Today's Goal

- Visualise the importance of Chemistry in daily life
- Explain the term 'chemotherapy'
- Describe the basis of classification of drugs
- Explain drug-target interaction of enzymes and receptors
- Explain how various types of drugs function in the body
- Know about artificial sweetening agents and food preservatives
- Discuss the chemistry of cleansing agents

Drugs and their Classification

-Drugs are chemicals of low molecular masses (~100 – 500u).

-These interact with macromolecular targets and produce a biological response. When the biological response is therapeutic and useful, these chemicals are called **medicines** and are used in diagnosis, prevention and treatment of diseases.

- If taken in doses higher than those recommended, most of the drugs used as medicines are potential poisons.

-Use of chemicals for therapeutic effect is called **chemotherapy,**

Classification of Drugs

Drugs can be classified mainly on criteria outlined as follows:

(a) **On the basis of pharmacological effect** (Useful for Doctor's)

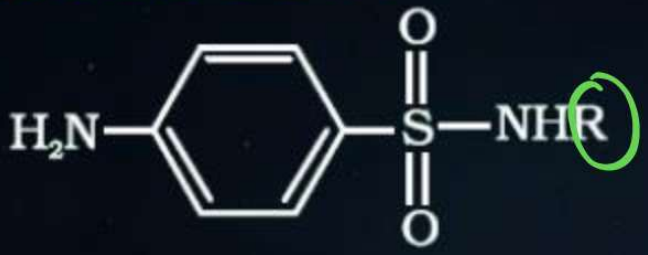
This classification is based on pharmacological effect of the drugs. It is useful for doctors because it provides them the whole range of drugs available for the treatment of a particular type of problem. For example, analgesics have pain killing effect, antiseptics kill or arrest the growth of microorganisms.

(b) On the basis of drug action

It is based on the action of a drug on a particular biochemical process. For example, all antihistamines inhibit the action of the compound, histamine which causes inflammation in the body. There are various ways in which action of histamines can be blocked. You will learn about this in Section

(c) **On the basis of chemical structure**

It is based on the chemical structure of the drug. Drugs classified in this way share common structural features and often have similar pharmacological activity. For example, sulphonamides have common structural feature, given below.



Structural features of sulphonamides

(d) **On the basis of molecular targets**

Drugs usually interact with biomolecules such as carbohydrates, lipids, proteins and nucleic acids. These are called target molecules or drug targets. Drugs possessing some common structural features may have the same mechanism of action on targets. The classification based on molecular targets is the most useful classification for medicinal chemists.

Drugs –Target Interaction

(i) Macromolecules of biological origin perform various functions in the body.

(ii) For example, proteins which perform the role of biological catalysts in the body are called enzymes.

(iii) Those which are crucial to communication system in the body are called receptors.

(iv) Carrier proteins carry polar molecules across the cell membrane.

(v) Nucleic acids have coded genetic information for the cell.

(vi) Lipids and carbohydrates are structural parts of the cell membrane.

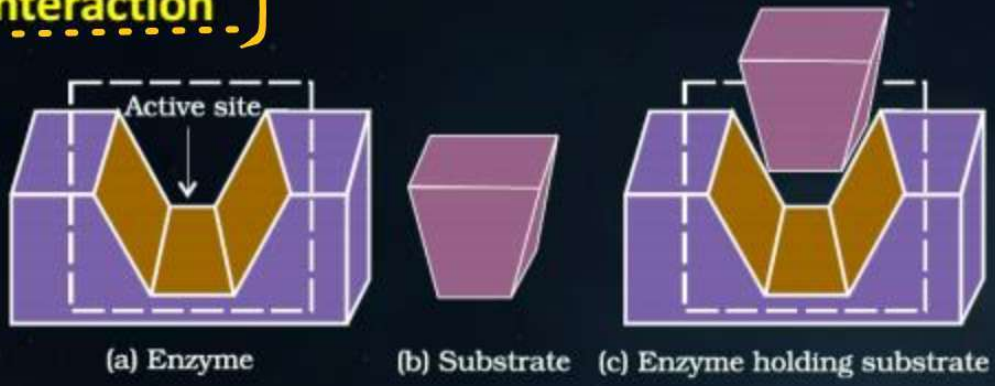
(vii) We shall explain the drug-target interaction with the examples of enzymes and receptors.

Enzymes as Drug Targets

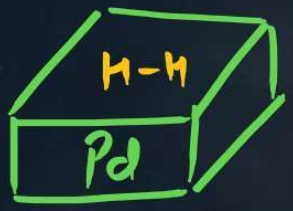
(a) **Catalytic action of enzymes** For understanding the interaction between a drug and an enzyme, it is important to know how do enzymes catalyse the reaction.

In their catalytic activity, enzymes perform two major functions:

(i) The first function of an enzyme is to hold the substrate for a chemical reaction. Active sites of enzymes hold the substrate molecule in a suitable position, so that it can be attacked by the reagent effectively. Substrates bind to the active site of the enzyme through a variety of interactions such as ionic bonding, hydrogen bonding, van der Waals interaction or dipole-dipole interaction



(a) Enzyme (b) Substrate (c) Enzyme holding substrate



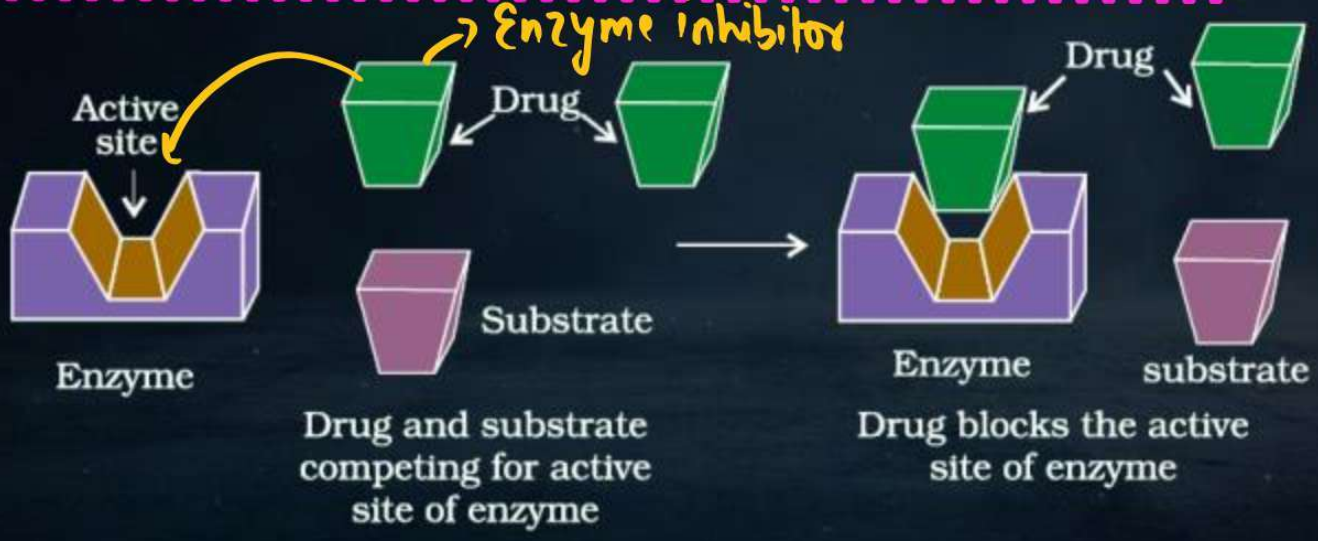
(ii) The second function of an enzyme is to provide functional groups that will attack the substrate and carry out chemical reaction.

