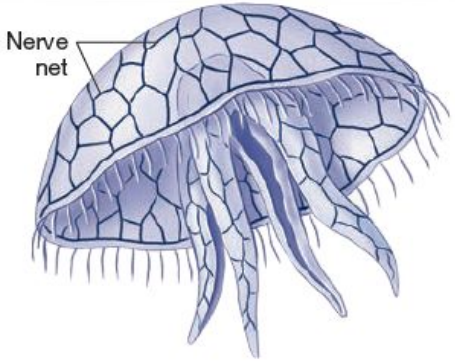
Hjärnan

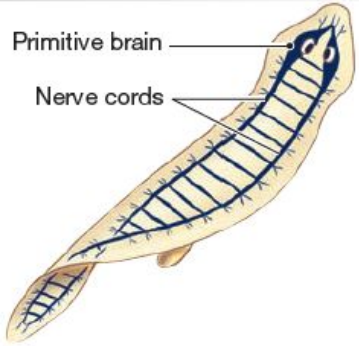
Kråka Larsen VFU 2025

FIG. 9.1 Evolution of the nervous system

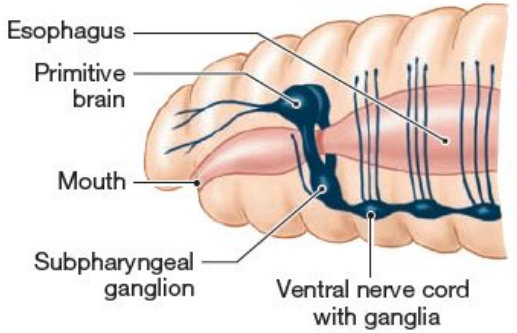
(a) Nerve net of jellyfish



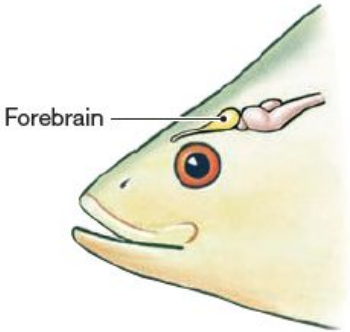
(b) The flatworm nervous system has a primitive brain.



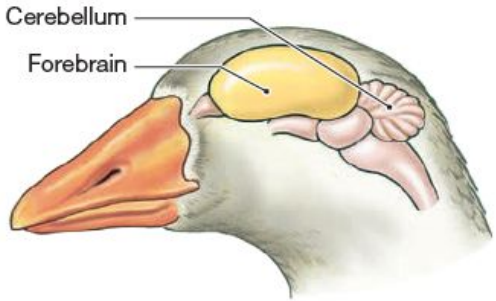
(c) The earthworm nervous system has a simple brain and ganglia along a nerve cord.



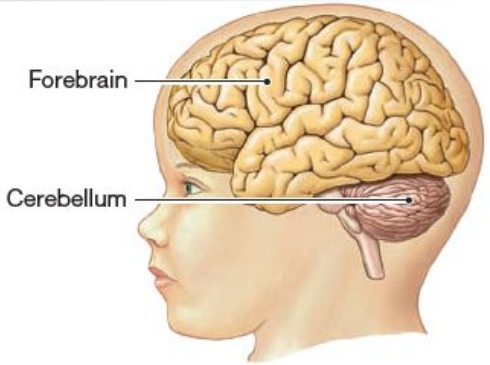
(d) The fish forebrain is small compared to remainder of brain.



(e) The goose forebrain is larger.

