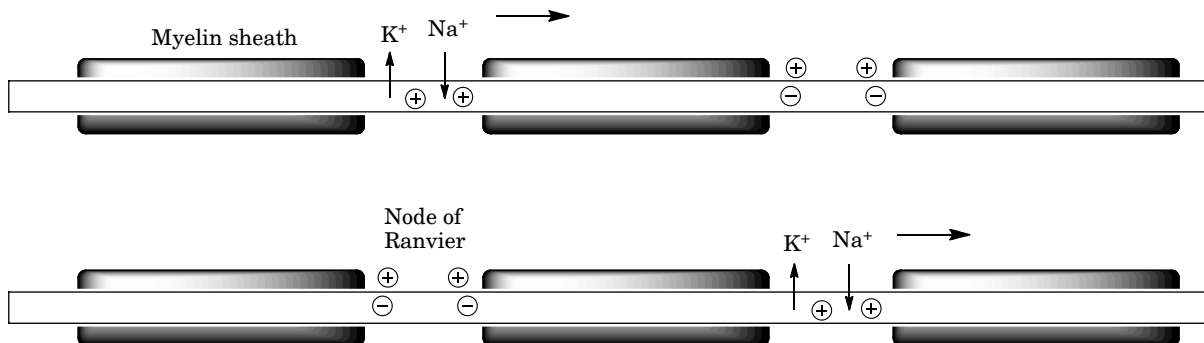
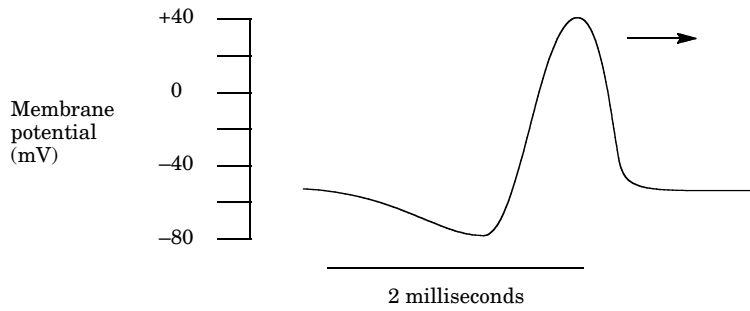
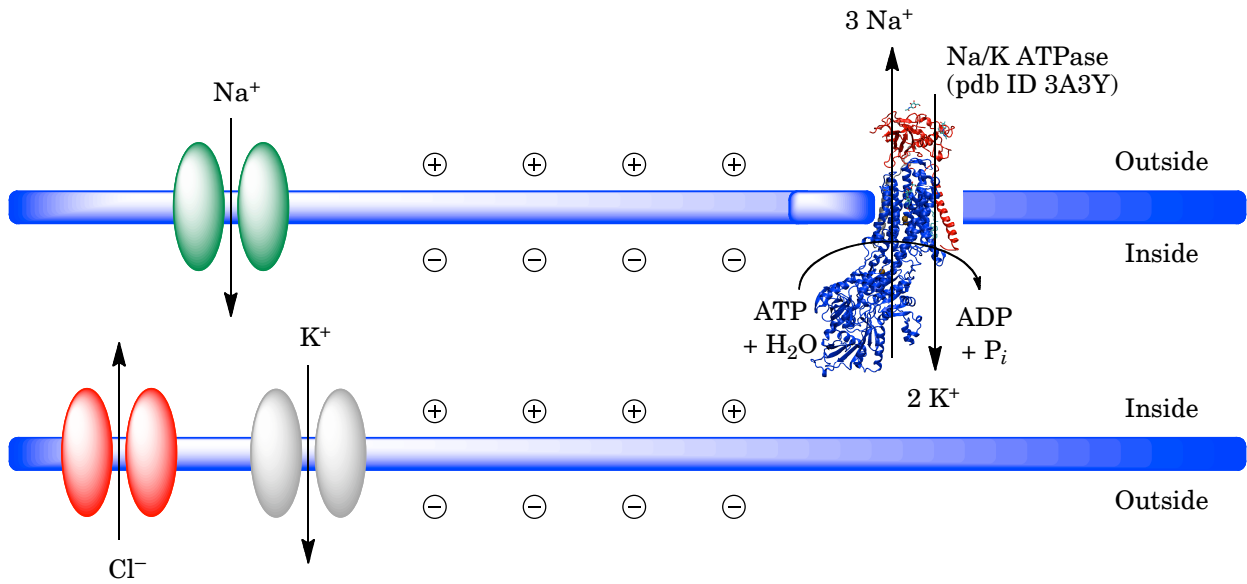
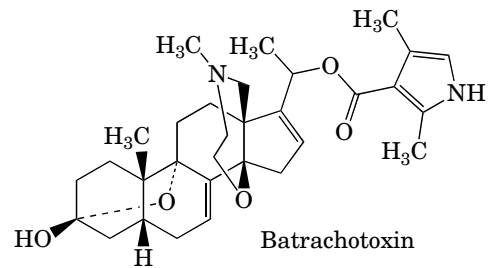
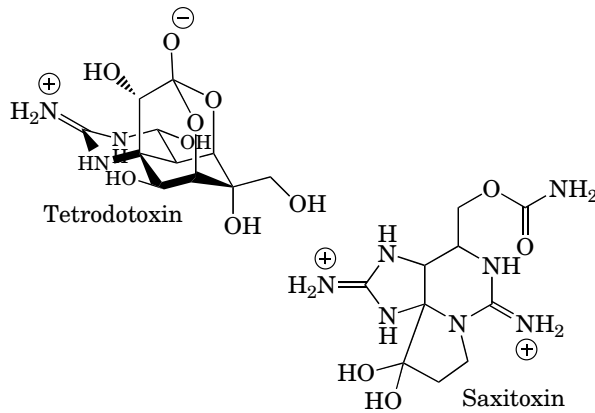
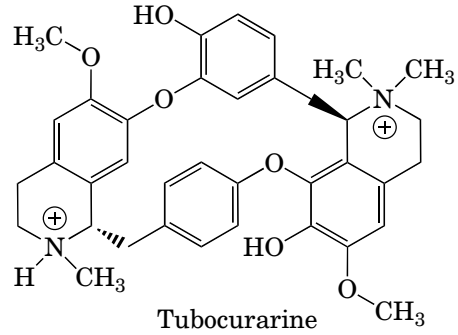
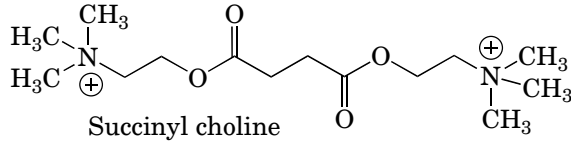
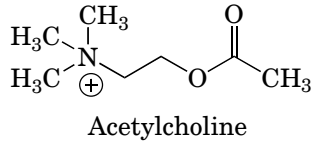


