

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
(وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ)



جَلِيلٌ

Pharmacology | Lecture 1

Introduction to Pharmacology

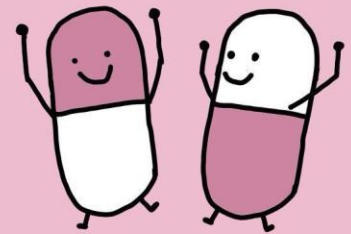


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Pharmacodynamics

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happy pills

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Learning Objectives

- Define pharmacodynamics and its scope in pharmacology.
- Differentiate pharmacodynamics from pharmacokinetics.
- Describe how drugs act on biological targets to produce effects.
- Identify major drug targets: receptors, enzymes, ion channels, and transporters.

Introduction

General overview ::

- We are going to study how drugs work in pharmacology.
- We take drugs to treat certain conditions in our bodies.

Panadol is a trade name, just like Tylenol and Panda.
The scientific name is paracetamol.

It is more ethical for a doctor to write the scientific
name of the drug on the prescription.



Introduction

- ★ Pharmacology is the study of the biochemical and physiological aspects of the drug effects including Absorption, Distribution, Metabolism, Elimination, toxicity and specific mechanism of action.



ADME : Pharmacokinetics

- ★ The main areas of pharmacology are :
 - **Pharmacokinetics** (what my body does to the drug) : the way the body handle drug absorption, distribution, biotransformation, and excretion. (مادّة الدكتور يعقوب)
 - **Pharmacodynamics**: the study of the biochemical and physiological effect of the drugs and their mechanism of action. (مادّة الدكتورة علياء)

Introduction

- ★ Pharmacology is the study of the biochemical and physiological aspects of the drug effects including **A**bsorption, **D**istribution, **M**etabolism, **E**limination, toxicity and specific mechanism of action.
- **Absorption** : By body cells in the intestine
- **Distribution** : target الجسم رح يلفف مادة الدواء في الدم blood stream حتى توصل الى
- **Metabolism** : in the liver
- **Elimination** : mainly in kidneys, then excretion outside the body

All these processes occur in parallel and influence one another continuously.

Definitions

Drug: It is any chemical that affect living processes. It modifies an already existing function, and does not create a new function.

This chemical is going to give me two effects :

- 1) the wanted effect (the therapeutic effect)
- 2) Side effect (not all drugs have side effects)

all these effects are

Within the living system



99.9% of drug effects occur because they modify a physiological process in the body.

For example, Paracetamol acts on a normal enzyme in the body that produces prostaglandins, causing vasodilation and edema, and ultimately leading to pain, inflammation, and fever.

Paracetamol works by inhibiting the enzyme cyclooxygenase, or COX for short. This enzyme normally produces prostaglandins – the chemicals that cause inflammation, pain, and fever. By reducing prostaglandin production, paracetamol helps relieve these symptoms.

Effects (or indications) of Paracetamol:

- Antipyretic → lowers body temperature (fever-reducing) **خافض للحرارة**.
- Analgesic → relieves pain **مسكّن للألم**.
- Has weak anti-inflammatory activity compared to other drugs.

Pharmacodynamics

الدواء لازم يتفاعل مع شيء معيّن في جسمي حتّى يكون له تأثير، وهذا الشيء المعيّن نسّميه : **Target**

Drug targets are usually **receptors** or **enzymes**. The drug needs to bind a sufficient number of target protein at a reasonable dose, so the drug should be potent .

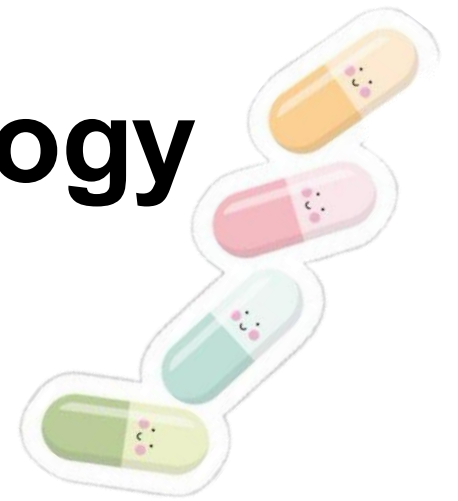
★ The most important part in the body that deals with drug is the receptor (Lecture 3 topic)

★ The study of the biochemical and physiological effect of the drugs and their mechanism of action. ((How drugs work))

★ The study of the relationship of drug concentration to drug effects .

Introduction to Pharmacology

Definitions in Pharmacology



Definitions

Drug: It is any chemical that affect living processes (can be microorganisms or bacteria). It **modifies** an already existing function, and **does not create** a new function.

- There are a few simple exceptions related to genetic therapies. For instance, when I take supplements such as calcium or certain vitamins, they work through the body's natural mechanisms rather than creating a new process.

Dr Notes

- Drug modifications can be either inhibitory or stimulatory, meaning they can activate or inhibit an enzyme.
More will be discussed later in pharmacodynamics.
- Learning the pharmacodynamics of a drug means understanding its mechanism of action, indications, side effects or toxicity, and **contraindications**, a condition or situation in which a drug should not be used because it may be harmful to the patient.

Dr Notes

Uses of Ibuprofen:

Anti-inflammatory → reduces inflammation (swelling, redness, pain)

Analgesic → relieves pain

Antipyretic → lowers fever

A common Side effects of Ibuprofen:

Gastric irritation or stomach pain

Details.. Next semester.. GIS

Definitions

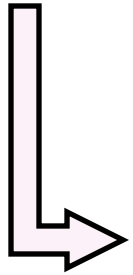
Pharmacology:

The science of drugs.

It is the knowledge of history, source, physical and chemical properties, absorption, distribution, excretion, biotransformation (metabolism, تحويل الدواء من شكل لشكل), actions (we have the mechanism of action and the physiological action of the drug) and therapeutic uses of drugs (the treatment) . (or toxic effects on microbes and cancer cells).

Definitions

Pharmacology:



Some drugs are given only بالوريد and not orally, because their structure is highly polar, so they can't be absorbed through جدار الأمعاء since it's ليبيد in nature.

That's an example of what we'll cover about the chemical structure and properties of drugs – we won't نتعمق into that, because that's the job of إخواننا طلاب الصيدلة.

Definitions

Medical (or Clinical) Pharmacology:

Is the science that deals with the use of drugs for diagnosis, prevention and treatment of human disease.

Definitions

Pharmacy:

Is that branch of the health sciences dealing with the preparation, dispensing, and proper utilization of drugs.

Definitions

Toxicology:

**Is that aspect of pharmacology which deals with adverse effects of drugs and the toxic effects produced by household, environmental and industrial chemicals.
(poisons are also drugs, why?)**

Additional Resources:

رسالة من الفريق العلمي:

الشباب مرحلة عظيمة جدًّا في حياة المرء، ينبغي عليه أن يُحسِّن
اغتنامها، وأن يُجاهد نفسه مجاهدةً تامّةً على عدم تفويت خيرها وبركتها
مستعينًا بالله عزّ وجلّ طالبًا مدّه وعونه وتوفيقه
وأن يذكر نفسه بأنّ الله عزّ وجلّ سائله عن هذه المرحلة سؤالًا عظيمًا
يوم يلقاه
-عن عمره فيما أفناه، وعن شبابه فيما أبلاه-

من كتاب وصايا السلف للشباب
[لتحميل الكتاب، 33 صفحة](#)



For any feedback, scan the code or click on it.



Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1			
V1 → V2			