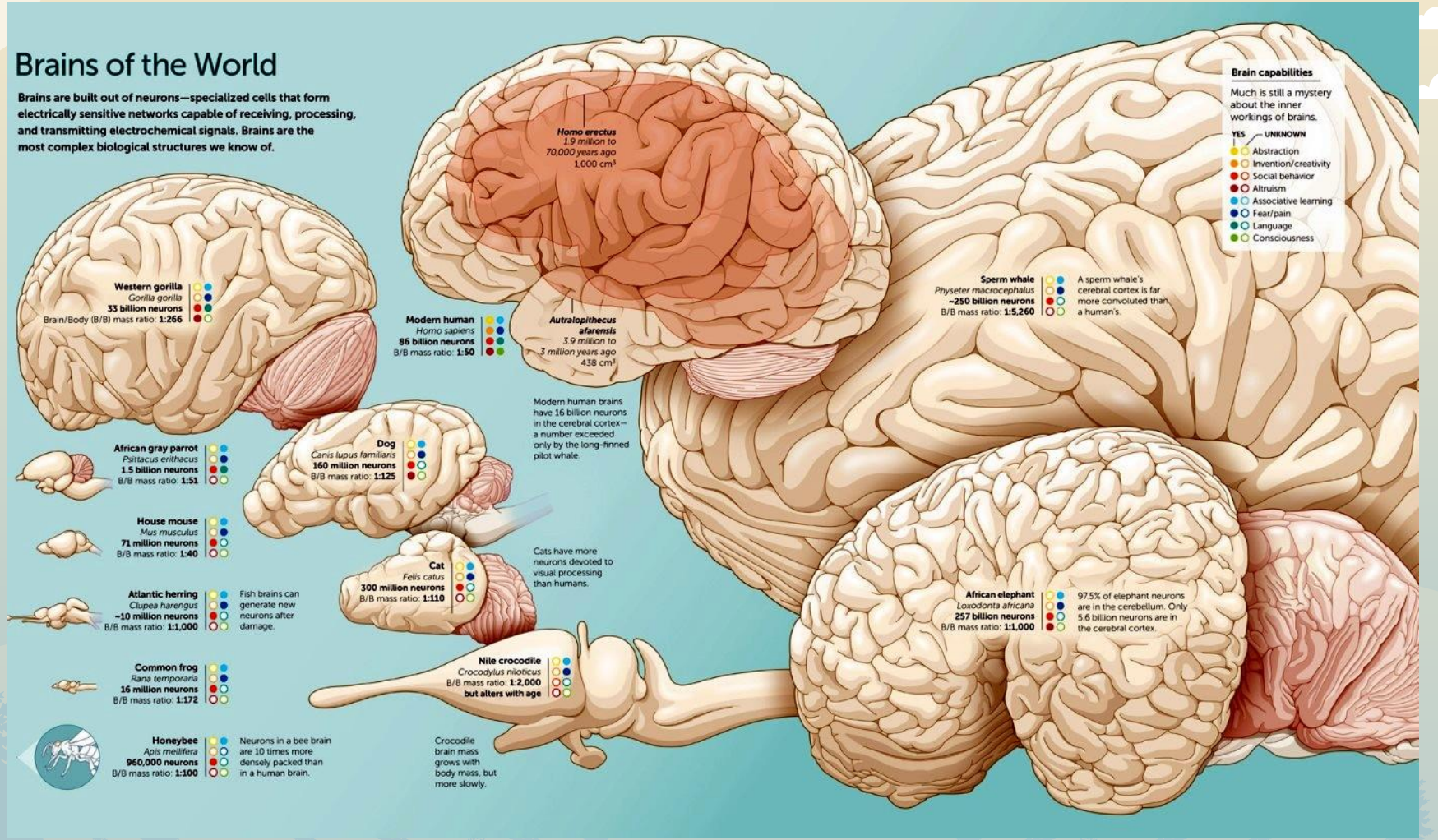


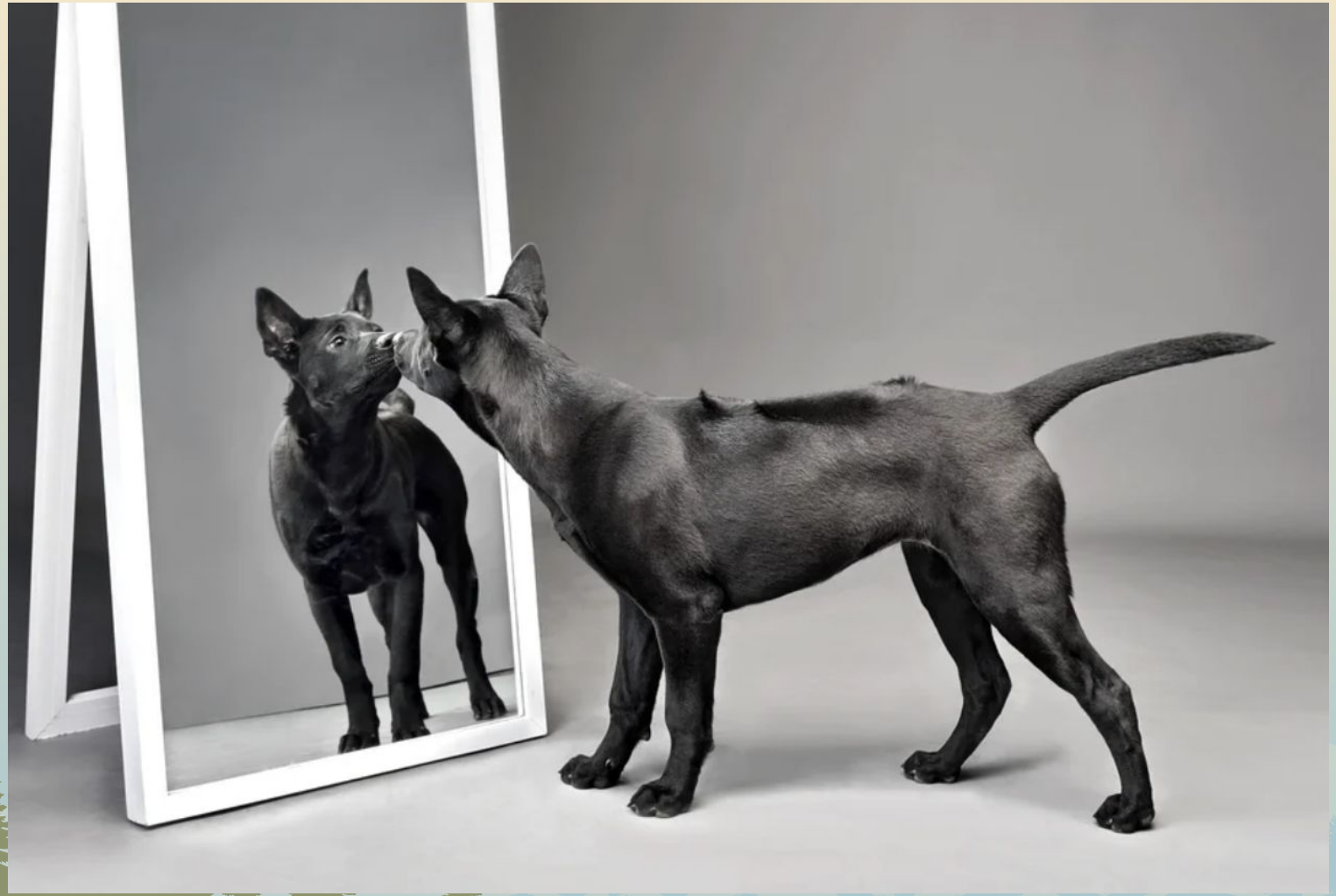
(f) The human forebrain dominates the brain.



Brains of the World

Brains are built out of neurons—specialized cells that form electrically sensitive networks capable of receiving, processing, and transmitting electrochemical signals. Brains are the most complex biological structures we know of.





Synapser och Dendriter

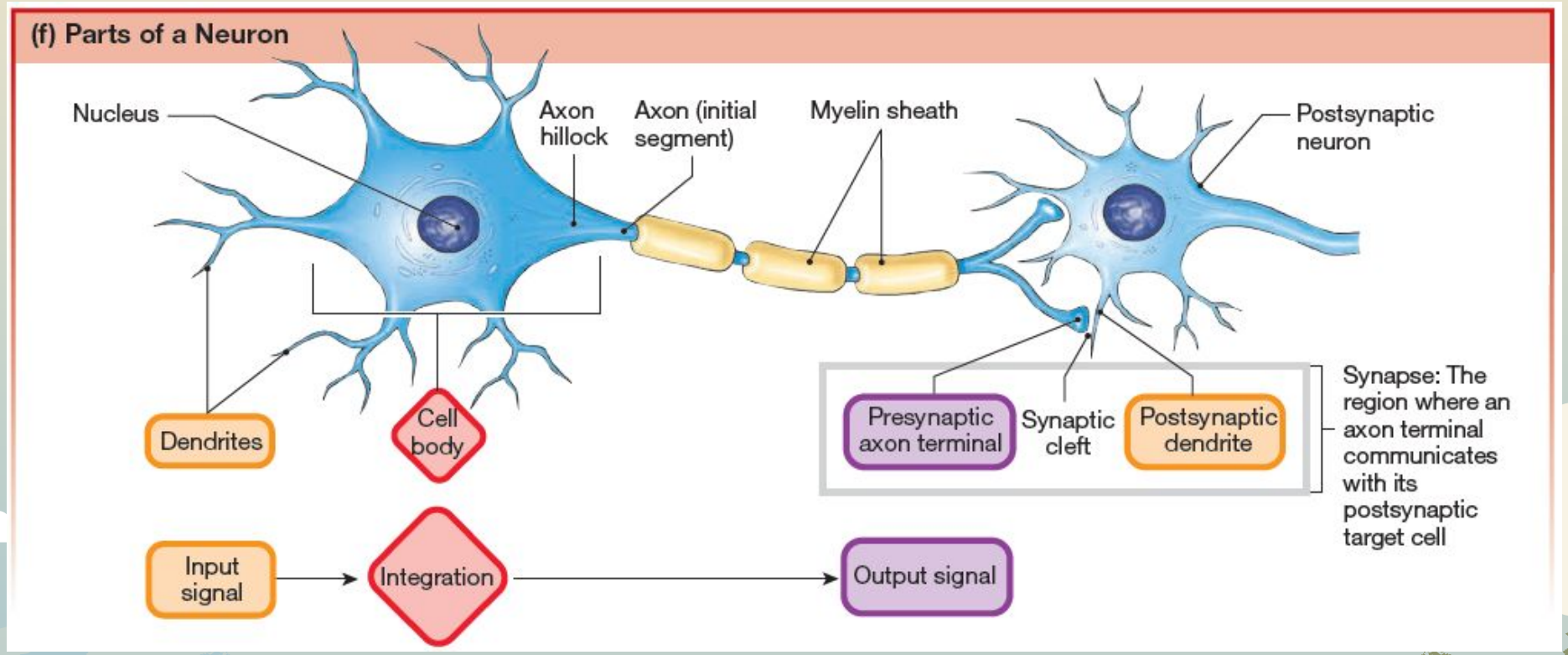
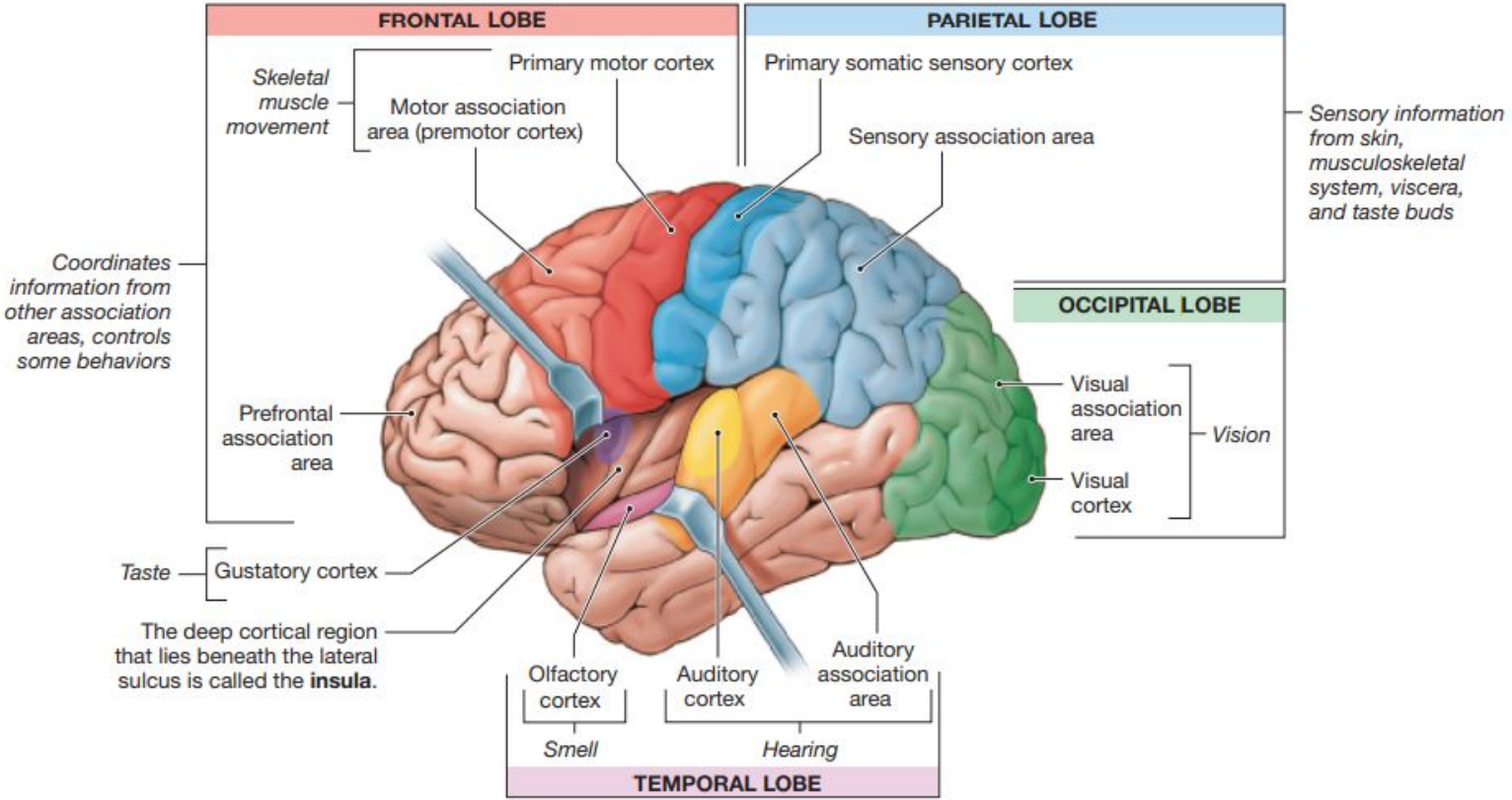


FIG. 9.13 Functional areas of the cerebral cortex

The cerebral cortex contains sensory areas for perception, motor areas that direct movement, and association areas that integrate information.



