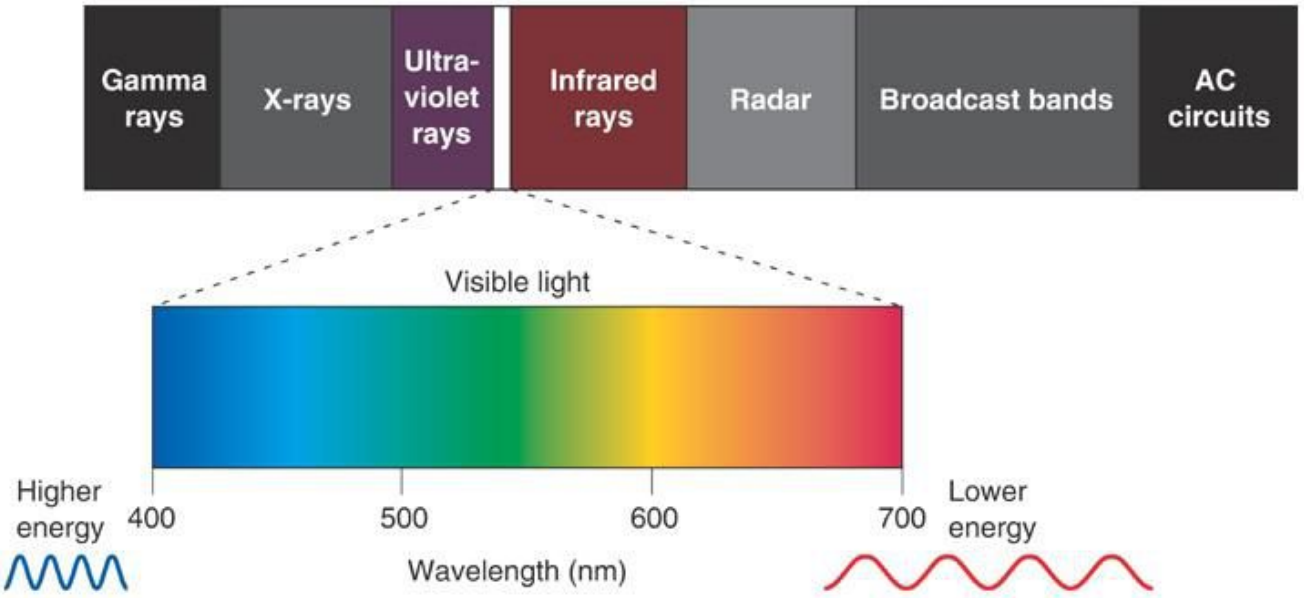
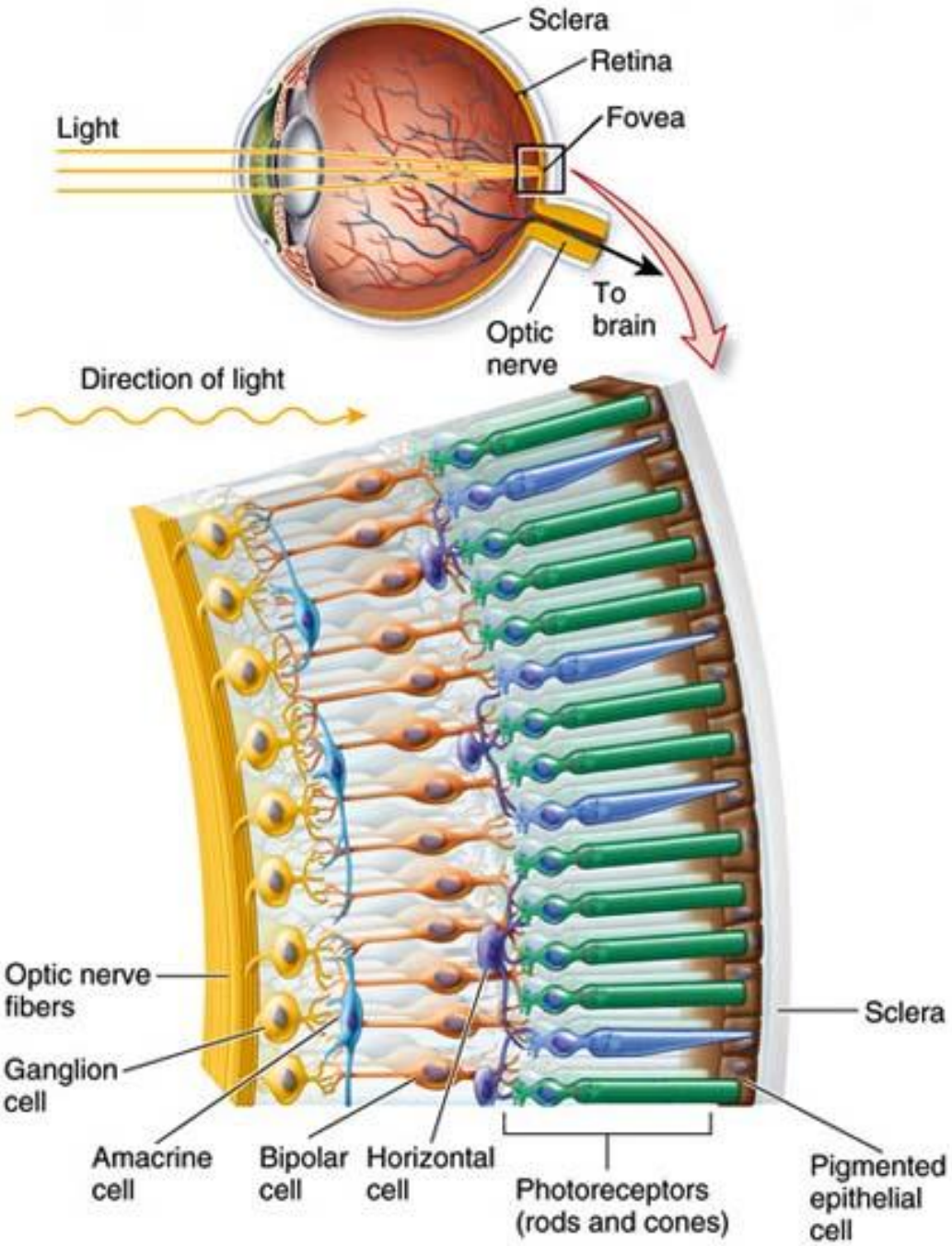
Curs VII
Sistemele senzoriale II

IV. Analizatorul vizual

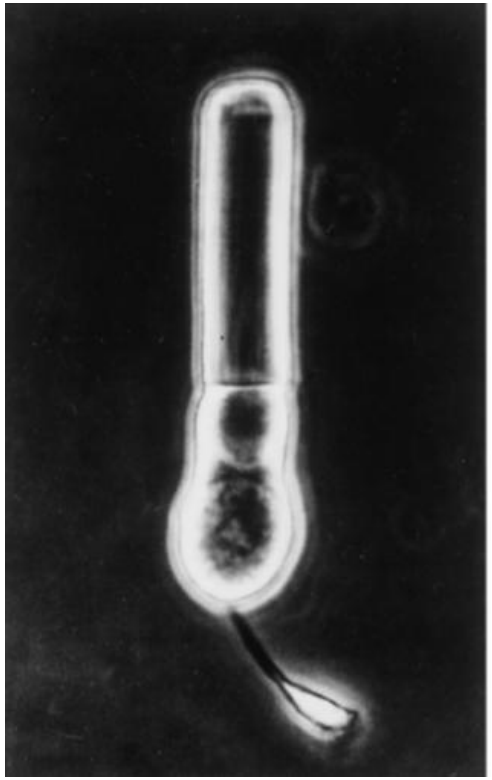
Stimulii vizuali – radiația electromagnetică



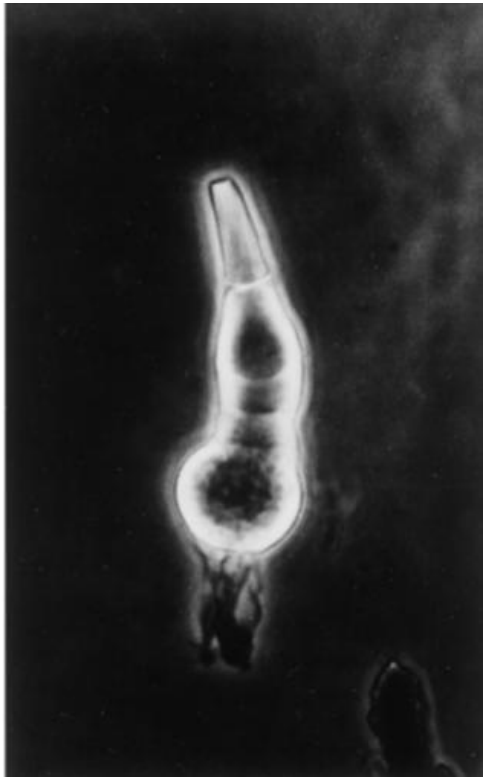

Sclera
Retina
Fovea
Light
To brain
Optic nerve
Direction of light
Optic nerve fibers
Ganglion cell
Amacrine cell
Bipolar cell
Horizontal cell
Photoreceptors (rods and cones)
Sclera
Pigmented epithelial cell