(b) Drug-enzyme interaction

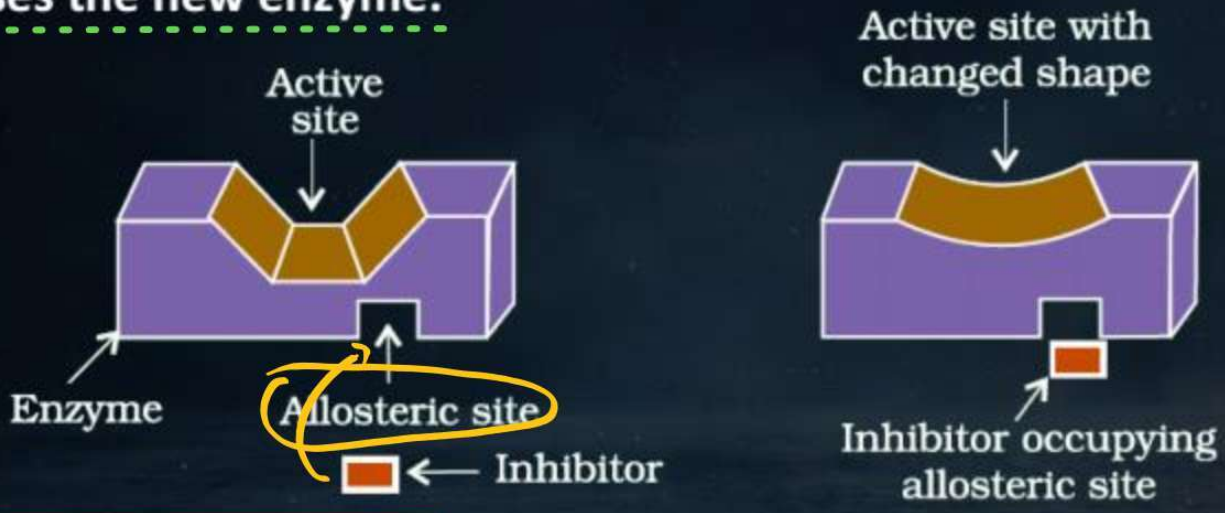
Drugs inhibit any of the above mentioned activities of enzymes. These can block the binding site of the enzyme and prevent the binding of substrate, or can inhibit the catalytic activity of the enzyme. Such drugs are called **enzyme inhibitors.**

Drugs inhibit the attachment of substrate on active site of enzymes in two different ways.

(i) Drugs compete with the natural substrate for their attachment on the active sites of enzymes. Such drugs are called **competitive inhibitors**



(ii) Some drugs do not bind to the enzyme's active site. These bind to a different site of enzyme which is called allosteric site. This binding of inhibitor at allosteric site (Figure) changes the shape of the active site in such a way that substrate cannot recognise it. If the bond formed between an enzyme and an inhibitor is a strong covalent bond and cannot be broken easily, then the enzyme is blocked permanently. The body then degrades the enzyme-inhibitor complex and synthesises the new enzyme.



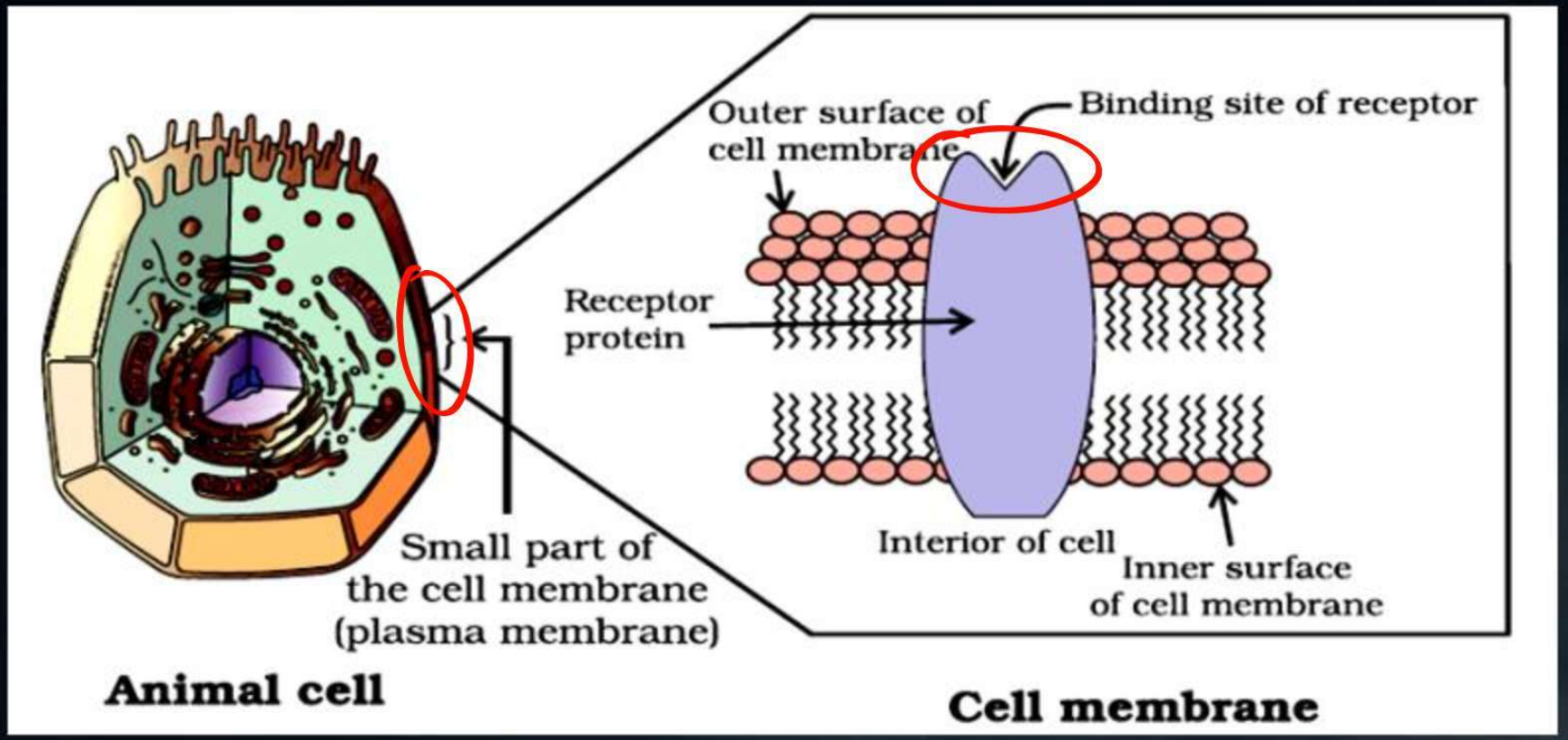
Non-competitive inhibitor changes the active site of enzyme after binding at allosteric site.

Receptors as Drug targets

(i) Receptors are proteins that are crucial to body's communication process.

(ii) Majority of these are embedded in cell membranes.

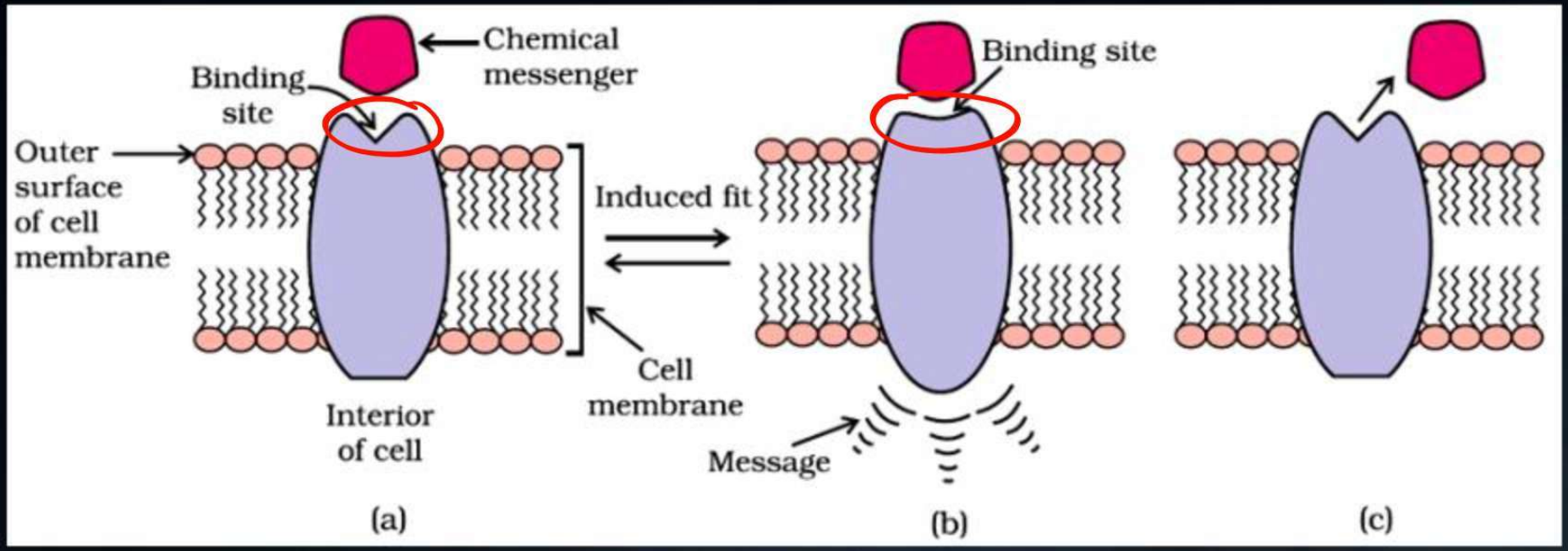
(iii) Receptor proteins are embedded in the cell membrane in such a way that their small part possessing active site projects out of the surface of the membrane and opens on the outside region of the cell membrane



Receptor protein embedded in the cell membrane, the active site of the receptor opens on the outside region of the cell.