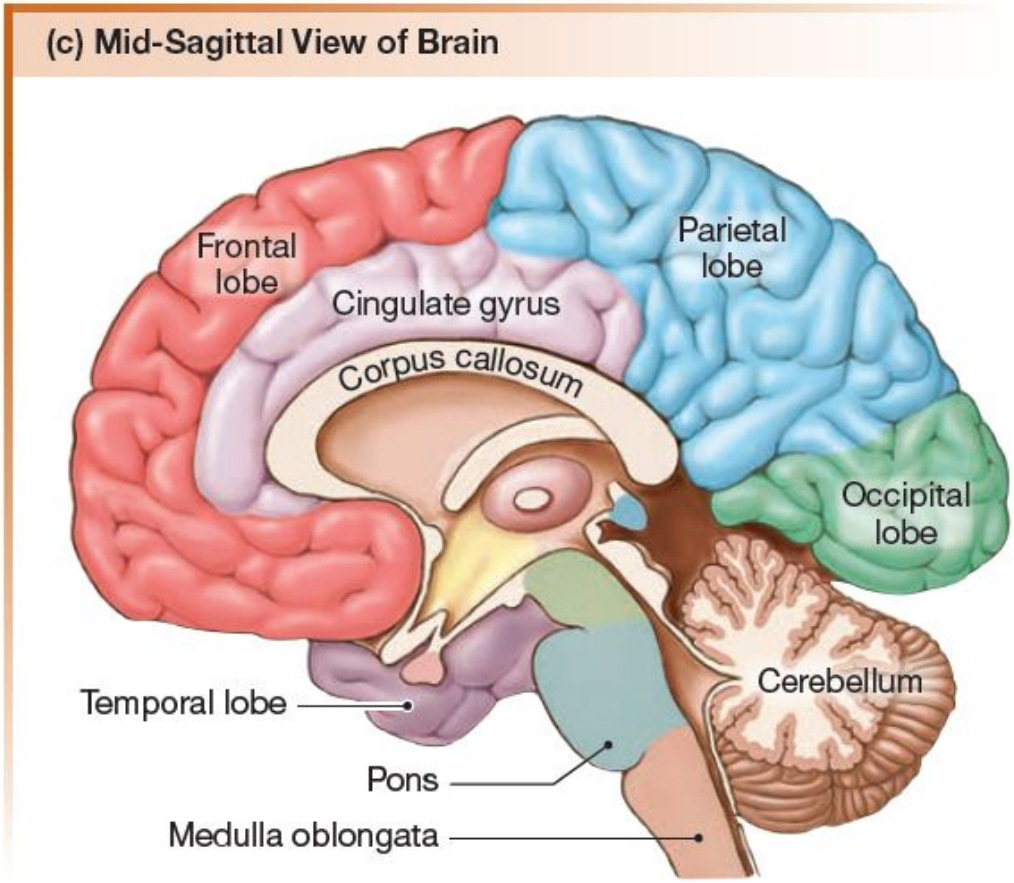
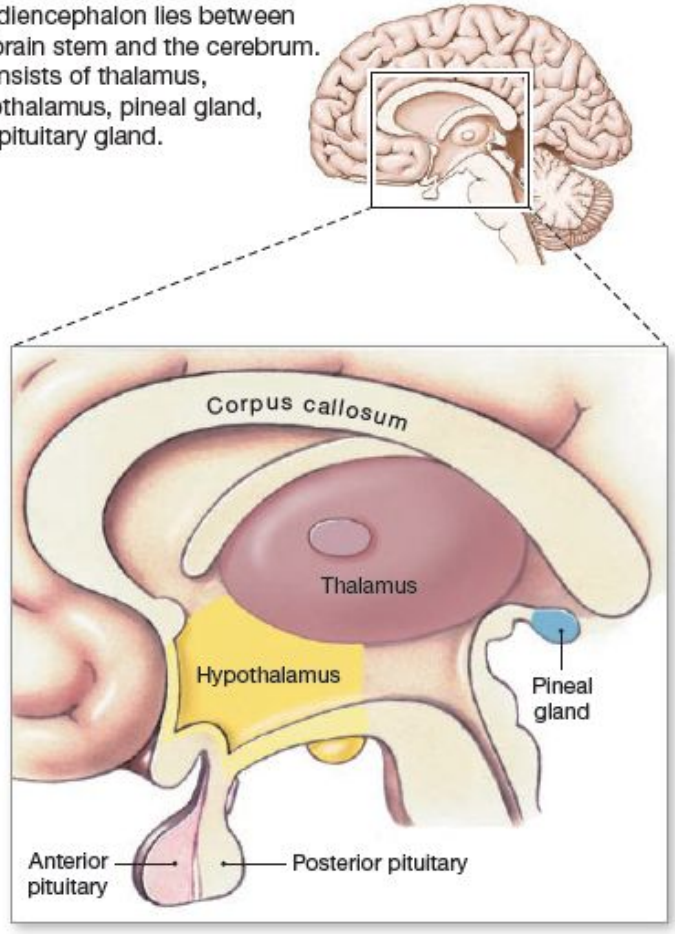
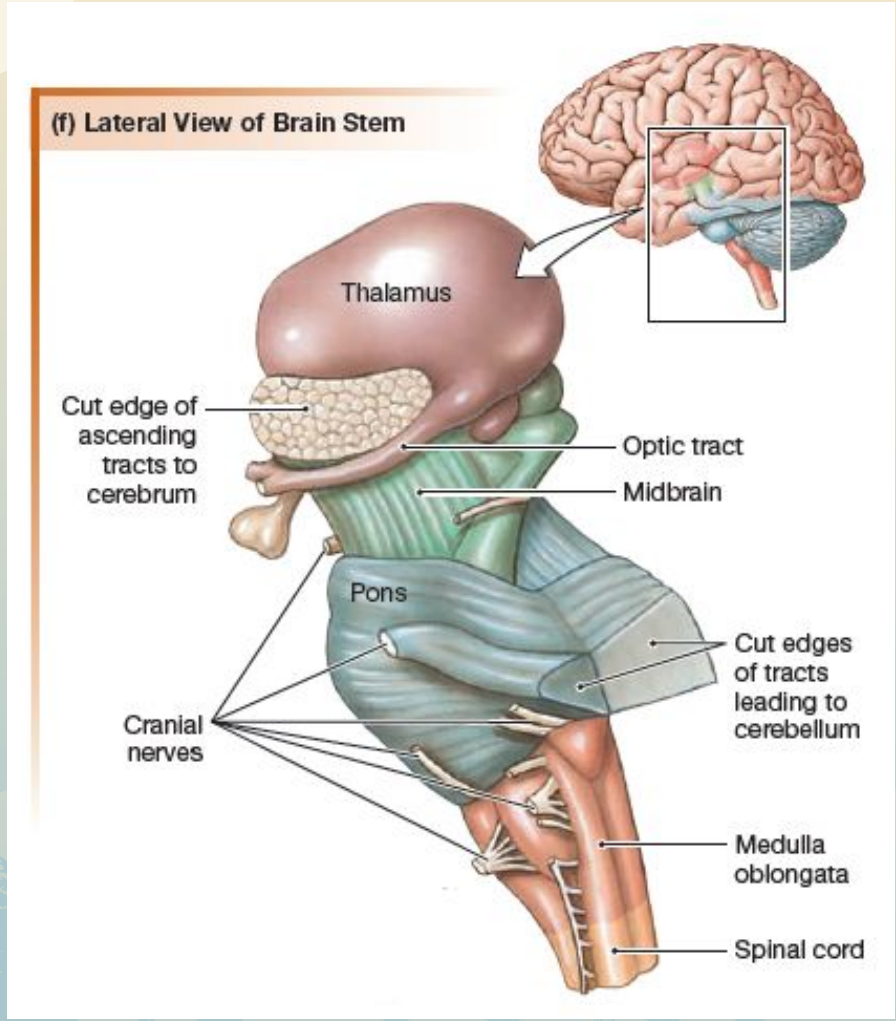
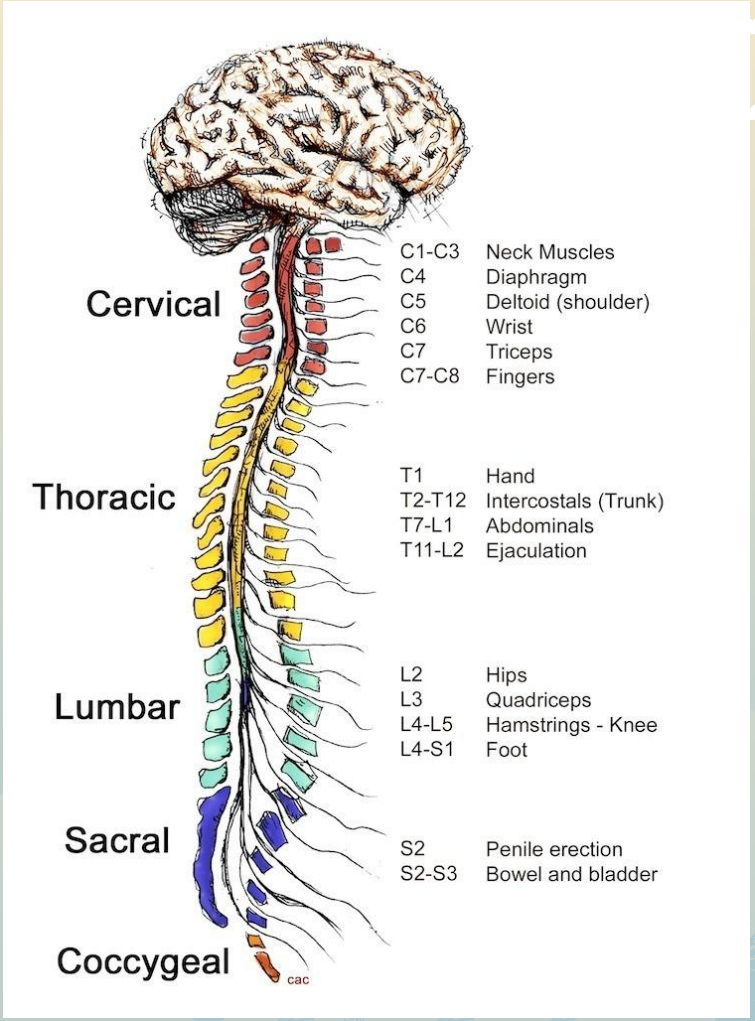


