NCERT EXRECISES

16.1. Why do we need to classify drugs in different ways?
Ans: Drugs are classified in following different ways:
(a) Based on pharmacological effect.
(b) Based on action on a particular biochemical process.
(c) Based on chemical structure.
(d) Based on molecular targets.
Each classification has its own usefulness.
(a) Classification based on pharmacological effect is useful for doctors because it provides them the whole range of drugs available for the treatment of a particular disease.
(b) Classification based on action on a particular biochemical proc*ess is useful for choosing the correct compound for designing the synthesis of a desired drug.
(c) Classification based on chemical structure helps us to design the synthesis of a number of structurally similar compounds having different substituents and then choosing the drug having least toxicity.
(d) Classification on the basis of molecular targets is useful for medical chemists so that they can design a drug which is most effective for a particular receptor site.

16.2. Explain the term, target molecules or drug targets as used in medicinal chemistry.
Ans: Drugs interact with macromolecules like proteins, carbohydrates, lipids and nucleic acids thus these macro molecules are called drug targets. These macromolecules perform various functions in the body for example, proteins perform several roles in the body. Proteins which act as biological catalysts are called enzymes, those which are involved in communication system are called receptors. Carrier proteins carry polar molecules across the cell membrane. Nucleic acids have coded genetic information in the cell whereas lipids and carbohydrates form structural part of cell membranes.

16.3. Name the macro molecules that are chosen as drug targets.
Ans: Proteins, carbohydrates, lipids and nucleic acids are chosen as drug targets.

16.4. Why should not medicines be taken without consulting doctors?
Ans: Some drugs can cause side effects when drug binds to more than one type of receptor. Therefore, doctor's consultation is must to choose the right drug that has the maximum affinity for a particular receptor site to have desired effect. Dose of the drug taken at a time is also crucial because some drugs in higher doses act as poisons and may cause death.

16.5. Define the term chemotherapy.
Ans: It is the branch of chemistry that deals with the treatment of diseases by using chemicals as medicines.

16.6. Which forces are involved in holding the drugs to the active site of enzymes?
Ans.The following forces are involved in holding the drugs to the

active site of enzymes:
(a) Hydrogen bonding
(b) Ionic bonding
(c) Dipole-dipole interactions
(d) van der Waals interactions

16.7. While antacids and antiallergic drugs interfere with the function of histamines, why do these not interfere with the function of each other?
Ans: Drugs are designed to cure some ailment in one organ of the body do not affect the other because they work on different receptors. For example, secretion of histamine causes allergy. It also causes acidity due to release of hydrochloric acid in the stomach. Since antiallergic and antacids drugs work on different receptors, therefore, antihistamines remove allergy while antacids remove acidity.

16.8. Low level of noradrenaline is the cause of depression. What type of drugs are needed to cure this problem? Name two drugs.
Ans: In case of low level of neurotransmitter, . noradrenaline, tranquilizer (antidepressant) drugs are required because low levels of noradrenaline leads to depression. These drugs inhibit the enzymes which catalyse the degradation of noradrenaline. If the enzyme is inhibited, noradrenaline is slowly metabolized and can activate its receptor for longer periods of time thereby reducing depression. Two important drugs are iproniazid and phenylzine.

16.9. What is meant by the term broad spectrum antibiotics? Explain.
Ans: Broad spectrum antibiotics are effective against several different types or wide range of harmful bacteria. For example, tetracycline, chloramphenicol and of loxacin. Chloramphenicol can be used in case of typhoid, dysentry, acute fever, urinary infections, meningitis and pneumonia.

16.10. How do antiseptics differ from disinfectants? Give one example of each.
Ans: Antiseptics are chemical substances which prevent the growth of micro-organisms and may even kill them but they are not harmful for human or animal tissues. For example, dettol and savlon. They are generally applied on wounds, cuts, ulcers and diseased skin surfaces. Furacin and soframycin are well known antiseptic creams.
Disinfectants are chemical substances which kill microorganisms but are not safe to be applied to the living tissues. These are generally used to kill microorganisms present in the drains toilets, floors, etc. Some common examples of disinfectants are phenol (1% solution) and chlorine (0.2 to 0.4 ppm).

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