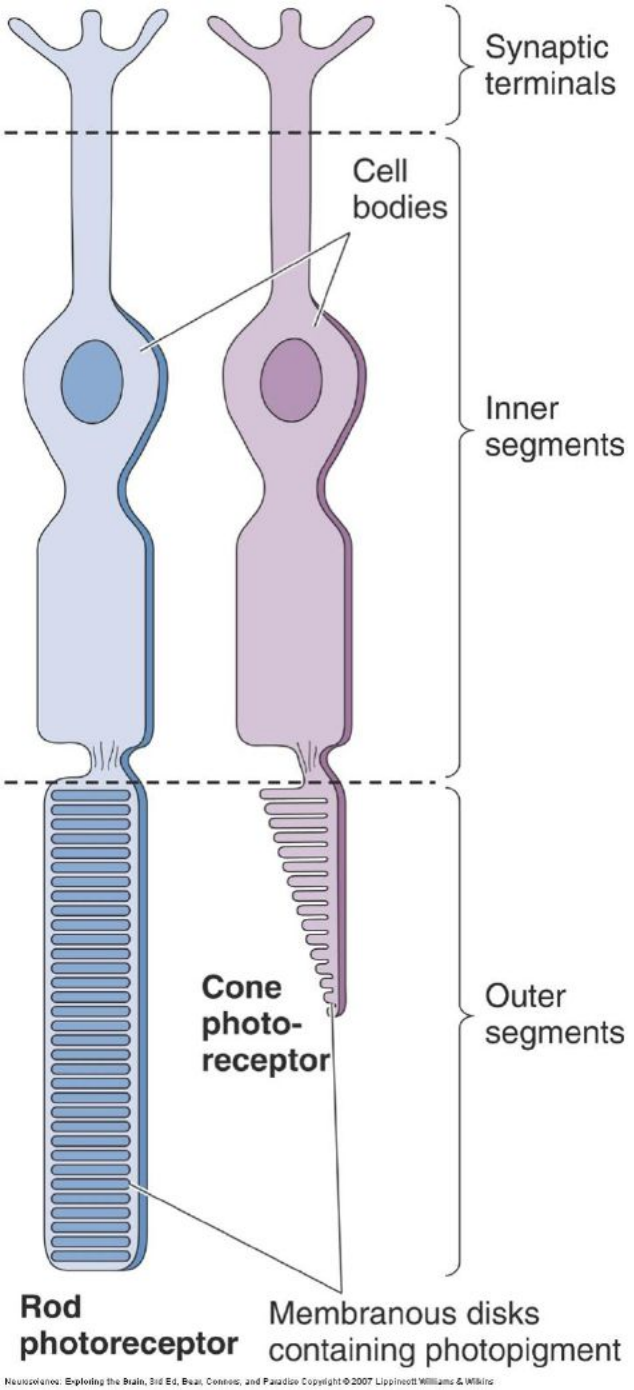
Fotoreceptorii retinieni

Celulă cu bastonaş

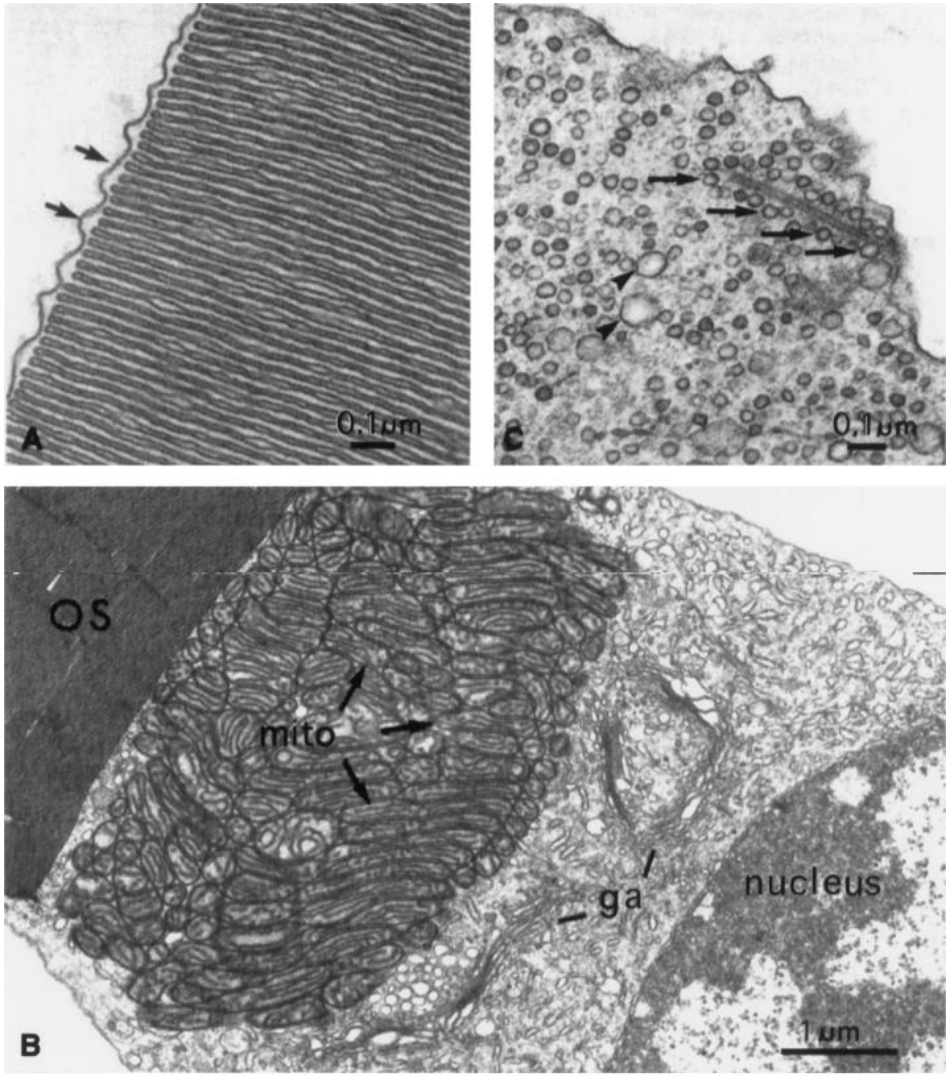


Celulă cu con

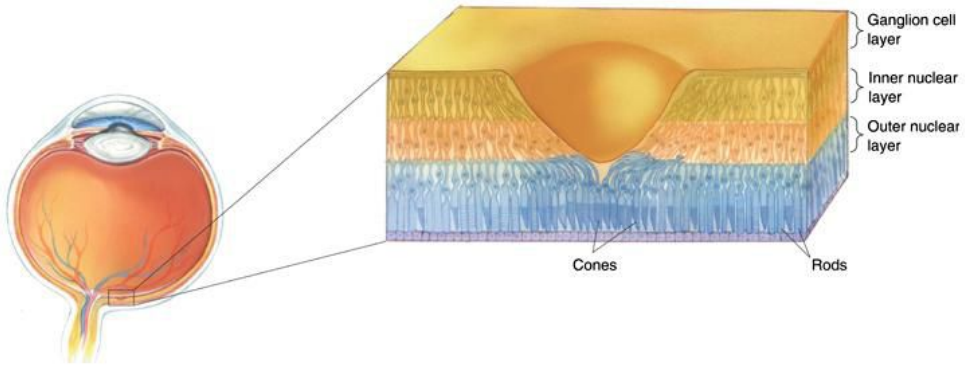


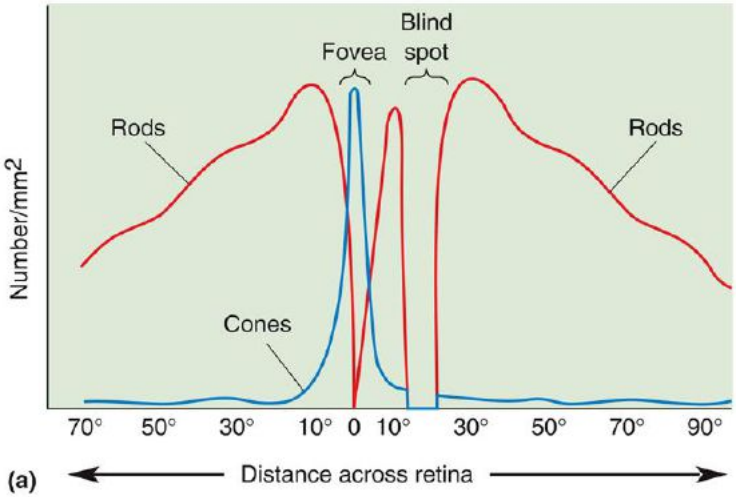


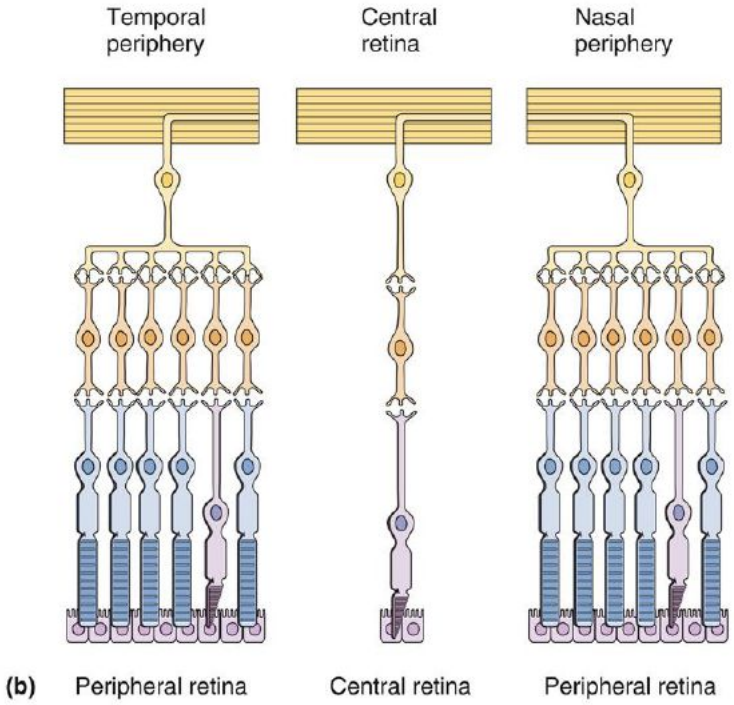
Structura fotoreceptorilor



Diferențe locale în structura retinei



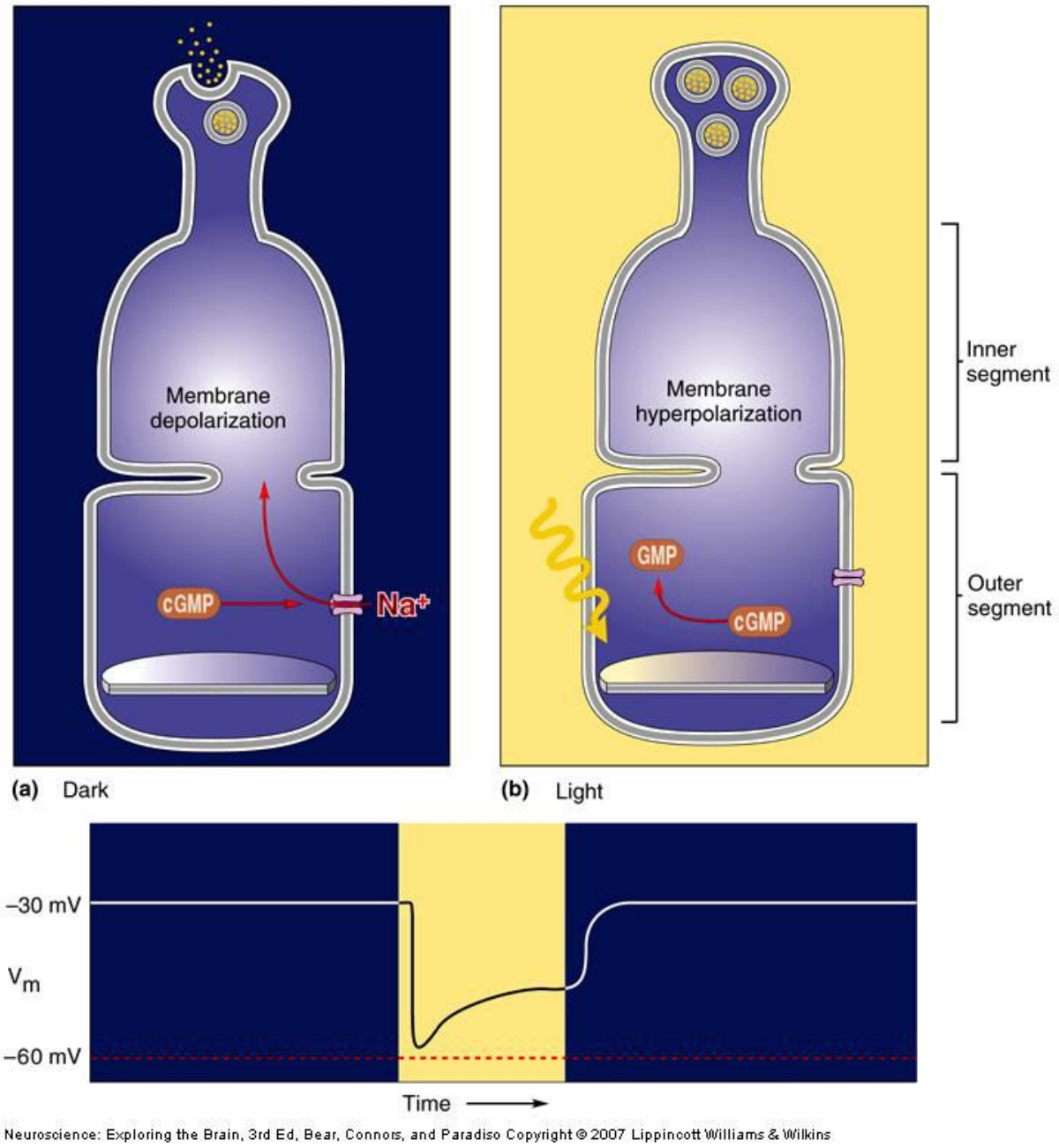




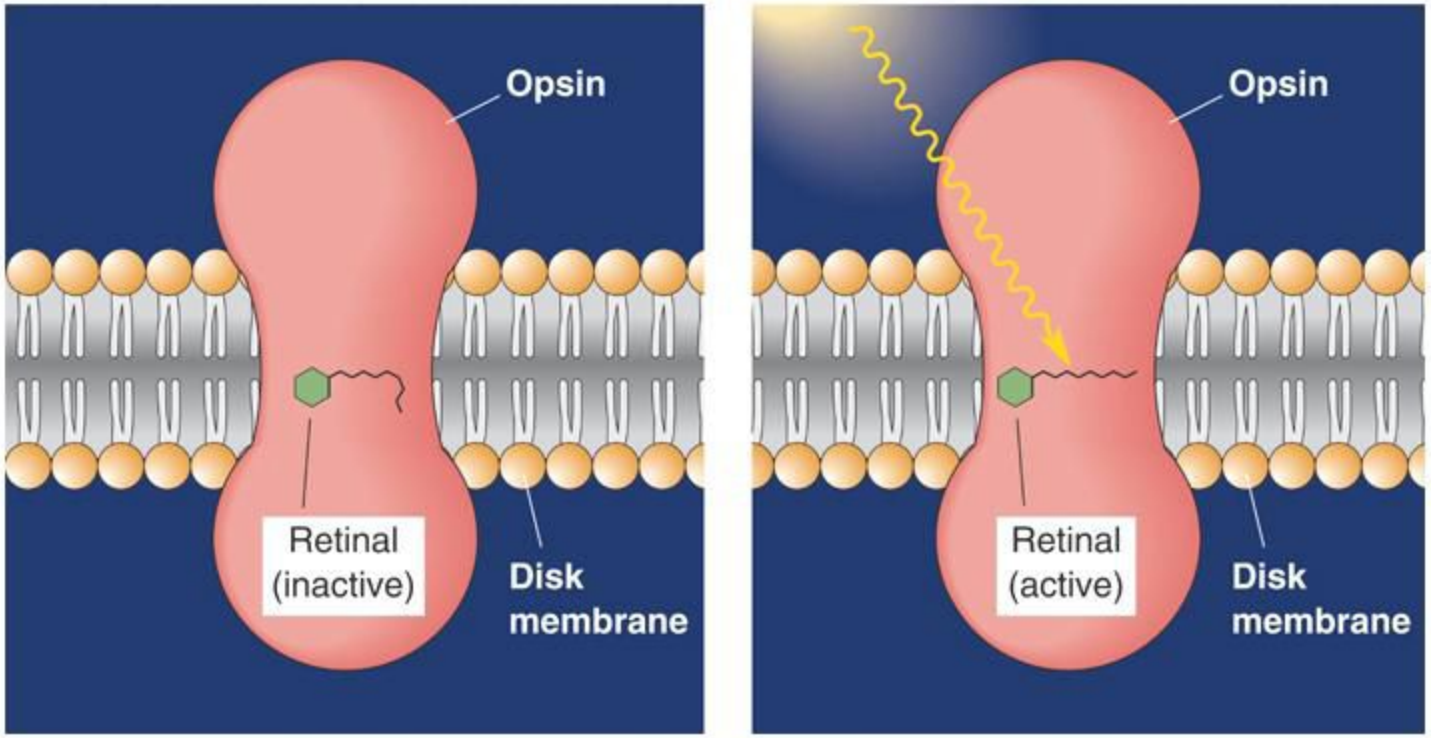
Traducerea stimulilor vizuali