FIG. 9.9 The diencephalon

The diencephalon lies between the brain stem and the cerebrum. It consists of thalamus, hypothalamus, pineal gland, and pituitary gland.




(f) Lateral View of Brain Stem
Thalamus
Cut edge of ascending tracts to cerebrum
Optic tract
Midbrain
Pons
Cut edges of tracts leading to cerebellum
Cranial nerves
Medulla oblongata
Spinal cord

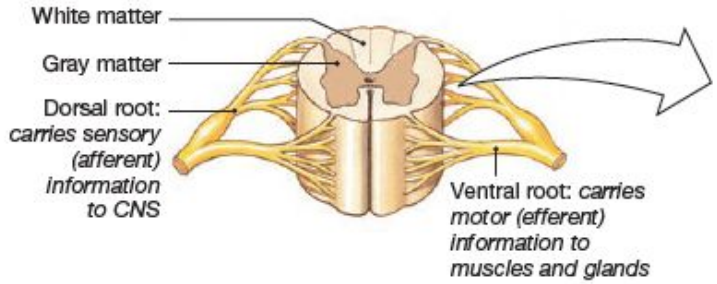

Cervical
C1-C3 Neck Muscles
C4 Diaphragm
C5 Deltoid (shoulder)
C6 Wrist
C7 Triceps
C7-C8 Fingers
Thoracic
T1 Hand
T2-T12 Intercostals (Trunk)
T7-L1 Abdominals
T11-L2 Ejaculation
Lumbar
L2 Hips
L3 Quadriceps
L4-L5 Hamstrings - Knee
L4-S1 Foot
Sacral
S2 Penile erection
S2-S3 Bowel and bladder
Coccygeal
cac

Blåtunga

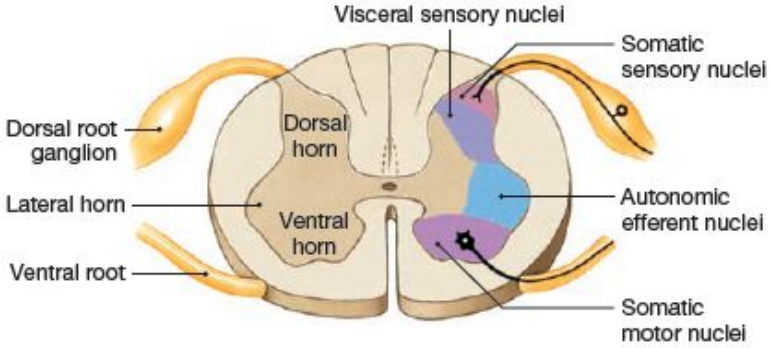
FIG. 9.6 Organization of the spinal cord

The spinal cord contains nuclei with cell bodies of efferent neurons and tracts of axons going to and from the brain.

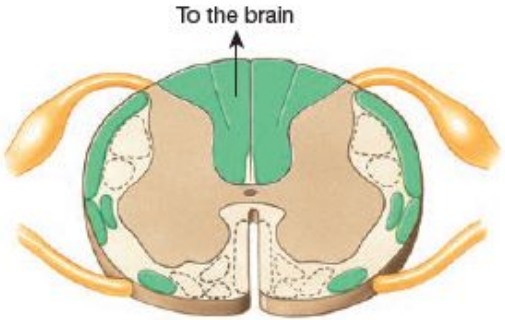
(a) One segment of spinal cord, ventral view, showing its pair of nerves

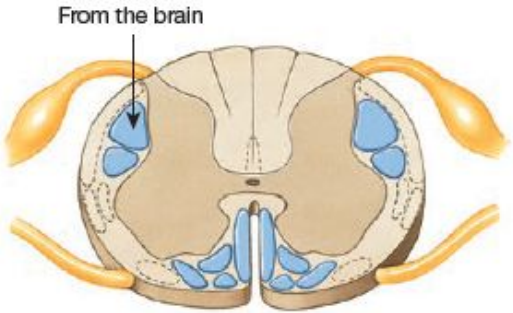


(b) Gray matter consists of sensory and motor nuclei.



(c) White matter in the spinal cord consists of tracts of axons carrying information to and from the brain.

