Master's Degree

Veterinary Pharmacology

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Master's Degree
Veterinary Pharmacology

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/veterinary-medicine/master-degree/master-veterinary-pharmacology

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01

Introduction

This Master's Degree generates specialized content in the treatment of diseases in different animal species. It is a great tool available to veterinary professionals that allows them to specialize in the area of veterinary clinical pharmacology, as pets and exotic animals increasingly require professional care. A high-quality program, offering the most advanced resources in online specialization to guarantee the student an effective, real and practical education that will boost their competencies to the highest level in this area of work.

Specialize in Veterinary Pharmacology, updating and expanding your knowledge through this revolutionary education for its quality of teaching and content, and its intensive and flexible approach at the same time"

Veterinary Pharmacology is a multidisciplinary science, fundamentally related to other disciplines: Physiology, Microbiology, Surgery, Surgical Pathology, Medical Pathology, Nutrition and Feeding, Zootechnics, Food Technology, Immunology, Infectious Diseases, Parasitic Diseases, Obstetrics and Reproduction, Companion Animal Hospital Clinic and Large Animal Hospital Clinic, among others.

Veterinary Pharmacology is a branch of veterinary science that aims to improve current outcomes in the prevention and treatment of disease at the veterinary level through pharmacological strategies. It is the science in charge of the search for and adaptation of drugs capable of solving animal health problems.

To achieve its objective, Veterinary Pharmacology must promote research into new drugs, new indications for drugs already on the market and new therapeutic strategies. On the other hand, the correct use of the drugs available at any given time for established indications should be considered. It is important to interpret the kinetics of drugs from the time they enter the body until they are eliminated. As well as the analysis of the correlation between the effects of the drugs and the concentration of their free fraction in blood, as well as the consideration of drug interactions and their undesirable effects or side effects that may occur.

This Master's Degree in Veterinary Pharmacology contains the most complete and up-to-date program, designed by experts in Pharmacology and Veterinary Clinicians, constituting a great tool for veterinarians who wish to specialize in Veterinary Pharmacology, an indispensable tool for the professional in the veterinary clinic.

This **Master's Degree in Veterinary Pharmacology** contains the most complete and up-to-date educational program on the market. The most important features include:

- Innovative and up-to-date diagnostic techniques in infectious diseases and their application in daily clinical practice, including the use of cytology as a diagnostic tool in these diseases
- Infectious Pathologies oriented to the Feline Species, dealing extensively with all those of this species
- "One Health" vision, in which Zoonoses and their implications for public health will be reviewed
- Most frequent Infectious Pathologies of dogs and cats in the tropics. At present, there are no more exotic diseases, and they should be included by the clinician in the differential diagnosis when the epidemiology allows to suspect them
- Prevention and management of all infectious diseases, including clinical, home and community settings

A comprehensive training in the use of veterinary drugs for the prevention and treatment of diseases affecting animal health"

A revolutionary study for its ability to reconcile the highest quality of learning with the most complete online specialization"

A great opportunity for the veterinary medicine professional to advance his or her competencies and catch up on all the latest developments in pharmacological approaches.

Learn in an efficient way with a real qualification objective, with this unique Master's Degree for its quality and price, in the online teaching market.

Its teaching staff includes professionals belonging to the field of Veterinary Medicine, who bring to this Master's Degree the experience of their work, as well as renowned specialists from reference societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the specialist must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced psychology experts.

02

Objectives

The Master's Degree aims to provide students with the required competencies in relation to preclinical or clinical research of drugs used in veterinary medicine, and their application in the therapeutic use of drugs so that they can be integrated into the professional field.

Acquire the knowledge of the scientific, ethical and social foundations of Veterinary Pharmacology and the skills and attitudes for its practical application in an education created for excellence"

General Objectives

- Examine the general concepts of pharmacology at the veterinary level
- Determine the mechanisms of action of drugs
- Analyze Pharmacokinetics and Pharmacodynamics
- Review the current legislation on veterinary pharmaceutical products
- Analyze aspects related to the prescription, dispensing and administration of veterinary pharmaceutical products
- Determine the importance of the responsible and rational use of medicines for global health
- Differentiate the autonomic nervous system and its organization
- Identify the groups of drugs that act on the autonomic nervous system
- Recognize the mechanisms of action and therapeutic uses of this group of drugs
- Examine the main pharmacological properties of the groups of drugs acting on the central nervous system
- Identify the different pharmacological targets involved in CNS transmission
- Recognize the mechanisms of action, therapeutic and toxic uses of this group of drugs
- Examine the pharmacological basis of cardiorespiratory system therapy and homeostasis
- Identify the main therapeutic groups and their indications
- Determine the mechanisms of action of different drug groups, properties and pharmacokinetics
- Develop the student's critical and analytical skills through the resolution of clinical cases
- Determine the pharmacological basis of digestive tract therapy
- Identify the main therapeutic groups and their indications in veterinary medicine
- Examine different drug groups' mechanisms of action, properties and pharmacokinetics

- Develop the student's critical and analytical skills through the resolution of clinical cases
- Examine pharmacology in relation to reproduction and metabolism
- Identify each pharmacological group with its uses and applications
- Prescribe drugs in a reasonable manner
- Examine and explain the main pharmacological properties of the anti-infective drug groups
- Identify the different pharmacological targets involved in anti-infective agents
- Recognize the main pharmacological characteristics (mechanism of action, pharmacokinetics, and therapeutic and toxic effects) of groups of anti-infective drugs
- Examine and explain the main pharmacological properties of the antineoplastic drug groups
- Identify the different pharmacological targets involved in antineoplastic agents
- Know the main toxic effects of antineoplastic drugs
- Prepare professionals in simple and natural treatments, and their integration in the curative activities within Conventional Veterinary Medicine
- Examine the theoretical bases of Natural Medicines; especially homeopathy, phytotherapy and the use of nutraceuticals
- Briefly frame the evolution of the disciplines within a historical context

Specific Objectives

Module 1. General Pharmacology

- Develop all those processes that affect a drug molecule when administered to an animal species
- Establish the different biological barriers and their significance in therapeutic effectiveness.
- Examine the factors that will influence drug absorption, distribution and elimination processes
- Analyze how to manipulate the renal excretion process and its importance in the treatment of intoxications
- Establish, based on the pharmacodynamics and pharmacokinetics of a drug, its possible pharmacological interactions
- Identify and characterize at the molecular level the different types of pharmacological receptors
- Determine which second messengers and biochemical pathways are coupled to each of the pharmacological receptor types
- Present the relationship between the molecular phenomenon and the pharmacological effect
- Analyze all the phenomena involved in drug-receptor interaction
- Examine the different types of pharmacological agonism and antagonism
- Correctly establish the differences between the different species that are important for the administration of drugs or their therapeutic efficacy
- Develop the concepts of side, adverse and toxic effects

Module 2. Legal Framework for Veterinary Medicinal Products and Veterinary Pharmacovigilance

- Consult and apply current regulations in a practical way in veterinary medicine
- Quickly find the resources available on the AEMPS website and, in particular, the information available on the online Veterinary Medicines Information Center (CIMA Vet)
- Determine everything related to the veterinary prescription being able to make the appropriate prescription in each specific case
- Understand the roles and responsibilities of the various actors involved in the dispensing and supply of veterinary medicinal products
- Be able to make decisions regarding pharmacological treatments with an adequate benefit-risk ratio, or discontinue their use when this is not possible
- Examine the Guidelines for responsible use in different animal species and how to apply them appropriately in veterinary practice
- Examine the responsibility that one has in the exercise of professional work, in the use of medicines, in relation to animal health, human health and the environment
- Assume the importance of our decisions in the use of antimicrobials, in the prevention and control of antimicrobial resistance and know and follow the PRAN guidelines

Module 3. Pharmacology of the autonomic nervous system

- Establish the classification of drugs according to their structure, mechanism of action and pharmacological action acting on the Autonomic Nervous System
- Distinguish the chemical mediators and receptors that interact in the autonomic nervous system
- Determine the classification of drugs by their mechanism of action and pharmacological action that act on the autonomic nervous system
- Analyze the drugs that act at the level of cholinergic transmission in the Autonomic Nervous System by their structure, mechanism of action and route of administration
- Examine drugs acting at the level of adrenergic transmission in the autonomic nervous system by their structure, mechanism of action and route of administration
- Determine the general effects of neuromuscular blocking agents on the peripheral nervous system by their mechanism of action and pharmacological action
- Solve problems and interpret results of pharmacological experiments associated with the organ bath technique
- Acquire the ability to search for and manage information related to the Autonomic Nervous System