-la întuneric membrana fotoreceptorilor este depolarizată datorită curentului de întuneric (influx de Na^+ şi Ca^{2+})

-iluminarea duce la oprirea curentului de întuneric şi la hiperpolarizarea fotoreceptorilor



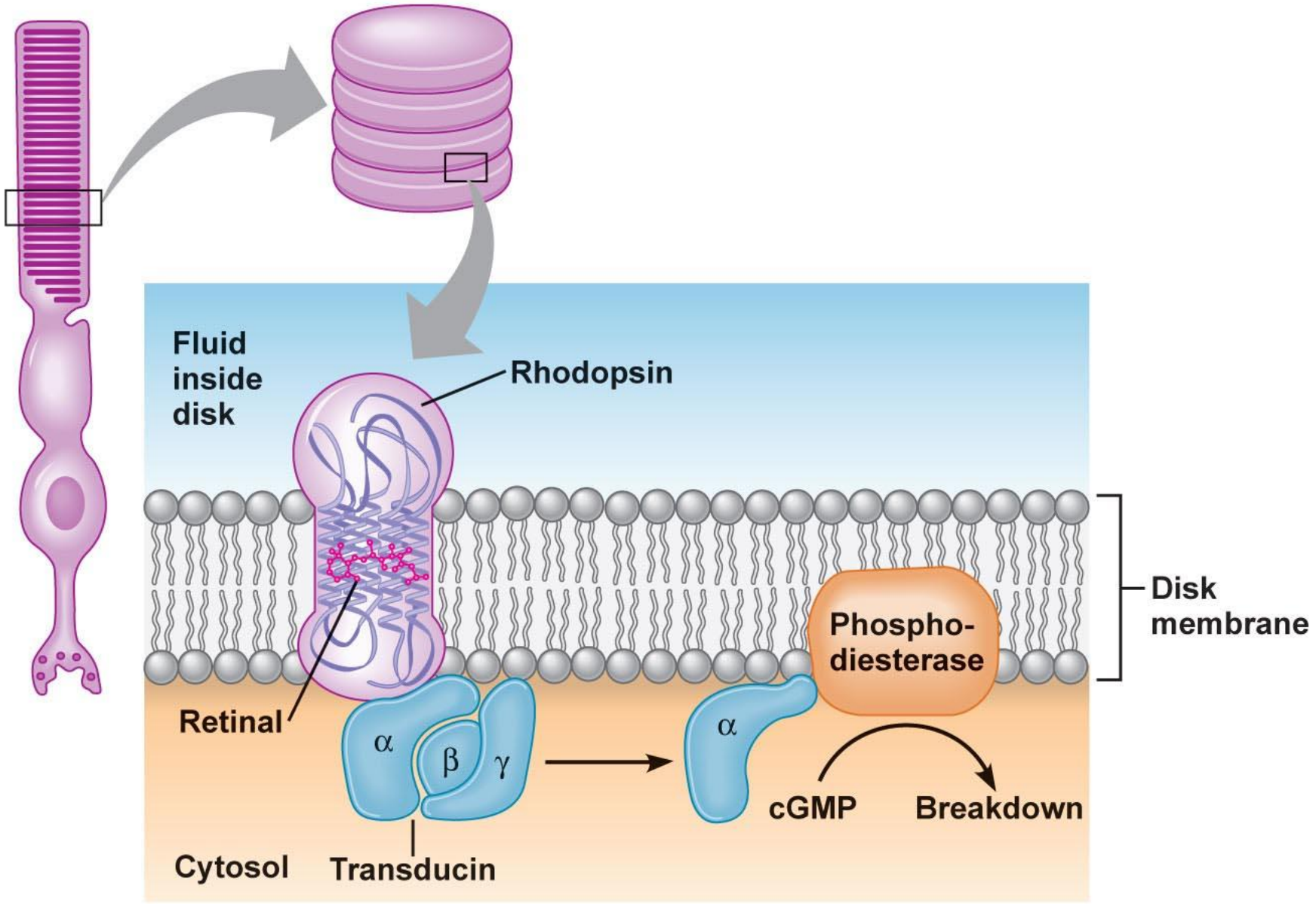
Traducerea stimulilor vizuali



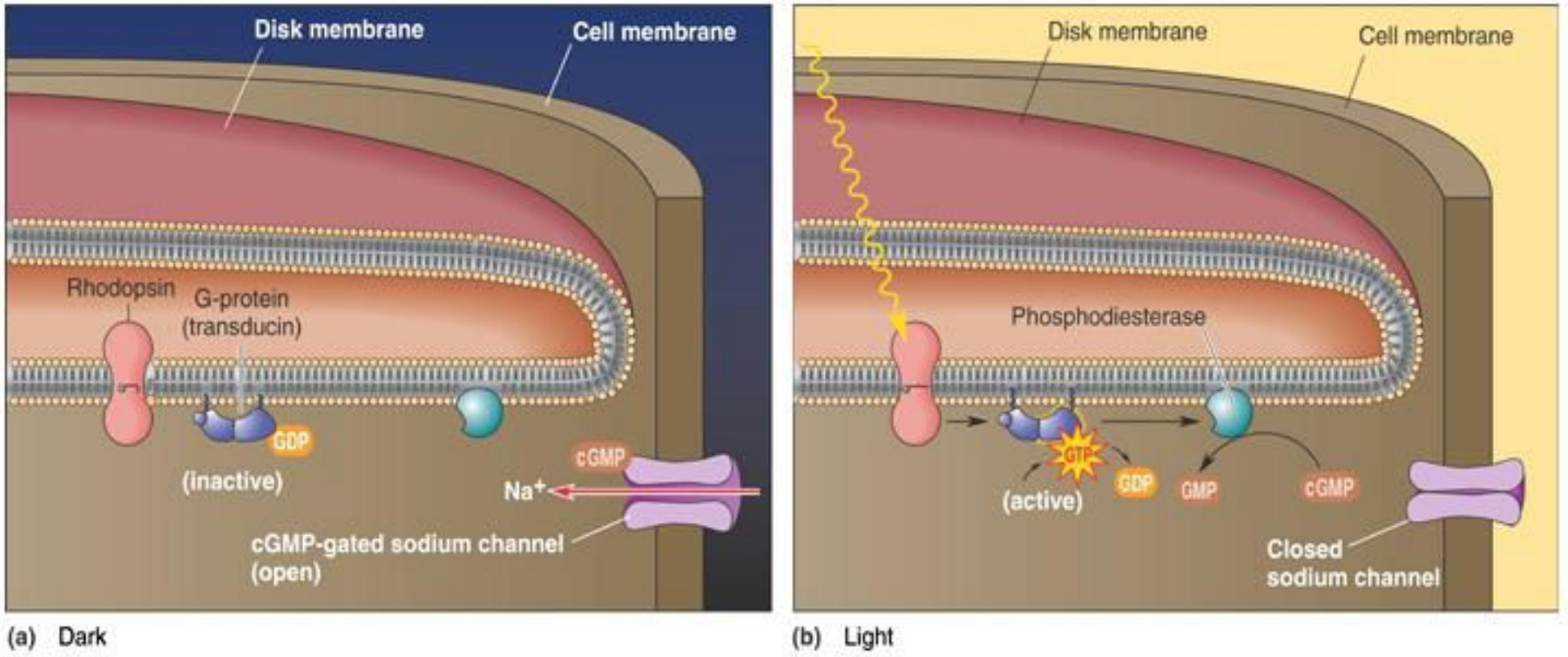
Neuroscience: Exploring the Brain, 3rd Ed, Bear, Connors, and Paradiso Copyright © 2007 Lippincott Williams & Wilkins

