



Drug Receptors and Response



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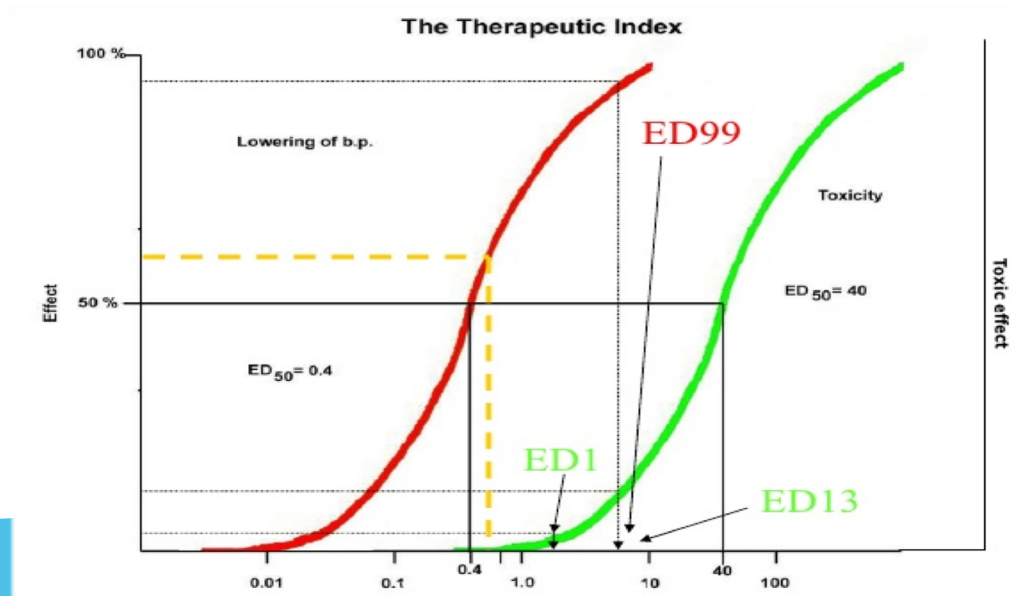
ILOS

- ◆ Define drug receptor interaction
- ◆ Illustrate types of drug receptors
- ◆ List different forms of receptor binding
- ◆ Discuss how drug interactions occur
- ◆ List types of drug responses
- ◆ List factors modifying action of drugs



Define drug receptor interaction

Drug receptor interaction can generally be defined as specific, dose-related and saturable interaction. These characteristics of a drug at a receptor are described by K_D and ED_{50} and can be obtained from ligand binding and dose–response curves.