Module 4. Pharmacology of the central nervous system

- Establish the classification of drugs according to their structure, mechanism of action and pharmacological action acting on the Central Nervous System
- Always act with the objective of facilitating good health and quality of life for the animals, avoiding unnecessary suffering through the administration of different drugs
- Distinguish the chemical mediators and receptors that interact in pain
- Differentiate the classification of analgesic drugs by their mechanism of action and pharmacological action acting on the Central Nervous System
- Analyze the drugs that act at the level of anesthesia and sedation in the Central Nervous System by their structure, mechanism of action and route of administration
- Determine the general effects of stimulant drugs on the Central Nervous System and recognize their mechanism of action and pharmacological action
- Determine the general effects of depressant drugs on the Central Nervous System and recognize their mechanism of action and pharmacological action

Module 5. Pharmacology of the Cardiovascular, Renal and Respiratory System. Hemostasis

- Describe the mechanisms of action of drugs used to treat heart failure, hypertension or arrhythmias
- Examine anti-anemic drugs and growth factors, as well as mechanisms of action, adverse reactions and pharmacokinetics
- Determine the main routes of administration of drugs used in the cardiorespiratory system and homeostasis
- Present the drugs used against cough, mucolytics and expectorants and their mechanisms of action, adverse reactions, pharmacokinetics and side effects
- Solve problems and clinical cases related to the cardiorespiratory system
- Associate the correct drug to the main symptoms and pathologies of the cardiorespiratory system
- Safe and effective use of pharmaceuticals

Module 6. Pharmacology of the Digestive System

- Identify the most common routes of administration of each of the drugs and the forms of presentation of the same in veterinary medicine
- Examine drugs related to acid secretion: antisecretory, antacids and mucosal protectants, as well as their adverse effects, contraindications and pharmacokinetics
- Present drugs to improve gastrointestinal motility, their mechanisms of action, drug interactions and adverse reactions
- Describe the drugs used to treat vomiting
- Determine the pharmacology of the hepatobiliary and pancreatic systems, their mechanisms of action, interactions and pharmacokinetics
- Solve problems and clinical cases related to the digestive system
- Associate the correct drug to the main symptoms and pathologies of the digestive tract

Module 7. Pharmacology of the Endocrine and Reproductive System. Reproductive Disorders

- Determine the pharmacological basis of reproductive system therapy
- Examine different drug groups' mechanisms of action, properties and pharmacokinetics
- Identify the main therapeutic groups and their indications in veterinary reproduction
- Treat the most prevalent obstetric cases
- Present reproductive biotechnologies and understand the scope of their application
- Solving individual and population reproductive problems
- Establish the different animal pathologies of the endocrine system and their treatment
- Identify the main therapeutic groups and their indications in endocrine system pathologies
- Develop the student's critical and analytical skills through the resolution of clinical cases

Module 8. Antiseptics and Chemotherapeutics I

- Analyze the historical development of antiseptic and chemotherapeutic substances
- Point out the general principles of chemotherapy and the drugs that comprise it
- Define the concepts of antiseptic and antibiotic
- Explain the mechanisms of antibiotic resistance
- Classify antibiotics according to mechanism of action
- Describe each of the groups of antibiotics and know their mechanism of action
- Classifying antifungal and antiviral drugs
- Describe each of the groups of antifungal and antiviral drugs and their mechanism of action
- Analyze the importance of antiparasitics in Veterinary Medicine

Module 9. Chemotherapy II: Antineoplastic Drugs

- Analyzing cancer in small animals
- Point out the general principles in the use of antineoplastic drugs
- Know the care in the application of antineoplastic drugs
- Classify the main families of chemotherapeutics
- Determine the main drugs for palliative use in neoplasms
- Consider the use of each antineoplastic according to the pathology
- Analyze the main toxicity effects of antineoplastic drugs
- Describe each of the groups of antifungal and antiviral drugs and their mechanism of action
- Analyze the importance of antiparasitics in Veterinary Medicine.

Module 10. Natural Therapies: Homeopathy, Phytotherapy and Nutraceuticals

- Analyze objective clinical signs or manifestations and subjective symptoms or perceptions in homeopathy
- Approach the anamnesis from these objective and subjective manifestations
- Present the Homeopathic Materia Medica and its therapeutic indications
- Determine the rationale behind the development of drugs
- Approaching the approach to pathologies from homeopathic repertorization
- Establish the active principles most commonly used in phytotherapy and their application.
- Examine the different nutraceutical products and their application

A path to achieve knowledge and professional growth that will propel you towards a greater level of competitiveness in the employment market".

03

Skills

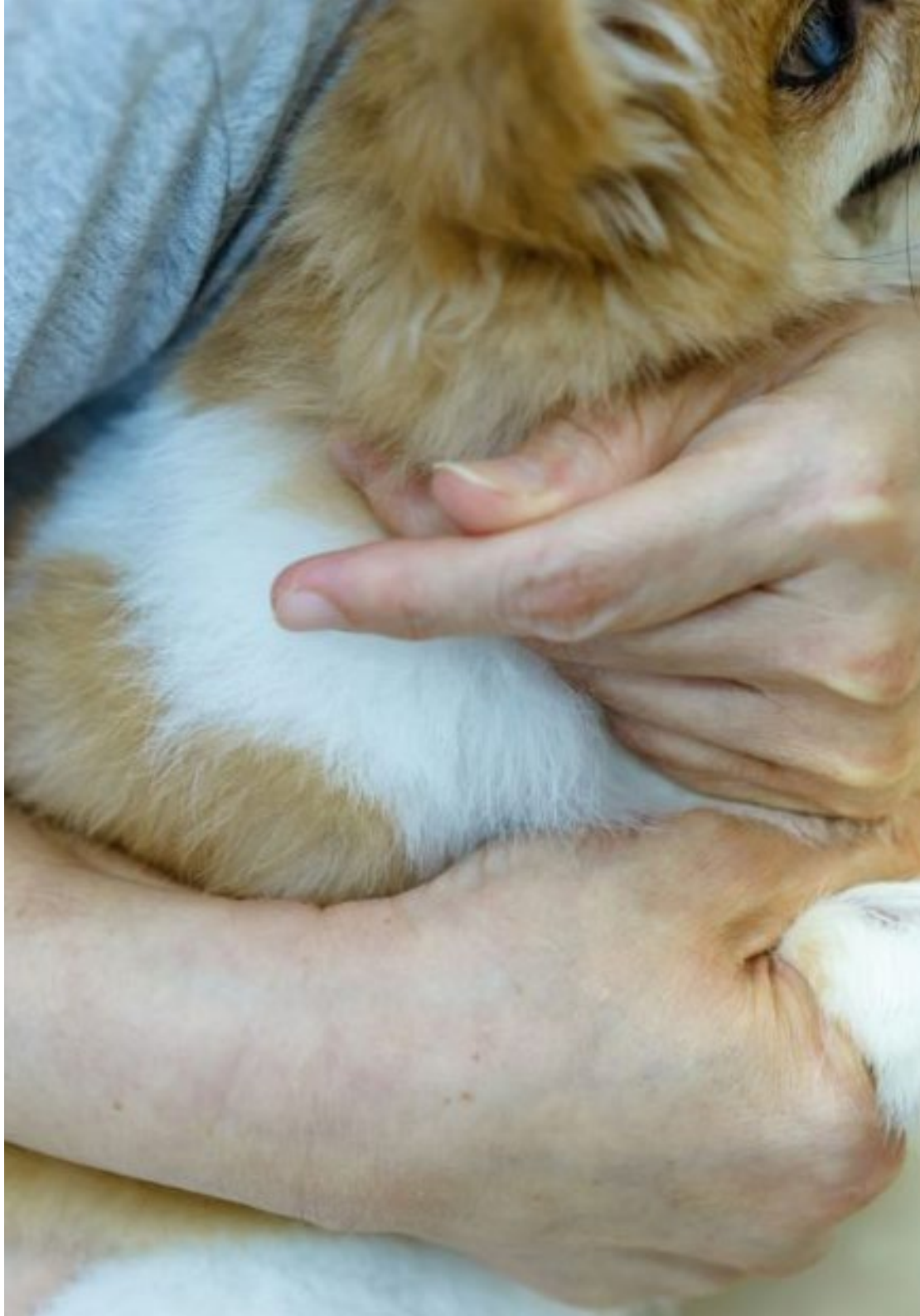
This Master's Degree offers the student a realistic learning experience in the context of Veterinary Pharmacology, which makes it an extremely useful tool for the veterinary professional. Through clinical simulations at a practical level, you will be able to face real situations and provide a broader and more effective response to them.