-rodopsina este formată dintr-o parte proteică (opsina) și o parte prostetică (retinalul)

- iluminarea induce fotoizomerizarea retinalului de la *11-cis* la *all trans* – ceea ce duce la apariția unei transformări conformaționale a întregii molecule de rodopsină – activarea acesteia (starea metarodopsina II)

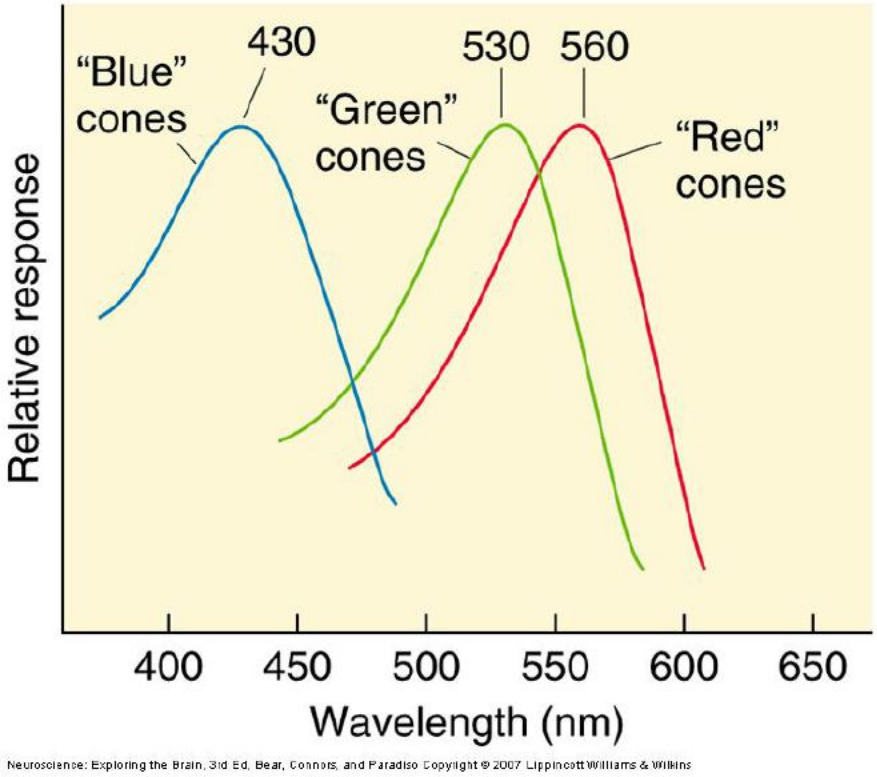


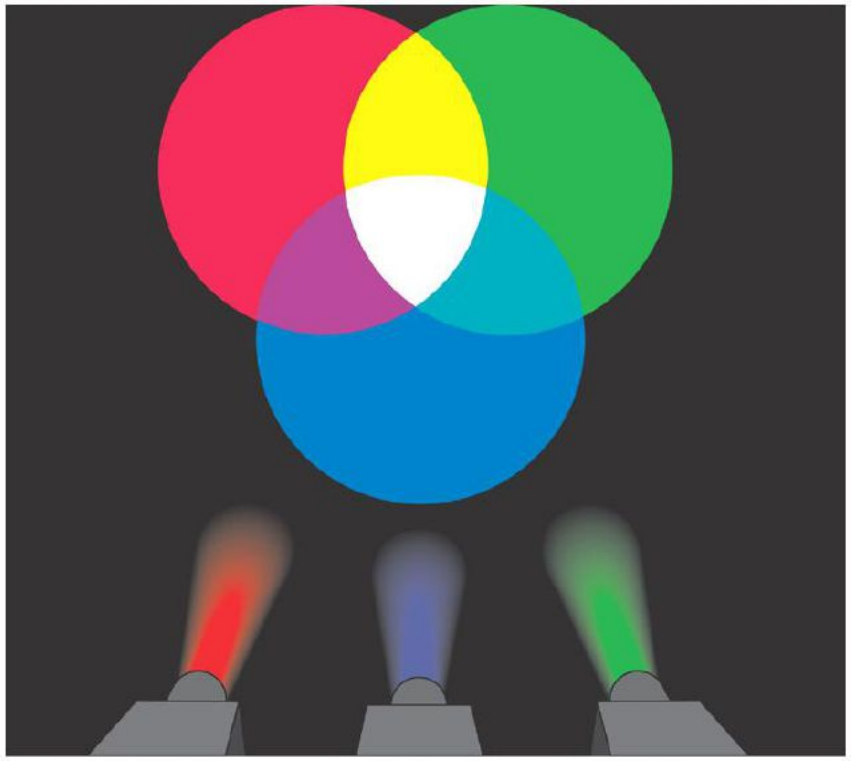
Traducerea stimulilor vizuali



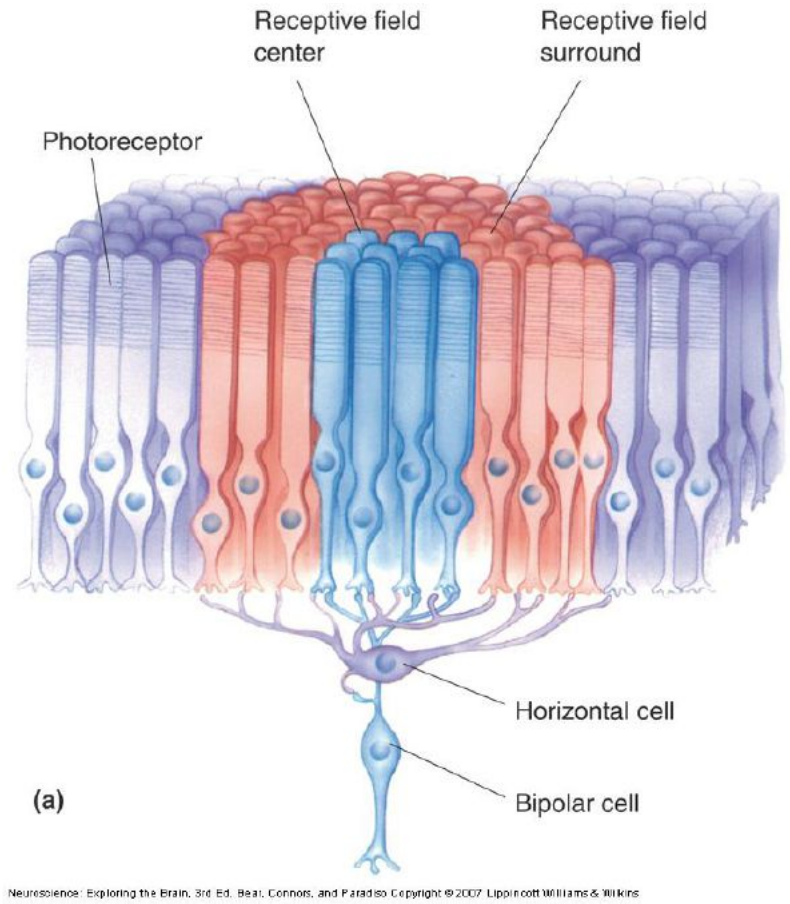
- iluminare → activarea rodopsinei (metarodopsina II) → activarea transducinei (proteina G) → activarea fosfodiesterazei (PDE) → hidroliza GMPc la GMP → scăderea concentrației de GMPc → închiderea canalelor cationice sensibile la nucleotide ciclice → hiperpolarizare → scăderea cantității de neuromediator (glutamat) eliberat la sinapsele cu celulele bipolare

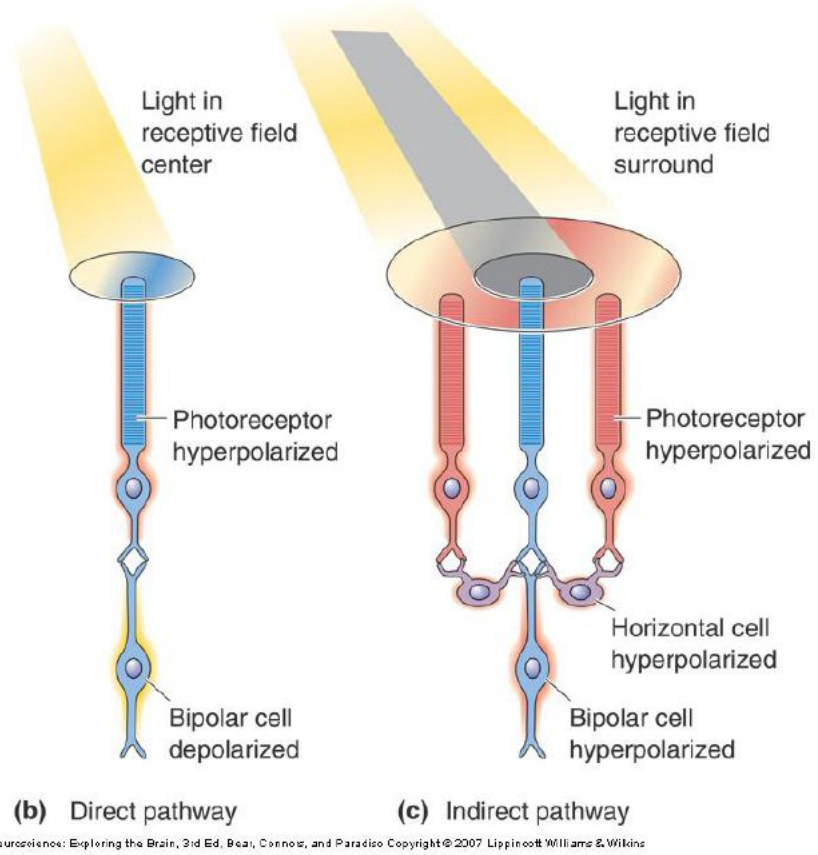
Vederea colorată – trei tipuri de fotoreceptori cu con – trei fotopigmenți

