

# Pharmacology

Greek; **Pharmacon**  
(an active principle)

&

**logos** (a discourse or treatise)

Pharmacology

A science which deals with the study of **substances** that interact with living systems

&

activating or inhibiting normal body process

**Therapeutics**

The branch of medicine concerned with the **treatment of disease**

**Therapy** ---the act of caring for someone (as by medication or remedial training)

**Physiotherapy** ---- Therapy that **uses physical agents**: exercise, massage, & other modalities

**Pharm**; Pertaining to drug

**Pharmacy** --- The art of preparing or compounding and dispensing of medicines or preparing suitable dosage forms for administration of drugs to man or animals.

A **shop** for compounding and dispensing drugs and medical supplies

**Pharmacist** --- A qualified person licensed to compound or dispense drugs

**Pharmaceutics** -- The large scale manufacture of drugs

**Pharm**; Pertaining to drug

**Pharmacognosy** ---- **identification of drugs**

The study of biological, biochemical and economic features of natural drugs and their constituents

**Materia medica** -----

The science of drug preparation and the medical use of drugs.

**Pharm**; Pertaining to drug

**Pharmacogenomics: (Pharmacogenetics)**

The study of **genetic variations** that cause differences in drug response among individuals or populations.

**Pharmaco-diagnosis** --- The use of drugs in diagnosis

**Posology**--- It is the branch of pharmacology which deals with the **doses** of drugs

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Toxicology

(Greek; toxicos-poisonous; logos- discourse in)

That branch of pharmacology which deals with the **undesirable effects of drugs and chemicals** on living system

Detection, prevention

& treatment of poisoning

### DRUG BODY INTERACTIONS

Drug

Body  
(Pharmacodynamics)

Drug

Body  
(Pharmacokinetics)

### PHARMACOKINETICS

(Greek: Kinesis- movement)

It is the actions of **body on the drug**

What happens with the drug in the body (**absorption, distribution, metabolism, and excretion**)

### PHARMACODYNAMICS

(Greek: dynamis - Power)

It is the actions of **drugs on the body**

Pharmacological effects --- therapeutic / toxic effects produced by the drug and its mechanism of action

#### Pharmacodynamics

is what drugs do to the body

#### Pharmacokinetics

is what the body does to drugs

#### Pharmacodynamics                      Pharmacokinetics

Where it acts? (site of action)

What are the effects ? (pharmacological effects)

How it acts?            (mechanism of action)

**Absorption**                      (locally or into the blood from its site of application)

**Distribution**                      (to its site of action or other non required sites )

**Permeation**                      (through various membranes)

**Elimination by Metabolism or Excretion**

### Drug

Any substance used for the purpose of diagnosis, prevention, relief or cure of a disease in man or animal

Drug (WHO, 1966)

“drug is any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the patients”

### Drug

A **chemical substance** of known structure, other than a nutrient or an essential dietary ingredient, which, **when administered to a living organism, produce a biological effect.**

Drugs

A **drug** is any substance that brings about a **change in biological function** through its chemical actions. It reacts with a **regulator molecule called as receptor** to show its effects

Nature of drugs

**Are hormones drugs?**

Yes or No?

**Hormones** are drugs synthesized within the body

Nature of drugs

**Xenobiotics**

*(Greek xenos; stranger)*

**Chemicals not synthesized in the body**

**Drugs synthesized in the pharmaceutical industries**

Poisons and Toxins

**Poisons** are substances that have almost exclusively harmful effects

Inorganic poisons --- lead, arsenic

**Toxins** are poisons of biological origin ---synthesized by plants or animals.

**Are poisons drugs?**

Yes or No?

**Poisons in small doses are drugs**

Paracelsus (1493-1541)

“All things are poisons and there is nothing that is harmless, **the dose alone** decides that something is no poison”

William withering (1741-1799)

“Poisons in small doses are the best medicine; and useful medicines in too large doses are poisonous” i.e., **drugs are useful poisons.**

**Rumi's definition of poison**

Anything which is more than our necessity is poison. It may be power, wealth, hunger, ego, greed, laziness, love, ambition, hate, or anything

Medicine / Drug

**Medicine = active ingredient + excipient**

A **drug** is a single chemical substance that forms the **active ingredient** of a medicine

**Excipient**

Substances in which an active ingredient (drug) is incorporated to formulate medicines

An **inert** (or slightly active substance) used in preparing medicines as a **vehicle or medium of administration** for the medicinal agents

**Excipient**

To deliver drugs in a stable form, acceptable and convenient to the patient

May affect absorption as well as solubility of the medicine

**Lactose, sucrose, starch, calcium phosphate or lactate**

Hippocrates (460-355 B.C.)

**“First do no harm”**

**“It is good remedy sometimes to use nothing”**

Napoleon Bonaparte, 1820

**I do not want two diseases -----**

**one nature made,**

**one doctor made**