# Neurotransmission



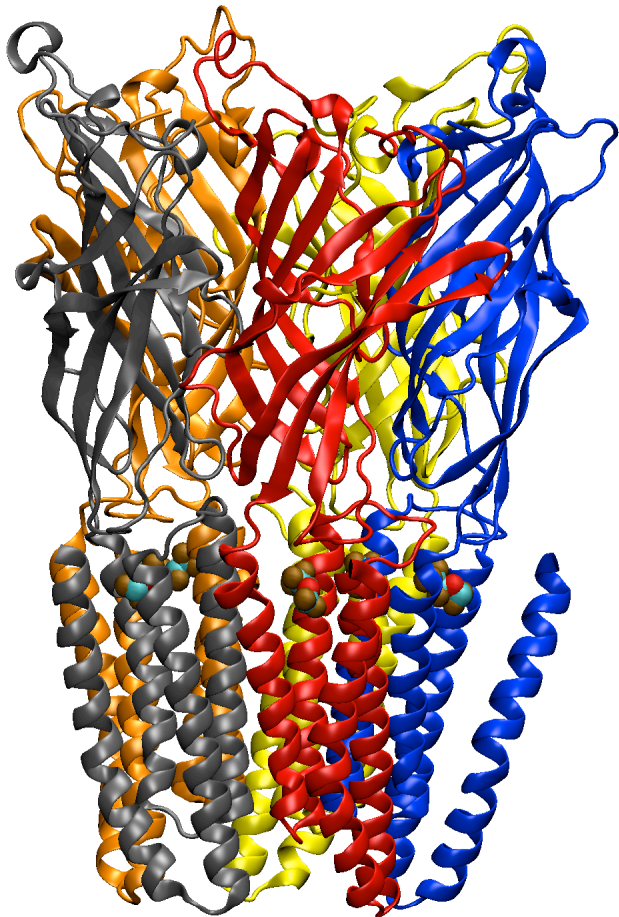
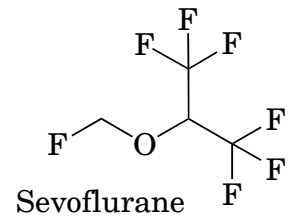
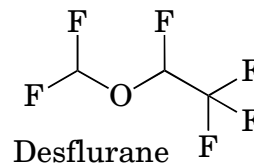
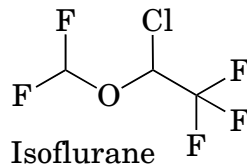
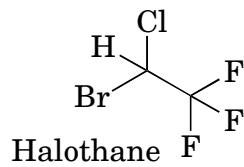
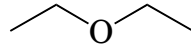
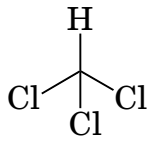
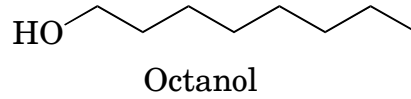
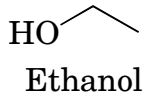




