

16. CHEMISTRY IN EVERYDAY LIFE

1. What are drugs?

Drugs are chemicals of low molecular masses which interact with macromolecular targets and produce a biological response.

2. What is meant by chemotherapy?

Use of chemicals for therapeutic effect is called chemotherapy

3. Explain the classification of drugs?

Drugs are classified on the basis of the following criteria:

- i) Based on pharmacological effect
- ii) Based on drug action
- iii) Based on molecular structure
- iv) Based on molecular target



4. What are antacids? Give example.

Over production of acid in the stomach causes irritation and pain. The chemicals used to reduce the acidity in stomach are called antacids. E.g. NaHCO_3 , metal hydroxides etc.

5. What are anti-histamines?

An important reason for the hyperacidity in stomach is a chemical substance called histamine. It stimulates the secretion of pepsin and hydrochloric acid. It is also responsible for the nasal congestion associated with common cold and allergic response to pollen. The drugs which reduce the action of histamine are called anti-histamines.

E.g. brompheniramine (Dimetapp), terfenadine (seldane), cimetidine, ranitidine etc.

6. Is a potent vasodilator? Ans: Histamine

7. Distinguish between tranquilizers and analgesics?

Tranquilizers and analgesics are neurologically active drugs.

Tranquilizers are a class of chemical compounds used for the treatment of stress, and mild or even severe mental diseases. These relieve anxiety, stress, irritability or excitement by inducing a sense of well-being. They are essential component of sleeping pills.

E.g. Iproniazid, phenelzine (nardil), chlordiazepoxide, meprobamate, Equanil, derivatives of barbituric acid like veronal, amytal, nembutal, luminal and seconal.

Analgesics reduce or abolish pain without causing impairment of consciousness, mental confusion etc. These are classified into two:

(i) Non-narcotic (non-addictive) analgesics:

These groups of drugs are antipyretics and analgesics. They give immediate relief from pain and fever and prevent platelet coagulation. They abolish (remove) the cause of pain.

E.g. aspirin, paracetamol, novalgin etc.

(ii) Narcotic analgesics:

These are sleep inducing analgesics. They help to relieve the feeling of pain, but they do not remove the cause of pain. E.g. morphine, heroin, codeine etc.

8. Name two antidepressant drugs.

Ans: Iproniazid, phenelzine

9. Which is the chemical substance discovered by Paul Ehrlich for the treatment of syphilis?

Ans: Salvarsan

10. What are antibiotics? Give e.g.

Antibiotics are substances produced wholly or partially by chemical synthesis, which in low concentrations inhibit the growth or destroys micro organisms by intervening in their metabolic processes.

The first antibiotic 'penicillin' was developed by Alexander Fleming from the fungus *Penicillium notatum*. Other examples are Ofloxacin, Erythromycin, Aminoglycosides, Tetracycline, Chloramphenicol, Vancomycin, Ampicillin, Amoxycillin etc.

11. Give the difference between bactericidal and bacteriostatic antibiotics?

Ans: Bactericidal is a type of antibiotic that kills bacteria whereas bacteriostatic is a type of antibiotics that inhibit the growth and reproduction of bacteria. Penicillin, Aminoglycosides, Ofloxacin etc. are bactericidal while, Erythromycin, Tetracycline, Chloramphenicol etc are bacteriostatic antibiotics.

12. What is mean by spectrum of action of antibiotics? Explain the classification of antibiotics based on this?

Ans: The range of bacteria or other microorganisms that are affected by a certain antibiotic is expressed as its spectrum of action.

Antibiotics which kill or inhibit a wide range of Gram-positive and Gram-negative bacteria are called broad spectrum antibiotics. E.g. Ampicillin, Amoxycillin, Chloramphenicol, Vancomycin, Ofloxacin etc.

Antibiotics which are effective mainly against Gram-positive or Gram-negative bacteria are narrow spectrum antibiotics. E.g. Penicillin G

Antibiotics which are effective against a single organism or disease are called limited spectrum antibiotics.

13. Distinguish between antiseptics and disinfectants?

Antiseptics and disinfectants are the chemicals which kill or prevent the growth of microorganisms.

Antiseptics can be applied to the living tissues such as wounds, cuts, ulcers and diseased skin surfaces.

Examples are furacine, soframycin, tincture of iodine, bithional, dettol etc.

Disinfectants are applied to inanimate objects such as floors, drainage system, instruments, etc.

Some substance can act both as an antiseptic and disinfectant at different concentrations. For example 0.2% solution of phenol is an antiseptic, while its one percent solution is disinfectant. Cl_2 , SO_2 etc. in very low concentration are disinfectant.

14. Distinguish between antibiotics and antiseptics?



Both, **antibiotics** and **antiseptics**, are chemical substances that prevent the growth and development of the micro-organisms. The differences are:

- Antibiotics are effective only against bacteria while antiseptic acts against a wide range of micro-organisms.
- Antibiotics kill and stop the growth of bacteria while antiseptic prevents the growth and development of the micro-organism without necessarily killing them.
- Antibiotics are used internally as well as externally, but antiseptics are mainly used externally.

15. What are artificial sweetening agents?

They are substitute for sugar in foods and soft drinks. They are non-nutritive in nature.

E.g. Saccharin (it is about 550 times sweeter than cane sugar), aspartame, alitame, sucralose etc.

16. What are cleansing agents?

Detergents are called cleansing agents. These are of two types – soaps and synthetic detergents.

Soaps are sodium or potassium salt of long chain fatty acids. They are produced by heating fat with aqueous NaOH. The process is known as saponification.

17. Soaps do not work in hard water. Why?

Hard water contains Ca^{2+} and Mg^{2+} ions. These ions form insoluble calcium and magnesium salts with soap. So hard water does not easily form lather with soap. Synthetic detergents can form lather with soap.

18. Explain the different types of synthetic detergents with example?

Synthetic detergents are classified into three types: (i) Anionic detergents (ii) Cationic detergents and (iii) Non-ionic detergents

i) **Anionic Detergents:**

Anionic detergents are sodium salts of sulphonated long chain alcohols or hydrocarbons.

In anionic detergents, the anionic part of the molecule is involved in the cleansing action. They are used in toothpastes.

E.g. Sodium salts of alkylbenzenesulphonates.

ii) **Cationic Detergents:**

Cationic detergents are quaternary ammonium salts of amines with acetates, chlorides or bromides as anions. Cationic part possesses a long hydrocarbon chain and a positive charge on nitrogen atom. Hence these are called cationic detergents. They have germicidal properties.

E.g. Cetyltrimethylammoniumbromide and it is used in hair conditioners.

iii) **Non-ionic Detergents:**

They do not contain any ion in their constitution. Liquid dishwashing detergents are non-ionic type.

E.g. detergent formed when stearic acid reacts with polyethyleneglycol.

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