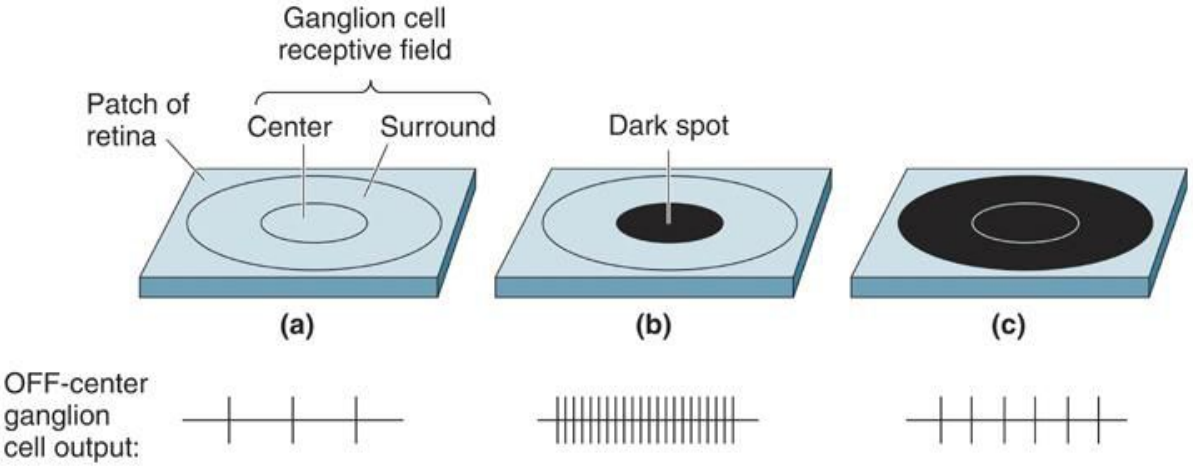




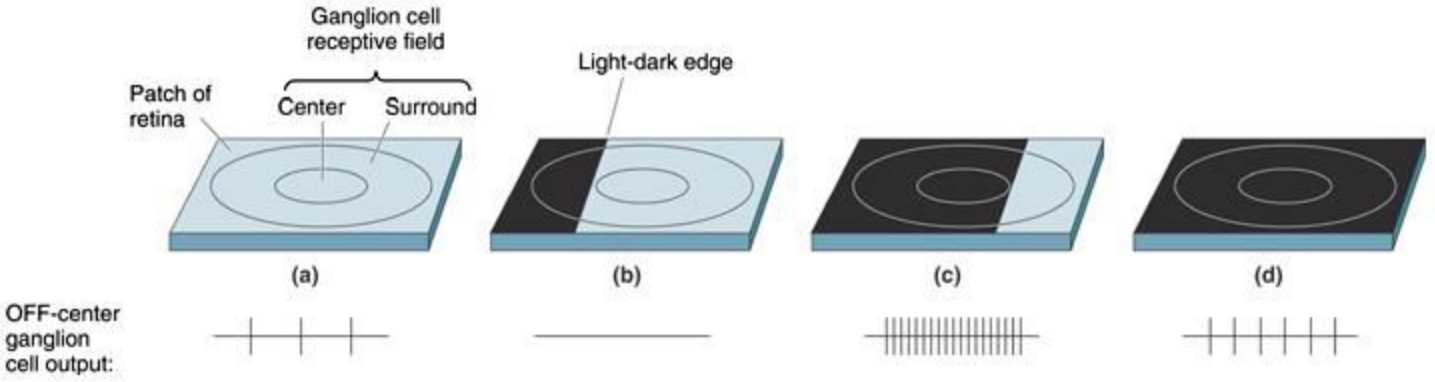
Procesarea imaginii la nivelul retinei

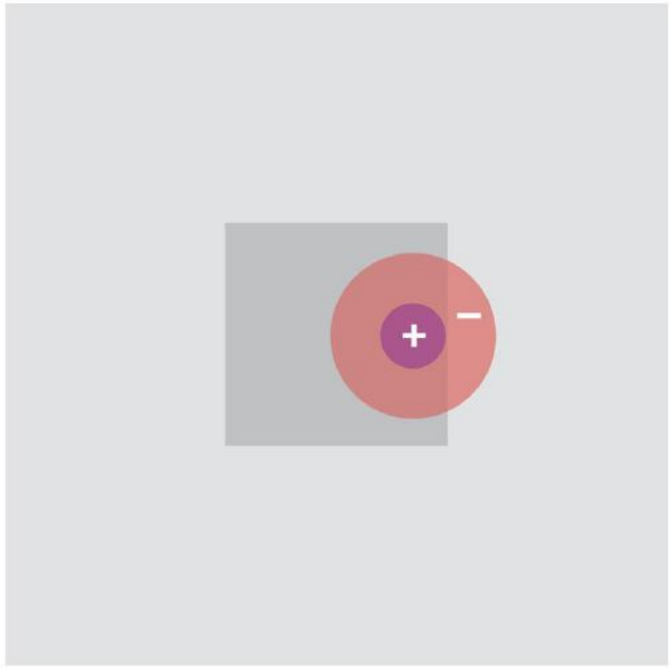


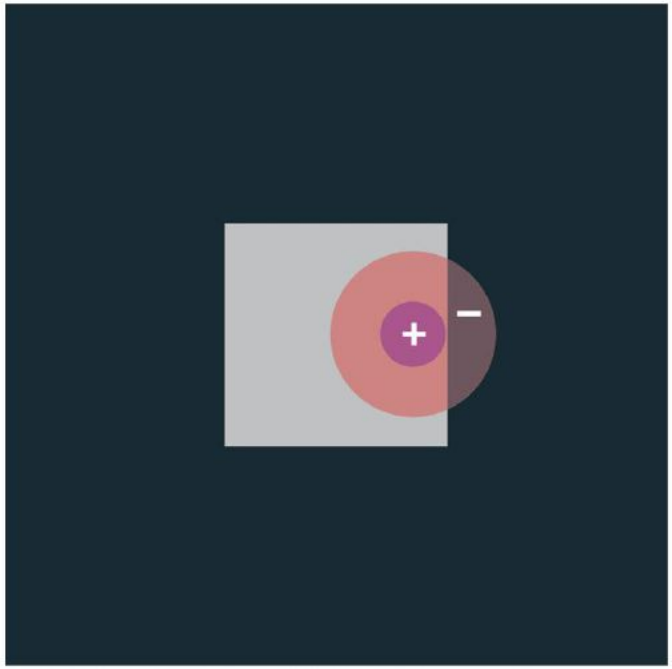


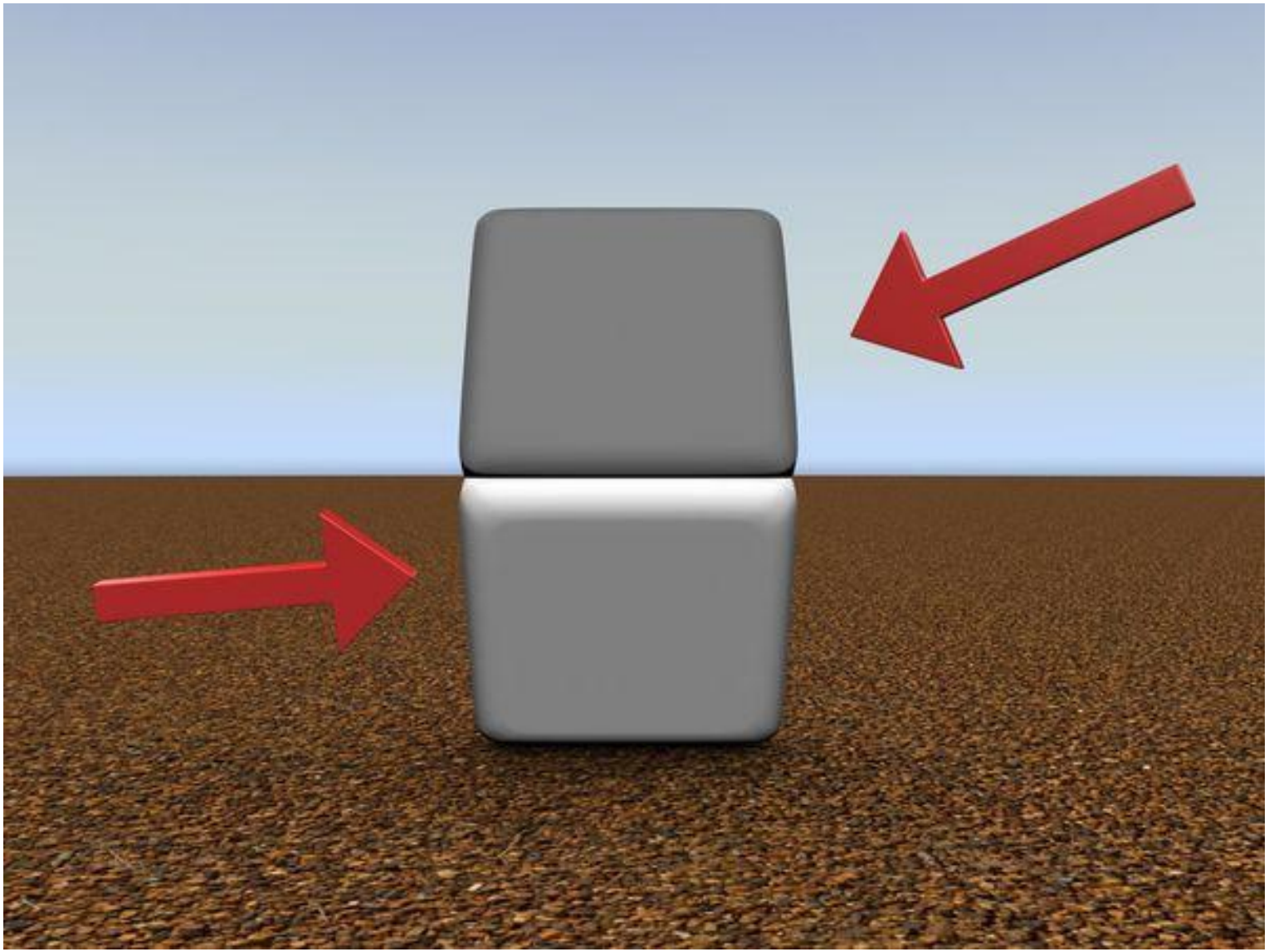


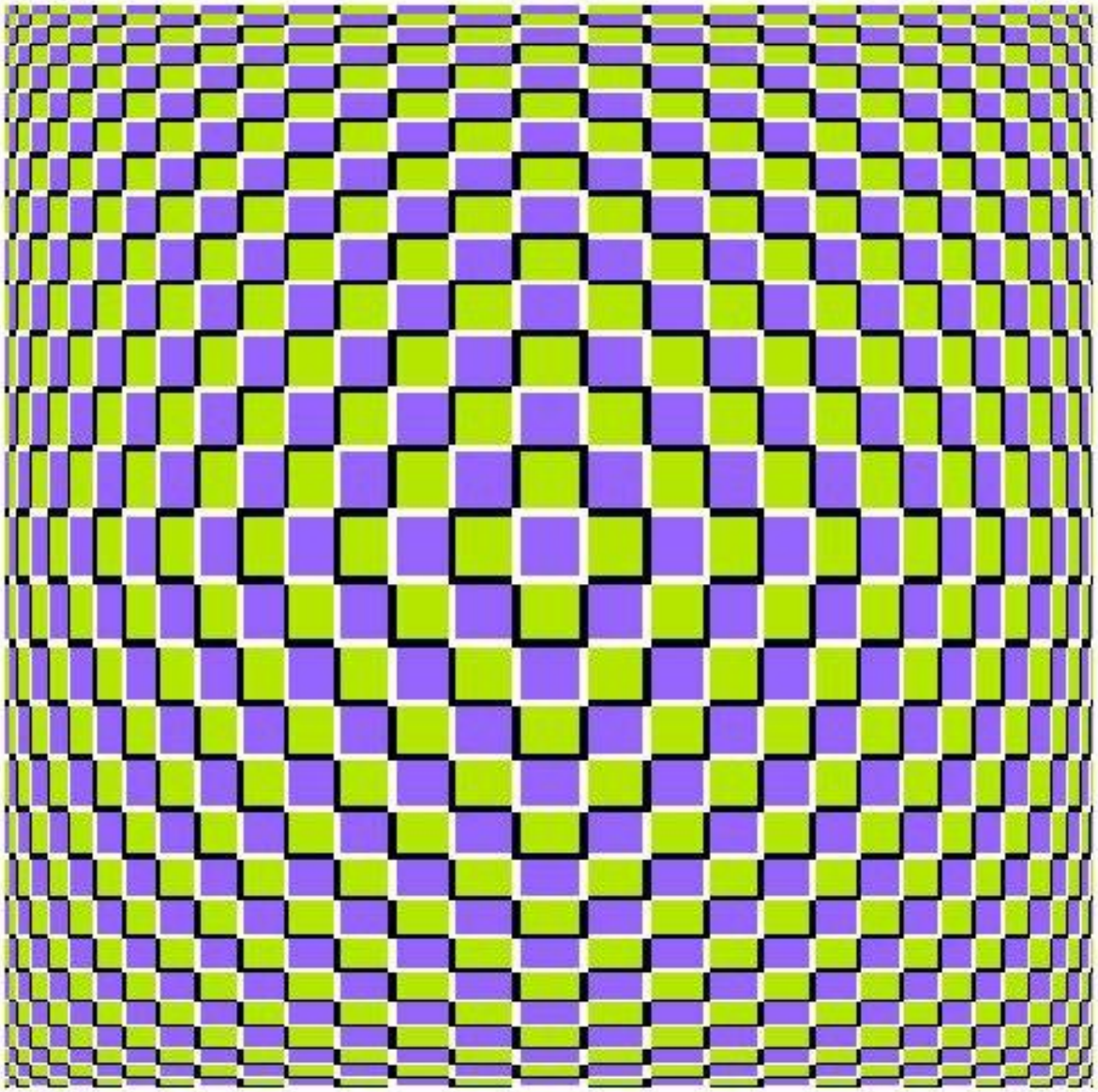
Câmpurile receptoare ale celulelor ganglionare

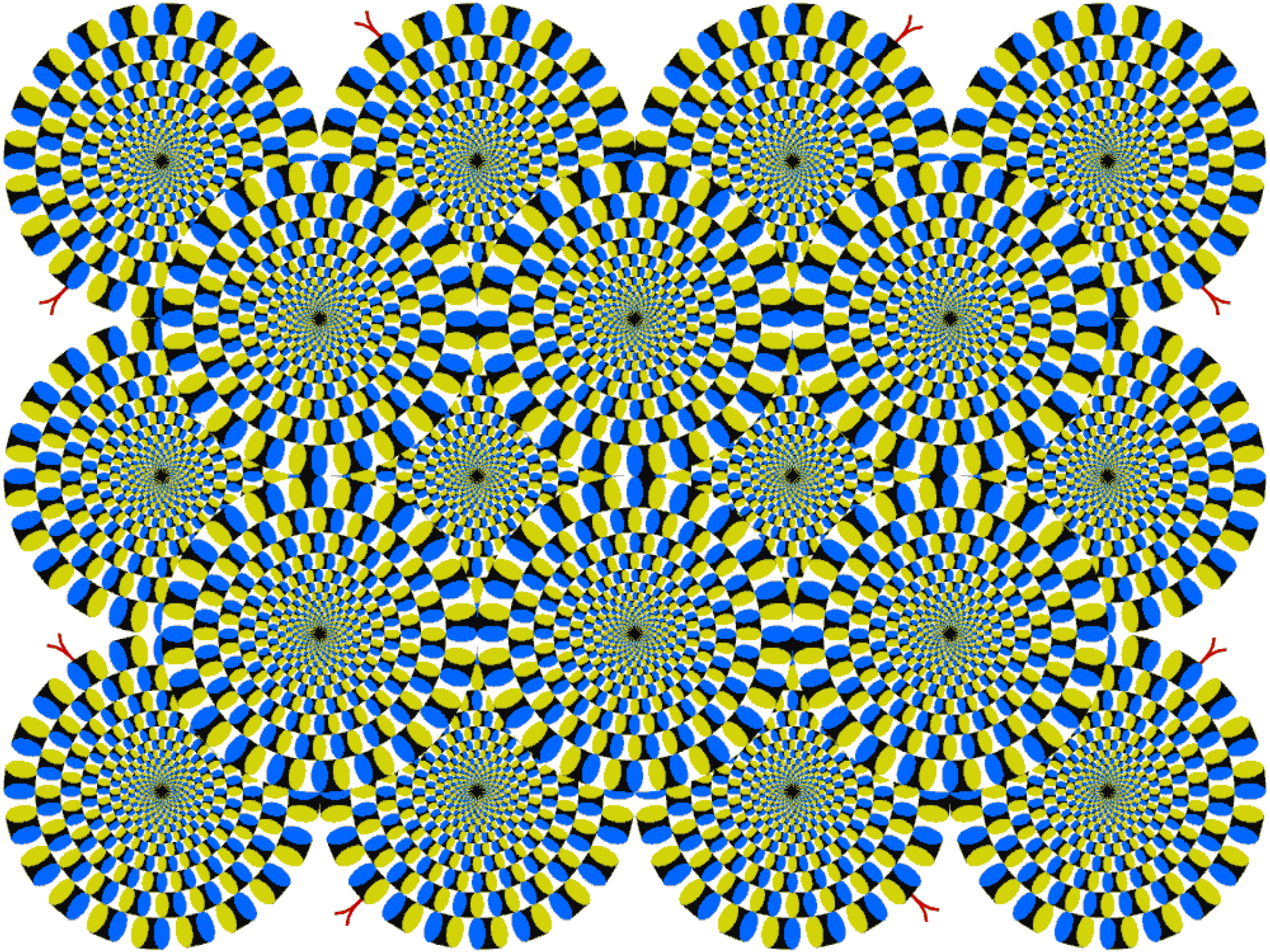




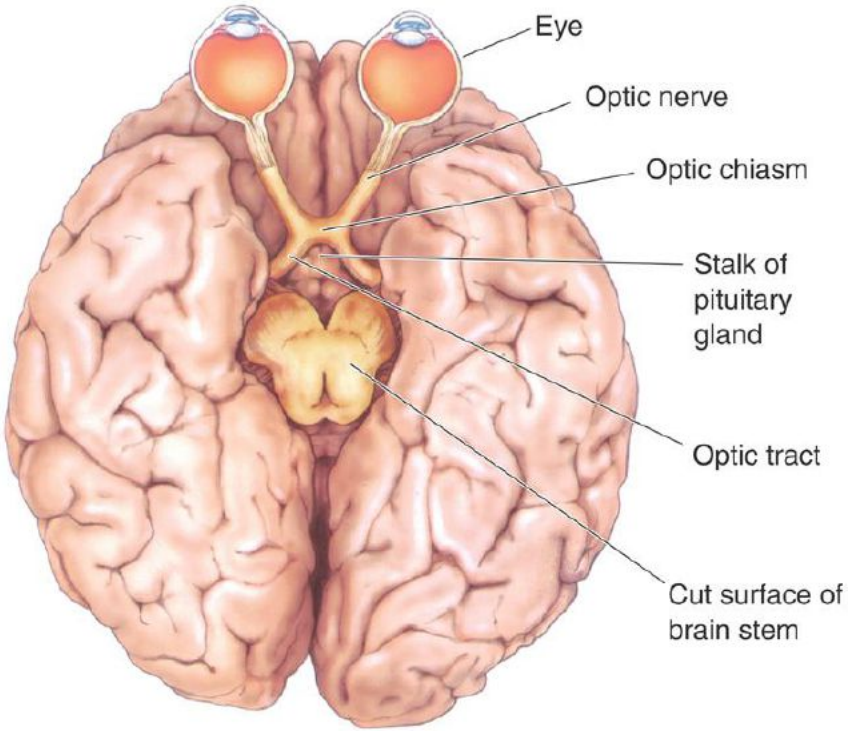


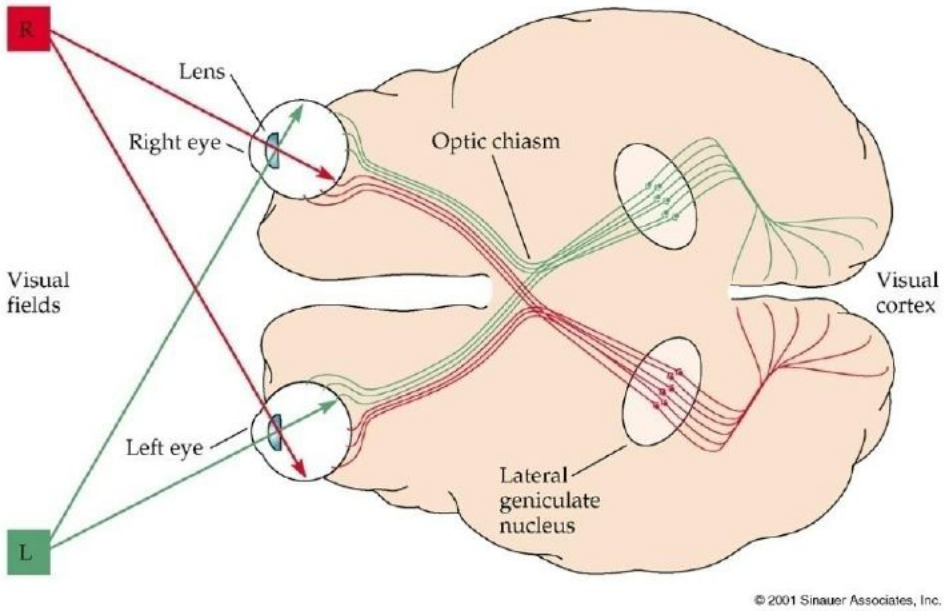


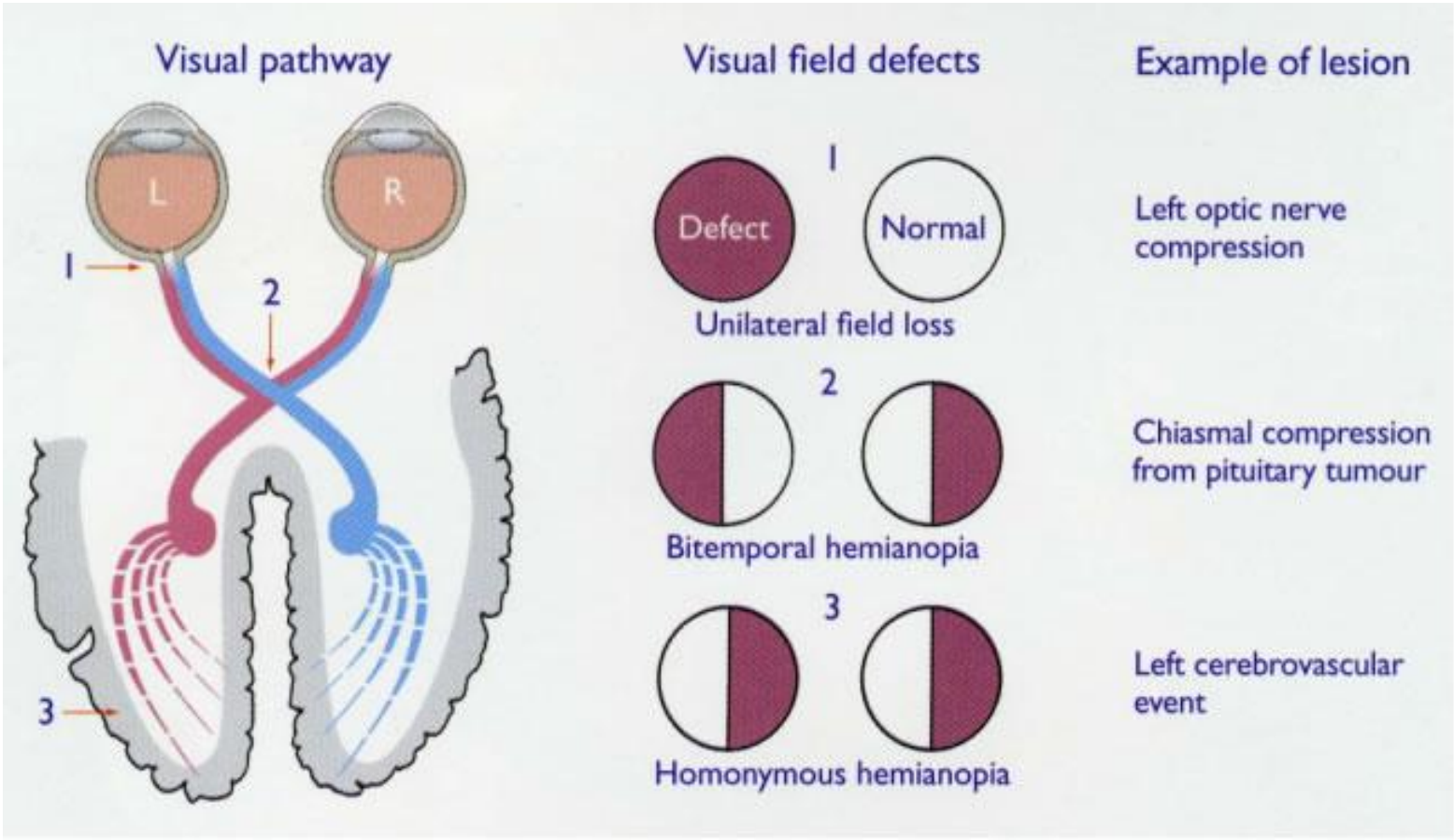


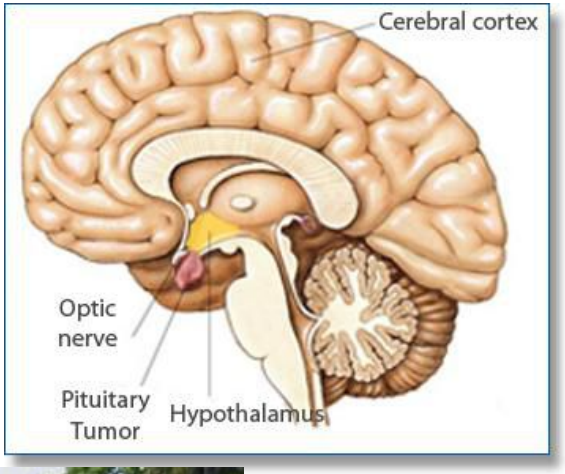


Căile centrale ale analizatorului vizual

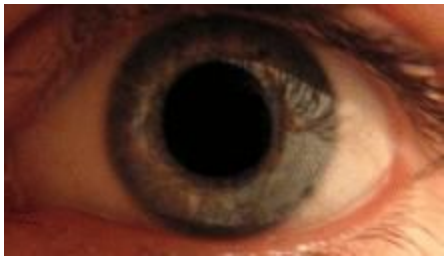


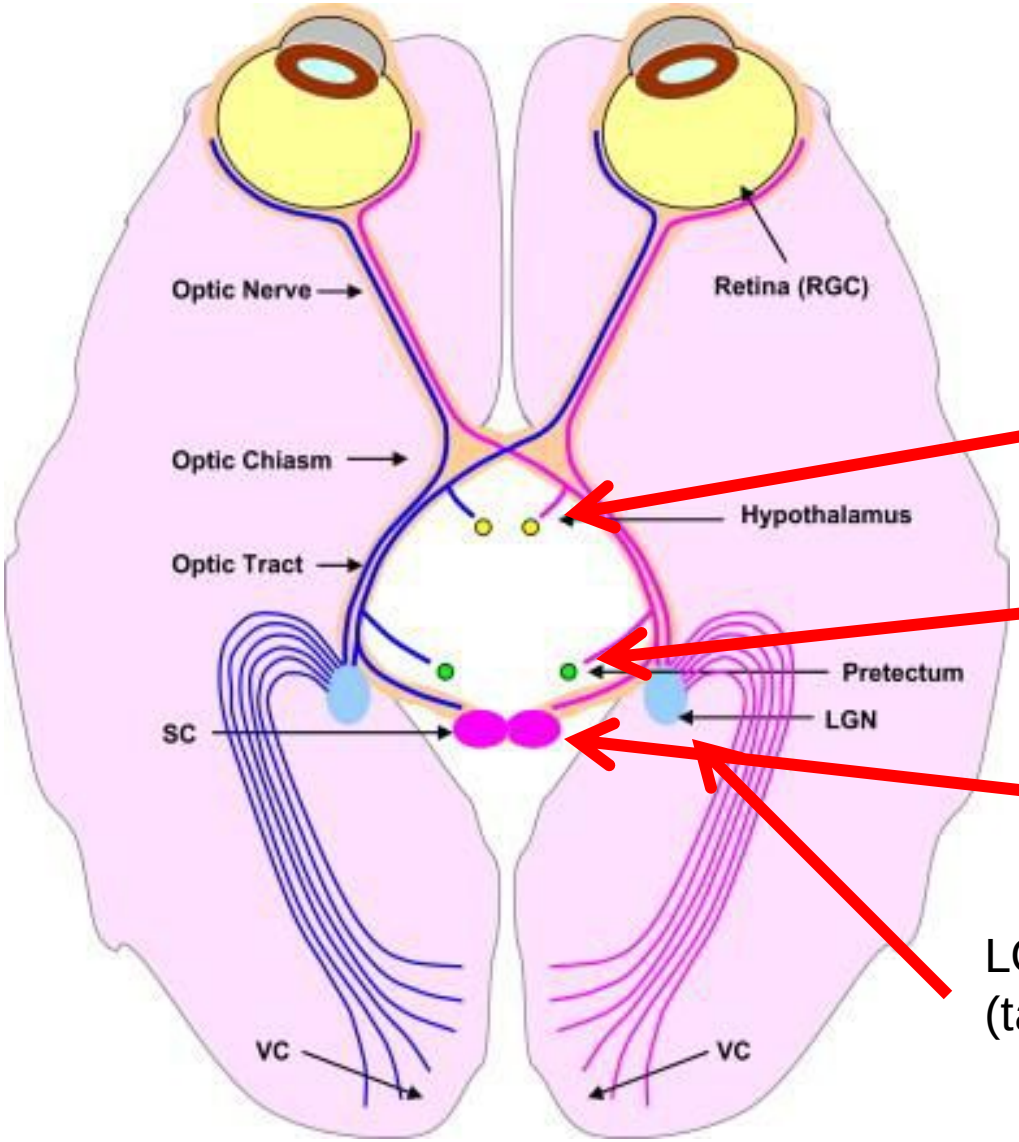



Visual pathway
L
R
1
2
3
Visual field defects
1
Defect
Normal
Unilateral field loss
2
Bitemporal hemianopia
3
Homonymous hemianopia
Example of lesion
Left optic nerve compression
Chiasmal compression from pituitary tumour
Left cerebrovascular event


Cerebral cortex
Optic nerve
Pituitary Tumor
Hypothalamus


Normal peripheral vision
Loss of peripheral vision with optic chiasm compression





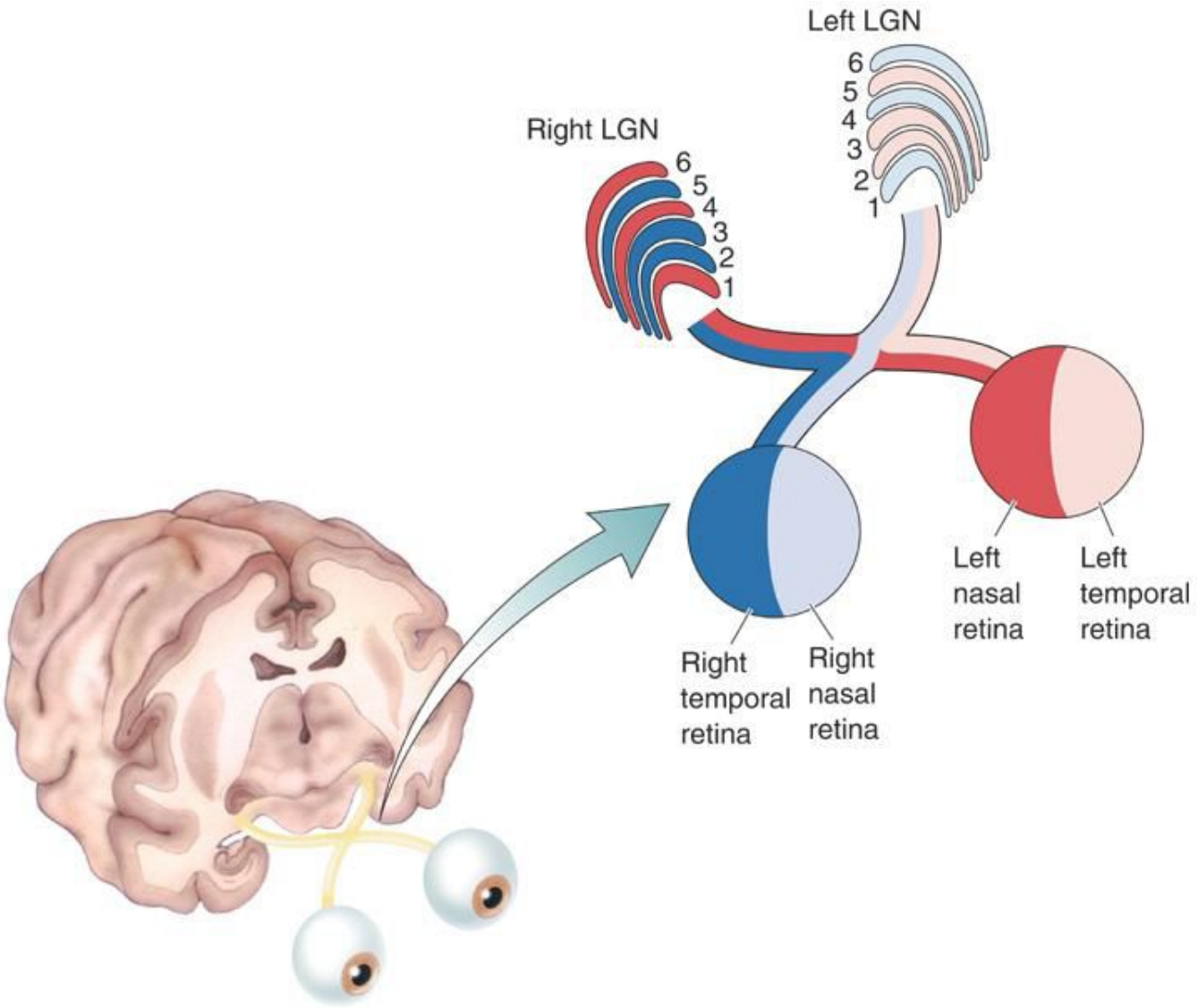
SCN – suprachiasmatic nucleus (hipotalamus)

