Pharmacology (Speedy Study Guides

Speedy Study Guides

PHARMACOLOGY

Pharmacology

Pharmacology is a subject that integrates knowledge of biochemistry, cell and molecular biology, physiology and chemistry to study the relationship between biological processes and therapeutic agents. Pharmacologists investigate the effects and mechanism of action of drugs and chemical agents with living organisms. The areas of pharmacology are many and diverse, and include the therapeutic and toxicological actions of drugs on humans, animals and microorganisms, the influence of chemicals upon the environment and biological ecosystems, and the use of drugs as research tools for the elucidation of molecular and biochemical mechanisms.

Definitions of commonly used pharmacological terms

Agonist A drug that binds to and activates a receptor. Can be full, partial or inverse. A full agonist has high efficacy, producing a full response while occupying a relatively low proportion of receptors. A partial agonist has lower efficacy than a full agonist. It produces sub-maximal activation even when occupying the total receptor population, therefore cannot produce the maximal response, irrespective of the concentration applied. An inverse agonist produces an effect opposite to that of an agonist, yet binds to the same receptor binding site as an agonist.

Allosteric Modulator A drug that binds to a receptor at a site distinct from the active site. Induces a conformational change in the receptor, which alters the affinity of the receptor for the endogenous ligand. Positive allosteric modulators increase the affinity, whilst negative allosteric modulators decrease the affinity.

Antagonist A drug that attenuates the effect of an agonist. Can be competitive or non-competitive, each of which can be reversible or irreversible. A competitive antagonist binds to the same site as the agonist but does not activate it, thus blocks the agonist's action. A non-competitive antagonist binds to an allosteric (non-agonist) site on the receptor to prevent activation of the receptor. A reversible antagonist binds non-covalently to the receptor, therefore can be "washed out". An irreversible antagonist binds covalently to the receptor and cannot be displaced by either competing ligands or washing.

Bmax The maximum amount of drug or radioligand, usually expressed as picomoles (pM) per mg protein, which can bind specifically to the receptors in a membrane preparation. Can be used to measure the density of the receptor site in a particular preparation.

Cheng-Prusoff Equation Used to determine the Ki value from an IC50 value measured in a competition radioligand binding assay:

The Cheng-Prusoff Equation

Where [L] is the concentration of free radioligand, and Kd is the dissociation constant of the radioligand for the receptor.

Competitive Antagonist See Antagonist

Desensitization A reduction in response to an agonist while it is continuously present at the receptor, or progressive decrease in response upon repeated exposure to an agonist.

EC50 The molar concentration of an agonist that produces 50% of the maximum possible response for that agonist.

ED50 In vitro or in vivo dose of drug that produces 50% of its maximum response or effect.

Efficacy Describes the way that agonists vary in the response they produce when they occupy the same

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Reviews

A fresh electronic book with a new perspective. It is one of the most remarkable book we have go through. Your daily life period will likely be transform the instant you full reading this article pdf.

(Katrine Kohler DVM)

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