Safely acquire the most advanced skills of a professional Veterinary Pharmacology specialist and give your practice a boost to the highest level"

General Skills

- Understand that Pharmacology is the rational basis of all therapies
- Training to recognize and select different drugs by their generic names
- Be able to prescribe scientific pharmacotherapy for preventive, prophylactic, symptomatic and curative purposes
- Have a clear knowledge of the uses of drugs, pharmacokinetics, pharmacodynamics and adverse effects to be able to apply them in the clinic
- Be able to judge the risk involved in prescribing a drug to a patient and to select the drug based on criteria of effectiveness and safety

A unique, key, and decisive training experience to boost your professional development"



Specific Skills

- Choosing a drug at the veterinary level
- Know the mechanisms of action and available therapeutic groups, etc.
- Know what the differential pharmacokinetic characteristics are
- Determine the most frequent interactions
- Know the safety of drug use in each case
- Distinguish factors that alter the response
- Determine the route of administration, dosage and therapeutic regimen
- Establish the duration of treatment
- Controlling the Treatment
- Recognize the mechanism of action of drugs
- Know the relationship between chemical structure and biological action
- Localize the site of action of drugs in the biological system under study
- Know the mechanisms of absorption, distribution, metabolism and excretion of drugs
- Know the relationship between the dose of a drug and the biological effect produced
- Explain the pharmacological actions in different organs, tissues and organisms

04

Course Management

The teaching staff of this Master's Degree is made up of professionals specialized in the study of Pharmacology with clinical experience in small and large animals. They have extensive and recognized teaching and research experience, with officially recognized six-year research periods, participation in numerous research projects and dissemination of their research both nationally and internationally in high impact journals, books and conferences.

A unique opportunity to learn from internationally renowned professors, with teaching, clinical and research experience"

Management

Dr. Santander Ballestín, Sonia

- Teaching Coordinator, Department of Pharmacology, University of Zaragoza, Spain
- Lecturer in the university course: "Introduction to Pharmacology: Principles for the Rational Use of Drugs" Basic Program of the University of Experience of Zaragoza
- Teacher evaluator in: structured objective clinical grade assessment
- Degree in Biology and Biochemistry, specializing in the area of Pharmacology
- PhD with the European Degree from the University of Zaragoza
- Master's Degree in Environment and Water Management. Andalusia Business School
- Title of the doctoral program: Biochemistry and Molecular and Cellular Biology

Professors

Ms. Arribas Blázquez, Marina

- Degree in Biology. Specialty in Fundamental Biology and Biotechnology by the University of Salamanca
- Bill and Melinda Gates Foundation: teaching and postdoctoral research employment contract
- Institute of Biomedical Research: Alberto Sols Labor researcher and teacher
- Complutense University of Madrid: postdoctoral teaching and research labor contract
- Complutense University of Madrid: teaching and research employment contract
- Molecular Biology Center Severo Ochoa: teaching and predoctoral researcher labor contract
- Complutense University of Madrid: predoctoral teaching and research labor contract
- Category B qualification in Protection of animals used for experimental and other scientific purposes.
- Master's Degree in Neurosciences
- Doctorate in Neuroscience from the Complutense University of Madrid.
- Postgraduate Certificate in Culture Room Standards for the use of viral and other pathogenic biological agents at Instituto de Investigaciones Biomédicas de Madrid.

Ms. Abanto Peiró, María Dolores

- Pharmacist of Health Administration in Alcañiz
- Technical Agricultural Engineering, Literary University of Valencia
- Agricultural Research Projects at the Valencian Institute of Agrarian Research
- Assistant Pharmacist in Pharmacy Office
- Medical Visitor
- State Pharmacist in the Government Delegation of Aragon
- Inspection and control of drugs in public and judicial security
- Foreign Health Inspection
- Degree in Pharmacy

Dr. García Barrios, Alberto

- Interim Professor at the University of Zaragoza
- Casetas Veterinary Clinic
- Utebo Veterinary Clinic
- Nanoscale Biomagnetics R&D Researcher
- Veterinary Clinic Utebo. Clinical Veterinarian
- PhD in Veterinary Science
- Teacher with an interim contract. University of Zaragoza
- Degree in Veterinary Medicine
- Postgraduate Veterinary Oncology (Improve International). Homologation of the qualification to work with experimental animals

Ms. González Sancho, Lourdes

- Health administration Pharmacist. Health Care Dept.
- Pharmacist of Health Administration Dept. of Health and Consumer Affairs
- Food E-Commerce Course Directorate General of Public Health
- Food Composition Labeling and Claims Course. General Directorate of Public Health

- Antibiotic Resistance Course Directorate General of Public Health
- Biocides Regulatory Framework. Health Surveillance HPAI
- Recycling of Plastics and Contaminants in Food and Feed. General Directorate of Public Health
- Course on Audit Systems and Internal Auditing General Directorate of Public Health
- Degree in Pharmacy from the University of Valencia.

Ms. Lomba, Laura

- Professor of Pharmacokinetics and Physicochemistry at San Jorge University.
- Degree in Chemistry from the University of Zaragoza
- Degree in Pharmacy and PhD from the Universidad San Jorge.
- Predoctoral stay at the Cancer Therapy Institute (Bradford).
- She has ANECA accreditation in the positions of Assistant Professor Doctor, Hired Professor Doctor and Professor of Private University.
- 1 six-year period recognized 2012-2017 by CNAI
- She has directed 10 grants for collaboration and initiation to research, 12 graduate theses and a doctoral thesis. She is currently supervising 3 doctoral theses.
- In the teaching field, she has 6 scientific articles, 24 communications in congresses and 6 research projects

Ms. Luesma Bartolomé, María José

- Veterinarian. Study Group on Prion Diseases, Vectorial Diseases and Emerging Zoonoses at the University of Zaragoza
- Study group of the University Research Institute
- Professor of Film and Anatomy. University degree: Complementary Academic Activities
- Professor of Anatomy and Histology University degree: Graduate in Optics and Optometry. University of Zaragoza
- Professor of Final Degree Project University Degree, Bachelor's Degree in Medicine
- Professor of Morphology. Development Biology University degree: Master's Degree in Initiation to Research in Medicine. University of Zaragoza
- Doctor of Veterinary Medicine. Official Doctorate Program in Veterinary Sciences. University of Zaragoza
- Degree in Veterinary Medicine. University of Zaragoza

It advances towards excellence with the help of the best professionals and teaching resources of the moment"

05

Structure and Content

This Master's Degree provides all the necessary knowledge to be able to perform in the best possible way, the Pharmacology in Veterinary Medicine. It is important to take into account that the contents allow the student to obtain specialized knowledge of pharmacology, as well as the ability to deal with different solutions for veterinary pathologies. A complete and accessible preparatory course that will make a difference in your career progression.

A complete preparatory program that will lead you to the comprehensive education necessary to intervene as a specialist in the theoretical and practical aspects of Veterinary Pharmacology"

Module 1. General Pharmacology

1.1. Concept and Evolution of Pharmacology. Objectives of Veterinary Pharmacology
- 1.1.1. Origin
- 1.1.2. Evolution of Pharmacology as a science
- 1.1.3. Veterinary Pharmacology: Objectives
- 1.1.4. General Concepts
  - 1.1.4.1. Pharmaceuticals
  - 1.1.4.2. Medication
  - 1.1.4.3. Pharmaceutical Forms
  - 1.1.4.4. Others

1.2. Pharmacokinetics I: Drug Transport Systems across Biological Membranes
- 1.2.1. General Principles
- 1.2.2. General Transportation Mechanisms
  - 1.2.2.1. Transport Across Cell Membranes
  - 1.2.2.2. Transport Through Intercellular Clefts

1.3. Pharmacokinetics II: Routes of Drug Administration. Concept of Absorption
- 1.3.1. General Principles
- 1.3.2. Routes of Administrating Medication
  - 1.3.2.1. Enteral Routes
    - 1.3.2.1.1. Oral
    - 1.3.2.1.2. Rectal
    - 1.3.2.1.3. Sublingual
    - 1.3.2.1.4. Others: Inhalation, Otic, Conjunctival, Dermal or Topical
  - 1.3.2.2. Parenteral Routes
    - 1.3.2.2.1. Intravenous
    - 1.3.2.2.2. Intramuscular
    - 1.3.2.2.3. Subcutaneous
    - 1.3.2.2.4. Intrathecal
    - 1.3.2.2.5. Epidural
- 1.3.3. Absorption Mechanisms
- 1.3.4. Concept of Bioavailability
- 1.3.5. Factors that Modify Absorption

1.4. Pharmacokinetics III Drug Distribution I
- 1.4.1. Distribution Mechanisms
  - 1.4.1.1. Binding to Plasma Proteins
  - 1.4.1.2. Blood-Brain Barrier
  - 1.4.1.3. Placental Barrier
- 1.4.2. Factors that Modify the Distribution
- 1.4.3. Distribution Volume

