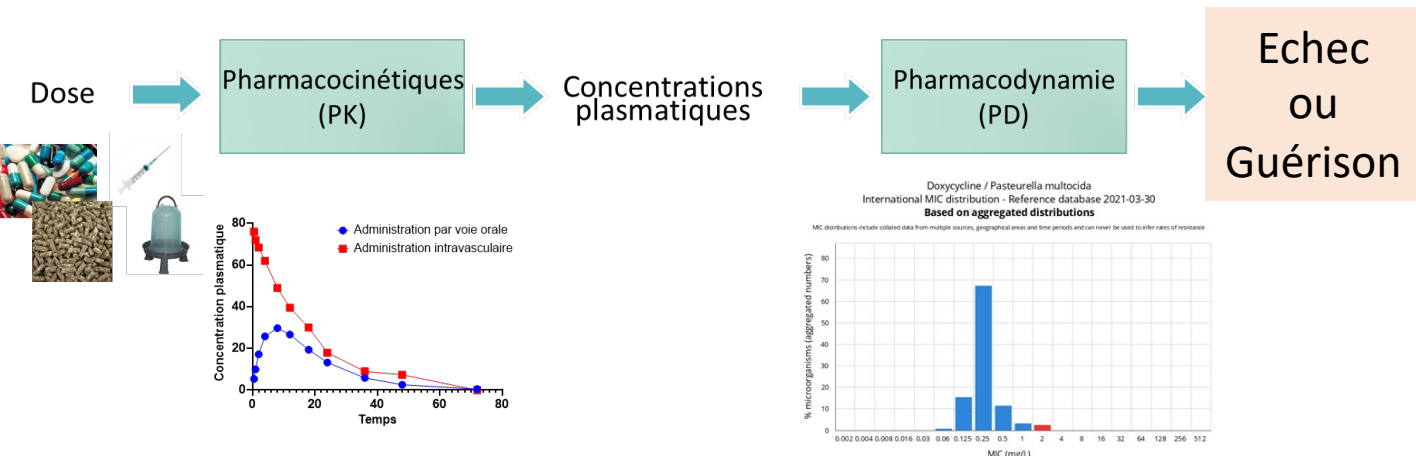


# Pharmacokinetic/Pharmacodynamic Studies

Pharmacokinetics aims to study the fate of a substance, contained in a drug, within the body after its administration via various routes (e.g., intravenous, intramuscular, oral, subcutaneous...). Pharmacokinetic studies help characterize the absorption, distribution, metabolism, and excretion (ADME) of a substance.

Pharmacodynamic studies aim to gather information on the effects of a drug on the body.

By understanding the kinetic profiles that enable the control of both the efficacy of a drug and the limitation of its adverse/toxic effects, it is possible to define dosing regimens suitable for different animal species, including humans.



## Stages of PK/PD Studies

### Selection of in vitro/in vivo Models and Administration Routes



- Primary culture of hepatocytes, macrophages, dialysis, hollow-fibers
- Animals: Rodents, Carnivores, Rabbits, Pigs, Sheep, Cattle, Horses
- Animal cohorts
- Clinical (healthy volunteers, patients) studies
- Administration modalities: IV, PO, SC, IP, IM, IN

### Biological matrices



- Blood, urine, feces
- Tissues, organs
- Amniotic fluid, cerebrospinal fluid (CSF)
- Exudates, transudates

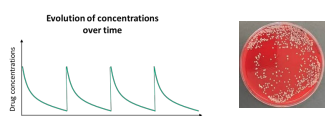
### Analytical technics



- Liquid chromatography (LC) with UV detection, fluorescence
- LC/mass spectrometry (MS)/MS, 2D-LC/MS/MS
- Enzymatic and colorimetric analyses

<https://envt.fr/recherche/plateformes-techniques/plateau-analytique/>

### Pharmacokinetics / Pharmacodynamics



- Pharmacokinetics : standard and **modeling** approaches
- Pharmacodynamics (clinical and microbiological targets)