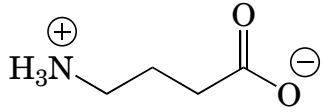
## Toxins

| Toxin            | Estimated LD <sub>50</sub><br>( $\mu\text{g}/\text{kg}$ of body weight) | Exposure method        | Source  | Action  |
|------------------|---|------------------------|---|---|
| Botulinum toxin  | 0.001   | Injection or ingestion | <i>Clostridium botulinum</i>                      | Protease: Inhibition of acetylcholine exocytosis    |
| Botulinum toxin  | 0.003   | Inhalation             |   |   |
| Tetanus toxin    | 0.002   | Injection              | <i>Clostridium tetani</i>                         | Protease: Inhibition of neurotransmitter exocytosis |
| Diphtheria toxin | 0.1   |                        | <i>Corynebacterium diphtheriae</i>                | ADP-ribosylation of eEF-2                           |
| Ricin            | 3.  | Inhalation             | Castor beans ( <i>Ricinus communis</i> )          | 23S rRNA inactivation                               |
| Ricin            | 20,000.   | Ingestion              |   |   |
| Batrachotoxin    | 2.  | Ingestion              | <i>Phyllobates aurotaenia</i> (arrow poison frog) | Sodium channel activator                            |
| Tetrodotoxin     | 8.  | Ingestion              | Tetraodontidae species (e.g., puffer fish)        | Sodium channel blocker                              |
| VX               | 15.   | Inhalation             |   | Acetyl cholinesterase inhibition                    |
| Sarin            | 100.  | Inhalation             |   | Acetyl cholinesterase inhibition                    |
| NaCN             | 10,000.   | Ingestion              |   | Cytochrome oxidase inhibition                       |

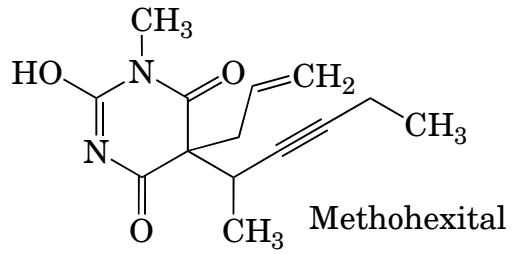
## Anesthetics



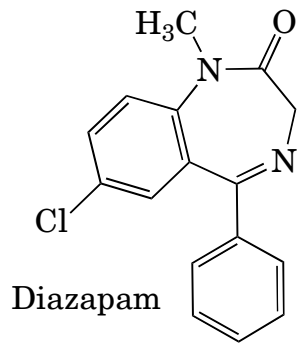
Ligand-gated ion channel GLIC from *Gloeobacter violaceus* bound to desflurane (pdb ID 3P4W)



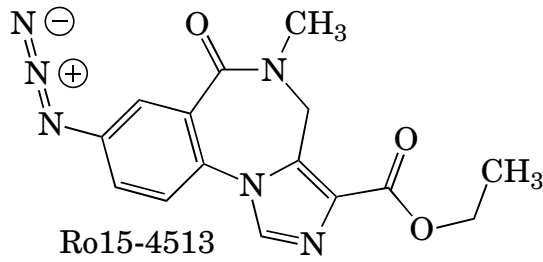
$\gamma$ -Amino butyric acid (GABA)