1.5. Pharmacokinetics IV: Drug Distribution II. Pharmacokinetic Compartments.
- 1.5.1. Pharmacokinetic Models
- 1.5.2. Concepts of the Most Characteristic Parameters
  - 1.5.2.1. Apparent Volume of Distribution
  - 1.5.2.2. Aqueous Compartments
- 1.5.3. Variability of the Response

1.6. Pharmacokinetics V: Drug Elimination: Metabolism
- 1.6.1. Concept of Metabolism
- 1.6.2. Phase I and II Metabolic Reactions
- 1.6.3. Hepatic Microsomal System: Cytochromes. Polymorphisms.
- 1.6.4. Factors Influencing Biotransformation Processes
  - 1.6.4.1. Physiological Factors
  - 1.6.4.2. Pathological Factors
  - 1.6.4.3. Pharmacological Factors (Induction/Inhibition)

1.7. Pharmacokinetics VI: Drug Elimination: Excretion
- 1.7.1. General Mechanisms
- 1.7.2. Renal Excretion
- 1.7.3. Biliary Excretion
- 1.7.4. Other Excretion Routes
  - 1.7.4.1. Saliva
  - 1.7.4.2. Milk
  - 1.7.4.3. Sweat
- 1.7.5. Elimination Kinetics
  - 1.7.5.1. Elimination Constant and Half-Life
  - 1.7.5.2. Metabolic and Excretion Clearance
- 1.7.6. Factors that Modify the Excretion

1.8. Pharmacodynamics: Drug Action Mechanisms Molecular Aspects
- 1.8.1. General Concepts Receptor
- 1.8.2. Types of Receivers
  - 1.8.2.1. Ion Channel Associated Receptors
  - 1.8.2.2. Enzyme Receptors
  - 1.8.2.3. Receptors Associated with Prots g
  - 1.8.2.4. Intracellular Receptors
- 1.8.3. Drug-Receptor Interactions

1.9. Adverse Reactions to Medications. Toxicity
- 1.9.1. Classification of Adverse Reactions According to their Origin
- 1.9.2. Mechanisms of Production of Adverse Reactions
- 1.9.3. General Aspects of Drug Toxicity

1.10. Pharmacological Interactions
- 1.10.1. Concept of Pharmacological Interaction
- 1.10.2. Modifications Induced by Pharmacological Interactions
  - 1.10.2.1. Synergy
  - 1.10.2.2. Agony
  - 1.10.2.3. Antagonism
- 1.10.3. Pharmacokinetic and Pharmacodynamic Interactions
  - 1.10.3.1. Variability in Response Due to Pharmacokinetic Causes
  - 1.10.3.2. Variability in Response due to Pharmacodynamic Causes

Module 2. Legal Framework of Medicine for Veterinary Use. Veterinary Pharmacovigilance

2.1. Prescription of Medicines for Animal Use
- 2.1.1. Veterinary Prescription
- 2.1.2. Ordinary Statute of Limitations
- 2.1.3. Exceptional Requirements
- 2.1.4. Prescription of Narcotic Drugs
- 2.1.5. Prescription of Medicated Feed

2.2. Dispensing of Medicines for Animal Use
- 2.2.1. Pharmacy Offices
- 2.2.2. Livestock Entities or Groups
- 2.2.3. Retail Commercial Establishments
- 2.2.4. Emergency First Aid Kits

2.3. Supply of Medicinal Products for Animal Use to Veterinarians
- 2.3.1. Professional Practice of Veterinary Medicine
- 2.3.2. Availability of Veterinary Medicines
- 2.3.3. Possession and Use of Medicinal Gases

2.4. Commercial Presentation and Information on Veterinary Medicinal Products
- 2.4.1. Packaging and Labeling
- 2.4.2. Prospectus
- 2.4.3. Information and Advertising

2.5. Veterinary Pharmacovigilance 1
- 2.5.1. Introduction to Veterinary Pharmacovigilance. Glossary of Terms
- 2.5.2. Risks Derived from Marketed Medicines

2.6. Veterinary Pharmacovigilance 2. Animal Safety
- 2.6.1. Safe Use of Veterinary Drugs in Animals
- 2.6.2. Animal Welfare and Disease Prevention in Animals
- 2.6.3. Guidelines for the Responsible Use of Large Animal Species: Animals for Slaughter
- 2.6.4. Guidelines for Responsible Use of Companion Animal Species

2.7. Veterinary Pharmacovigilance 3. Safety of Persons
- 2.7.1. Adverse Effects of Veterinary Drugs on Humans
- 2.7.2. Good Practices in the Use and Administration of Veterinary Medicine
- 2.7.3. Protective Equipment for the Administration of Veterinary Pharmaceuticals

2.8. Veterinary Pharmacovigilance 4. Safety of Foods of Animal Origin
- 2.8.1. Residues of Veterinary Medicine in Products of Animal Origin
- 2.8.2. Importance of the Routes of Administration in Waiting Times
- 2.8.3. Maximum Residue Limits (MRL)

2.9. Veterinary Pharmacovigilance 5. Antibiotic Resistance and Safety for the Environment
- 2.9.1. Importance of Responsible Use of Veterinary Antimicrobials to Prevent Antibiotic Resistance
- 2.9.2. Categorization of Antibiotics for Veterinary Use
- 2.9.3. Importance of the Responsible Use of Medicines for the Environment

Module 3. Pharmacology of the Autonomic Nervous System

3.1. Peripheral Nervous System
- 3.1.1. Definition
- 3.1.2. Classification
- 3.1.3. Autonomic Nervous System
  - 3.1.3.1. Definition
  - 3.1.3.2. Classification

3.2. Cholinergic Neurotransmitter System
- 3.2.1. Definition
- 3.2.2. Nicotinic and Muscarinic Receptors
- 3.2.3. Classification of Drugs

3.3. Pharmacology of Cholinergic Transmission I
- 3.3.1. Transmission Blocking Drugs in Autonomous Ganglia
- 3.3.2. Nicotinic Receptor Antagonists with Sympathocolitic Effects
- 3.3.3. Nicotinic Receptor Antagonists with Parasympatholytic Effects (Hexamethonium, Mecamylamine)

3.4. Pharmacology of Cholinergic Transmission II
- 3.4.1. Transmission-Blocking Drugs at Neuroeffector Junctions
- 3.4.2. Muscarinic Receptor Antagonists
- 3.4.3. Parasympatholytic Effects (Atropine, Scopolamine)

3.5. Pharmacology of Cholinergic Transmission
- 3.5.1. Drugs that Mimic the Effects of Acetylcholine on Neuroeffector Junctions
- 3.5.2. Muscarinic Receptor Agonists
- 3.5.3. Parasympathomimetic Effects (Acetylcholine, Methacholine, Betanechol)

3.6. Adrenergic Neurotransmitter System
- 3.6.1. Definition
- 3.6.2. Adrenergic Receptors
- 3.6.3. Classification of Drugs

3.7. Pharmacology of Adrenergic Transmission
- 3.7.1. Drugs that Promote Noradrenaline at Neuroeffector Synapses

3.8. Pharmacology of Adrenergic Transmission
- 3.8.1. Transmission-Blocking Drugs at Neuroeffector Junctions

3.9. Pharmacology of Adrenergic Transmission
- 3.9.1. Drugs that Mimic the Effects of Noradrenaline at Neuroeffector Junctions

3.10. Pharmacology in the Motor Plate
- 3.10.1. Ganglionic or Ganglioplegic Blocking Drugs
- 3.10.2. Non-Depolarizing Neuromuscular Blocking Drugs
- 3.10.3. Depolarizing Neuromuscular Blocking Drugs

Module 4. Pharmacology of the Central Nervous System

4.1. Pain
- 4.1.1. Definition
- 4.1.2. Classification
- 4.1.3. Pain Neurobiology
  - 4.1.3.1. Transduction
  - 4.1.3.2. Transmission
  - 4.1.3.3. Modulation
  - 4.1.3.4. Perception
- 4.1.4. Animal Models for the Study of Neuropathic Pain

4.2. Nociceptive Pain
- 4.2.1. Neuropathic Pain
- 4.2.2. Pathophysiology of Neuropathic Pain

4.3. Analgesic Drugs. Nonsteroidal Anti-Inflammatory Drugs
- 4.3.1. Definition
- 4.3.2. Pharmacokinetics
- 4.3.3. Mechanism of Action
- 4.3.4. Classification
- 4.3.5. Pharmacological Effects
- 4.3.6. Side Effects

4.4. Analgesic Drugs. Steroidal Anti-Inflammatory Drugs
- 4.4.1. Definition
- 4.4.2. Pharmacokinetics
- 4.4.3. Mechanism of Action. Classification
- 4.4.4. Pharmacological Effects
- 4.4.5. Side Effects