(i) In the body, message between two neurons and that between neurons to muscles is communicated through certain chemicals. These chemicals, known as chemical messengers are received at the binding sites of receptor proteins.

(ii) To accommodate a messenger, shape of the receptor site changes. This brings about the transfer of message into the cell. Thus, chemical messenger gives message to the cell without entering the cell



(a) Receptor receiving chemical messenger
(b) Shape of the receptor changed after attachment of messenger
(c) Receptor regains structure after removal of chemical messenger.

(i) There are a large number of different receptors in the body that interact with different chemical messengers.

(ii) These receptors show selectivity for one chemical messenger over the other because their binding sites have different shape, structure and amino acid composition.

(iii) **Antagonists**- Drugs that bind to the receptor site and inhibit its natural function are called antagonists. These are useful when blocking of message is required.

(iv) **Agonists**- There are other types of drugs that mimic the natural messenger by switching on the receptor, these are called agonists. These are useful when there is lack of natural chemical messenger.

Therapeutic Action of Different Classes of Drugs

In this Section, we shall discuss the therapeutic action of a few important classes of drugs.

Classification of drugs according to their actior :

(1) Antacids :

(i) The chemicals which are used to reduce the acidity of the stomach are called antacids.

Ex:- $NaHCO_3$, $Al(OH)_3$, $Mg(OH)_2$

(ii) Antacids are basic in nature.

(iii) Their pH value is in the range of 7.0 to 8.0.

(iv) Example sodium hydrogencarbonate or a mixture of aluminium and magnesium hydroxide.

(v) Excess of acidity leads to formation of excess of histamine (Fig. 1). Therefore modern synthetic drugs use anthhistamines for the treatment of gastic ulcers by blocking the acid release action of histamine.

(vi) Common drugs are :

(a) Cimetidine (Tagamet), Fig. 2
(b) Ranitidine (Zantac), Fig. 3
(c) Omeprozole
(d) Lansoprazole

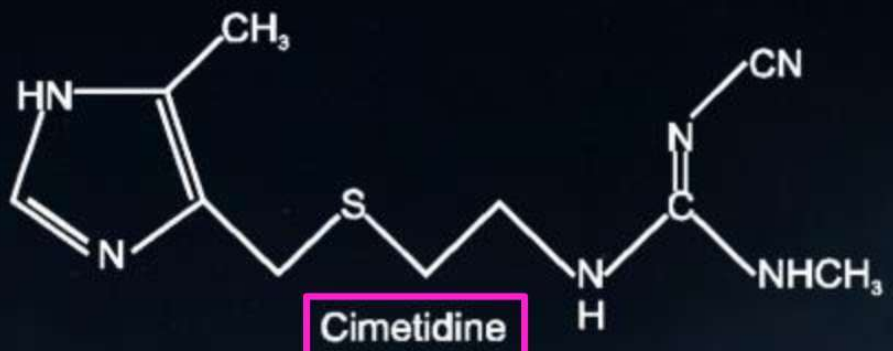
Trick for antacid →

Cim	Ran
Ta	Za
OmLet	Lana

सिमरन ताजा आमलेट लाना

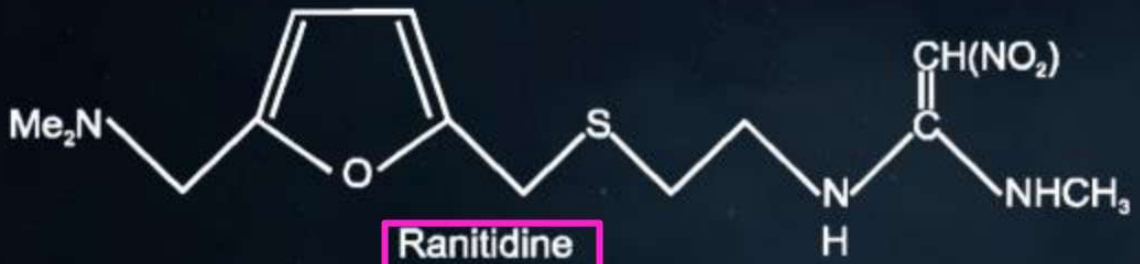
Histamine

Fig. 1



Cimetidine

Fig. 2

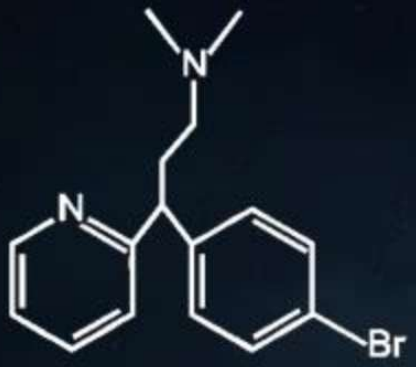


Ranitidine

Fig. 3

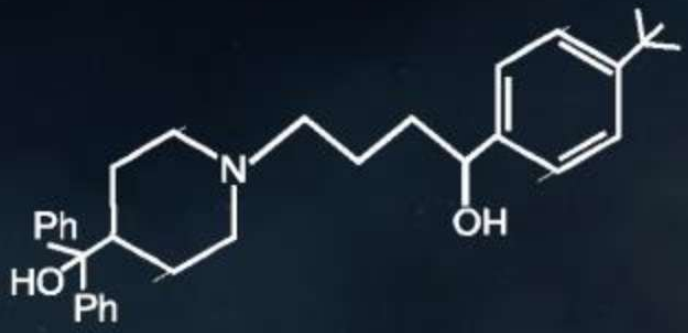
(2) Antihistamines or Antiallergic Drugs :

Antihistamines are the drugs which diminish or abolish the effects of histamine. Synthetic drugs, brompheniramine (Dimetane) (Fig. 4) and terfenadine (Seldane) act as antihistamines (Fig. 5).



Brompheniramine
(Dimetapp. Dimetane)

Fig. 4



Terfenadine (Seldane)

Fig. 5

Trick for Anthistamine.

"Bro	Dimppi	Diet	Tera Phn	Silent h"
Bromopheniramine	Dimetapp	Dimetane	Terfenadine	Seldane

Allergy : Allergy may be defined as the hypersensitive reponse of the body of certain persons to the external stimulus (such as some drugs, foods, dust, pollen grains, catfur, fabrics etc.)

- The substances which cause allergy are called **allergens**.

-Most commonly used anti-histamine under the trade name **avil** (Pheniramine maleate).

(3) Neurologically Active Drugs

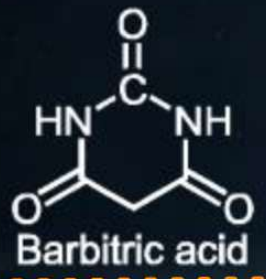
(a) Tranquilizers :

(i) The chemicals which are used to reduce mental tension, relieve anxiety and mental stress are called Tranquilizer.

(ii) They act on central nervous system and are hypnotics.

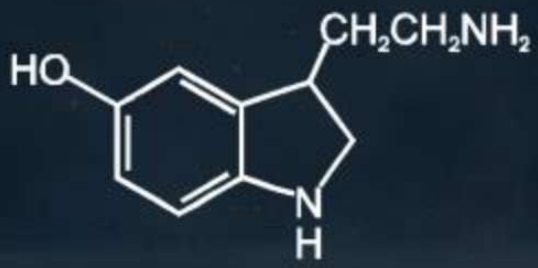
(iii) Tranquilizers are effective in such mental disorder when ordinary hypnotics or sedatives fail. These are called as psychotherapeutic drugs.

eg. Barbituric acid (Fig. 6), Luminal, Serotonin (Fig. 7).