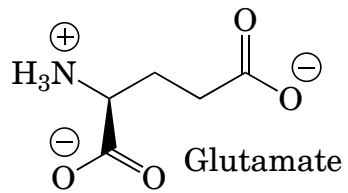
Methohexital



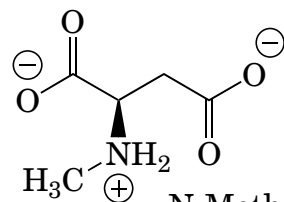
Diazepam



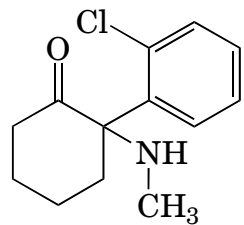
Ro15-4513



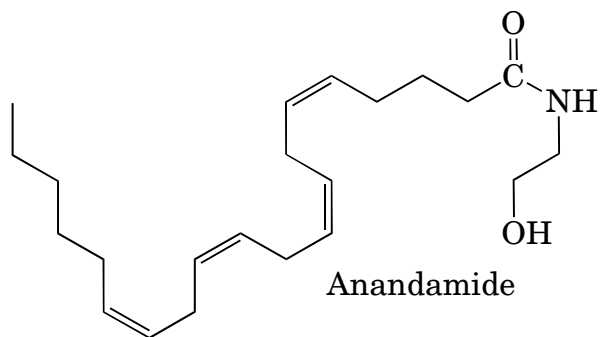
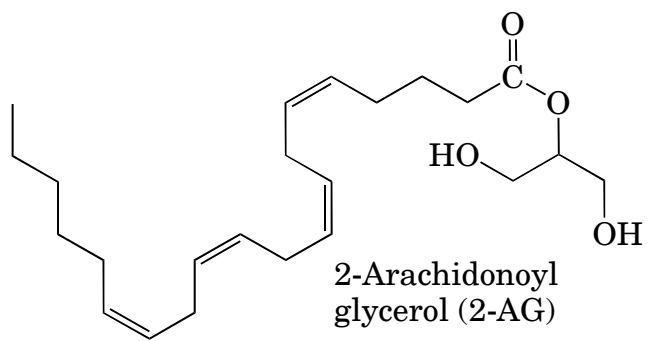
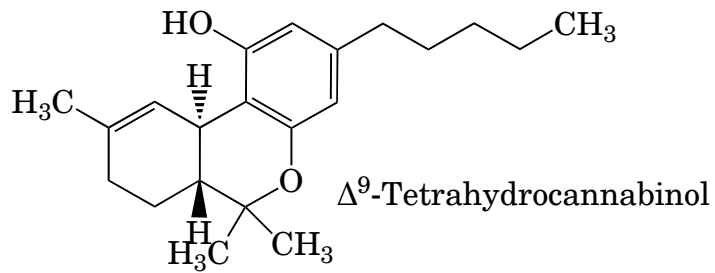
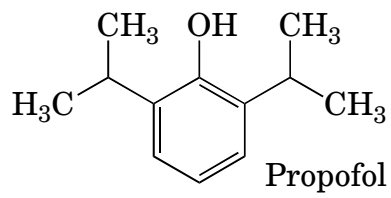
Glutamate



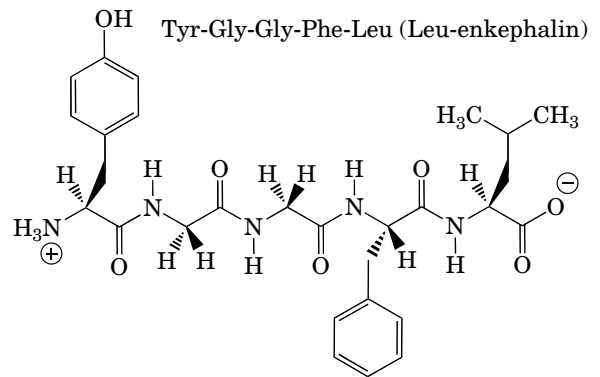
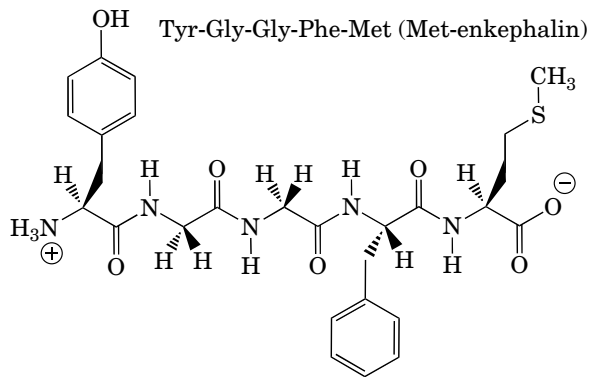
N-Methyl-D-aspartic acid (NMDA)



Ketamine



## Opioids



$\beta$ -endorphin: YGGFMTSEKSQTPLVTLFKNAIIKNAYKKGE

