



# Definition of pharmacology lec1

- **Pharmacology**: It is the science that deals with interaction of drugs with living systems.
- **Drugs**: These are chemical substances that shows biological activity (treatment or sometimes diagnosis).
- **Divisions of Pharmacology**:
  1. **Pharmacodynamics: (What the drug does to the body)**
    - This deals with the action of drugs on living tissues , namely the type or quality of action, its quantitative aspect, as well as the mechanism of action.
    - Adverse effects and safety of drugs on body tissues or systems are also included
    - The main organ or tissue on which the drug acts, and for which it is used therapeutically, is called the target organ or tissue of drug action
  2. **Pharmacokinetics: (What the body does to drug)**
    - This includes administration and **absorption** of drugs, their **distribution** inside body, and their elimination by **metabolism** or **excretion**

## Other topics linked to pharmacology



**Pharmacotherapeutics:** It is concerned with the proper use of drugs in treatment of disease in man

### **Clinical Pharmacology, this includes:**

- I. Drug pharmacology
- II. Clinical evaluation of drugs in treating disease in man, this is done by:
  - a. Clinical trials.
  - b. Surveillance studies

### **.Chemotherapy:**

- It is used to imply the use of drugs to inhibit growth or kill either:
  - Microbes(i.e. anti-microbial agents)
  - Cancer cells (Cyto-toxic anti-cancer drugs)

**Pharmacy:** It is the science and profession that is concerned with the preparation, storage, dispensing, and proper utilization of drug products

**Toxicology :** It is the science that deals with the harmful effects of chemicals (including drugs).

Rational drug design :drug molecule on basis of 3-dimensional structure of its receptor



# Drug sources



**1- Synthetic sources:** by labs, factories of the pharmaceutical industry.

**2- Semi-synthetic drugs:** obtained from **natural** sources, but are **modified** by pharmaceutical industry in order to improve their physical or chemical properties or pharmacological activity.

**3- Natural sources,** these are less used now and they may be either:

**A. Organic:**

✓ **Plants** ,examples : alkaloids, steroids, some vitamins, tannins, volatile oils, gums

Note: Alkaloids are small organic molecules containing nitrogen . e.g. atropine, morphine, caffeine, theophylline, quinine

✓ **Animals:** proteins , oils, enzymes from exocrine glands, hormones, vaccines and anti-sera, and some vitamins

✓ **Microbes:** like fungi, and sometimes bacteria which are sources of antibiotics

**B. Non-Organic sources :**

▪ **Metals:** Platinum, Zinc

▪ **Non-metals:** Sodium chloride, magnesium sulfate

# Drugs classifications:



- **There is no fixed rule; classification is usually done according to their: imp**

**1. Therapeutic use:** e.g. anti-hypertensive drugs ; anti-microbial drugs ; anaesthetics; hypoglycemic drugs; anticoagulants;

**2. Type of pharmacological action:** This should be precise. e.g. local or general anesthetics; vasodilators; anticoagulants

OR according to molecular or cellular site of action in target cells, e.g. enzyme inhibitors, receptor blockers, ion channel blockers, inhibitors of transporters, antimicrobials acting on cell wall, DNA, or ribosomes

**3. Physiological systems on which they act**

**4. Chemical nature or Source :**

Common chemical groups or structures can be used to classify drugs that have similarity in their pharmacological profile e.g. benzodiazepines, steroids.

-For drugs derived from nature, both the plant species or genus and drug chemistry are included e.g. **belladonna alkaloids from atropa belladonna, digitalis glycosides from Digitalis leaves.**







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Drugs names	Details:
<b>Chemical name</b>	-chemical compound that provides information about drug -not usually used to name drugs. -e.g. <b>acetylsalicylic acid</b> (aspirin) , <b>acetaminophen</b> (paracetamol)
<b>Generic (non-proprietary) name</b> <b>scientific name</b> الاسم العلمي	-used in scientific publications as well as in prescriptions esp. in hospitals . -makes it easier for pharmacist to choose from many available brands of same drug (Also,have common endings → e.g. <b>-olol</b> for beta-adrenoceptor blockers; <b>-caine</b> for local anesthetic drugs  -Only few drugs show more than one generic name : <b>.Noradrenaline &amp; adrenaline</b> in UK but = <b>Nor-epinephrine and epinephrine</b> in USA & WHO; <b>salbutamol</b> in UK = <b>albuterol</b> in USA
<b>Commercial or trade or brand or proprietary name</b> الاسم التجاري	-given by the specific pharmaceutical company synthesizing and marketing the drug. -single drug can have many brand names Diclofenac Na (Voltaren, Inflanban, Diclogesic)

# Dose forms of drugs:



Form	Include :
<b>Oral</b> عن طريق الفم	Pill: Tablets and capsules Liquid: Syrup or suspension Powder Herbal plants: seeds, leaves etc.. Pastes <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
<b>Inhalational</b> عن طريق الاستنشاق	Aerosol Inhaler Vaporizer (Solutions) <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
<b>Parentral</b> عن طريق الحقن	Intradermal (ID) Intramuscular (IM) Intraperitoneal (IP) Intravenous (IV) Subcutaneous (SC) Intrathecal (IT)
<b>Topical</b> موضعي	Cream, gel, ointment, lotion Eye drops ( ophthalmic) Ear drops (otic) Skin patch (transdermal)
<b>Suppository</b> تحاميل	Vaginal Rectal

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