Barbitric acid

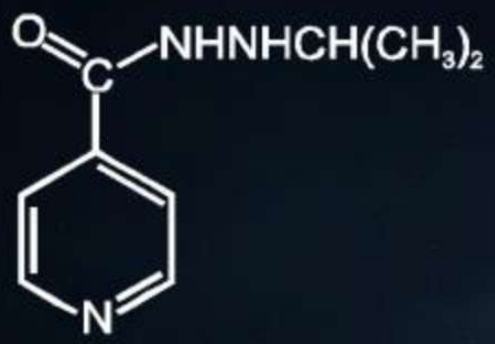
Fig. 6



Serotonin

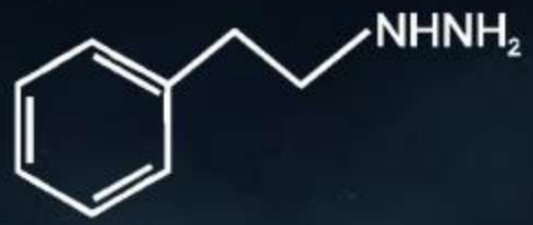
Fig. 7

Noradrenaline is a mood change neurotransmitter. Iproniazide (Fig. 8) and phenelzine (Fig. 9) are anti depressent drugs. These drugs inhibits the enzyme which catalyse the degradation of noradrenaline.



Iproniazid

Fig. 8



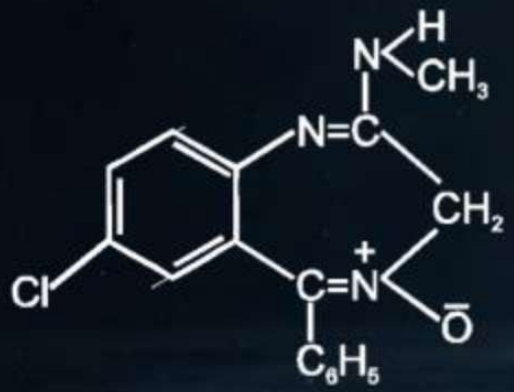
Phenelzine (Nardil)

Fig. 9

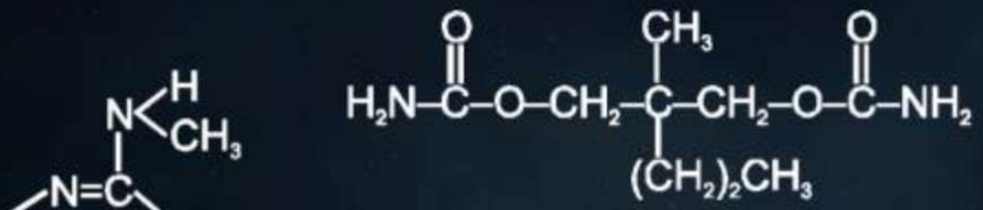
Note : Reserpine, an alkanoid, is a powerful tranquillzer. It is obtained from a plant, Rauwolfia serpentina (common name - Sarpagandha) which grows in India.

Tranquillzer namely **chlordiazepoxide** (Fig. 10) and **meprobamate** (Fig. 11) are relatively mild suitable for relieving tension.

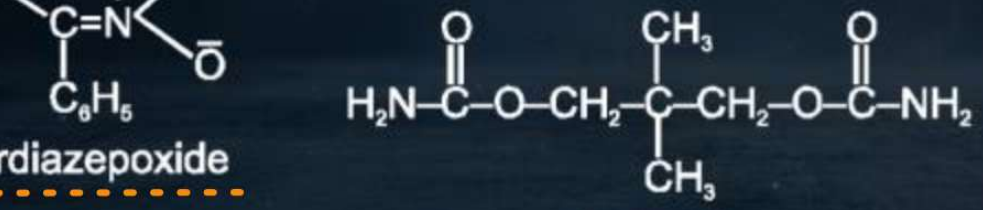
Equanil (Fig. 12) is used in controlling depression and hypertension.



Chlordiazepoxide



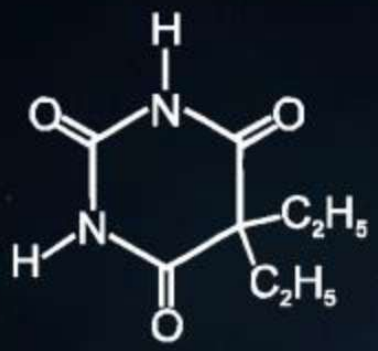
Meprobamate



Equanil

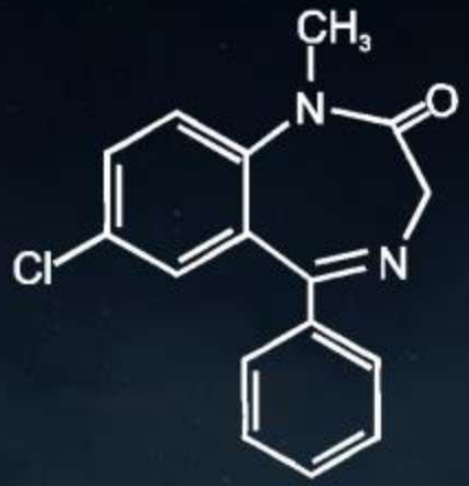
Fig. 10, 11 & 12

Barbituric acid and their derivatives (Barbiturates) as veronal (Fig. 13), amytal, nembutal, luminal and valium (Fig. 14) are hypnotic and sleep producing agents.



Veronal

Fig. 13



Valium

Fig. 14

Trick for Tranquilizer

Badla	Lu mein	sher se	is zid	pr naraz dil
Barbituric acid	Luminal	Serotinin	Ipromizid	Phenelzine(Nardil)

Ada h	Mene pyr se	Qha Q	Vero	Vali
Amytal	Meprobamate	Equanil	Veronal	Valium

Nakal	Cr rha h
Nembutal	Chlordiazepoxide

(b) Analgesics : The chemicals which are used for relieving pain are called ANALGESICS.

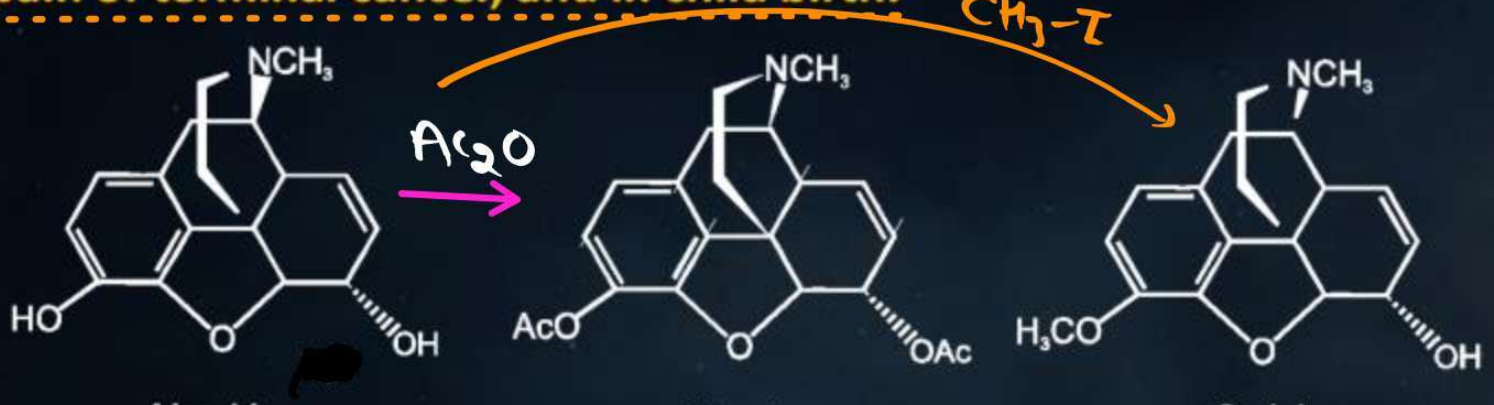
(i) Non-narcotic analgesics (Non addictive) : Aspirin (acetyl salicylic acid) and Paracetamol (4-acidamido phenol), Ibuprofen belong to this class. These drugs also act as antipyretic (reducing fever), and preventing platelet coagulation.

Par	Aspr
Paracetamol	Aspirin

Analgesic, Antipyretic, Blood thinner

(ii) **Narcotic Analgesics** : Morphine (Fig. 15), Heroin (Fig. 16), Codeine (Fig. 17) and its homolgues in medicinal doses, relieve pain and produce sleep.

- In higher doses these produce COMA, CONVULSIONS and ultimately death.
- The narcotics are mainly used for the relief of postoperative pain, cardiac pain and pain of terminal cancer, and in child birth.



Morphine — Fig. 15

Heroin — Fig. 16

Codeine — Fig. 17

Meri	Heroin	Con Hai
Morphine	Heroin	Codeine

(4) **Antimicrobials** : The chemicals which stop the growth or kill the micro organism such as bacteria, virus, fungi, moulds etc are called antimicrobials.

Antibiotics, antiseptics and disinfectants are antimicrobial drugs.

