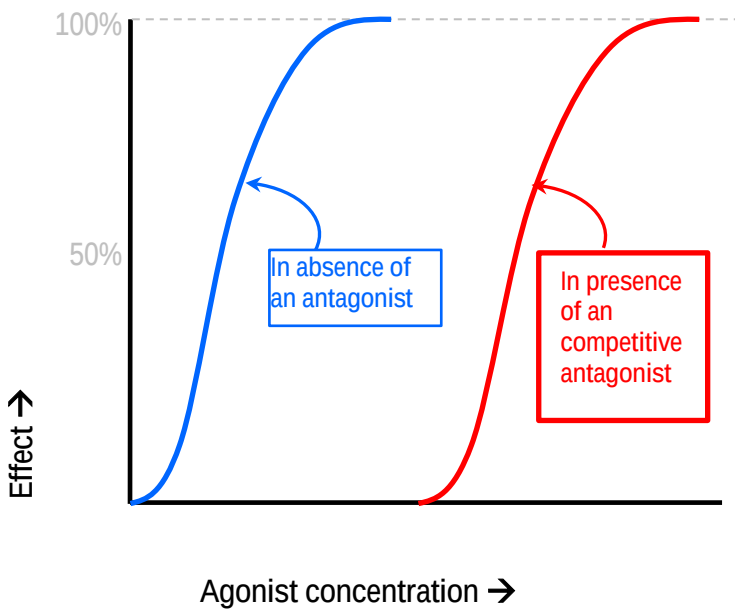
Competitive and irreversible antagonists



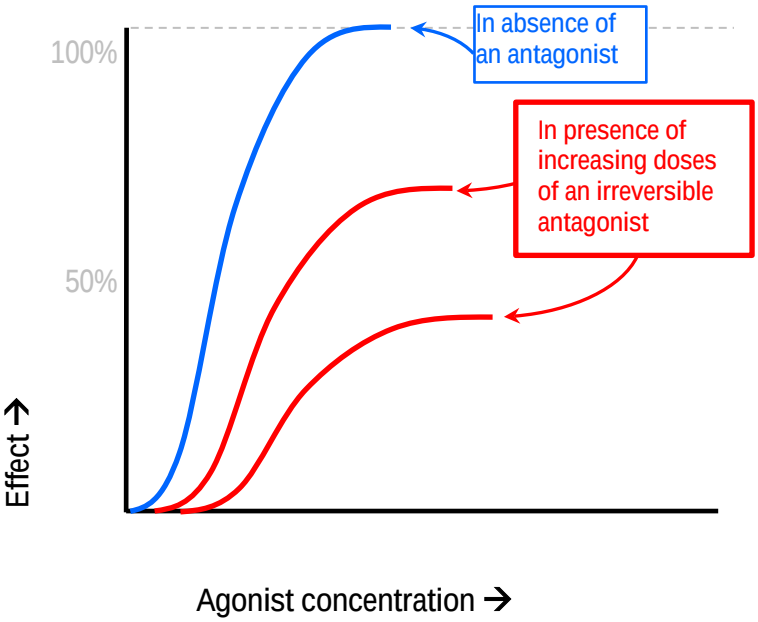
COMPETITIVE (REVERSIBLE) ANTAGONISTS

These can be overcome with a high enough concentration of agonist

With competitive antagonism, the amount of agonist needed to get the same response is greater, and the EC50 is shifted to the right.

The potential for a maximum effect remains the same

(there is, after all, the same number of receptors to bind - its just that some of them have an antagonist latched onto them, and with a high enough concentration you will displace them all and get a maximum effect)



IRREVERSIBLE ANTAGONISTS

These drugs take some receptors completely out of the game. The favourite way of doing this is to bind to the receptor in a covalent fashion.

This may mean that the remaining number of free receptors is uselessly low.

The maxiumum possible response is thus DECREASED.

... UNLESS! There are “Spare receptors”.

Say there are 100 receptors and 50 effectors. So maybe you manage to irreversibly antagonize 50 of the receptors. So what? The redundant 50 receptors are still enough to activate 50 effectors, so if you then give an agonist drug it will still achieve the maximum effect. The dose-response curve will look as if no antagonist was given.

From “Goodman & Gilman's The Pharmacological Basis of Therapeutics” 11th ed by Brunton et al,and “Basic & Clinical Pharmacology” 11th ed. By Katzung et al