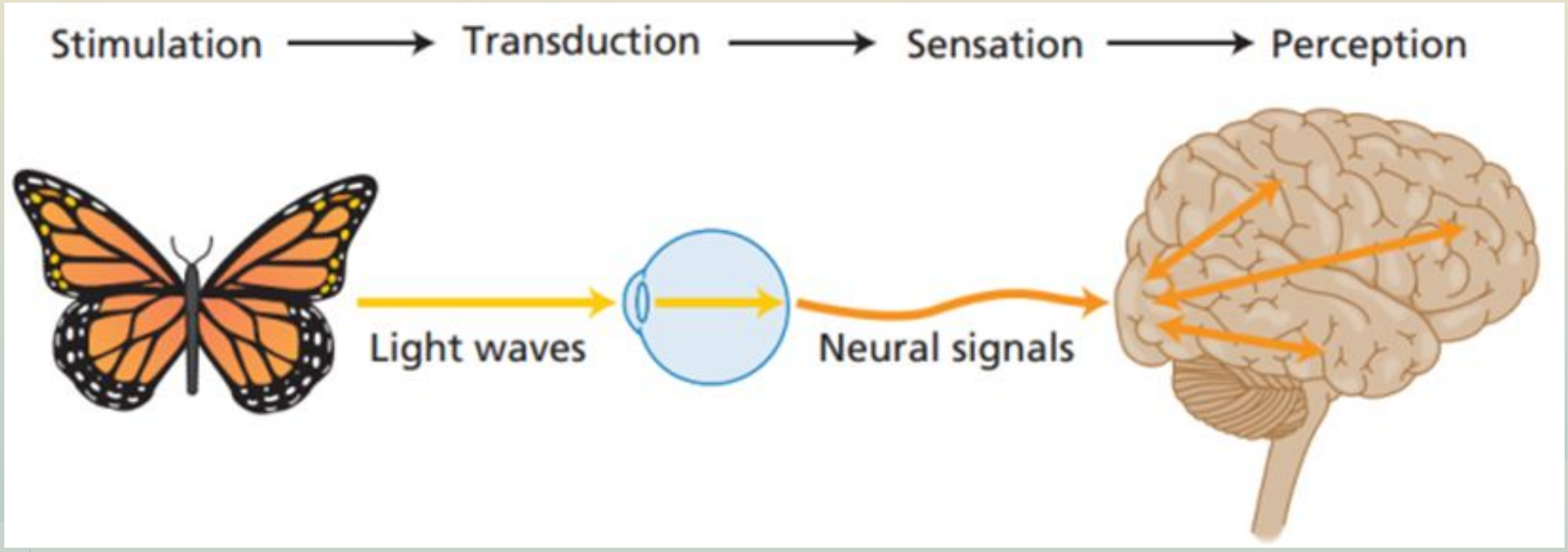


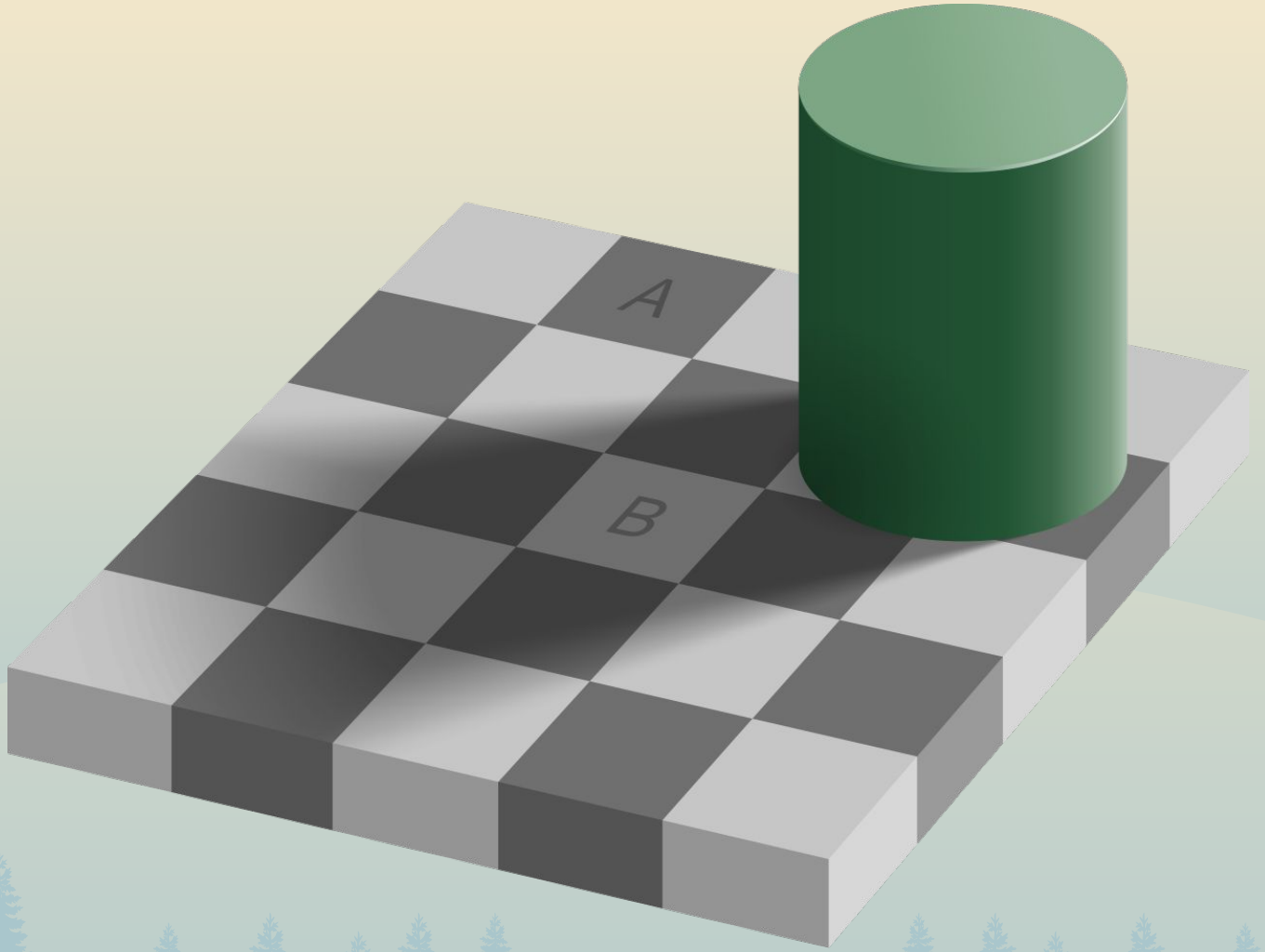


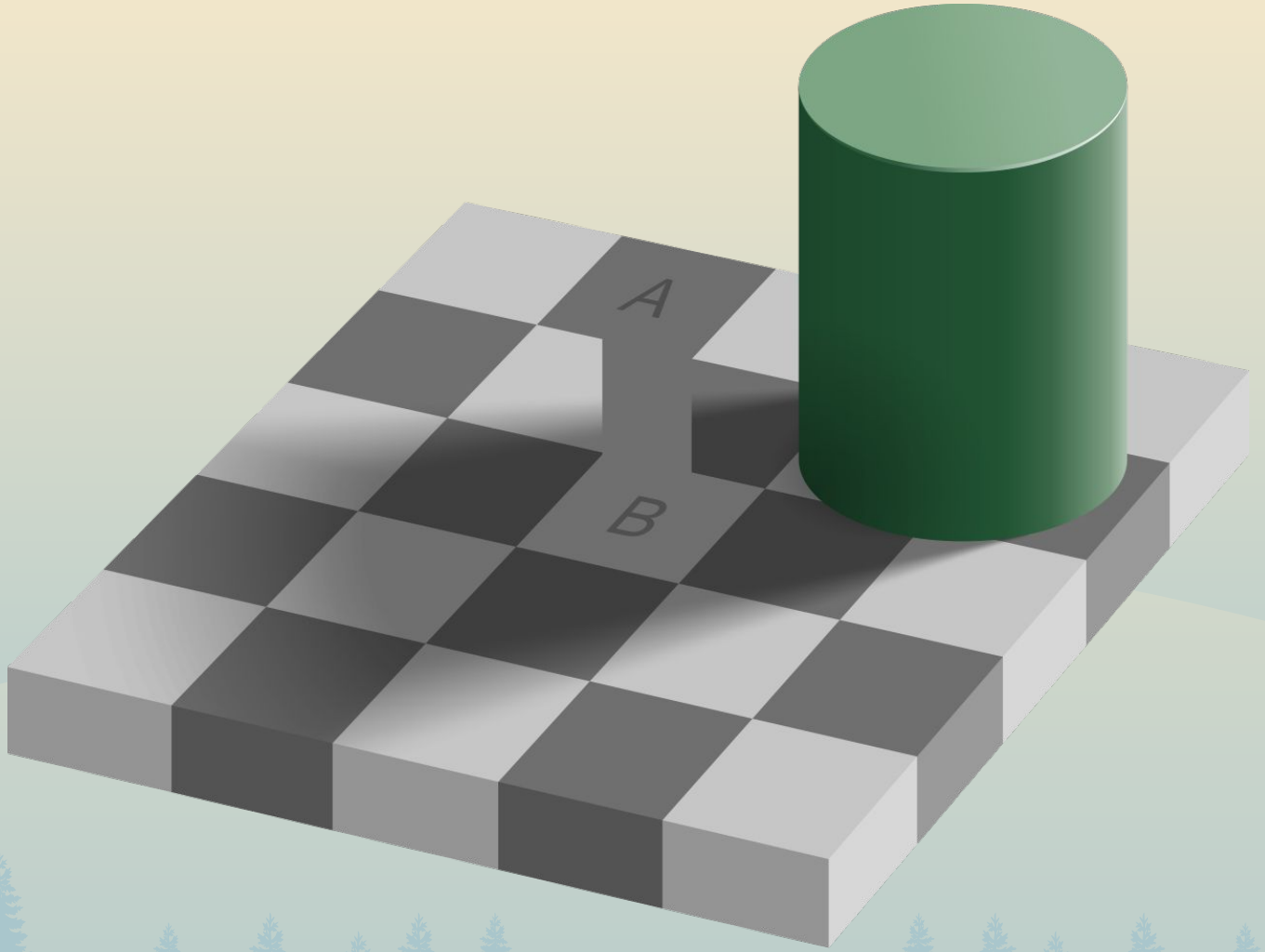
KEY

Ascending tracts carry sensory information to the brain.

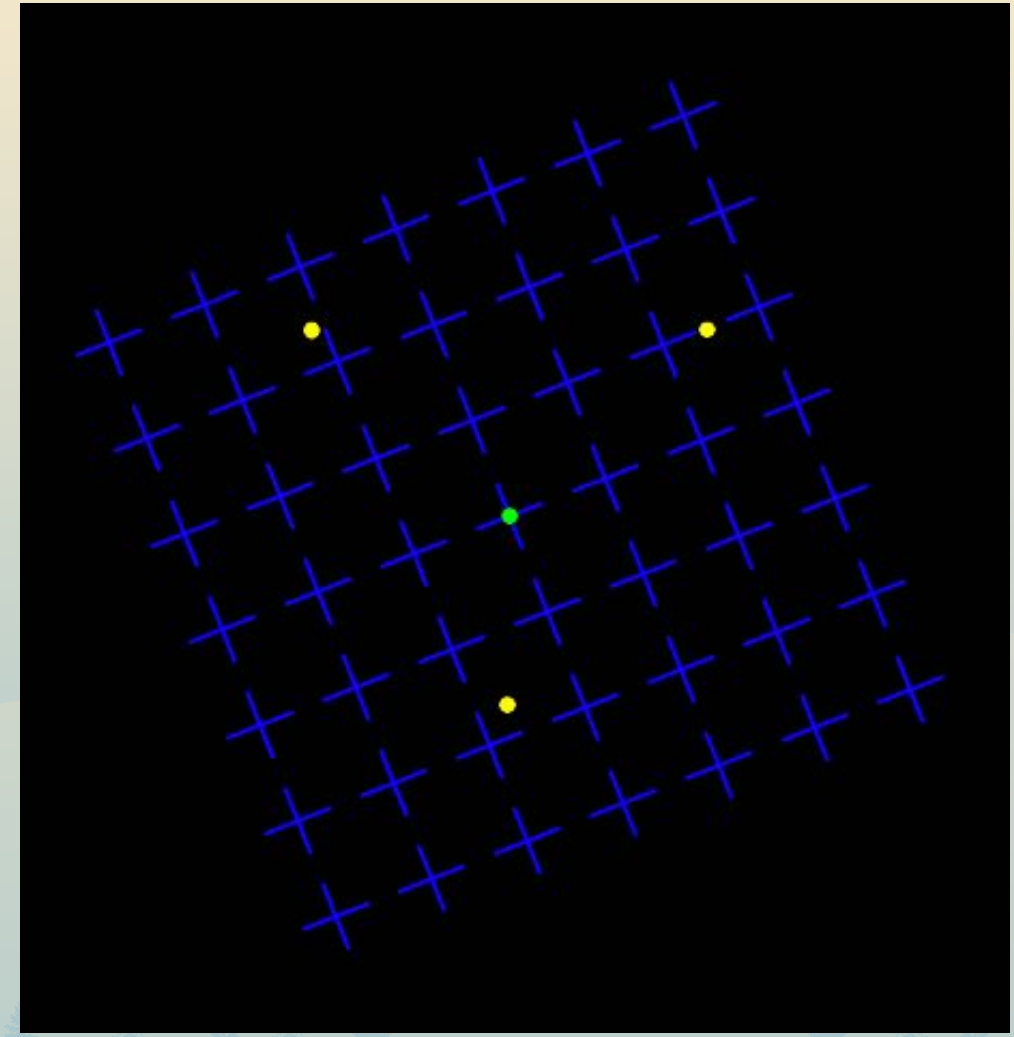
Descending tracts carry commands to motor neurons.

