

## Types of Neurons (figure 6-4)

Type	Info Direction	Parts in PNS	Parts in CNS
Afferent	From receptor (or stimulus)	-Body - most of axon	- Small portion of axon (1)
Efferent	To effector (ex. muscle, gland, neuron)	- Most of axon	- Small portion of axon (10) - body - dendrites
Interneurons	Relays between afferent and efferent	n/a	All (by definition) (200K)

CNS encompasses all of our interneurons

For every one afferent neuron you have 10 efferent and 200K interneurons

That mean we have more efferent than afferent neurons

There are less sensory neurons than there are "control" neurons

Afferent

The cell body is in the middle of the axon. That is why there are no dendrites

### Synapse Types

- Synapse = connection between neurons
- **Electrical**
  - o Via gap junctions
  - o Fastest
  - o Much faster than the chemical one
  - o But the signal meanders back and forth before it gets there
    - It can go either way
- **Chemical**
  - o Slower
  - o There is a space between neurons where neurotransmitters are released and bind to receptors on the other cell
  - o **Most common** even though its send signals slower
    - In theory it should be the electrical ones but the big gain with the chemical signals is that the communication can only travel in one direction; so in the end communication with chemical is faster
  - o Faster if we are talking about the overall process
  - o One way
  - o Composition:
    - Presynaptic and postsynaptic
      - Most neurons are presynaptic and postsynaptic. It depends on which synapse you are talking about
    - Interstitial fluid between neurons
  - o Terms:
    - **Convergence:** pre > post
      - More presynaptic communication with one postsynaptic
      - Figure 6-25

- **Divergent:** pre < post
  - Less presynaptic than postsynaptic

### Membrane Potential (**know this!**)

- Electrical Charge separation across Plasma Membrane due to distribution of charged components
  - Figure 4-11
  - Ex. most cells = higher negative charge on the inside
    - Inside of cell is slightly negative
- **Electrochemical Gradient**
  - **Net gradient** = concentration gradient + electrical gradient
    - Directions could be
      - Same (ex. sodium)
        - Concentration: Sodium wants to move into the cell (because the concentration is higher outside)
        - Electrically: sodium want to move inside the cell because the inside is negatively charge
      - Opposite (ex. potassium)
        - Basically vector addition; one will have a bigger influence than the other
        - Concentration: potassium wants to move out of the cell because there is less potassium outside
        - Electric: potassium wants to move into the cell because it is positively charged and the inside of the cell is negatively charged
        - One will dominate
        - Need to know sizes (of gradients)