(a) **Antibiotics** : The chemicals produced by micro organisms like bacteria, fungi and moulds that inhibit the growth or destory other micro organism causing infectious diseases in men or animal's body are called antibiotics.

Bactericidal (Kill the bacteria)

Penicillin (Fig. 18)

Aminoglycosides

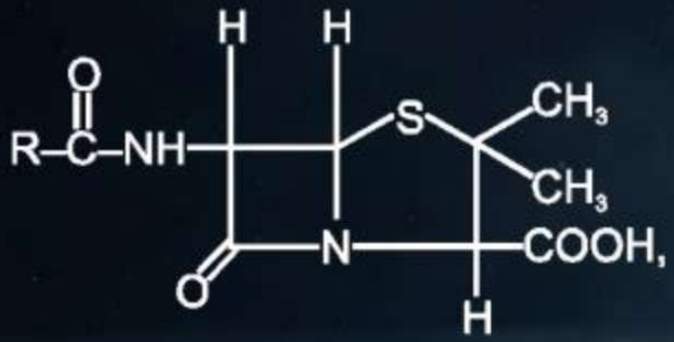
ofloxacin

Becteriostatic (stops the growth of bacteria)

Erythromycin

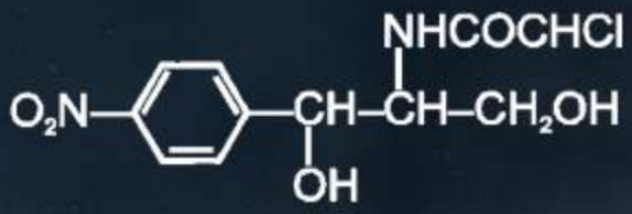
Tetracycline

Chloramphenicol (Fig. 19)



General Sturcture of Pencillin

Fig. 18



Chloramphenicol

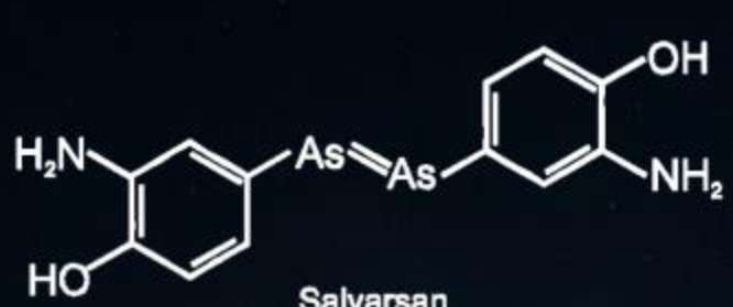
Fig. 19

Broad spectrum Antibiotic	Narrow Spectrum Antibiotic	Limited Spectrum antibiotic
gram ⊕ve bacteria as well as gram ⊖ve bacteria both stop growing or killed	either gram ⊕ve or gram ⊖ve bacteria.	use for treatment of particular diseases.

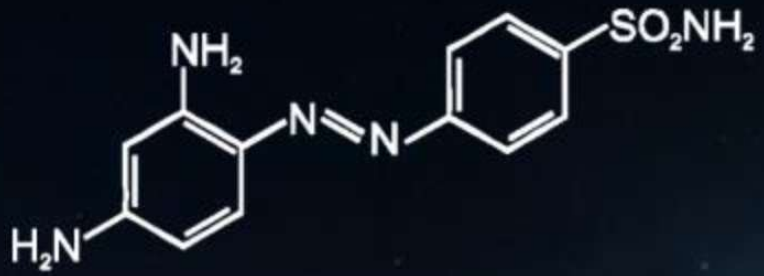
(I) Penicillin : Six types of penicillines have been isolated so far. Among them penicillin-G is most widely used and is narrow spectrum antibiotics.
Ampicillin and amoxicilline are synthetic modification of penicilline and these has broad spectrum effect.
Penicillin is used for the treatment of pneumonia, bronchitis, bounds etc.

(II) Streptomycin : It is an effective broad spectrum antibioctic. It is used for the treatment of tuberculosis, meningitis and pneumonia

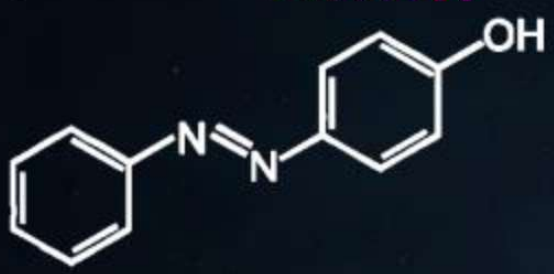
(III) Chloramphenicol : It is marketed as chloromycetin and is used for the treatement of typhoid, dysentery, pneumonia, meningitis etc.
Paul Ehrlic developed arsphenamine (salvarsan (Fig. 20)) for the treatment of syphillis. Ehrlic worked on azodyes (Fig. 21) and succeeded in developing first effective antibacterial agent Prontosil (Fig. 22).



Salvarsan



Prontosil



Azodye

Trick :→

AzKal din me	Salman	Parathe khata h
Azodye	Salvarsan	Prontosil

Bhai	Amrishpuri	Or	Amir
Broad Spectrum	Amipiciline	Ofloxacin	Amoxiciline
Stress Me	Chai Pete h		
Streptomycin	Chloramphenicol		

TRICKS

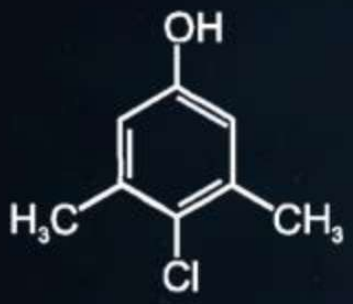
Nashte Me	Parle-G Khate h
Narrow Spectrum	Penicillin-G

(b) Antiseptic and Disinfectants :

Antiseptics are applied to the living tissues such as wounds, cuts ulcers and diseased skin surface. Examples are furacin, soframycin etc.

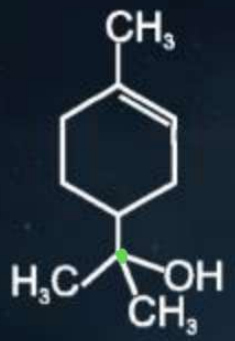
Commonly used antiseptic is dettol, it is a mixture of chloroxylenol (Fig. 23) and terpineol (Fig. 24).

Bithional Fig. 25) is added to soaps to impart antiseptic properties.



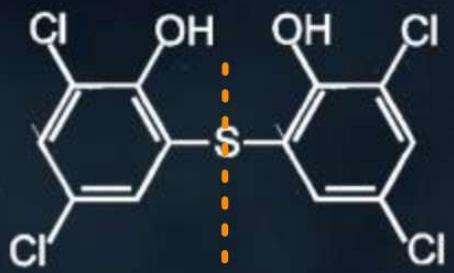
Chloroxylenol

Fig. 23



Terpineol

Fig. 24



Bithionol

Fig. 25

Iodoform is also used as antiseptic for wounds, boric acid in dilute aqueous solution is weak antiseptic for eyes.

Disinfactants are the substances which applied to inanimate objects such as floors drainage system instruments etc.

One substance can act as an antiseptic and also act as disinfactant for example

(a) 0.2 percent solution of phenol is an antiseptic while its 1% solution is disinfectant.

(b) Chlorine in 0.2 to 0.4 ppm in aqueous solution is used to disinfect drinking water.

(c) Hexachlorophen : It is mainly used in soaps creams and emulsions.

(d) Thymol : It is a natural derivative of phenol and is a powerfull disinfectant

(e) Amyl meta cresol (5-methyl-2-pentyl phenol) it is used as antiseptic in mouth wash or gargles.

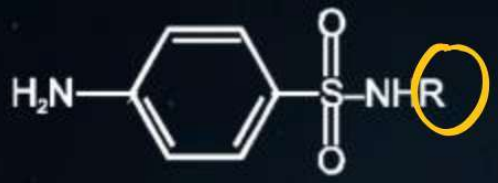
(f) Gention violet and methylene blue are organic dyes but used as effective antiseptic.

