UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Antimicrobial Resistance in the Environment and Risk Assessment of Veterinary Medicinal Products (VMPs) (Curricular - Environment)

**2223-94R-SCGA28**

## Title

**Antimicrobial resistance in the environment and risk assessment of veterinary medicinal products (VMPs)**

## Teacher(s)

Andrea Franzetti ; Sara Villa

## Language

English / italiano

## Short description

European Union legislation on medicinal products is the primary means for ensuring the quality, safety and efficacy of pharmaceuticals for use in humans and animals, and their safety for the environment.

An environmental risk assessment is now mandatory for all applications for a marketing authorisation for human and veterinary medicinal products (VMPs).

Several antimicrobial pharmaceuticals from the treatment of humans and animals have been found in the environment: their presence may play a role in accelerating the development, maintenance and spread of resistant bacteria and fungi.

The One Health approach, which had previously already taken account of the interconnection between human and animal health, now also encompasses the environmental dimension, recognising it as another link between diseases in humans and animals and as a potential source of new resistant microorganisms

In this framework, the detailed contents are:

1) Mechanisms of action of the main antimicrobial compounds;

2) Mechanisms and development of antimicrobial resistance (AMR);

3) Antimicrobial resistant bacteria (ARB) and antimicrobial resistance genes (ARGs)

4) The environmental cycle of antimicrobial resistance;

5) Consumption of veterinary antibiotics;

6) Emissions and fate of VMPs as sources of antimicrobial substances to and within the environment;

7) Risks to human and animal health from AMR in the environment.

8) Evaluation of the current risk assessment process for VMPs

9) Mitigation of AMR in the environment

Evaluation: NO

## CFU / Hours

2 CFU - 16 Hours (Lecture)

## Teaching period

II semester

## Sustainable Development Goals

ZERO HUNGER