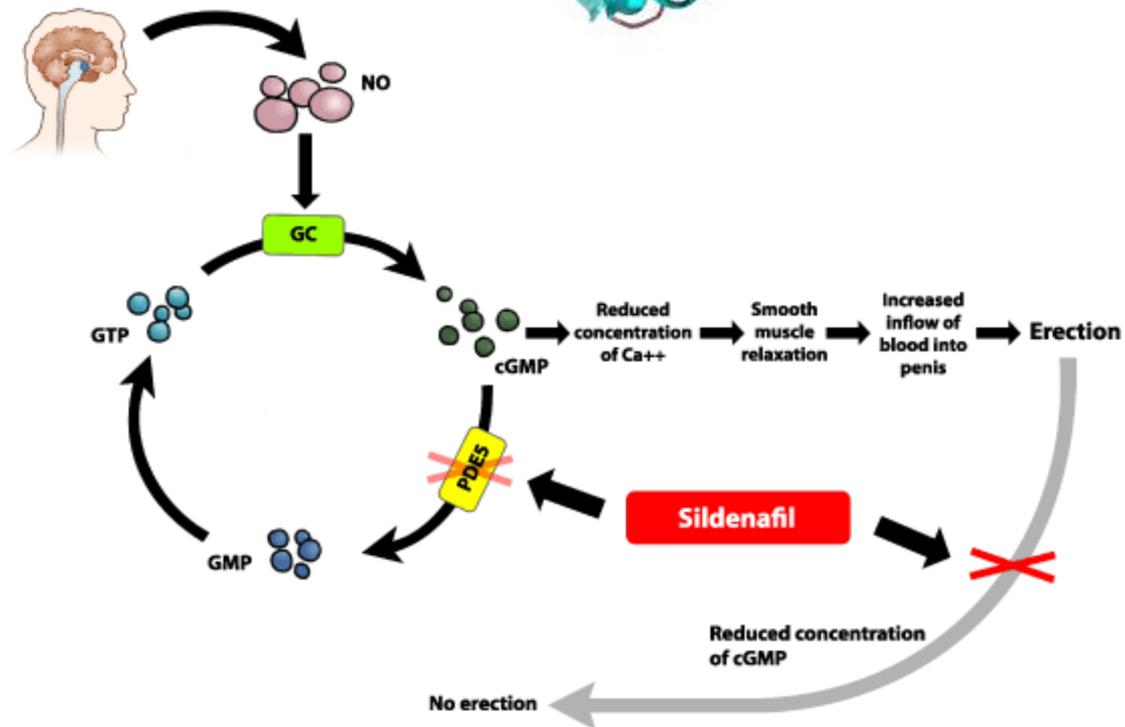
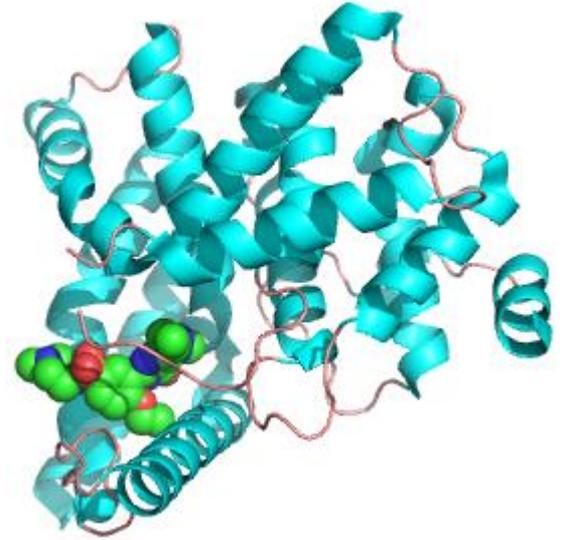


Examples of a Competitive Inhibitor

Sildenafil (Viagra)

Nitric Oxide (NO) binds receptors in the smooth muscle cells of the penis. This results in increased levels of cyclic guanosine monophosphate (cGMP) which increases vasodilation. An enzyme called PDE5 degrades cGMP. Sildenafil fits into the same active site of PDE5 as cGMP, thus competitively inhibiting PDE5 from working.



