

¹ANTIMICROBIAL AGENT

- Is a broad terminology describing activity against microbes.
- Antimicrobials are the chemical agents used to destroy or inhibit the growth of pathogenic micro-organism.
- They are normally ineffective in the sporing state of microorganism.

Disinfectants -are substances that are applied to non-living/inanimate objects to destroy microorganisms that are living on the objects.

E.g. Chlorinated lime, potassium permanganate, formaldehyde, phenol etc.

Antiseptic: They are antimicrobial substances that are applied to living tissue/skin to reduce the possibility of infection, sepsis.

e.g. Hydrogen peroxide, potassium permanganate, Iodine, Povidone iodine etc.

2 **Sterilization:-**the complete destruction living microorganism including bacterial spores .it can be achieved by physical methods or by chemical means.

Germicide:-the agents which are employed to kill M.O. it can be broad form germicidal, virucide, fungicide etc.

Static:-stops the growth of M.O.

Bacteriostatic:- The agent which primarily function by inhibiting the growth of bacteria. Thus, bacteriostatic drugs or agents do not kill but arrest the growth of bacteria.

PROPERTIES

- It should have antiseptic or germicide activity & not bacteriostatic activity because if M.O are not killed , they may grow & cause infection.
- To reduce incidence of resistance it should have **rapid onset of action** & sustain activity.
- Have good **therapeutic index**.
- Should not produce **local cellular damage** or should not interfere with **body defense**.
- It should show no **systemic toxicity** from topical application.
- It should have in general **broad spectrum of activity**
- against bacteria, fungi, protozoa, virus etc.

MECHANISM OF ACTION

Antimicrobial is a broad terminology describing activity against microbes. Specific terminology describes exact mode or mechanism of action.e.g. **Antiseptics, Disinfectant, Germicide bactericide'** (against bacteria), **'fungicide'** (against fungi), **'virucide'** (against virus) etc. denotes exact action.),**Bacteriostatic.**

Inorganic compounds generally exhibit antimicrobial action by, either of the three mechanisms viz.

- (i) Oxidation**
- (ii) Halogenation**
- (iii) Protein binding or Precipitation.**

1. Oxidation Mechanism :

- Compounds acting by this mechanism belong to class of peroxide, peroxy-acids, oxygen liberating compounds like permanganate and certain oxo-halogen anions.
- They act on proteins containing sulphadryl group and oxidizes free sulphadryl to disulphide bridge and inactivate its function.

2. Halogenation Mechanisms:

- Compounds which liberate chlorine or hypochlorite or iodine act by this mechanism.
- This category of agents act on **peptide linkage** and alter its potential and property.
- The **destruction of specific function of protein** results in **death** of microorganisms.

3. Protein Precipitation :

- Many metals in their cation form exhibit protein binding or protein precipitation.
- The nature of interaction with protein occurs through polar group of protein which acts as ligands and metal ion acts as Lewis acid.
- The complex formed may be a strong chelate leading to inactivation of protein.
- This action in general is non-specific. Protein precipitants do not distinguish between the protein of microbes and that of host.
- Germicidal action results when the concentration of ion is such that reaction is restricted largely to the parasite cell

Various antimicrobials and astringents are classified as under:

- **Oxidative Antimicrobial agents**

e.g. Hydrogen Peroxide Solution, Zinc Peroxide, Sodium Perborate, Potassium Permanganate, Sodium Hypochlorite Solution, Chlorinated Lime.

- **Iodine Preparations and Compounds**

e.g. Iodine and Iodine Solutions, Povidone-Iodine.

- **Protein Precipitant Antimicrobial Agents**

- e.g. Silver Nitrate, Mild Silver Protein.

- **Mercury Compounds**

- e.g. Yellow Mercuric Oxide, Ammoniated Mercury, Mercuric Chloride.

- **Sulphur and Sulphur compounds**

- e.g. Sublimed Sulphur, Precipitated Sulphur, Sulphur Dioxide, Sulphureted Potash, Selenium Sulphide, Cadmium Sulphide.

- **Boric acid and Borax.**

- Sodium Borate

- **Arsenic Compounds**

- e.g. Carbarzone, Glycobiarsol, Tryparsamide.

- **Antimony Compounds**

- e.g. Antimony Sodium Gluconate, Stibophen.