Trick for Antisceptic

Dil	Chahega Bhi	Terpega	Bhi
Dettol	Chloroxylenol	Terpinol	Bithional
Tere	Pyar	Mein	Iodoform
	Phenol		CHI_3

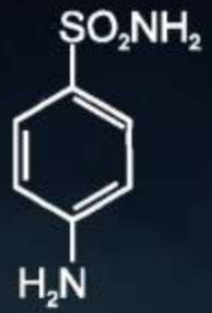
(c) Sulpha Drugs :

A group of drugs (Sulphonamides (Fig. 26)) which are derivatives of sulphanilamide (Fig. 27) are known as sulpha drugs. eg. Sulphadiazine, Sulphapyridine (Fig. 28)



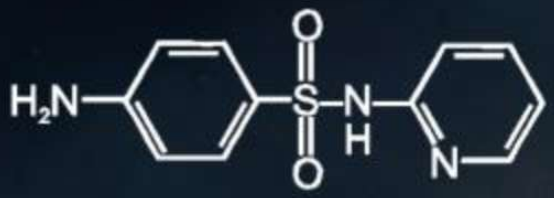
Structural features of sulphonamides

Fig. 26



Sulphanilamide

Fig. 27



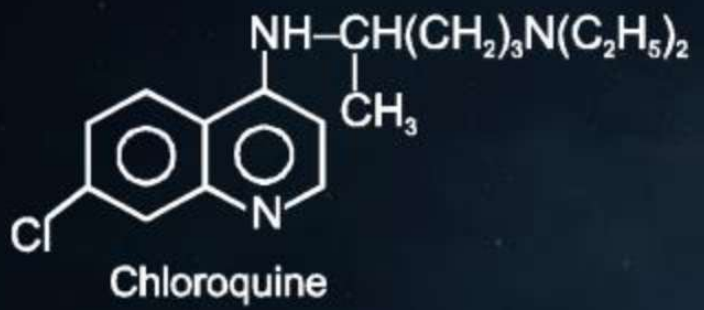
Sulphapyridine

Fig. 28

(d) Antimalarials :

These are the medicines of malaria. In earlier days malaria was treated with the bark of cinchona tree.

The chloroquine (Fig. 29) and their phosphates are sold in the market under the trade name - resochin, ciplaquine, nivaquine etc.



Chloroquine

Fig. 29

(e) Antifungal Drugs : These are drugs used for superfical and deep (systemic) fungal infections. Two important antibiotics used as antifungal drugs, introduced way back in 1960, are amphotericin-B and griseofulvin.

(f) Antiamoebic Drugs : These are drugs useful in infection, caused by the protozoa Entamoeba histolytica. Metronidazole, tinidazole and tetracyclines are important antiamoebic drugs, used these days.

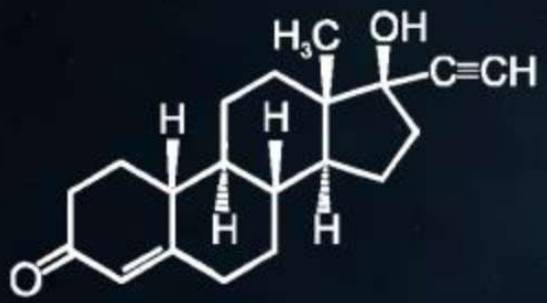
(g) Antiviral Drugs : Viruses are the ultimate expression of parasitism; they not only take nutrition from the host cell but also direct its metabolic machinery to synthesize new virus particles. Acyclovir, ribavirin, zidovudine, interferons are some of the important antiviral drugs, used these days.

(5) Antifertility Drugs :

(i) Chemcial substances which are used to check pregnancy in women are called anti-fertility drugs or birth control pills or oral contraceptives".

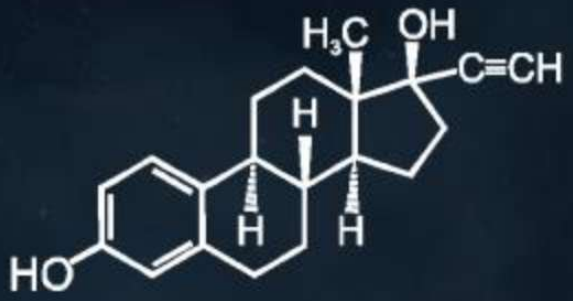
(ii) Birth control pills essentially contain a mixture of synthetic estrogen and progesteron derivatives. Both of these compounds are hormones.

eg. Norethyndron (Fig. 30), Ethynylestradiol (novestrol) (Fig. 31)



Norethindrone

Fig. 30



Ethynylestradiol (novestrol)

Fig. 31

Edhar Estarah	Na Hase	Na Roye
Ethynylestradiol	Novestrol	Norethyndron

2. Chemicals In Food :

Chemicals are added to food for their preservation, enhancing their appeal and adding nutritive values in them Main catergories of food additives are as follows

(i) Food colours.

(ii) Flavours and sweeteners.

(iii) Fat emulsifiers and stabilising agents.

(iv) Flour improvers antistaling agent and bleaches.

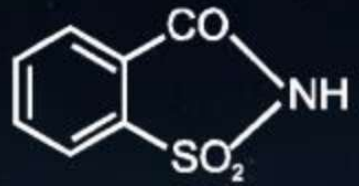
(v) Antioxidants

(vi) Preservatives

(vii) Nutritional supplements such as minerals, vitamins and amino acids

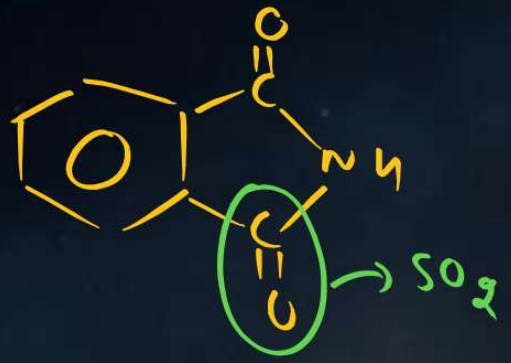
(a) Artificial sweetening agents :

-Saccharine (Fig. 32) is the first popular artificial sweetening agent used since 1879. It is about 550 times more sweet as cane sugar.

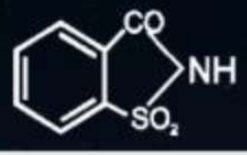
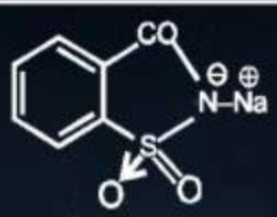
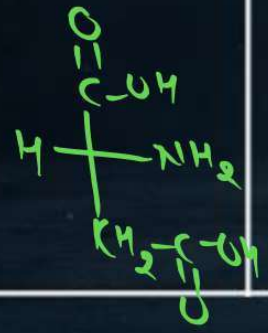
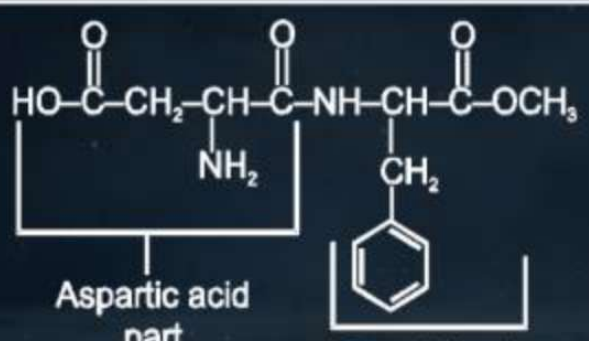
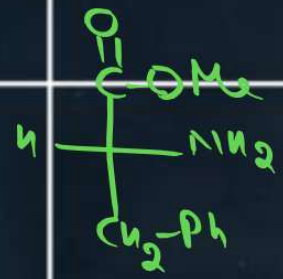


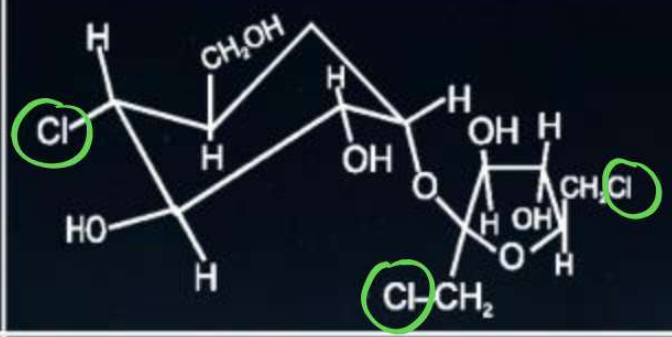
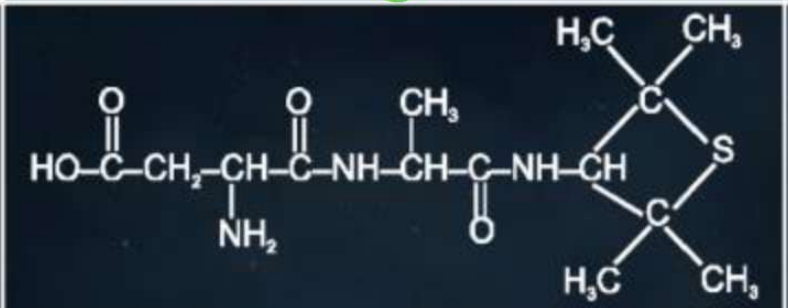
Saccharin

Fig. 32



-It's use is of great value to diabetic persons and people who need to control intake calories.

