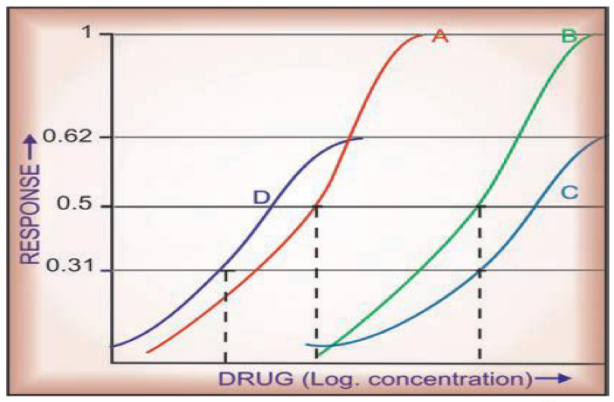
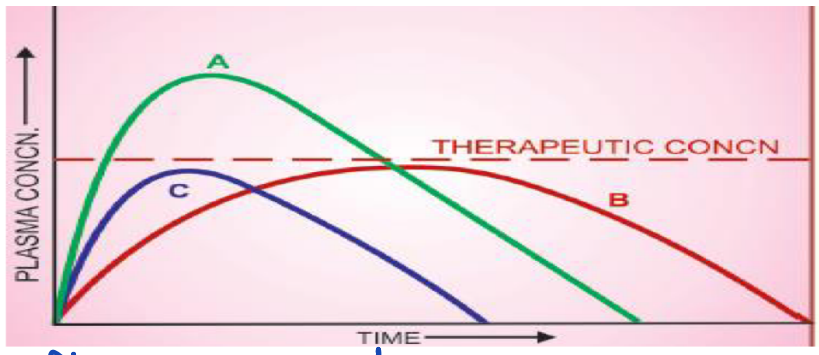


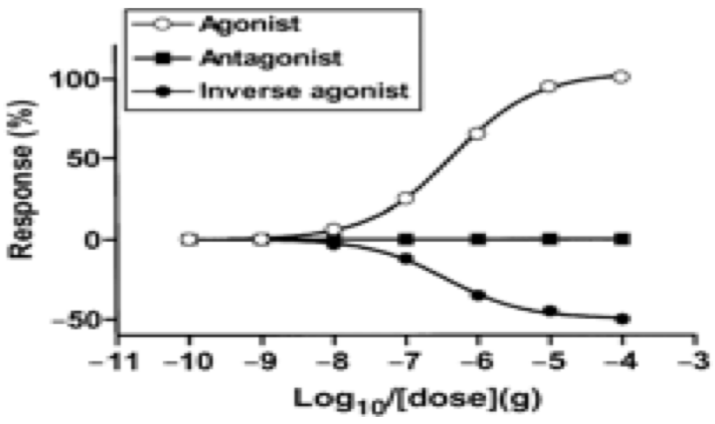
Dose - Response Curve Showing Potency & Efficacy

- Closer the drug to the Y-axis ⇒ more potent drug
- Height on Y-axis ⇒ efficacy
- D – most potent
- A & B – equally efficacious (most efficacious)



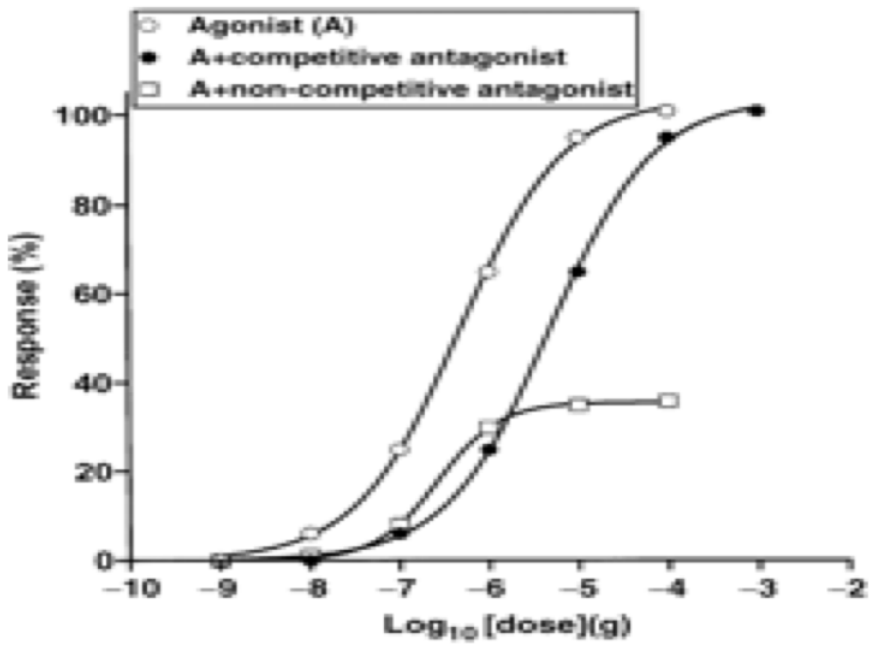
Plasma conc. – time curve showing bioavailability of 3 drug formulations containing the same amount of drug

