO, SAN ROMAN, SERRANO, MARTINEZ-SIERRA, CADAVID. Fundamental pharmacology. 2002. Ed. McGraw Hill. Madrid.

VELÁZQUEZ, MORENO, LEZA Basic and Clinical Pharmacology. 2008. Ed. Panamericana. Madrid.