Artifical sweeteners	Structural formula	Sweetness value in comparison to cane sugar
(1) Saccharine (o-sulpha) (insoluble in water benzimide)		550
(2) Sodium salt of saccharine (Soluble in water)		
(3) Aspartame 		 100

(4) Sucralose ↳ Trichloro derivative of Sucrose		600
(5) Alitame		2000

Alita ki Sa Su AasPass Hai
Alitame Saccharine Sucralose Aspartame
↳ unstable at cooking temp

(b) Food Preservatives :

-The chemical which are used to stop undesirable change in food caused by microorganism and save them from spoiling are called preservatives.

It reduces (stop the growth) and rate of reactions occuring due to bacteria in food).

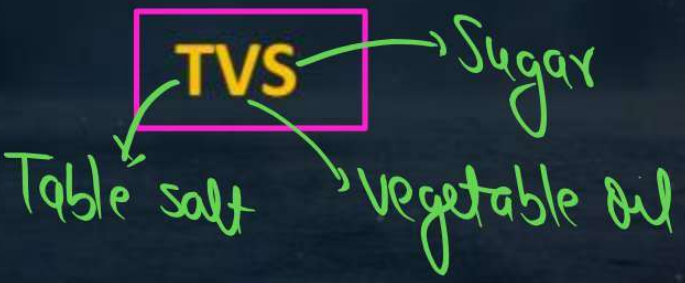
-The following properties must be present in a preservative :

(i) It should not react with food material.

(ii) It's effect should be for longer period.

(iii) It should not decrease the quality of food.

(iv) It should not have harmfull effect on the body.



Improtant preservatives are as follows :

(1) **Sodium benzoate** : It's 0.06% to 0.1% concentration is used for preservation of fruit juice , jam, jelly, pickles etc.

(2) **Parabens** : These are alkyl p-hydroxy benzoate and used for preservation of tomato sauce etc.

(3) **Sorbates** : These are salt of sorbic acid and used for preservation of milk cheese preparation certain meats and fish products. It inhibit the growth of yeast

(4) **Propionates** : These are ethyl and phenyl ester of propionic acid and used for the preservation of biscuits and baked product, etc from mould fungi etc.

(5) **Sodium or potassium metabisulphite ($Na_2S_2O_5$ or $K_2S_2O_5$)** : It is used as a preservative for food products such as jams, squashes, pickles etc.

(6) **Epoxides** : Epoxides are gases and preserves low moisture foods like nuts, dried fruits. Epoxides destroy all type of microorganism including spores and viruses.

(7) **p-Hydroxy benzoate ester** : The methyl, ethyl propyl and heptyl esters of p-hyroxybenzoic acid are used as preservatives in baked foods, soft drinks, beer and syrups.

(c) Antioxidants :

-The chemical substance which reduce the rate of reaction with oxygen in food, thus help in their preservation are called antioxidants.

-They reduce the rate of formation of free radicals responsible for ageing process 2,6 ditertiarybutylhydroxy toluene (p-cresol, BHT) and 2-tertiarybutylhydroxy anisole (BHA) are two most familiar antioxidants used.

So	So	k	Bahut	Bhari	Hogayee
SO_2	SO_3^{2-}		BHT	BHA	

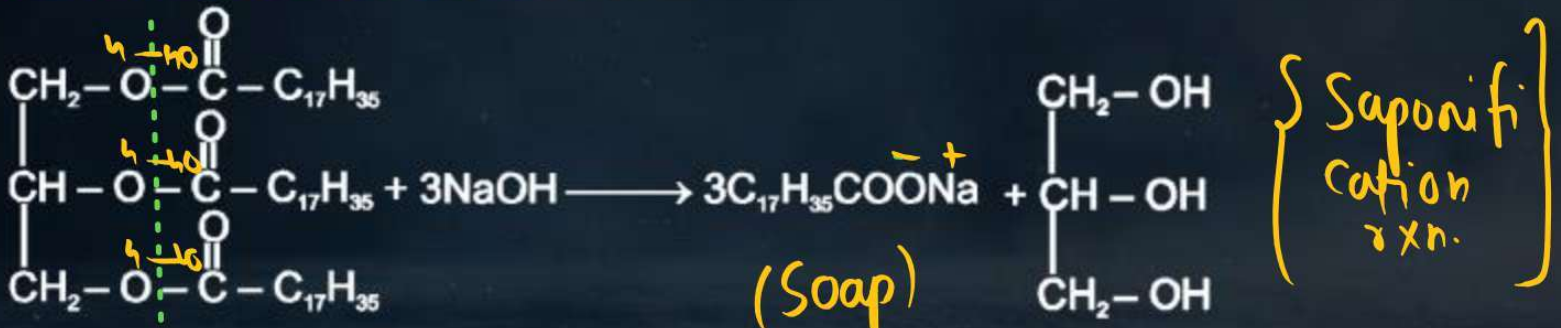
3. Cleansing Agents : (Soaps and Detergents)

Soaps :

Soaps are sodium or potassium salts of long chain fatty acids e.g steric, oleic and palmitic acids.

Soap containg sodium salts are formed by heating fat (i.e. glyceryl ester of fatty acid) with aqueous sodium hydroxide solution. This reaction is known as SAPONIFICATION.

Generally potassium soaps are soft to the skin.



Types of soaps :

There are so many types of soaps due to the using different raw materials

(i) Toilet soaps

(ii) Water floating soaps

(iii) Transparent soaps

(iv) Medicated soap

(v) Shaving soaps

(vi) Loundry soaps

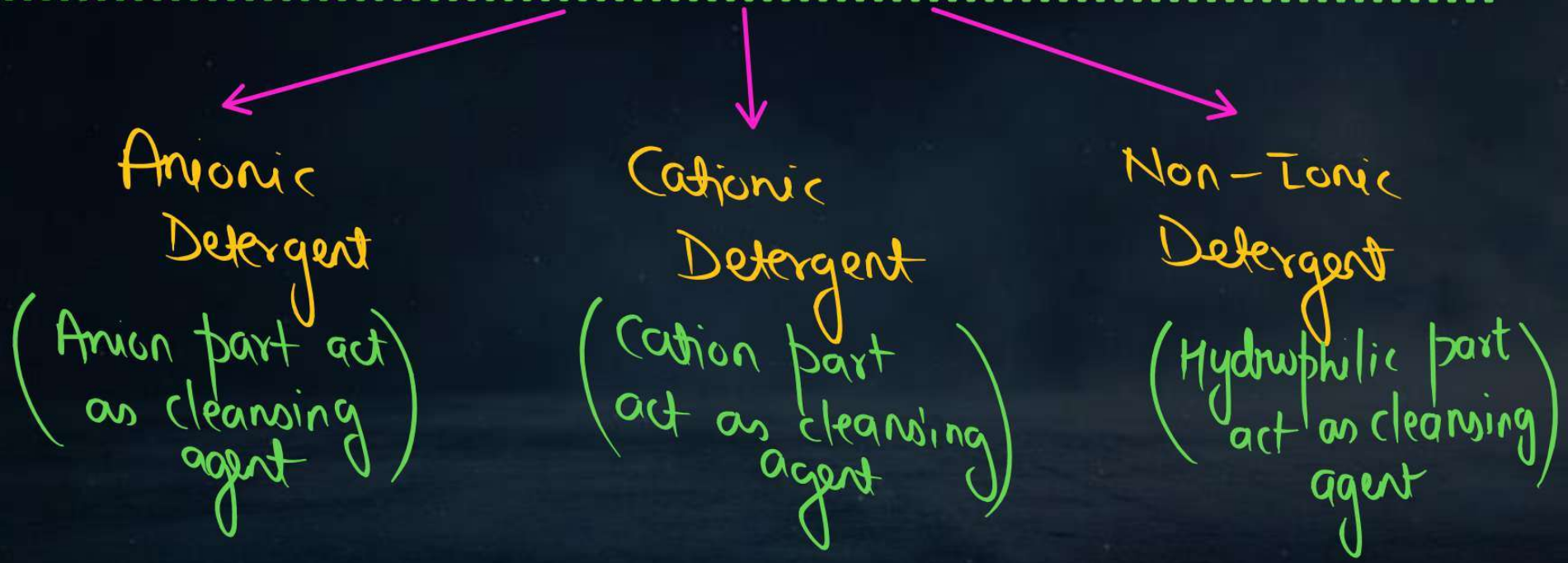
(vii) Soaps chips

(viii) Soap granules

Detergents :

The synthetic products, which like soaps remove dust and grease from a surface are called detergents, since they are not soap but work like a soap so they are also called as soapless soap.

