Drug Target Interaction

DRUGS
Chemicals of low molecular masses (~100-500u) and produce a biological response

RECEPTORS
Proteins for communication system in the body

ENZYME INHIBITORS
Drugs that block the binding site of the enzyme and prevent the binding of substrate.

COMPETITIVE INHIBITORS
Drugs compete with natural substrate for their attachment on the active sites of enzymes.

ALLOSTERIC SITE:
Some drugs do not bind to the enzyme's active site. These bind to a different site of enzyme.

CHEMICAL MESSENGERS
In human body, message between two neurons and the neurons to muscles is communicated through certain chemicals. These are called messengers.

ANTAGONISTS
Drugs that bind to the receptor site and inhibit its natural function

AGONISTS
Drugs that mimic the natural messenger by space on the called agonists.

PHYSICS WALLAH

CHEMISTRY IN EVERYDAY LIFE

Therapeutic Actions of Drugs

Antacid
Neutralise stomach acids
- Sodium hydrogencarbonate
- Aluminium hydroxide
- Magnesium hydroxide
- Magnesium carbonate
- Cimetidine, Ranitidine } Reduce secretion of pepsin & HCl in stomach due to histamine

Antihistamines
Anti allergic & antacid
- Diphenylhydramine
- Chlorpheniramine
- Brompheniramine
- Promethazine
- Terfenadine

Antifertility Drugs
(Synthetic progesterone derivatives)
progesterone supresses ovulation
- Norethindrone
- Mestranol
- Novestrol
- Mifepristone

N.A.D
(Neurologically active drugs)
Tranquilizers and analgesics are neurologically active drugs. These affect the message transfer mechanism from nerve to receptor.

Tranquilizers
Treatment for stress & mental diseases
- Chlordiazepoxide
- Meprobamate
- Equanil
- Veronal
- Amytal
- Nembutal
- Luminal
- Seconal
- Valium
- Serotonin

Analgesics
Pain killers
- Aspirin — Relief skeletal pain due to arthritis; Antipyretic; Antiblood clotting agent (prevention of heart-attack)
- Paracetamol
- Novalgin
- Phenacetin
- Brufane
- Morphine
- Heroine
- Codeine

Non narcotic
Non addictive
- Aspirin
- Paracetamol

Narcotic
Addictive
- Morphine

Antiseptics
on living tissues
- Furacine
- Soframicine
- Chloroxylenol, Terpineol } Dettol
- Tincture of iodine (2-3% solution in alchohol-water mixture)
- Iodoform
- Bithional (In soaps)
- 0.2% Phenol
- Iodine (Powerful)
- Boric acid (Weak antiseptic for eyes)

Antimicrobials
- An antimicrobial destroy prevent development or inhibit the pathogenic action of microbes such as bacteria, fungi, virus, parasites selectively
- Antibiotics antiseptics and disinfectats are antimicrobial drugs

Disinfectants
Either kill or prevent the growth of microorganisms
- 1% Phenol
- DDT
- 0.2-0.4 ppm solution of chlorine
- SO_2 in very low concentration

Antibiotics

On basis of mode of control of microbial diseases

Bactericidal	Bactériostatic
Penicillin Aminoglycosides Ofloxacin	Erythromycin Tetracycline Chloramphenicol

Salvarsan (arsenic based) used for treatment of syphilis

On basis of mode of its spectrum of action

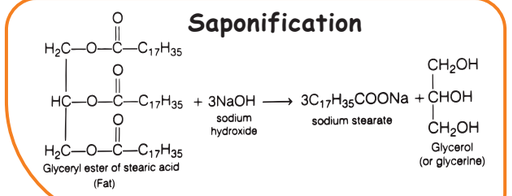
Broad spectrum	Narrow spectrum
Ampicillin, Amoxycillin } Synthetic modifications of penicillins Chloramphenicol Chloromycetin Tetracycline Vancomycin Ofloxacin	Penicillin G Clindamycin Metronidazole **Limited spectrum** Dysidazirine

Soaps & Detergents

Soaps

Sodium and Potassium salts of higher fatty acids (carbon atoms 12 or highter)

Saponification



Non-ionic Detergents:

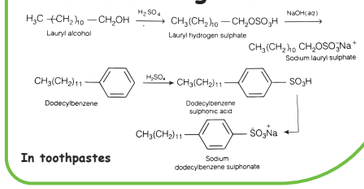
$CH_3(CH_2)_{16}COOH + HO(CH_2CH_2O)_nCH_2CH_2OH \longrightarrow CH_3(CH_2)_{16}COO(CH_2CH_2O)_nCH_2CH_2OH$

Liquid dishwashing detergents

Detergents

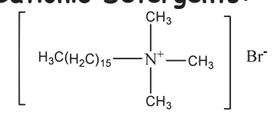
Are sodium and potassium salts of long chain sulphonic acids

Anionic Detergents:



In toothpastes

Cationic Detergents:



Cetyltrimethylammonium bromide

Germicidal properties

Chemicals in foods

(i) Artificial sweetening agents:

Artificial Sweetener	Sweetness value in comparison to cane sugar
Aspartame (Widely used, unstable at cooking T)	100
Saccharin	550
Sucralose (stable at cooking T, Does not provide calories)	600
Alitame (Stable than Aspartame, High potency sweetener)	2000

(ii) Food preservatives:

Prevent spoilage of food due to microbial growth. *Eg:* Table salt, sugar, vegetable oils, C_6H_5COONa, Salts of sorbic acid & propanoic acid

(iii) Antioxidants in Food

Butylated hydroxytoluene (BHT), butylated hydroxy anisole (BHA)-Increases shelf life of butter from months to years, SO_2,& sulphite-In beer & sugar syrups