

Genetics

Gene: sequence of DNA nucleotides A, T, C, G

Exons: segments in a gene that are transcribed into messenger RNA, then into a chain of amino acids that specifies for a protein

Introns: removed from final gene transcript but influence how genes are expressed

Cells of the Nervous System

Two categories: (1) neurons or nerve cells and (2) neuroglia

Nerve cells: electrical signaling over long distances

Neuroglia or Glial Cells: not capable of significant electrical signaling; however they have essential functions in the developing and adult brain

Neurons

Dendrites: primary target for synaptic input from other neurons, they have a high ribosome content as well as specific cytoskeletal proteins

- Some cells lack dendrites all together while some have a complex branched system of them
- Neurons with a large number of dendrites can be innervated by a large number of other neurons
- *Convergence*: the number of inputs to a single neuron
- *Divergence*: the number of targets innervated by any one neuron

The presynaptic terminal is immediately adjacent to the post synaptic specialization of the target cell

Synaptic cleft: space between the pre and post synaptic elements, site of extracellular proteins that influence diffusion, binding, and degradation of molecules secreted by the pre synaptic

Axon: where information conveyed by synapses is integrated and read out, portion of the nerve that is specialized for relaying electrical signals

- Has distinct cytoskeletal elements for functional integrity
- Short axons are features of *local circuit neurons or interneurons*
- Long axons are features of *projection neurons* that extend to distant targets