Illustrate types of drug receptors

A Ligand-gated ion channels

Example:
Cholinergic nicotinic receptors

B G protein-coupled receptors

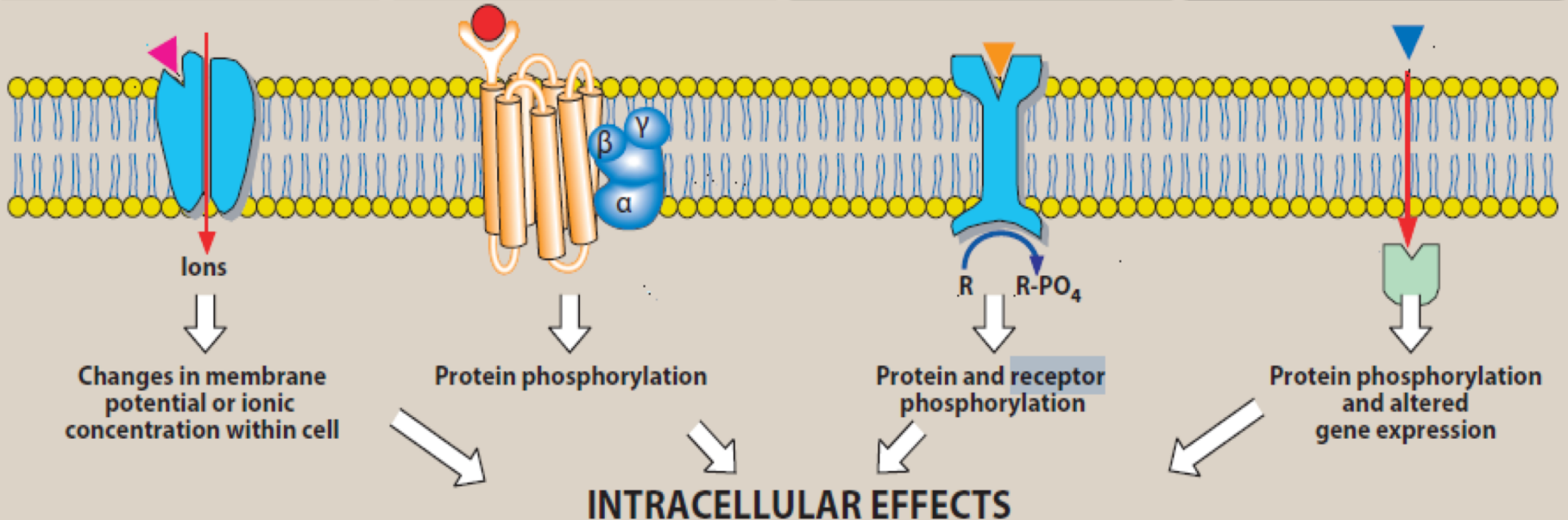
Example:
 α and β adrenoceptors

C Enzyme-linked receptors

Example:
Insulin receptors

D Intracellular receptors

Example:
Steroid receptors



List forms of receptor binding

There are two forms of binding to receptors:

❖ **Agonists**

Agonists are the drugs which when bind receptors, cause activation of receptors.

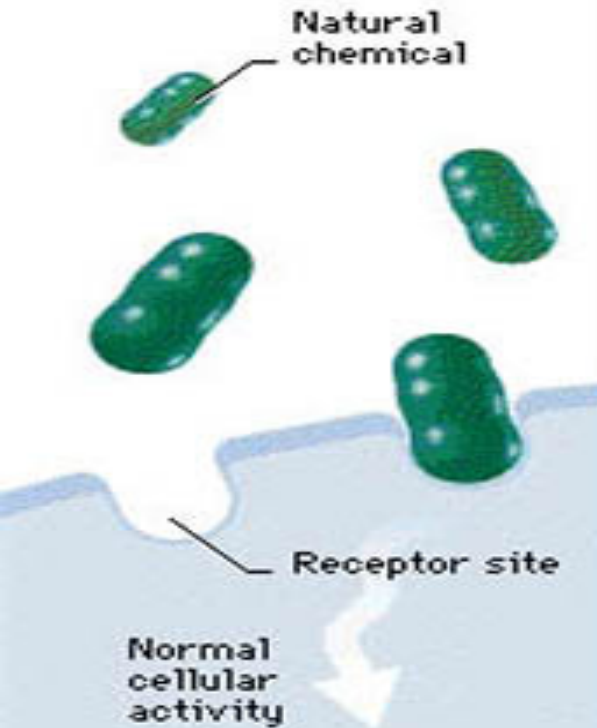
They have the capacity to produce chain reactions in the receptors which ultimately bring about the effects.

❖ **Antagonists:**

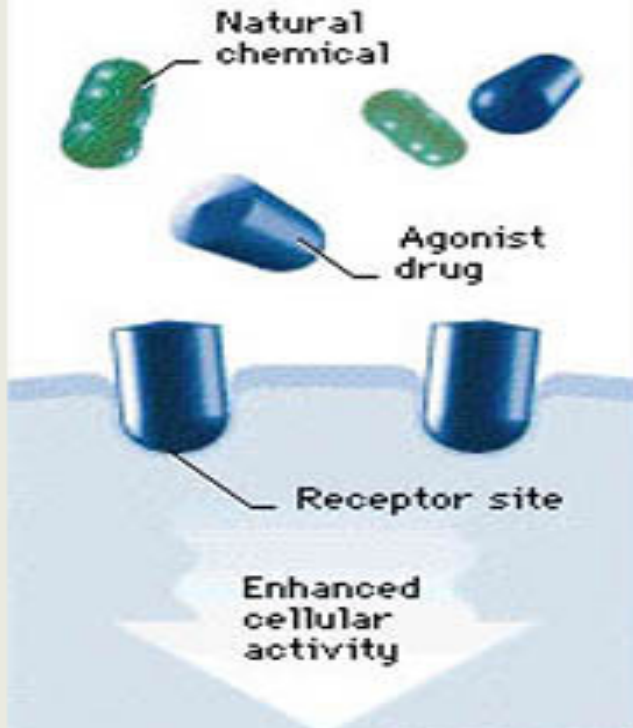
Binding of drug with receptor is the same. Most of the drugs binding receptors resemble the agonists but they cannot activate the receptors, and also prevent agonist binding.