4.5. Analgesic Drugs. Opioids
- 4.5.1. Definition
- 4.5.2. Pharmacokinetics
- 4.5.3. Mechanism of Action. Opioid Receptors
- 4.5.4. Classification
- 4.5.5. Pharmacological Effects
  - 4.5.5.1. Side Effects

4.6. Pharmacology of Anesthesia and Sedation
- 4.6.1. Definition
- 4.6.2. Mechanism of Action
- 4.6.3. Classification: General and Local Anesthetics
- 4.6.4. Pharmacological Properties

4.7. Local Anesthetic. Inhalation Anesthetics
- 4.7.1. Definition
- 4.7.2. Mechanism of Action
- 4.7.3. Classification
- 4.7.4. Pharmacological Properties

4.8. Non-Injectable Anesthetics
- 4.8.1. Neuroleptoanesthesia and Euthanasia. Definition
- 4.8.3. Mechanism of Action
- 4.8.3. Classification
- 4.8.4. Pharmacological Properties

4.9. Central Nervous System Stimulant Drugs
- 4.9.1. Definition
- 4.9.2. Mechanism of Action
- 4.9.3. Classification
- 4.9.4. Pharmacological Properties
- 4.9.5. Side Effects
- 4.9.6. Antidepressants

4.10. Central Nervous System Depressant Drugs
- 4.10.1. Definition
- 4.10.2. Mechanism of Action
- 4.10.3. Classification
- 4.10.4. Pharmacological Properties
- 4.10.5. Side Effects
- 4.10.6. Anticonvulsants

Module 5. Pharmacology of the Cardiovascular, Renal and Respiratory System. Hemostasis

5.1. Pharmacology of the Cardiovascular System I
- 5.1.1. Positive Inotropic and Inodilator Drugs
- 5.1.2. Sympathomimetic Amines
- 5.1.3. Glycosides

5.2. Pharmacology of the Cardiovascular System II
- 5.2.1. Diuretic Drugs

5.3. Pharmacology of the Cardiovascular System II
- 5.3.1. Drugs Acting on the Renin-Angiotensin System
- 5.3.2. Beta-Adrenergic Antagonist Drugs

5.4. Pharmacology of the Cardiovascular System IV
- 5.4.1. Vasodilator Drugs
- 5.4.2. Calcium Channel Antagonists

5.5. Pharmacology of the Cardiovascular System V
- 5.5.1. Antiarrhythmic Drugs

5.6. Pharmacology of the Cardiovascular System VI
- 5.6.1. Antianginal Drugs
- 5.6.2. Lipid-Lowering Drugs

5.7. Blood Pharmacology I
- 5.7.1. Anti-Anemia Drugs
  - 5.7.1.1. Iron
  - 5.7.1.2. Folic Acid
  - 5.7.1.3. Vitamin B12
- 5.7.2. Hematopoietic Growth Factors
  - 5.7.2.1. Erythropoietins
  - 5.7.2.2. Granulocyte Colony Stimulating Factors

5.8. Blood Pharmacology II
- 5.8.1. Antithrombotic Drugs
- 5.8.2. Anti-Aggregation Drugs
- 5.8.3. Anticoagulants
- 5.8.4. Fibrinolytic Drugs

5.9. Pharmacology of the Respiratory System I
- 5.9.1. Antitussives
- 5.9.2. Expectorants
- 5.9.3. Mucolytics

5.10. Pharmacology of the Respiratory System II
- 5.10.1. Bronchodilators (Methylxanthines, Sympathomimetics, Antimuscarinics)
- 5.10.2. Anti-inflammatory Drugs used in Asthma
- 5.10.3. Anti-inflammatory Drugs Used in Chronic Obstructive Pulmonary Disease (Corticosteroids, Mediator Release Inhibitors, Leukotriene Inhibitors)

Module 6. Pharmacology of the Digestive System

6.1. Pharmacology of Acid Secretion I
- 6.1.1. Physiology of Secretion and Main Alterations
- 6.1.2. Antisecretory Agents
- 6.1.3. Proton Pump Inhibitors
- 6.1.4. Histamine H2-Receptor Antagonists

6.2. Pharmacology of Acid Secretion II. Antacids
- 6.2.1. Magnesium Compounds
- 6.2.2. Aluminum Compounds
- 6.2.3. Calcium Carbonate
- 6.2.4. Sodium Bicarbonate

6.3. Pharmacology of Acid Secretion III. Mucous Membrane Protectors
- 6.3.1. Sucralfate
- 6.3.2. Bismuth Salts
- 6.3.3. Prostaglandin Analogs

6.4. Pharmacology of Ruminants
- 6.4.1. Biochemical Alterations of Drugs in the Rumen
- 6.4.2. Effects of Drugs on Ruminal Microflora
- 6.4.3. Drug Distribution in the Rumen-Reticulum

6.4.4. Salivary Secretion of Drugs
6.4.5. Agents Affecting Pre-stomach Functions
6.4.6. Treatment of Meteorism, Tympanism, Ruminal Acidosis and Atonia.
6.5. Pharmacology of Intestinal Motility I
6.5.1. Physiology of Motility and Main Alterations
6.5.2. Prokinetic Drugs
6.6. Pharmacology of Intestinal Motility II
6.6.1. Antidiarrheal Drugs
6.6.2. Prebiotics, Probiotics and Flora
6.7. Pharmacology of Intestinal Motility III. Constipation
6.7.1. Bolus-Forming Drugs
6.7.2. Lubricants and Emollients
6.7.3. Osmotic Laxatives
6.7.4. Stimulant Laxatives
6.7.5. Enemas
6.8. Pharmacology of Vomiting
6.8.1. Antiemetic and Emetic Drugs
6.8.2. D2 Dopaminergic Antagonists
6.8.3. Antihistamines
6.8.4. Muscarinic Antagonists
6.8.5. Serotonergic Antagonists
6.9. Pharmacology of the Hepatobiliary and Pancreatic System
6.9.1. Choleretic and Cholagogue Drugs
6.10. Pharmacology of Inflammatory Bowel Disease
6.10.1. Corticoids
6.10.2. Immunosuppressants
6.10.3. Antibiotics
6.10.4. Aminosalicylates

Module 7. Pharmacology of the Endocrine and Reproductive System. Reproductive Disorders

7.1. Endocrine System Pharmacology.
7.1.1. Introduction
7.1.2. Classification of Hormones of Pharmacological Interest
7.1.3. Mechanisms of Action
7.1.4. General Information on Hormone Therapeutics
7.2. Hormones Involved in Metabolism and Electrolyte Balance
7.2.1. Adrenal Pharmacology: Mineralocorticoids and Glucocorticoids
7.2.2. Pharmacological Actions
7.2.3. Therapeutic Uses
7.2.4. Side Effects:
7.3. Thyroid and Parathyroid Pharmacology
7.3.1. Thyroid Hormones
7.3.2. Antithyroid Drugs
7.3.3. Calcemia Regulation
7.3.3.1. Calcitonin
7.3.3.2. Parathormone
7.4. Pharmacology of the Pancreas
7.4.1. Insulin
7.4.2. Oral Hypoglycemic Agents
7.4.3. Glucagon
7.5. Hormones Involved in Reproduction
7.5.1. Introduction
7.5.2. Gonadotropin-Releasing Hormone
7.5.3. Pituitary and Non-pituitary Gonadotropins
7.6. Sex Hormones
7.6.1. Androgens
7.6.2. Estrogens
7.6.3. Progestogens
7.6.4. Actions in the Organism
7.6.5. Clinical Uses
7.6.6. Toxicity

7.7. Luteolytic Drugs
- 7.7.1. Prostaglandins
- 7.7.2. Oxytocic Drugs: Oxytocin
- 7.7.3. Pharmacology of Lactation

7.8. Diagnostic Hormones in Veterinary Medicine
- 7.8.1. Diagnostic Tests
  - 7.8.1.1. Hormones of Diagnostic Utility in Large Animals: Production Animals
  - 7.8.1.2. Testosterone
  - 7.8.1.3. Estrogens
  - 7.8.1.4. Progesterone
  - 7.8.1.5. Iodothyronines
- 7.8.2. Hormones of Diagnostic Utility in Companion Animals
  - 7.8.2.1. Reproductive Hormones
  - 7.8.2.2. Metabolic Hormones

7.9. Pharmacology of the Reproductive System
- 7.9.1. Introduction
- 7.9.2. Classification of Hormones of Pharmacological Interest
- 7.9.3. Mechanisms of Action
- 7.9.4. Therapeutics in General

7.10. Pharmacology of Reproductive Disorders
- 7.10.1. Main Reproductive Disorders
  - 7.10.1.1. Large Animals: Production Animals
  - 7.10.1.2. Companion Animals
- 7.10.2. Estrous Cycle Control
- 7.10.3. Melatonin

