

DRUG ACTIONS

Medications and drugs can work in many different ways to affect synaptic transmission. I have listed a few drug targets

1. The receptor.
2. A channel controlled by the receptor.
3. Enzymatic degradation of the drug or NT.
4. Reuptake of the NT out of the synaptic cleft.
5. Synaptic Release

DRUG TOLERANCE

- **KEY IDEA: Receptors that are *overstimulated* down-regulate their receptors in an attempt to compensate for NT binding.**
 - Drugs that cause overstimulate dopamine receptors may cause a down-regulation of dopamine receptors in the brain (especially in the limbic system).
 - Then without the drug, the person feels down, or depressed more than if he/she had never taken the drug.
 - Drug tolerance results, causing the "high" to require more and more of the drug in order to flood the now-smaller number of receptors.
 - This is generally true whether the receptor is responding to a neuron, or to hormones
 - Endocrine example: insulin receptors on the liver, fat cells, and muscle cells down-regulate when exposed to consistently elevated insulin levels.
 - This leads to "insulin resistance", a precursor to many Western health problems.
- **KEY IDEA: Receptors that are *understimulated* up-regulate their receptors in an attempt to compensate for the lack of NT binding.**
 - Drugs that block pain receptors may cause an up-regulation of pain receptors.
 - Then without the drug, the person feels MORE pain than they would have if he/she had never taken the drug.
 - Drug tolerance results as more and more of the drug is required to block the now-greater number of pain receptors.
 - Alcohol inhibits the central nervous system and, if abused, may cause an up-regulation of motor output receptors.
 - Without the alcohol there is a far greater brain activity which can result in delirium tremors and digestive and heart issues, etc.
 - Drug tolerance results as more and more alcohol is required to inhibit the now greater number of motor output receptors.