Examples of a Competitive Inhibitor

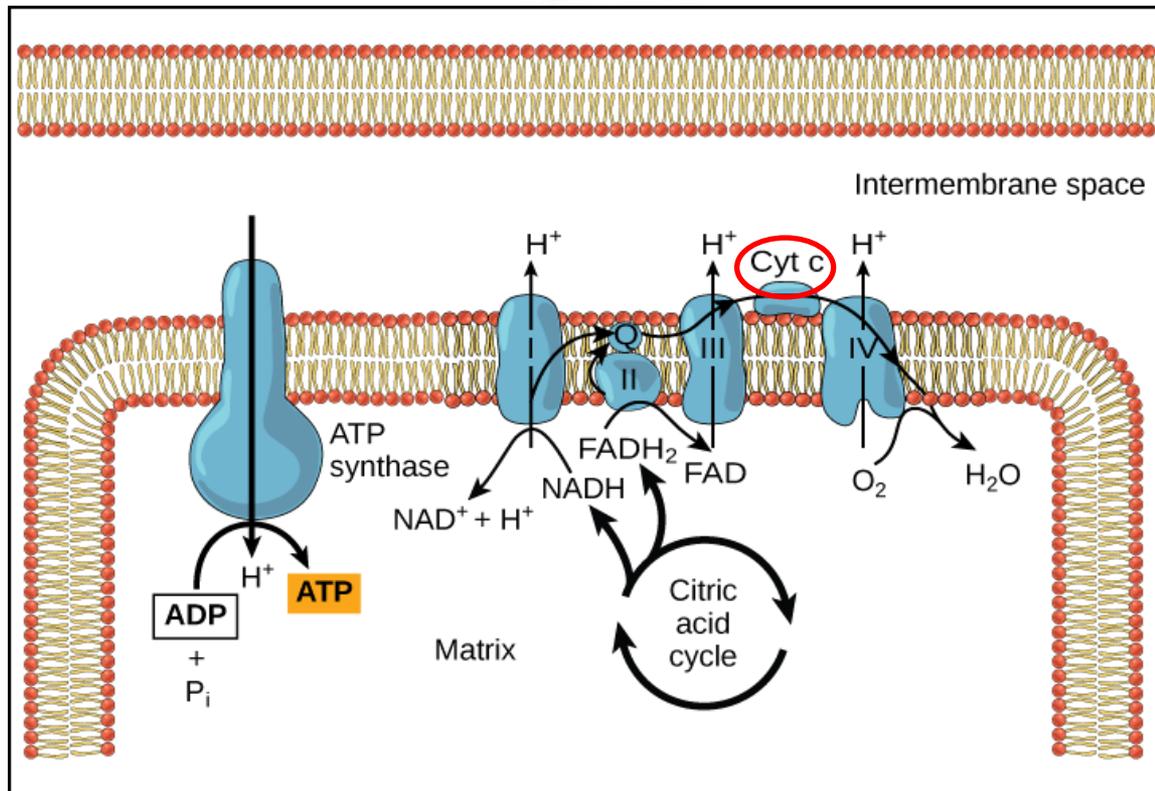
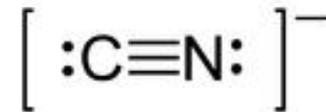
Cyanide

Cyanide acts as competitive inhibitor to the enzyme cytochrome c oxidase.

This prevents the electron transport chain (the last part of cellular respiration) from working, meaning that the cell can no longer produce ATP for energy.

Tissues that depend heavily on energy (the CNS and heart) are particularly affected.

A cyanide is any chemical compound that consists of a carbon atom triple bonded to a nitrogen atom.

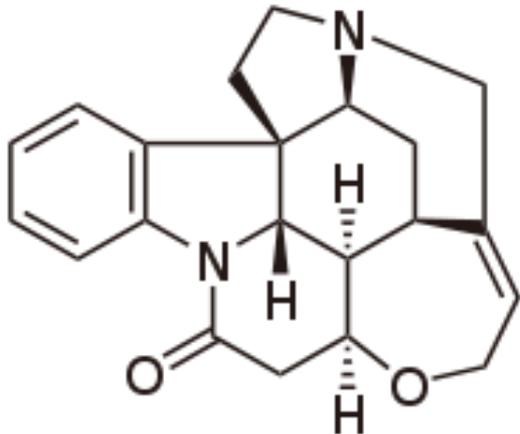


Examples of a Non-competitive Inhibitor (Allosteric)

Strychnine

Is a colorless highly toxic alkaloid that causes muscular convulsions and eventual death through asphyxia.

Strychnine binds to glycine receptors preventing glycine (an inhibitory neurotransmitter) from binding. This causes motor neurons to continuously fire, and the victim has constant muscle contractions.



Commonly used in the baits of animal traps, these have been replaced recently with chemicals less toxic to humans. There is no known antidote.



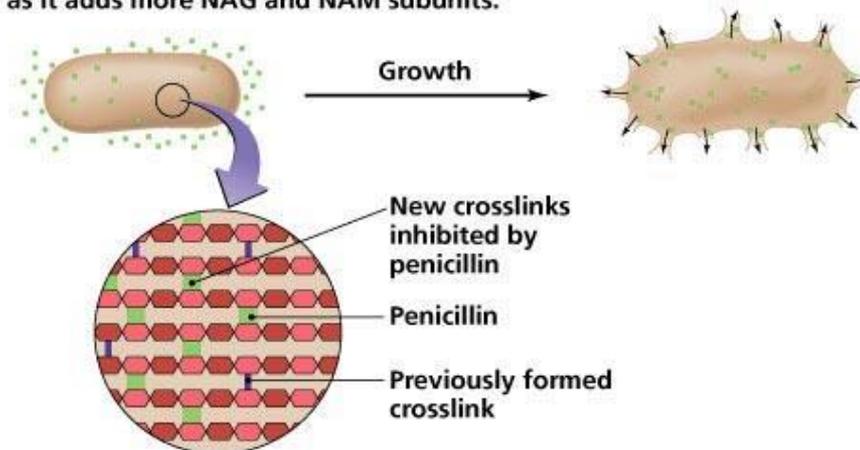
Examples of a Non-competitive Inhibitor (Allosteric)

Penicillin

Many antibiotics acts as allosteric inhibitors. Penicillin acts by binding to the bacterial enzyme DD-transpeptidase. The bacteria uses this enzyme to catalyze the formation of peptidoglycan cross-links in its cell wall. Without this enzyme it can no longer make new cross-links, all the while continuing to make enzymes that hydrolyze (break-down) these links. This will cause holes in the cell wall to form and eventually force the bacteria to shed most if not all of its wall.

Penicillin interferes with the linking enzymes, and NAM subunits remain unattached to their neighbors. However, the cell continues to grow as it adds more NAG and NAM subunits.

The cell bursts from osmotic pressure because the integrity of peptidoglycan is not maintained.



(d)

Example of an Allosteric Activator

Some allosteric processes can even enhance the attraction between the substrate and active sites. An example of this occurs when oxygen binds to hemoglobin. The binding of oxygen to one subunit induces a conformational change in that subunit that interacts with the remaining active sites to enhance *their* oxygen affinity.

