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A child's garden of blockers and toxins

Blockers and Toxins at neuromuscular junction

I. Presynaptic

A. Calcium channel blockers
1) Nifedipine (see below).
2) Cobalt (Co^{++}) - blocks voltage dependent Ca^{++} channels

B. Toxins that block vesicle exocytosis
1) Tetanus toxin (component) is a protease that cleaves the synaptic vesicle protein Synaptobrevin - blocks synaptic vesicles exocytosis (other components of Tetanus toxin proteins cleave to similar proteins and do similar things

2) Botulinium toxin (World's champ toxin)
acts similarly to tetanus toxin.

II. Postsynaptic

A. Acetylcholine Receptor Antagonists
1) succinyl choline - "muscle relaxant"
2) flaxedil - another muscle relaxant
3) β-,D-tubocuranine (an active ingredient in curare)
4) Cobra venom toxin (najatoxin)
5) α- bungarotoxin(Btx) - toxin from *Bungarus multicinctus* - a Taiwanese sea snake - affinity toxin used to isolate and purify the ACh receptor α subunit protein
6) Myasthenia Gravis, an auto immune disease in which patients make antibodies to their acetylcholine receptors

B. Acetylcholinesterase inhibitors
1) Eserine, neostrigmine, phytostigmine
2) organophosphorus insecticides -- e.g. Raid -- bad for bugs
3) organophosphorus nerve gases -- tabun, sarin, VX, etc. -- bad for you

III. Sodium Channel agents

A. Tetrodotoxin - TTX - a sodium channel blocker

B. Antagonists of Sodium Channel *inactivation* (the h-gate)
    1) internal pronase
    2) DDT (for arthropods only -- e.g. insects and lobsters)
    3) pyrethrin insecticides
    4) lipid soluble toxins such as veratridine and batrachotoxin

IV. Potassium Channel blockers (covered in detail in Nicholls et al, pg. 118. You should know two of these.)

A. Tetraethylammonium (TEA)
B. 2-aminopyridine

V. Calcium Channel blockers

A. Co^{++}
B. Nifedipine (for L-type Ca^{++} Channels)
C. various toxins from pretty seashell mollusks, e.g., ω-conotoxin from *Conus litteratus.* These calcium-channel toxins all start with "ω"

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