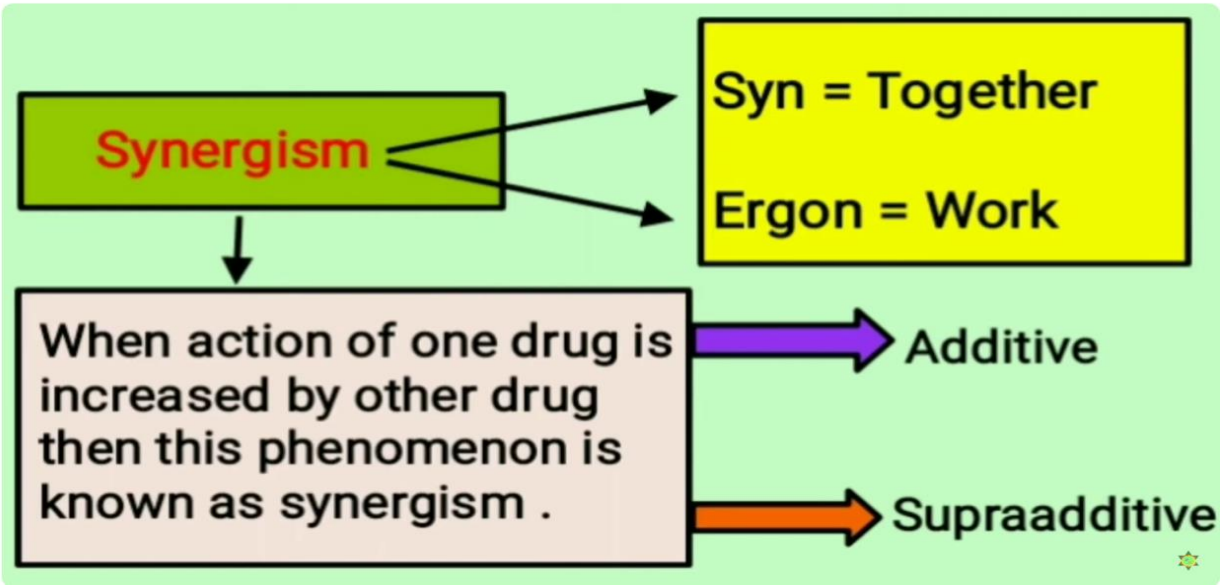
Combined Effect of drug

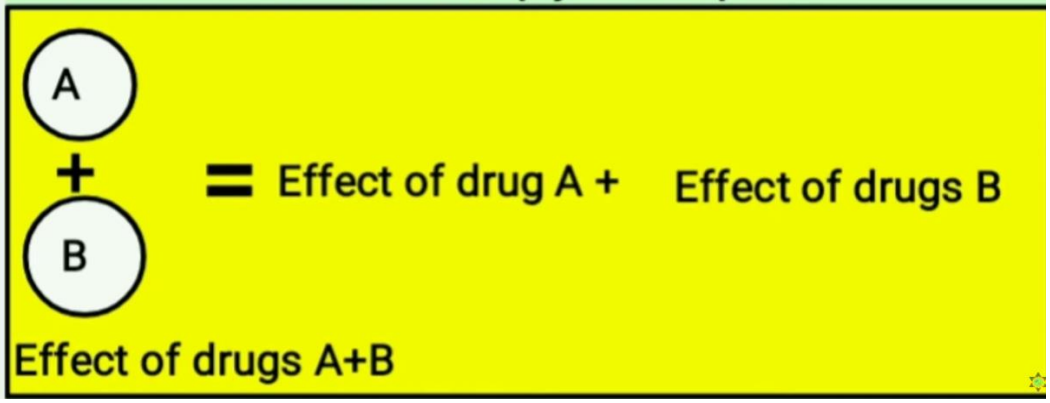
When we use two drug in combination , then two types of effects will be there -:

1. Synergism
2. Antagonism



1.Additive effect -:

The effects of two drugs is in same direction and simply adds up.



Example -:

