



Major Types of Receptor Antagonist and their Mechanism of Action

Masayuki Matsumoto *

Department of Pharmaceutical Science, China Pharmaceutical University, Nanjing, China

DESCRIPTION

A receptor antagonist is a type of drug that blocks the activation of a receptor by binding to it, preventing the natural ligand from binding and producing an effect. This mechanism of action is the opposite of that of a receptor agonist, which binds to and activates a receptor. Receptor antagonists are used in medicine for a variety of purposes, including pain relief, treatment of addiction, and management of high blood pressure. In this article, we will discuss the different types of receptor antagonists, their mechanisms of action, and their clinical applications.

Types of receptor antagonists

There are two main types of receptor antagonists: competitive and non-competitive. Competitive antagonists bind to the same site on the receptor as the natural ligand and prevent it from binding. Non-competitive antagonists bind to a different site on the receptor and prevent it from being activated by the natural ligand.

Competitive antagonists

Competitive antagonists are the most common type of receptor antagonist. They bind to the same site on the receptor as the natural ligand, but do not activate the receptor. Instead, they block the natural ligand from binding, preventing it from producing an effect. This type of antagonism is reversible, meaning that the drug can be displaced from the receptor by increasing the concentration of the natural ligand. One example of a competitive antagonist is naloxone, which is used to treat opioid overdose. Naloxone binds to the same receptors in the brain as opioids such as heroin, morphine, and fentanyl. However, naloxone does not activate these receptors, instead it blocks the opioids from binding, reversing the effects of the overdose.

Non-competitive antagonists

Non-competitive antagonists bind to a different site on the receptor than the natural ligand, preventing the receptor from being activated by the ligand. This type of antagonism is often

irreversible, meaning that the drug cannot be displaced from the receptor by increasing the concentration of the natural ligand. One example of a non-competitive antagonist is phenoxybenzamine, which is used to treat high blood pressure. Phenoxybenzamine binds irreversibly to alpha-adrenergic receptors in the blood vessels, preventing the natural ligand, adrenaline, from binding and causing vasoconstriction. This causes the blood vessels to relax, reducing blood pressure.

Mechanisms of action

Receptor antagonists work by blocking the activation of receptors by their natural ligands. This can occur through several mechanisms, depending on the type of antagonist and the receptor being targeted.

Competitive antagonists

Competitive antagonists work by binding to the same site on the receptor as the natural ligand. Because the antagonist does not activate the receptor, it prevents the natural ligand from binding and producing an effect. This type of antagonism is reversible, meaning that the drug can be displaced from the receptor by increasing the concentration of the natural ligand.

Non-competitive antagonists

Non-competitive antagonists work by binding to a different site on the receptor than the natural ligand. This prevents the receptor from being activated by the ligand, even if the concentration of the ligand is increased. This type of antagonism is often irreversible, meaning that the drug cannot be displaced from the receptor by increasing the concentration of the natural ligand.

Inverse agonists

Inverse agonists are a special type of receptor antagonist that actually produces an effect opposite to that of the natural ligand. They bind to the same site on the receptor as the natural ligand, but instead of blocking its activation, they activate the receptor in the opposite direction. For example, an inverse agonist of the histamine H1 receptor would cause sedation instead of stimulation.

Correspondence to: Masayuki Matsumoto, Department of Pharmaceutical Science, China Pharmaceutical University, Nanjing, China, E-mail: masayuki@mo.cn

Received: 01-Mar-2023, Manuscript No. PDS-23-20824; **Editor assigned:** 03-Mar-2023, Pre QC No. PDS-23-20824 (PQ); **Reviewed:** 20-Mar-2023, QC No. PDS-23-20824; **Revised:** 27-Mar-2023, Manuscript No PDS-23-20824 (R); **Published:** 04-Apr-2023, DOI: 10.35248/2167-1052.23.12.307

Citation: Matsumoto M (2023) Major Types of Receptor Antagonist and their Mechanism of Action. *Adv Pharmacoeconomol Drug Saf*. 12:307.

Copyright: © 2023 Matsumoto M. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.