These can be used both in soft and hard water, as they give foam even in hard water.



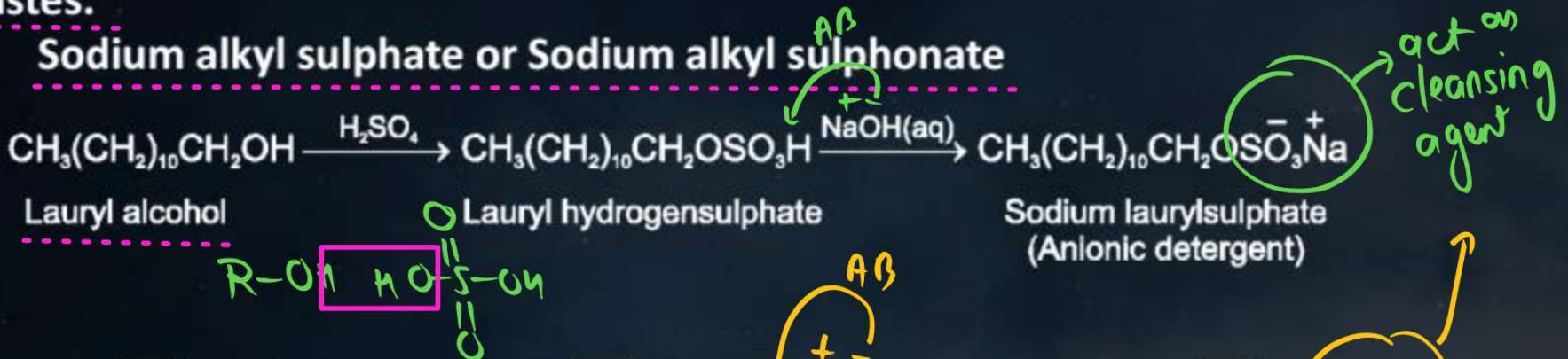
Synthetic detergents are mainly classified into three catagories :

(i) **Anionic detergents** : These are sodium salt of sulphonated long chain alcohols or hydrocarbons.

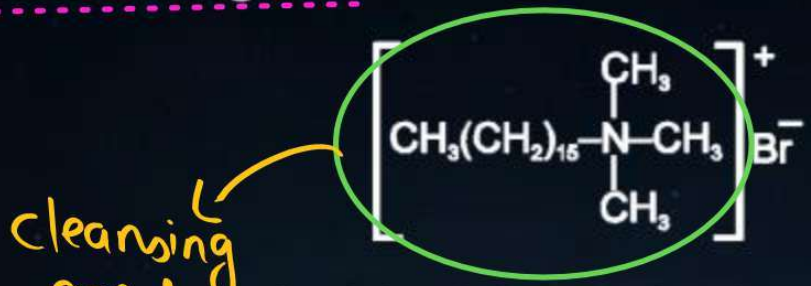
eg. Lauryl alcohol, Lauryl hyrogen sulphate, Sodium lauryl sulphate

In anionic detergents, the anionic part of the molecule is involved in the cleansing action. These are smoothly used for household work and are also used in toothpastes.

eg. : Sodium alkyl sulphate or Sodium alkyl sulphonate



(ii) **Cationic detergents** : These are quatenary ammonium salts of amines with acetates, chlorides or bromides as anion. Cetyltrimethylammonium bromide is a popular cationic detergent.

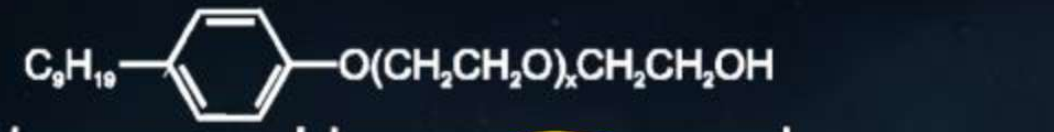


Cleansing agent

Cetyltrimethyl ammonium bromide

(iii) **Non ionic detergents** : These are moslty esters of poly hydroxy alcohols. They are in liquid form, and do not contain any ion in their constiution. One such detergent is formed when stearic acid reacts with polyethyleneglycol. eg. :
Stearic acid, Poly ethyleneglycol

Note : Liquid dish washing detergents are non ionic type.



Hydrophobic or non polar part

Hydrophilic or polar part → cleansing agent

(x=5 to10)

Difference between soap and detergents

(1) Soaps are salts of weak acid and strong base whereas detergents are salts of strong acid and strong base.

(2) Aqueous solution of soap is basic where as aqueous solution of detergents is neutral.

(3) woolen and silk cloths in which soft fibres are present cannot be washed with soap whereas all type of fabrics can be washed with detergents

(4) Soap cannot work in hard water because soaps are precipitated as insoluble salt by reaction with Ca^{2+} and Mg^{2+} ions.


PYQ's

Q

Which of the following is a cationic detergent?

[2020]

A. Sodium stearate

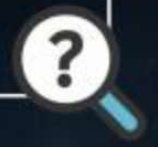
B. Cetyltrimethyl ammonium bromide

C. Sodium dodecylbenzene sulphonate

D. Sodium lauryl sulphate

Q

Among the following, the narrow spectrum antibiotic is: *[2019]*



(A) penicillin G

(B) ampicillin

(C) amoxycillin

(D) chloramphenicol

Q

Mixture of chloroxylenol and terpineol acts as:
[2017]

(A) antiseptic

(B) antipyretic

(C) antibiotic

(D) analgesic

Q

Which of the following is an analgesic? *[2016]*

A Novalgin

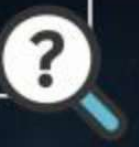
B Penicillin

C Streptomycin

D Chloromycetin

Q

Bithionol is generally added to the soaps as an additive to function as a/an : *[2015]*



(A) Dryer

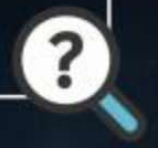
(B) Buffering agent

(C) Antiseptic

(D) Softner

Q

Artificial sweetner which is stable under cold conditions only is : *[2014]*



(A) Saccharine

(B) Sucralose

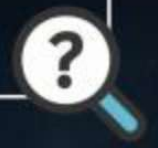
(C) Aspartame

(D) Alitame

Q

Antiseptics and disinfectants either kill or prevent growth of microorganisms. Identify which of the following statements **is not true:**

[NEET 2013]



(A) Chlorine and iodine are used as strong disinfectants.

(B) Dilute solutions of Boric acid and Hydrogen Peroxide are strong antiseptics.

(C) Disinfectants harm the living tissues.

(D) A 0.2% solution of phenol is an antiseptic while 1% solution acts as a disinfectant.

Q

Dettol is the mixture of *[1996, NEET Kar. 2013]*

(A) Terpineol and Bithionol

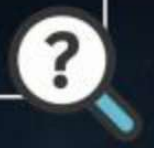
(B) Chloroxylenol and Bithionol

(C) Chloroxylenol and Terpineol

(D) Phenol and Iodine

Q

Chloroamphenicol is an : *[2012 M]*



(A) antifertility drug

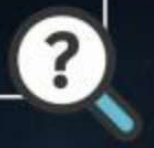
(B) antihistaminic

(C) antiseptic and disinfectant

(D) antibiotic-broad spectrum

Q

Which one of the following is employed as Antihistamine? *[2011]*



(A) Chloramphenicol

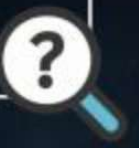
(B) Diphenyl hydramine

(C) Norothindrone

(D) Omeprazole

Q

Which one of the following is employed as a tranquilizer drug? *[2010]*



(A) Promethazine

(B) Valium

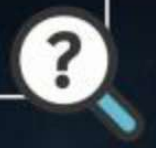
(C) Naproxen

(D) Mifepristone

Q

Which one of the following is employed as a tranquilizer?

[2009]



(A) Naproxen

(B) Tetracycline

(C) Chlorpheninamine

(D) Equanil

Q

Which one of the following can possibly be used as analgesic without causing addiction and mood modification ? *[1997]*

(A) Diazepam

(B) Morphine

(C) N-acetyl-para-aminophenol

(D) Tetrahydrocannabinol