Module 8. Antiseptics and Chemotherapeutics I

8.1. Introduction. Definition of Antiseptic and Chemotherapeutic. Antiseptics
- 8.1.1. Introduction
- 8.1.2. Antiseptic and Disinfectant Concept
- 8.1.3. Factors Affecting the Potency of Antiseptics and Disinfectants
- 8.1.4. Characteristics of an Ideal Antiseptic and Disinfectant
- 8.1.5. Classification of Disinfectants and Antiseptics
- 8.1.6. Main Antiseptics and Disinfectants for Clinical Use
  - 8.1.6.1. Alcohol
  - 8.1.6.2. Biguanides
  - 8.1.6.3. Halogenated Products
  - 8.1.6.4. Peroxygens
  - 8.1.6.5. Other Antiseptics

8.2. Introduction to Antimicrobial Therapy. Types of Antibiotics. Rational Use
- 8.2.1. Introduction
- 8.2.2. Historical Review of Antimicrobial Therapy
- 8.2.3. Side Effects:
- 8.2.4. Principles of Antibiotherapy
- 8.2.5. Resistance: Types and Mechanisms of Occurrence
- 8.2.6. Waiting Times
- 8.2.7. Requirements for an Antimicrobial
- 8.2.8. Classification of Antimicrobials
  - 8.2.8.1. According to its Spectrum
  - 8.2.8.2. According to its Effect
  - 8.2.8.3. According to its Mechanism of Action
  - 8.2.8.4. According to its Chemical Group
  - 8.2.8.5. Depending on the Microorganism Affected
- 8.2.9. Criteria to be Followed in the Selection of a Drug

8.3. Antimicrobials that Act Against the Bacterial Wall. Antibiotics that Inhibit Protein Synthesis
- 8.3.1. Antibiotics Acting Against the Bacterial Wall
  - 8.3.1.1. General Aspects
  - 8.3.1.2. Betalactams (b-lactams)
    - 8.3.1.2.1. Penicillins
    - 8.3.1.2.2. Cephalosporins
    - 8.3.1.2.3. Vancomycin and Bacitracin
- 8.3.2. Antibiotics that Inhibit Protein Synthesis
  - 8.3.2.1. Aminoglycosides
  - 8.3.2.2. Tetracyclines
  - 8.3.2.3. Chloramphenicol and Derivatives
  - 8.3.2.4. Macrolides and Lincosamides
- 8.3.3. β-Lactamase Inhibitors

8.4. Antibiotics that Act on the Synthesis of Nucleic Acids. Antibiotics Acting on the Bacterial Membrane
- 8.4.1. Fluroquinolones
- 8.4.2. Nitrofurans
- 8.4.3. Nitroimidazoles
- 8.4.4. Sulfamides
- 8.4.5. Polymyxins and Thyrotricins

8.5. Antifungal
- 8.5.1. General Description of the Mycotic Structure
- 8.5.2. Classification of Antifungal Agents by Chemical Structure
- 8.5.3. Systemic Antifungals
- 8.5.4. Topical Antifungals

8.6. Antivirals
- 8.6.1. Objective of Antiviral Chemotherapy
- 8.6.2. Groups of Antivirals According to their Origin, Chemistry, Pharmacological Action, Pharmacokinetics, Pharmacodynamics, Posology, Therapeutic Uses, Adverse Reactions, Contraindications, Interactions and Pharmaceutical Forms
  - 8.6.2.1. Inhibitors of RNA and DNA Synthesis
  - 8.6.2.2. Purine Analogs
  - 8.6.2.3. Pyrimidine Analogs
  - 8.6.2.4. Reverse Transcriptase Inhibitors
  - 8.6.2.5. Interferons

8.7. Antiparasitics II
- 8.7.1. Introduction to Antiparasitic Therapy
- 8.7.2. Importance of Dewormers in Veterinary Medicine
- 8.7.3. General Concepts: Antinematodic, Anticestodic, Antitrematodic, Antiprotozoal, Ectoparasiticide and Endectocide

8.8. Antiparasitics for Internal or Endoparasitic Use
- 8.8.1. Antinematodes
- 8.8.2. Antistatics
- 8.8.3. Antitrematodic
- 8.8.4. Antiprotozoals

8.9. Antiparasitics for External or Ectoparasitic Use
- 8.9.1. Introduction to External Parasites
- 8.9.2. Antiparasitics II

8.10. Antiparasitics for Internal and External Use or Endectocides
- 8.10.1. Introduction
- 8.10.2. Macrocyclic Lactones
- 8.10.3. Main Combinations of Endectocide Use

Module 9. Chemotherapy II: Antineoplastic Drugs

9.1. Introduction to Antineoplastic Therapy
- 9.1.1. Cancer in Veterinary Medicine: Pathophysiology and Etiology of Cancer
- 9.1.2. Antineoplastic Treatment Approach: Drug Posology
- 9.1.3. Administration of Chemotherapy Drugs
  - 9.1.3.1. Care in the Application of Chemotherapeutic Agents
  - 9.1.3.2. Standards and Instructions for Chemotherapy Application: Preparation/During Preparation/Administration of Cytotoxic Drugs

9.2. Palliative Antineoplastic Pharmacology. Introduction to Special Antineoplastic Pharmacology
- 9.2.1. Introduction to Palliative Antineoplastic Pharmacology: Oncologic Pain Control/Assessment. Pharmacological Principles for Palliative Pain Management. Nutritional Management of the Oncology Patient
- 9.2.2. Non-Steroidal Analgesics
- 9.2.3. Opioids
- 9.2.4. Others: NMDA Antagonists, Bisphosphonates, Tricyclic Antidepressants, Anticonvulsants, Nutraceuticals, Cannabidiol
- 9.2.5. Introduction to Special Antineoplastic Pharmacology. Main Antineoplastic Drug Families

9.3. Family 1: Alkylating Agents
- 9.3.1. Introduction
- 9.3.2. Nitrogen Mustards: Cyclophosphamide, Chlorambucil and Melphalan
- 9.3.3. Nitrosoureas: Lomustine/Procarbazine
- 9.3.4. Others: Hydroxyurea
- 9.3.5. Main Uses in Veterinary Medicine

9.4. Family 2: Antimetabolites
- 9.4.1. Introduction
- 9.4.2. Folic Acid Analogs (Antifolates): Methotrexate
- 9.4.3. Purine Analogues: Azathioprine
- 9.4.4. Pyrimidine Analogues: Cytosine Arabinoside, Gentabicin, 5-Fluorouracil
- 9.4.5. Main Uses in Veterinary Medicine

9.5. Family 3: Antibiotics
- 9.5.1. Introduction
- 9.5.2. Anthracycline-Derived Antibiotics (Doxorubicin/Other Anthracyclines) and Non-Anthracycline-Derived Antibiotics (Actinomycin-d, Mitoxantrone, Bleomycin)
- 9.5.3. Main Uses in Veterinary Medicine

9.6. Family 4: Antineoplastics of Plant Origin
- 9.6.1. Introduction
- 9.6.2. Alkaloids: History/Antitumor Activity. Vinca Alkaloids
- 9.6.3. Epipodophyllotoxin-Derived Ligands
- 9.6.4. Camptothecin Alkaloid Analogs
- 9.6.5. Main Uses in Veterinary Medicine

9.7. Family 5: Tyrosine Kinase Inhibitors
- 9.7.1. Introduction
- 9.7.2. Protein Kinases: Non-Receptor Tyrosine Kinase Proteins (NRTK; Receptor Tyrosine Kinase RTK)
- 9.7.3. Toceranib
- 9.7.4. Masitinib
- 9.7.5. Main Uses in Veterinary Medicine

9.8. Platinum Derivatives
- 9.8.1. Introduction
- 9.8.2. Carboplatin
- 9.8.3. Cisplatin
- 9.8.4. Main Uses in Veterinary Medicine

9.9. Miscellaneous. Monoclonal Antibodies. Nanotherapy. L-Asparaginase.
- 9.9.1. Introduction
- 9.9.2. L-Asparaginase
- 9.9.3. Monoclonal Antibodies
- 9.9.4. Tigylanol Toglate (stelfonta)
- 9.9.5. Immunotherapy
- 9.9.6. Metronomic Therapy

9.10. Toxicity of Antineoplastic Drugs
- 9.10.1. Introduction
- 9.10.2. Hematological Toxicity
- 9.10.3. Gastrointestinal Toxicity
- 9.10.4. Cardiotoxicity
- 9.10.5. Urinary Toxicity
- 9.10.6. Specific Toxicities: Hepatic, Neurological, Cutaneous, Hypersensitivity, Breed/Species Associated.
- 9.10.7. Pharmacological Interactions