List types forms of binding to receptors

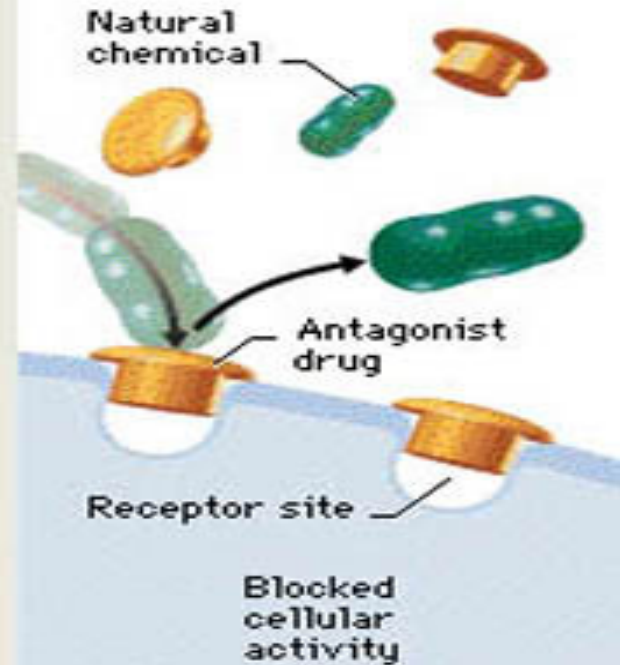
Before Drug



Agonist Drug



Antagonist Drug

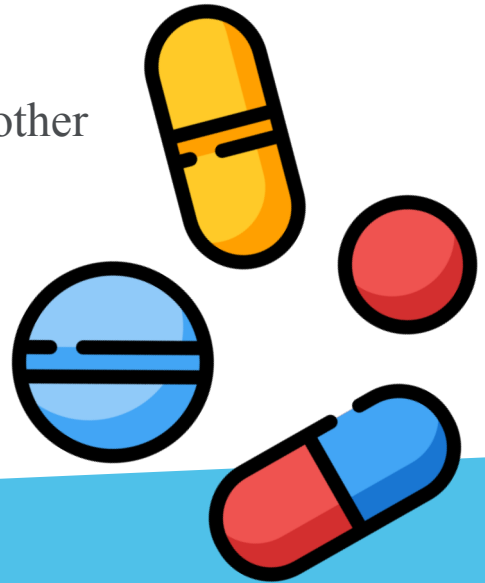


Discuss how drug interactions occur

Drug interactions can occur in several ways:

A pharmacodynamic interaction occurs when two drugs given together act at the same or similar receptor site and lead to a greater (additive or synergistic) effect or a decreased (antagonist) effect.

A pharmacokinetic interaction may occur if one drug affects another drug's absorption, distribution, metabolism, or excretion.



How often a drug interaction occurs, and your risk for a drug interaction depends upon factors such as:

- Total number of medications you take
- Age, kidney and liver function
- Diet and possible drug interactions
- Medical conditions
- Metabolic enzymes in your body and your genetics

Drug interactions are important to check for because they can:

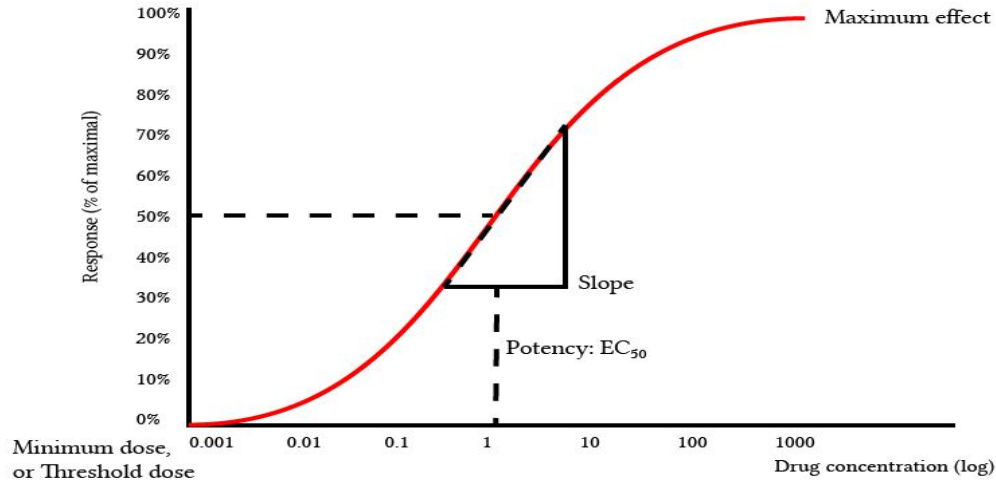
- Affect how your medication works by changing levels of the drug in your blood
- Put you at risk for side effects and toxicity
- Worsen a medical condition you may already have



List types of does responses

Graded dose-response relationships:

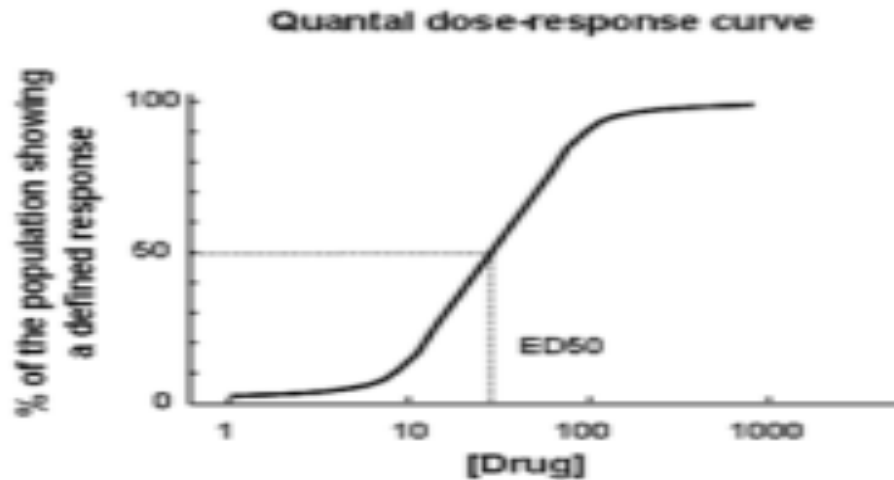
- ✓ Graded dose-response relationship describes a drug effect which increases in proportion to increasing drug dose.
- ✓ A graded response to a drug is seen in an individual, and increases with dose.
- ✓ Graded dose-response graphs plot the response to a drug against its concentration



List types of does responses

Quantal dose-response relationships:

- ✓ a Quantal dose-response relationship describes a drug effect which is binary (either present or absent).
- ✓ A quantal response to a drug is observed in a population, and is either present or absent in any single individual.
- ✓ Quantal dose-response graphs plot the rate of an outcome occurrence in a population against the drug dose.



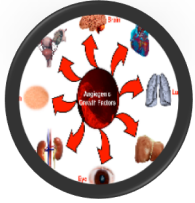
List factors modifying action of drugs



Physiological Factors



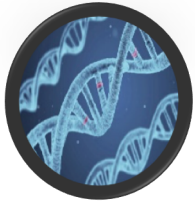
Environmental Factors



Pathological Factors (Diseases)



Interaction with other drugs



Genetic Factors

Conclusion

- Drug receptor interaction is generally defined as specific, dose-related and saturable interaction.
- Receptors that bind to drugs can be classified into four types.
- The concentration of drug can affect the response of the drug.
- There are different types response which are graded and quantal responses.
- There are factors that affect the response of the drug such as the physiological and genetic factors.

Reference

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