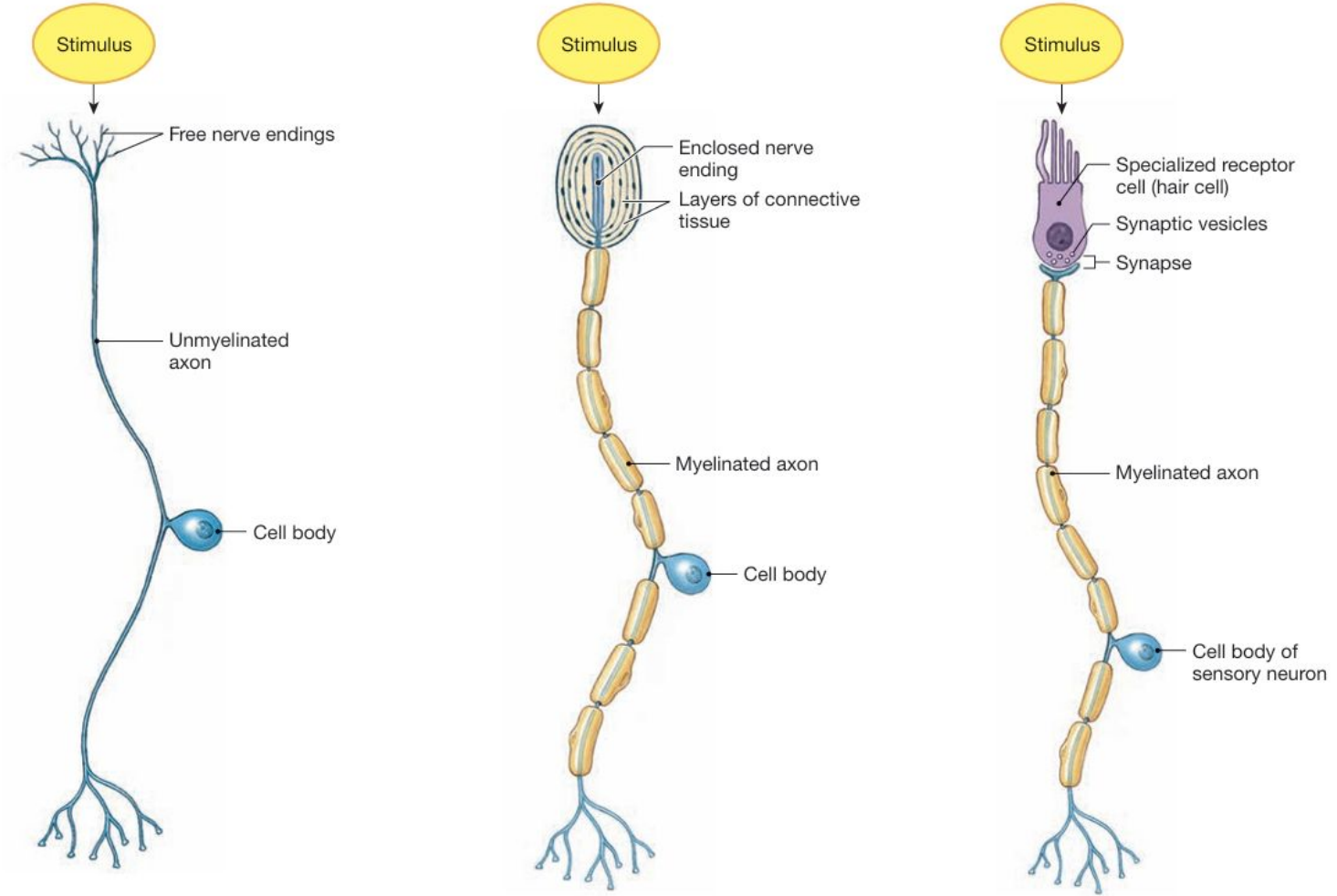

Stimulation
Transduction
Sensation
Perception
Light waves
Neural signals


A
B


A
B

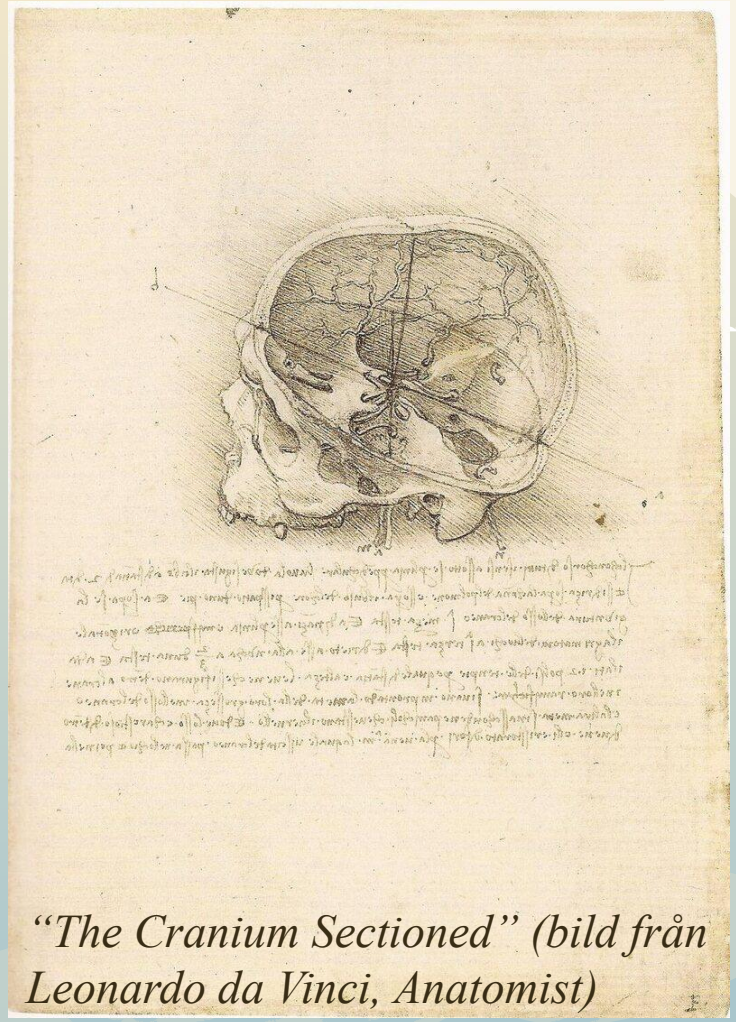
Källa här!




Stimulus
Free nerve endings
Unmyelinated axon
Cell body
Stimulus
Enclosed nerve ending
Layers of connective tissue
Myelinated axon
Cell body
Stimulus
Specialized receptor cell (hair cell)
Synaptic vesicles
Synapse
Myelinated axon
Cell body of sensory neuron

Laborationer

- Känselns konvergens
- Luktsinnets adaption



“The Cranium Sectioned” (bild från Leonardo da Vinci, Anatomist)

FIG. 10.2 Receptive fields of sensory neurons

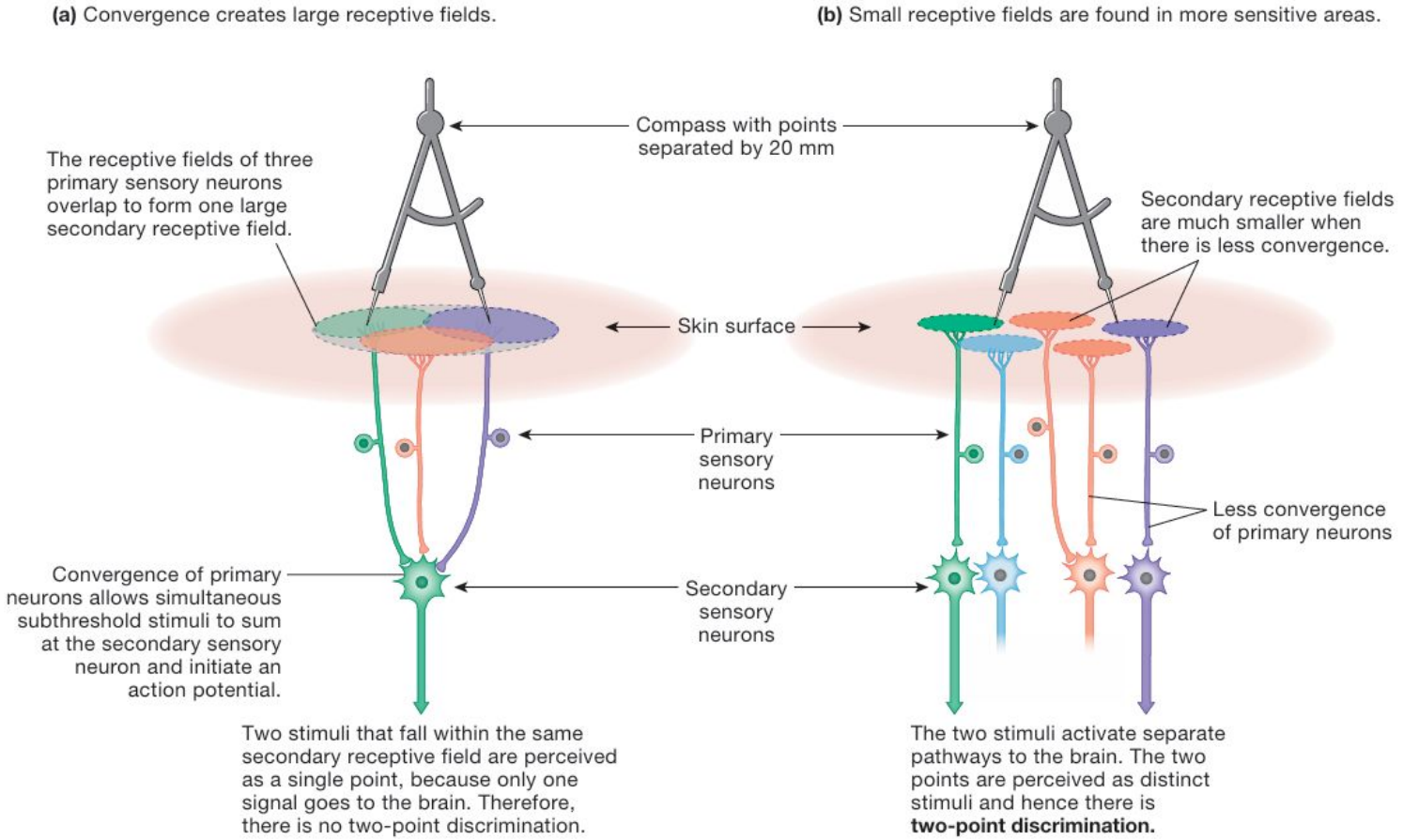


FIG. 10.10 Sensory receptors in the skin