- More AUC ⇒ More Bioavailability
- C – Least bioavailability
- A & B – same AUC
  - → B is more slowly absorbed than A
  - → B may not produce therapeutic effect after a single dose
- BA = $\frac{\text{AUC (oral)}}{\text{AUC (iv)}} \times 100$



Log Dose - Response Curve Showing Characteristics of agonist, antagonist, inverse antagonist

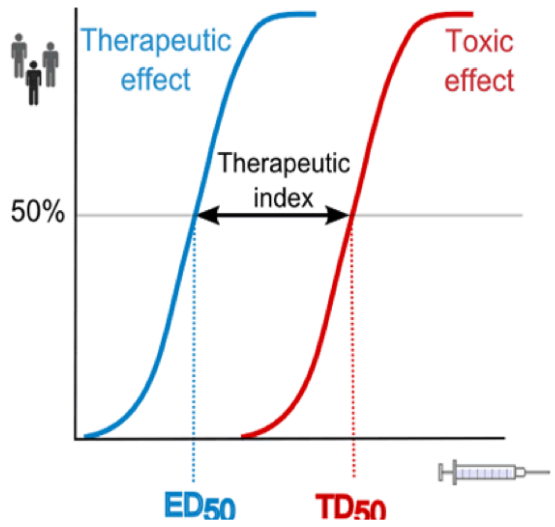
- Agonist – high affinity
  – high intrinsic activity
  – maximal biological response
  eg: Methacholine
- Antagonist – high affinity
  – no intrinsic activity
  eg: Atropine
- Inverse Agonist
  – have affinity for inactive site of receptor
  – produces opposite effect to that of agonist
  eg: β carboline
- Partial Agonists – have affinity
  – less intrinsic activity
  eg: Buprenorphine



DRC showing Properties of Antagonism

- Competitive Antagonist: shift to right with no change in maximum response eg: Ach - atropine
  → inhibition can be overcome by ↑ agonist conc.
- Non-competitive / Irreversible Antagonist: depresses the maximum response eg: Diazepam - Bicuculline
  → inhibition cannot be overcome by ↑ agonist conc.

→ aka Equilibrium type, Surmountable type } of Antagonism



DRC showing therapeutic index of a drug

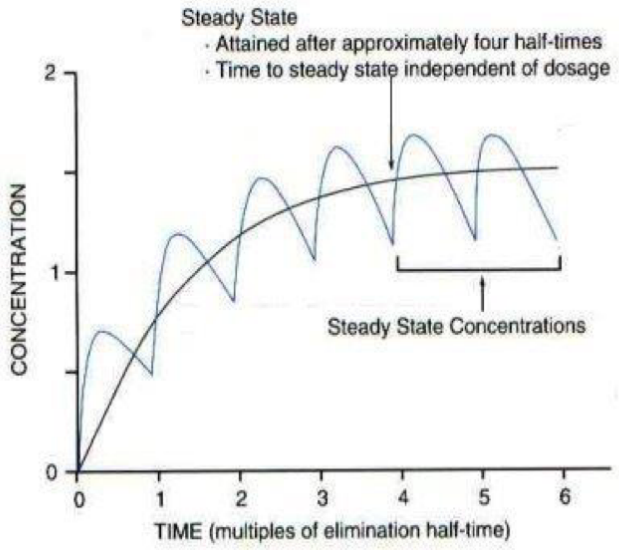
- Blue curve: shows therapeutic effect
- Red curve: toxic effect of drug

Therapeutic Index [TI]: ratio of dose that produces toxicity to dose that produces therapeutic effect

$$TI = \frac{LD50}{ED50}$$

Drugs With Narrow TI: • Lithium • Warfarin • Digoxin • Phenytoin

- Therapeutic range is in between
  - dose which produces minimum therapeutic effect
  - dose which produces maximal adverse effect



STEADY CONC. OF A DRUG

- drug accumulates as successive doses are administered
- steady state is reached when amount of drug administered = amount of drug excreted (height of crests & troughs is equal)

Plasma Half-Life: time taken for its plasma conc. to be reduced to half of its original conc.

→ 4-5 $t_{1/2}$ lives are required to attain steady state