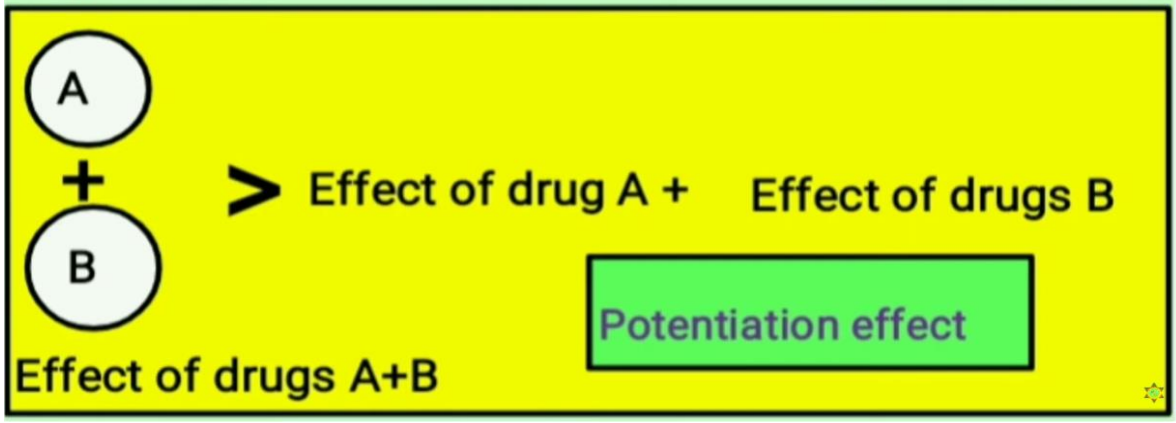
1. Aspirin + Paracetamol

2. Nitrous Oxide + Halothane

Side effects do not add up .

2. Supraadditive effect -:

The effect of combination is greater than the individual effects of components.



(A) Synergism:

Action of one drug is facilitated or increased by other.

1) **Additive:** Effect of two drugs is in same direction & thus the pharmacological effects of both drugs add up.

effect of Combination (A & B) = effect of drug A + effect of drug B.

2 = 1+1

eg. Nitrous Oxide + Halothane (General Anaesthetic)
Amlodipine + Atenolol (Antihypertensive)
Glibenclamide + Metformin (Hypoglycaemic)

2) **Supra additive (Potentiation):**

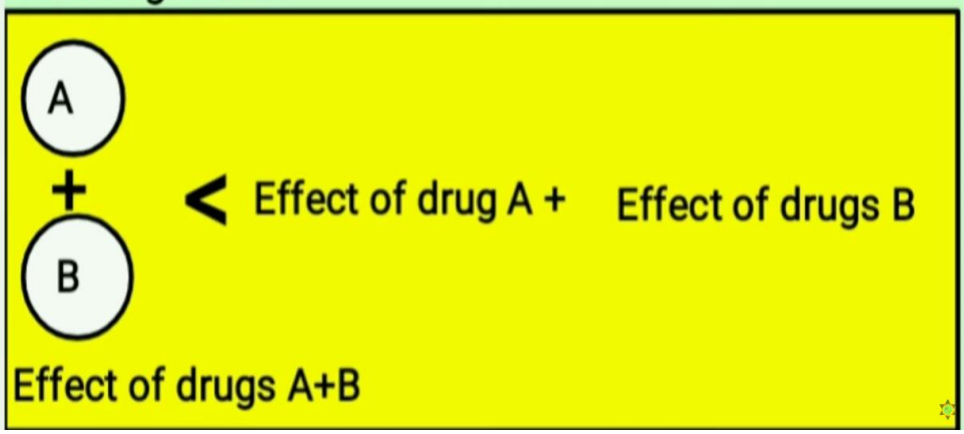
effect of combination (A & B) > effect of drug A + effect of drug B

eg 5 > 1+1

One drug has no effect, but enhances effect of other (potentiation)

eg. Acetylcholine + Physostigmine.
Levodopa + Carbidopa
Sulfamethoxazole + Trimethoprim

2. Antagonism -: When one drug decreases the effect of another drug , this phenomenon known as antagonism.



Antagonism:

When one drug decreases or stops the action of other.

effect of Combination (A & B) < Effect of A + Effect of B

1 < 2 + 2

1) Physical Antagonism:

eg Charcoal adsorbs Alkaloids preventing their Absorption.

2) Chemical Antagonism:

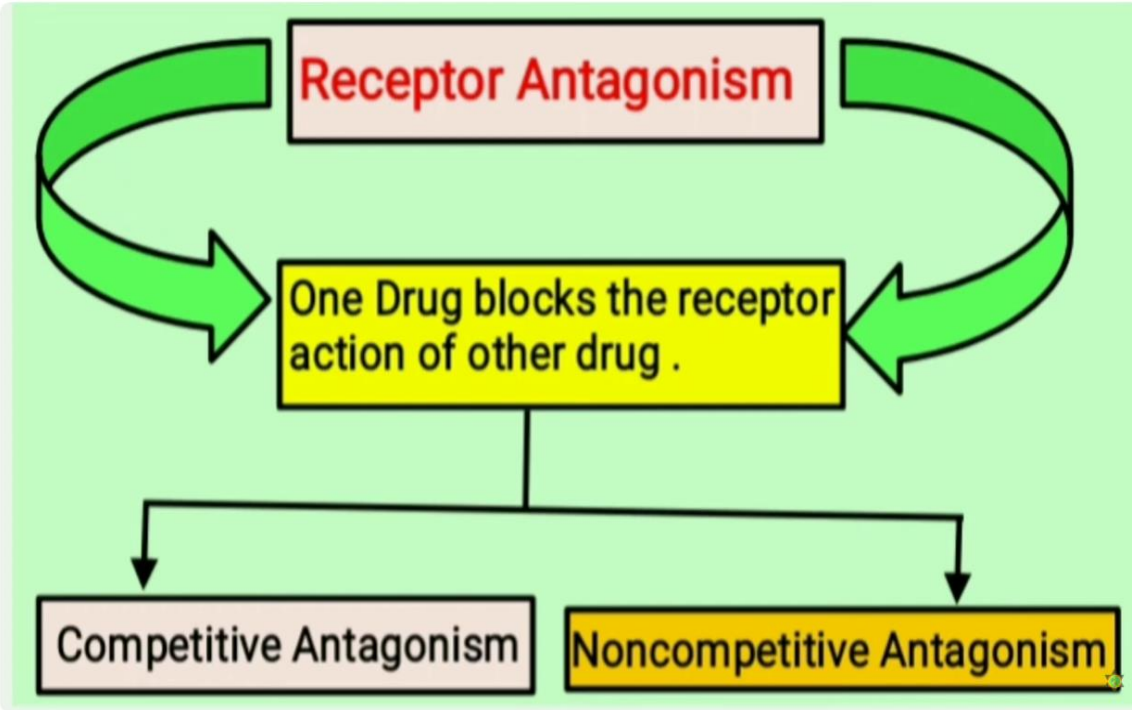
eg. (i) Calcium disodium edetate complexes lead.

(ii) Tannins react with alkaloids to produce insoluble alkaloidal tannate.

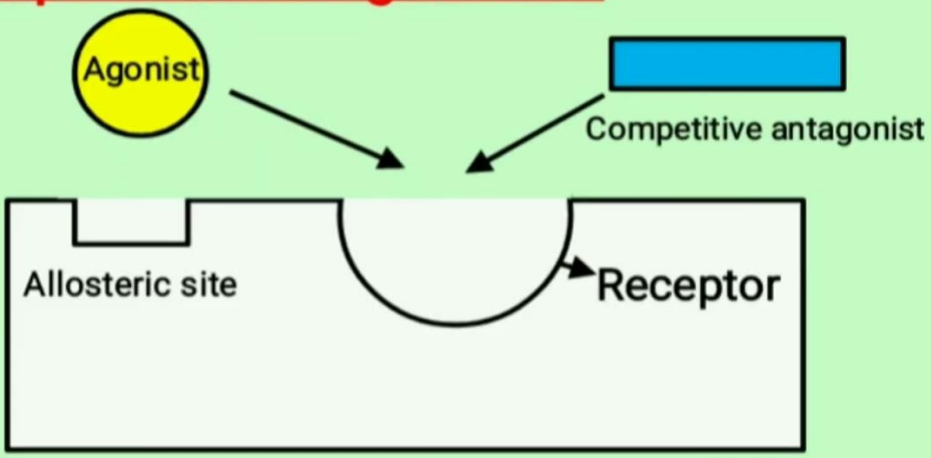
3) Physiological/functional Antagonism.

eg i) Histamine & Adrenaline on Bronchial Smooth Muscles.

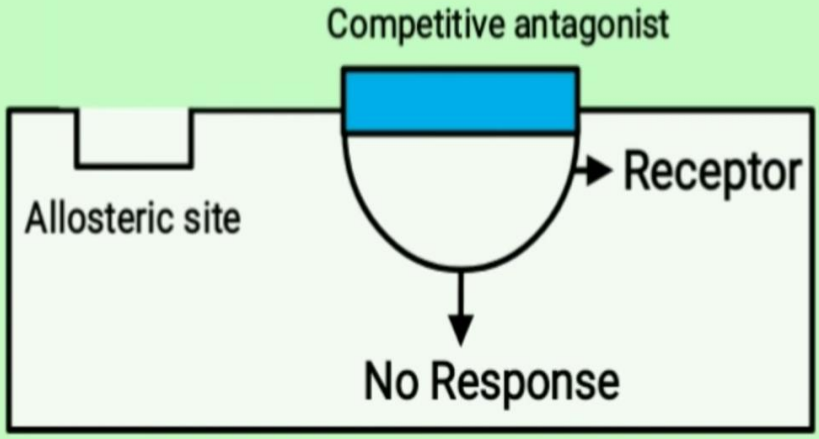
ii) Glucagon and Insulin on blood Sugar.


Receptor Antagonism
One Drug blocks the receptor action of other drug .
Competitive Antagonism
Noncompetitive Antagonism

Competitive Antagonism -:



Competitive Antagonism -:



Noncompetitive Antagonism -:

The antagonist is chemically unrelated to the agonist , binds to allosteric site and alter the receptor in such a way that it is unable to combine with the agonist or unable to produce response.

NMDA Receptor ⟶ Ketamine

Noncompetitive Antagonism -: