

MEDICINAL CHEMISTRY-I – BP402T

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- UNIT: 1
- CLASS: 10

TOPIC: CHEMOTHERAPY

Chemotherapy is the science of selective toxicity.

-The goal of chemotherapeutic treatment is to selectively attenuate or destroy pathogenic microorganisms of cells with minimum side effects to the host.

-The targeted cells or organisms may be bacteria, viruses, protozoans, fungi, helminthes or tumor cells.

-In order to achieve selective toxicity the target for chemotherapeutic agents may be unique to the target population, may be structurally different from host population, or may be more essential in the target population than in the host population.

-Modern chemotherapy started with the discovery of Trypan red I dye that is used against Trypanosomiasis (sleeping sickness).

CHEMOTHERAPEUTIC INDEX (C.I):

The ratio of minimal effective dose of a chemotherapeutic agent to its maximum tolerated dose is chemotherapeutic index.

- It is used to express the relative toxicity of a chemotherapeutic agent to a parasite and to its host.

$$C.I = \frac{\text{minimum effective dose}}{\text{maximum tolerated dose}}$$

DRUG RESISTANCE:

Drug resistance is the reduction of effectiveness of a drug such as an antimicrobial, antihelminthic or an antineoplastic in curing a disease or condition.

- When the drug is not intended to kill or inhibit a pathogen, then the term is equivalent to dosage failure of drug tolerance.

- When an organism is resistant to more than one drug, it is said to be multi drug resistant.
- **Eg: *Staphylococcus aureus*, Vancomycin resistant *enterococci*, macrolide resistant *Streptococcus***

SUPER INFECTION:

Super infection is the process by which a cell that has previously been infected by one virus gets co-infected with a different strain of virus or another virus, at a later point in time.

- Viral super infections may be resistant to the antiviral drug or drugs that were being used to treat the original infection.
- A super infection is generally defined as a second infection superimposed on an earlier one, especially by a different microbial agent of exogenous or endogenous origin, that is resistant to the treatment used against the first infection.

Eg: Overgrowth of endogenous *Clostridium difficile* which occurs following treatment with broad spectrum antibiotic.