

Pharmacodynamics

Study of the action of drug and the biochemical and physiological effects produced by the drug action.

“What the drug does to the body” or “the effects of a drug on the body”

Action: How and Where the effect is produced is called as Action.

Site of Drug Action

Where:

- | | | |
|-------------------|---|---------------------------------|
| 1. Extra cellular | → | Antacids |
| 2. Cellular | → | Ach on Nicotinic receptors |
| 3. Intracellular | → | Folic acid synthesis inhibitors |

Extra cellular site of action

1. Antacids neutralizing gastric acidity.
2. Chelating agents forming complexes with heavy metals.
3. MgSO₄ acting as purgative by retaining the fluid inside the lumen of intestine.

Cellular Site of Action

1. Ach on Nicotinic receptors of motor end plate, leading to contraction of skeletal muscle.
2. Effect of sympathomimetics on heart muscle and blood vessels.

Intracellular site of action

-Folic acid synthesis inhibitors. Folic acid which is intracellular component essential for synthesis of proteins and DNA and RNA. Trimethoprim and sulfa drug interfere with synthesis.

Effect: The type of response producing by drug.

EFFECT (Type of responses):-

1. Stimulation Catecholamines -----> ↑ Heart rate

2. Inhibition/Depression Atropine----- > x Ach action
Anesthetics----- > ↓ depress the CNS

3. Replacement Insulin ----- > Diabetes

4. Irritation Eucalyptus oil ---- > treating cough and muscle pain, insect repellent

5. Cytotoxic Anticancer drugs/ Antibiotics----- > ○ infecting organism/cancer cells

Stimulation

- Some of drugs act by increasing the activity of specialized cells. Ex: Catecholamines stimulate the heart and Heart rate, Force of contraction

Inhibition

- Some drugs act by decreasing the activity of specialized cells. Ex: Barbiturates, General anesthetic, these drug depress the CNS system. Atropine inhibits Ach action.

Replacement

- When there is a deficiency of endogenous substances, they can be replaced by drugs. Ex: Insulin in Diabetes mellitus, Throxine in cretinism and myxedema

Irritation

- Certain drugs on topical application cause irritation of the skin and adjacent tissues. These drugs are using for counter irritant. Ex: Eucalyptus oil, methyl salicylates (Used in sprains, joint pain, myalgia.

Cytotoxic

- Treatment of infectious disease/cancer with drugs that are selectively toxic for infecting organism/cancer cells Ex: Anticancer drugs, All Antibiotics