Module 10. Natural Therapies: Homeopathy, Phytotherapy and Nutraceuticals

10.1. Introduction
- 10.1.1. Definition of Natural Therapies
- 10.1.2. Classification
- 10.1.3. Differences with Conventional Medicine
- 10.1.4. Regulation
- 10.1.5. Scientific Evidence
- 10.1.6. Risk

10.2. Homeopathy I
- 10.2.1. Brief Historical Review. Hahnemann's Concept
- 10.2.2. Concept of Homeopathy: Key Ideas
- 10.2.3. Basic Principles

10.3. Homeopathy II The Field of Homeopathy
- 10.3.1. Constitutions
- 10.3.2. Symptom Modalities
- 10.3.3. Medical History
- 10.3.4. Hering Blade

10.4. Homeopathy III Properties
- 10.4.1. Preparation
  - 10.4.1.1. Substances Used in Their Manufacture
  - 10.4.1.2. Excipients

10.4.2. Preparation of Mother Tincture
10.4.3. Dilutions
10.4.3.1. Dilution Methods and Dilutions
10.4.3.2. Dynamization or Succussion
10.4.3.3. Classification of Dilutions
10.4.4. Pharmaceutical Forms
10.4.5. Routes of Administration
10.5. Homeopathy IV Related Symptoms
10.5.1. General Aspects
10.5.2. Medical Subject Matter. Hahnemann Treatise
10.5.3. Introduction to the Repertoire
10.6. Approach to Pathologies from the Homeopathic Repertorization (I)
10.6.1. Digestive System
10.6.2. Respiratory System
10.6.3. Urinary System
10.6.4. Male and Female Genital Apparatus
10.7. Approach to Pathologies from the Homeopathic Repertorization (II)
10.7.1. Mammitis
10.7.2. Tegumentary System
10.7.3. Locomotor System
10.7.4. Sensory Organs
10.8. Phytotherapy
10.8.1. Brief Historical Review
10.8.2. Veterinary Phytotherapy
10.8.3. Active Ingredients of Medicinal Plants
10.8.4. Preparations and Forms of Administration
10.8.5. Prescribing and Dispensing Guide
10.9. Phytotherapy. Addressing Pathologies
10.9.1. Digestive System
10.9.2. Respiratory System
10.9.3. Urinary System
10.9.4. Male and Female Genital Apparatus
10.9.5. Locomotor System
10.10. Nutraceuticals and Functional Foods
10.10.1. Brief Historical Review
10.10.2. Definition
10.10.3. Classification and Application

Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"

06

Methodology

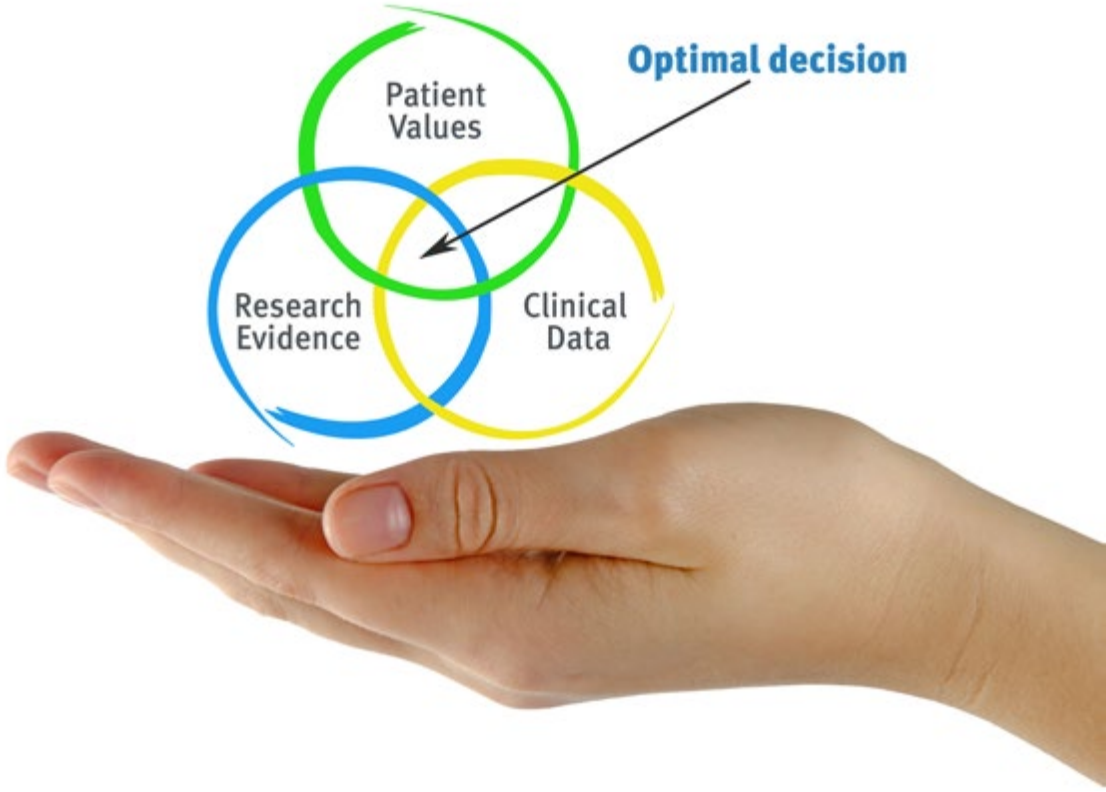
This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, in an attempt to recreate the actual conditions in a veterinarian's professional practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

The effectiveness of the method is justified by four fundamental achievements:

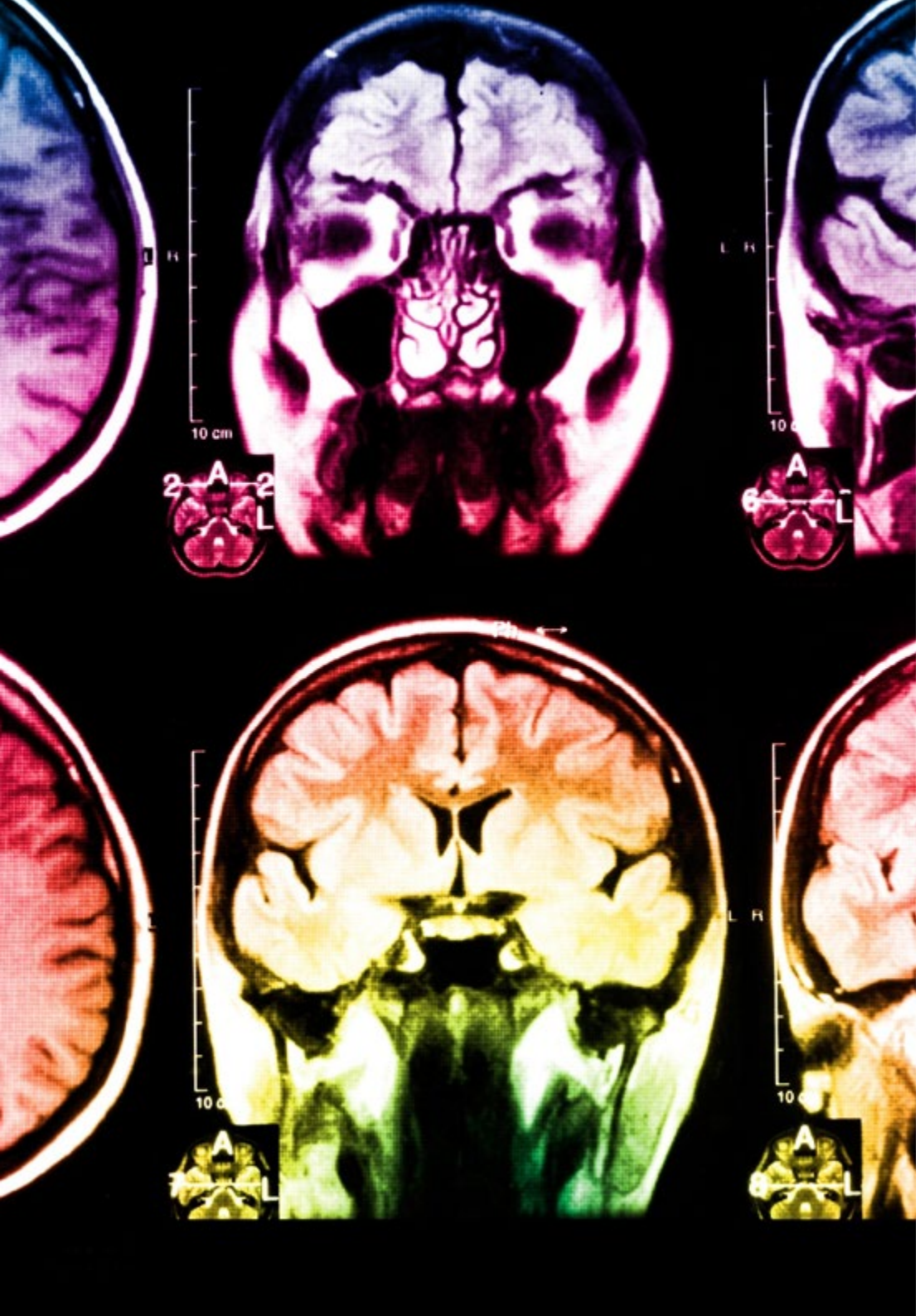
1. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. The feeling that the effort invested is effective becomes a very important motivation for veterinarians, which translates into a greater interest in learning and an increase in the time dedicated to working on the course.

Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

Veterinarians will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology more than 65,000 veterinarians have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. Our teaching method is developed in a highly demanding environment, where the students have a high socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Latest Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current and procedures of veterinary techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

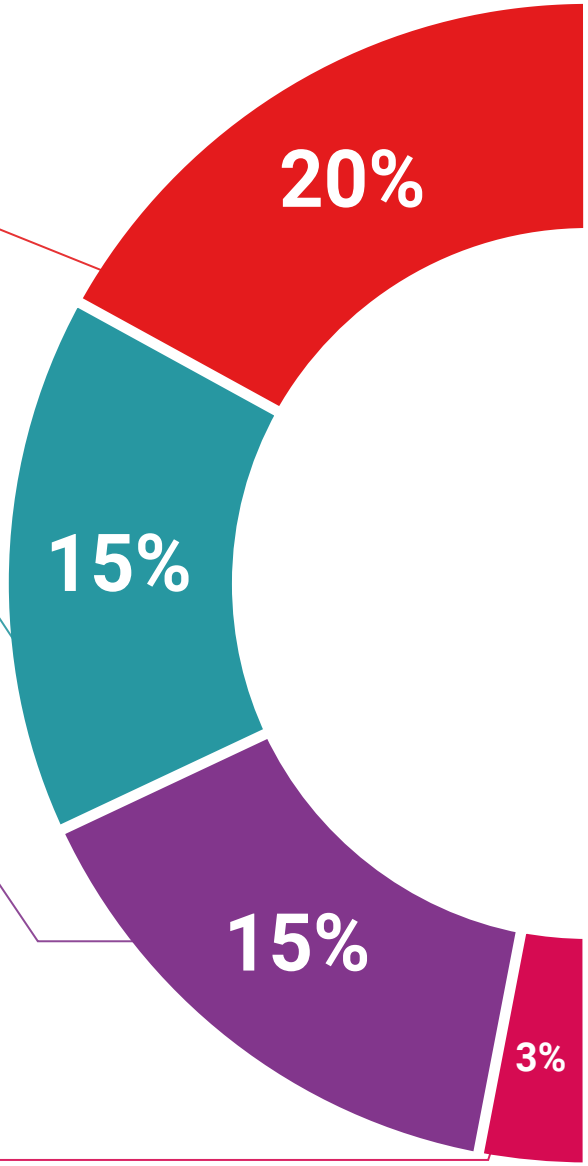
Interactive Summaries

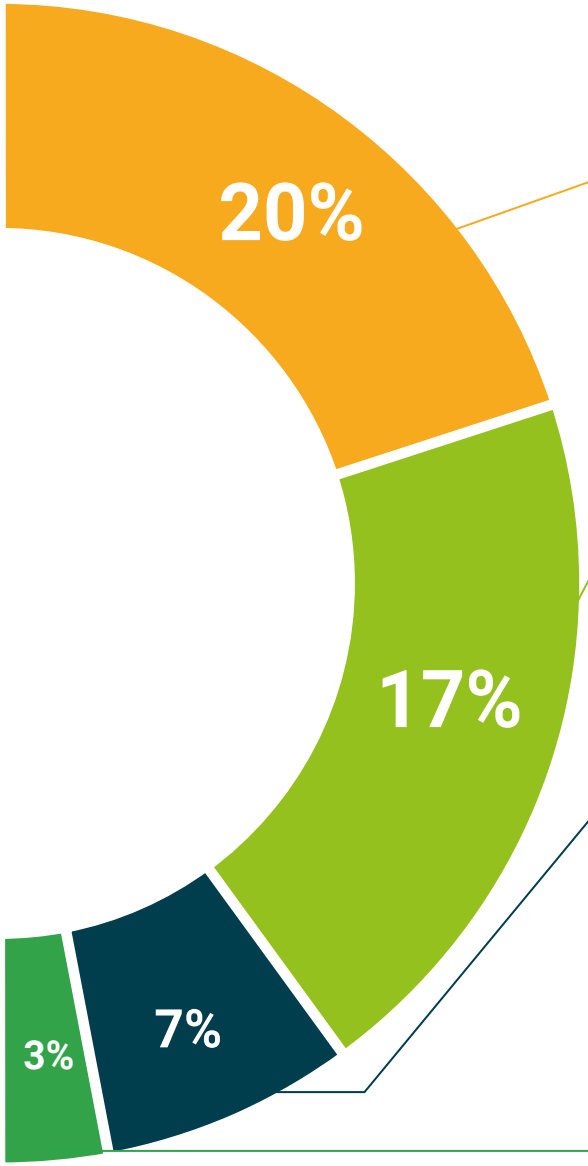
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.

07

Certificate

The Master's Degree in Veterinary Pharmacology guarantees students, in addition to the most rigorous and up-to-date education, access to a Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university degree without travel or laborious paperwork"

This program will allow you to obtain your **Master's Degree diploma in Veterinary Pharmacology** endorsed by **TECH Global University,** the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Master's Degree in Veterinary Pharmacology**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**

tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Master's Degree in Veterinary Pharmacology

This is a program of 1,500 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

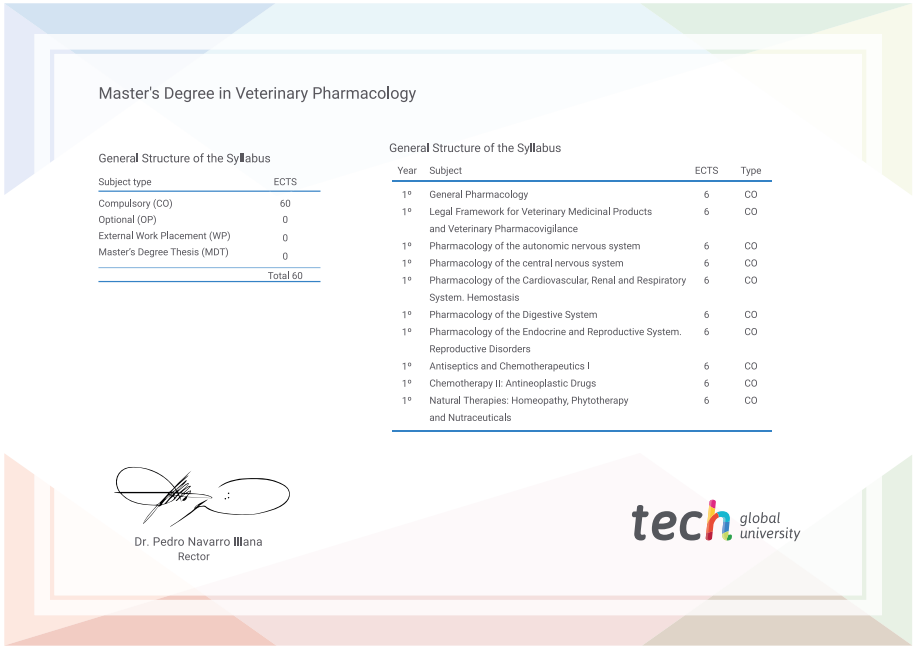
TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates


Master's Degree in Veterinary Pharmacology

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	General Pharmacology	6	CO
1º	Legal Framework for Veterinary Medicinal Products and Veterinary Pharmacovigilance	6	CO
1º	Pharmacology of the autonomic nervous system	6	CO
1º	Pharmacology of the central nervous system	6	CO
1º	Pharmacology of the Cardiovascular, Renal and Respiratory System. Hemostasis	6	CO
1º	Pharmacology of the Digestive System	6	CO
1º	Pharmacology of the Endocrine and Reproductive System. Reproductive Disorders	6	CO
1º	Antiseptics and Chemotherapeutics I	6	CO
1º	Chemotherapy II: Antineoplastic Drugs	6	CO
1º	Natural Therapies: Homeopathy, Phytotherapy and Nutraceuticals	6	CO

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Master's Degree
Veterinary Pharmacology

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Master's Degree

Veterinary Pharmacology

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