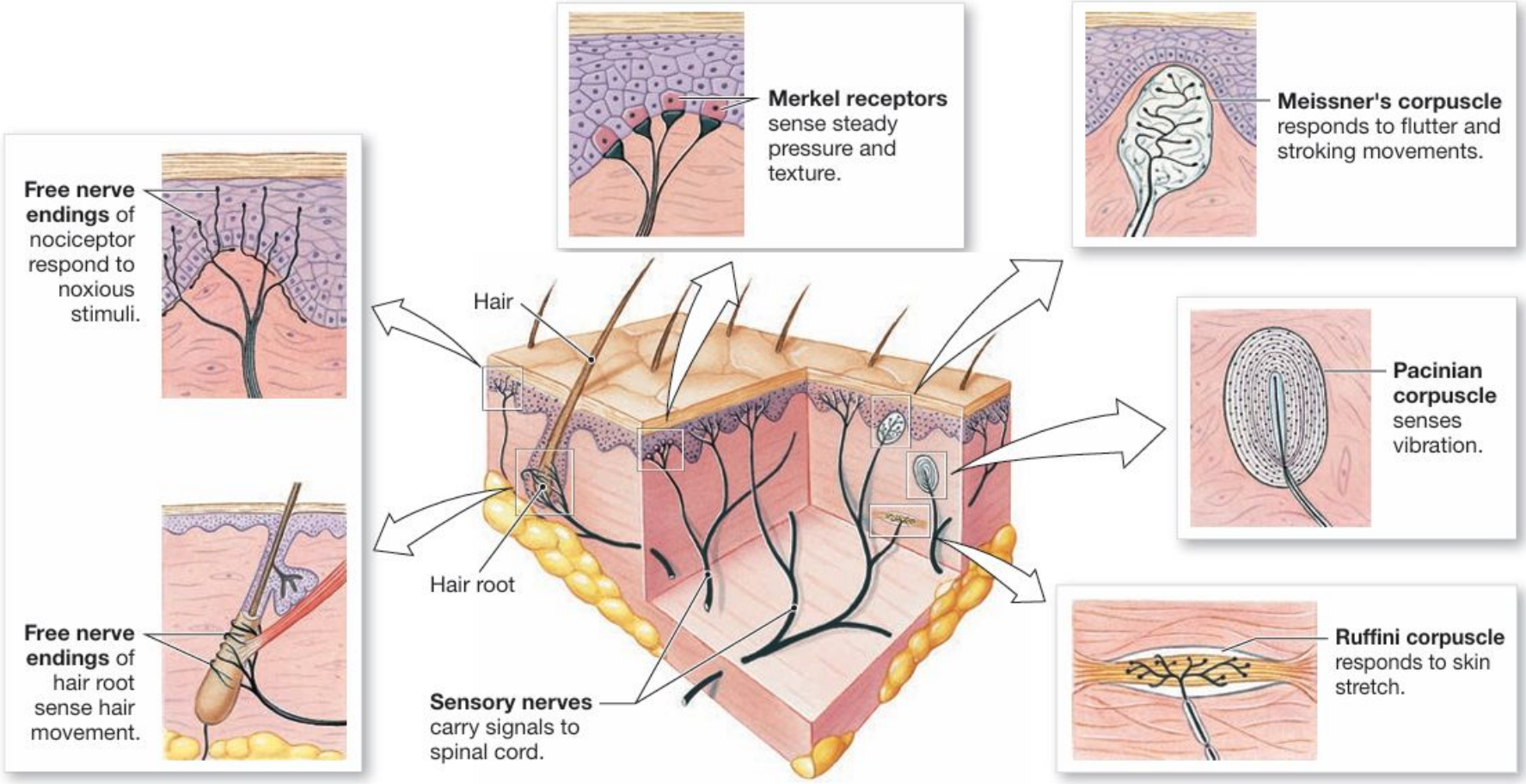
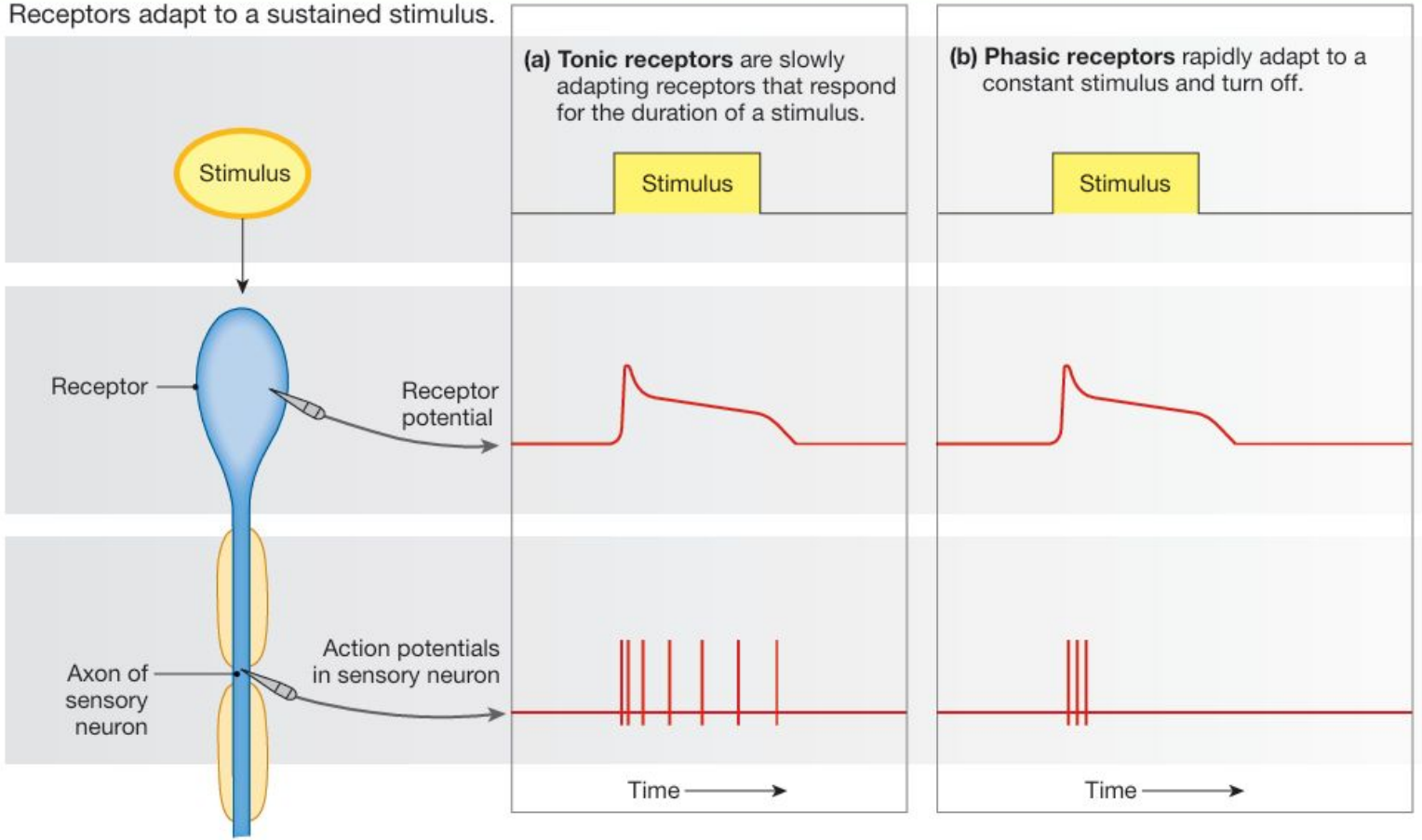
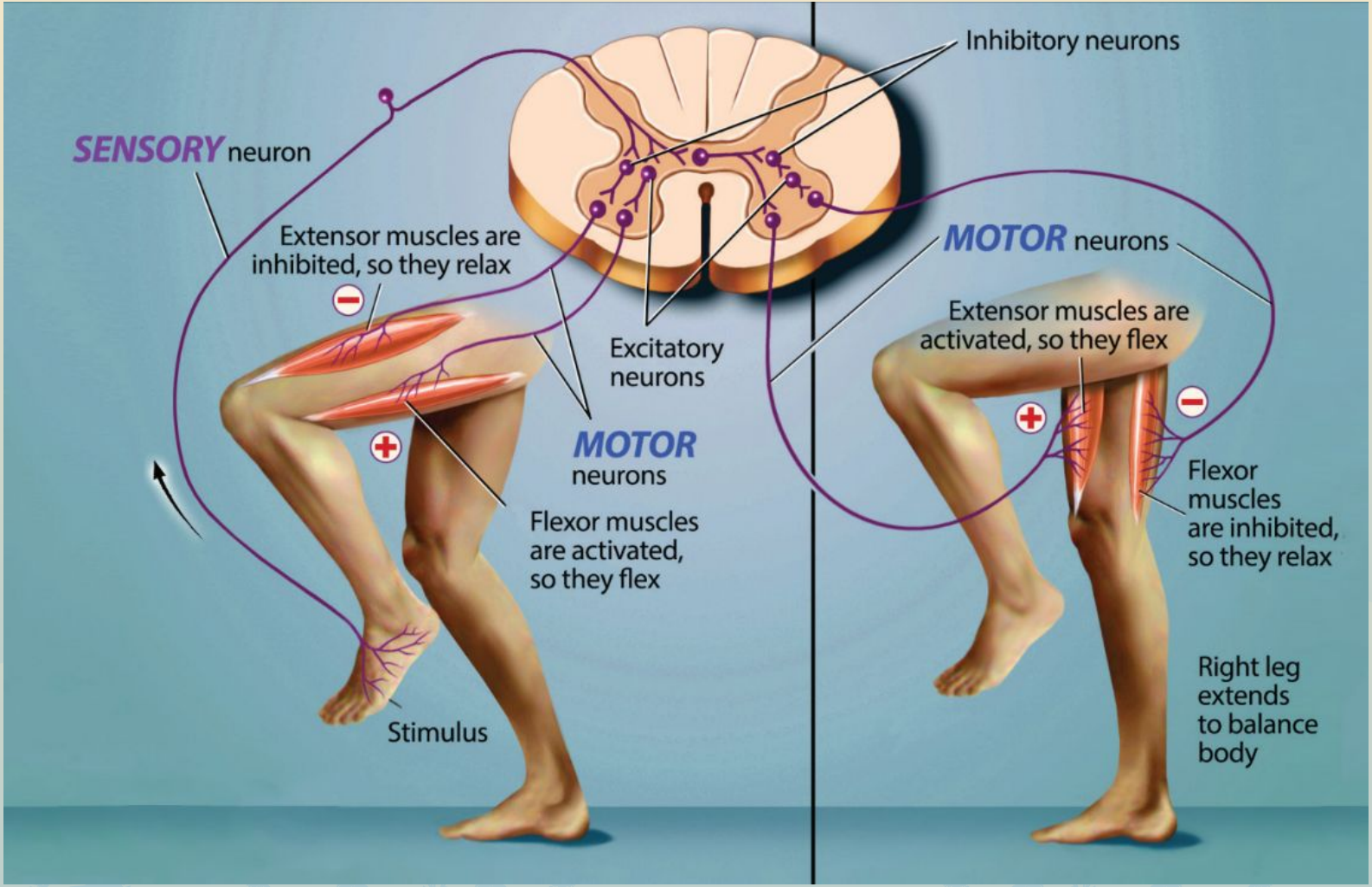
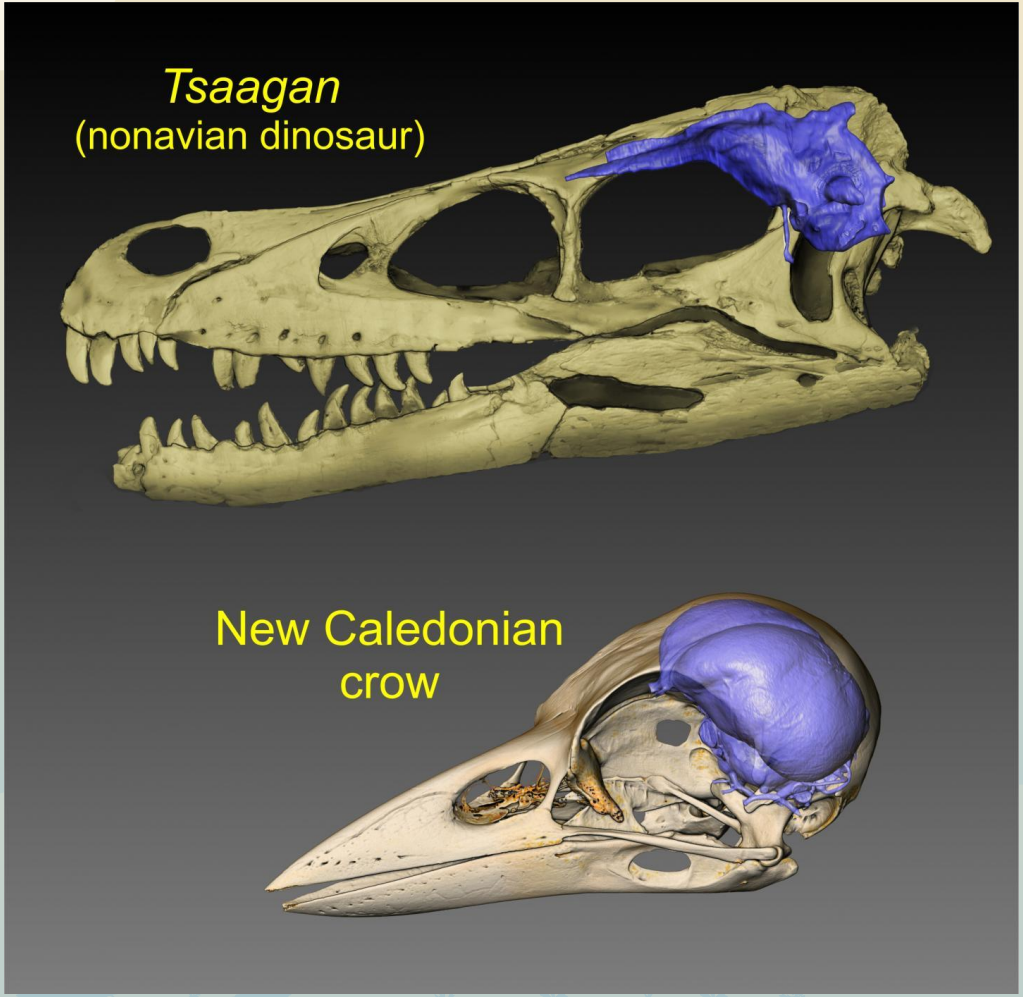


FIG. 10.7 Receptor adaptation




Inhibitory neurons
SENSORY neuron
Extensor muscles are inhibited, so they relax
MOTOR neurons
Extensor muscles are activated, so they flex
Excitatory neurons
MOTOR neurons
Flexor muscles are activated, so they flex
Flexor muscles are inhibited, so they relax
Stimulus
Right leg extends to balance body


Tsaagan
(nonavian dinosaur)
New Caledonian
crow