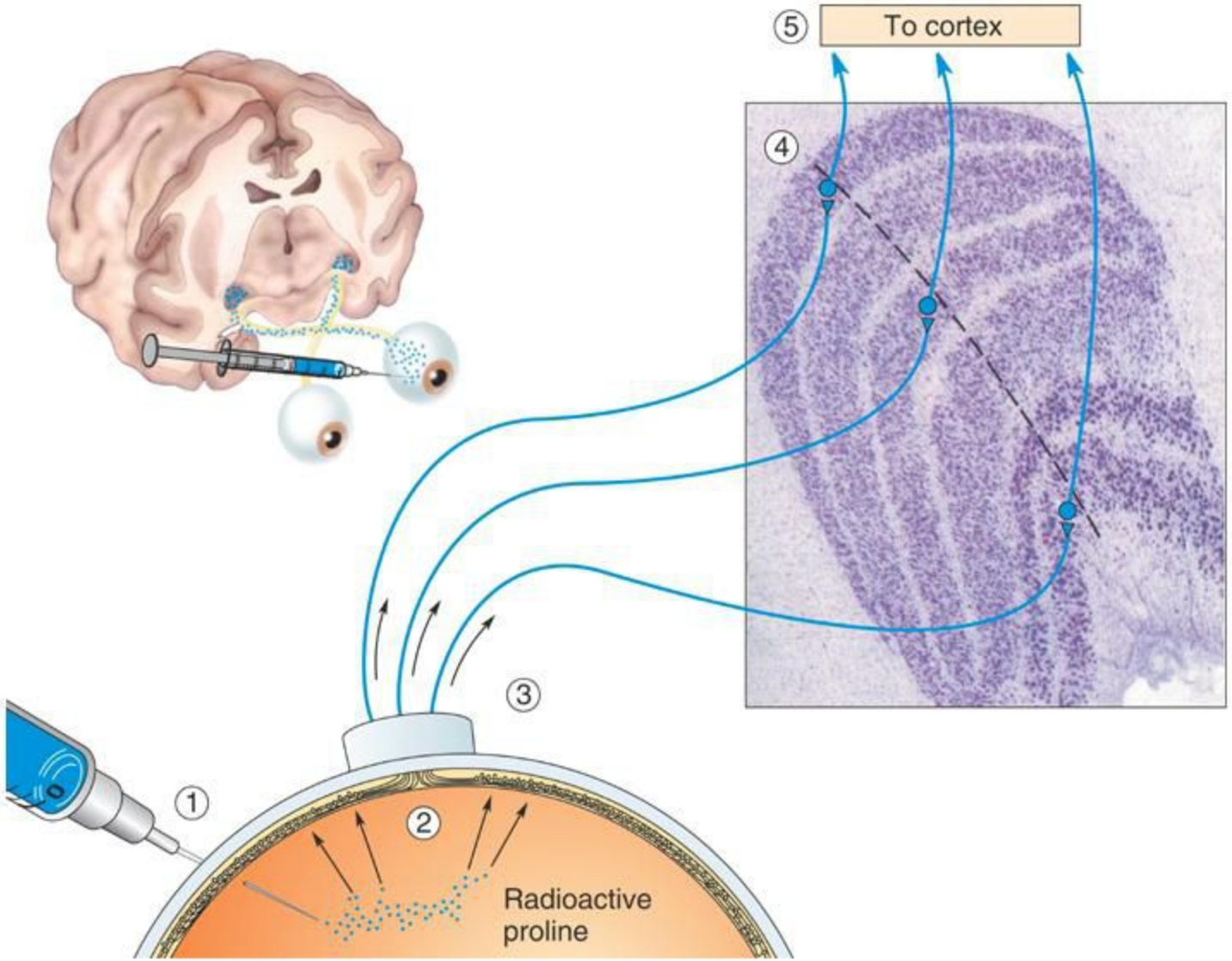
Pretectum (mezencefal)

SC - superior colliculus (mezencefal)

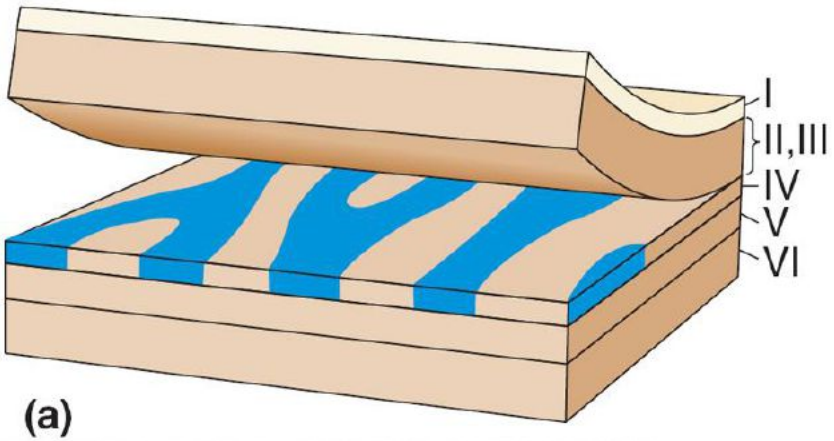
LGN – lateral geniculate nucleus (talamus)

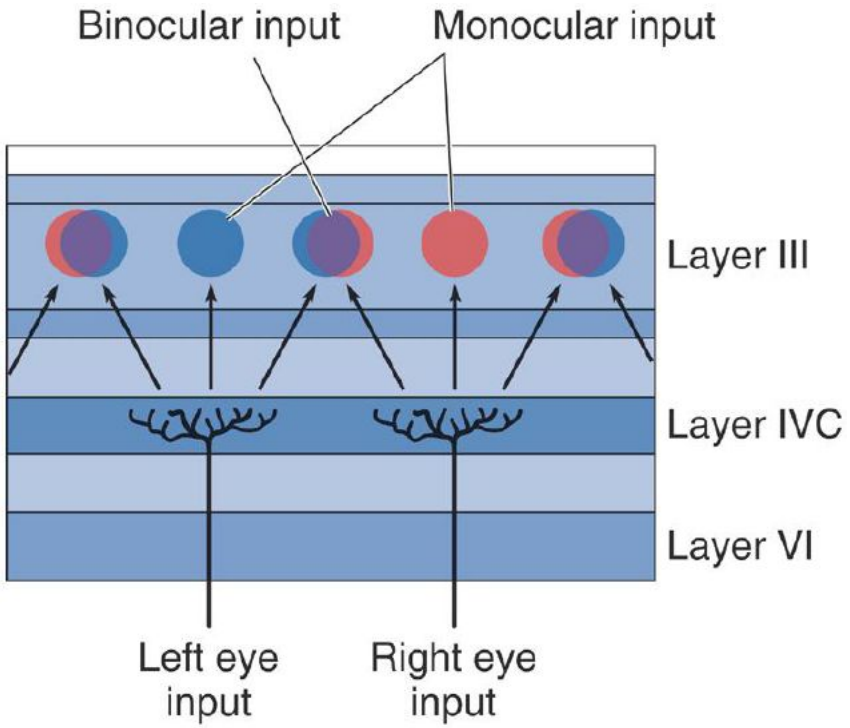
Nucleii geniculați laterali - Talamus



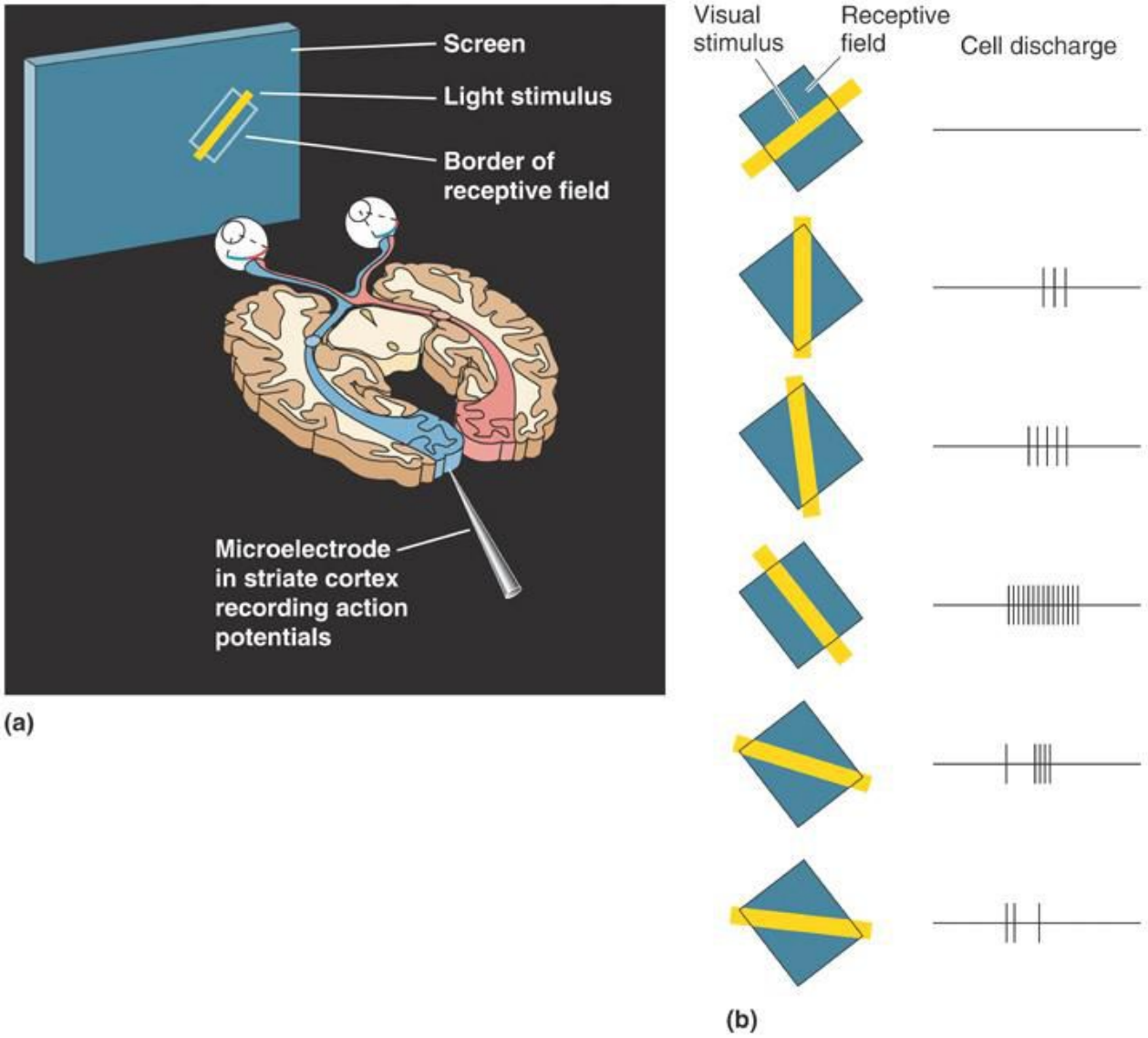


Coloane de dominanță oculară

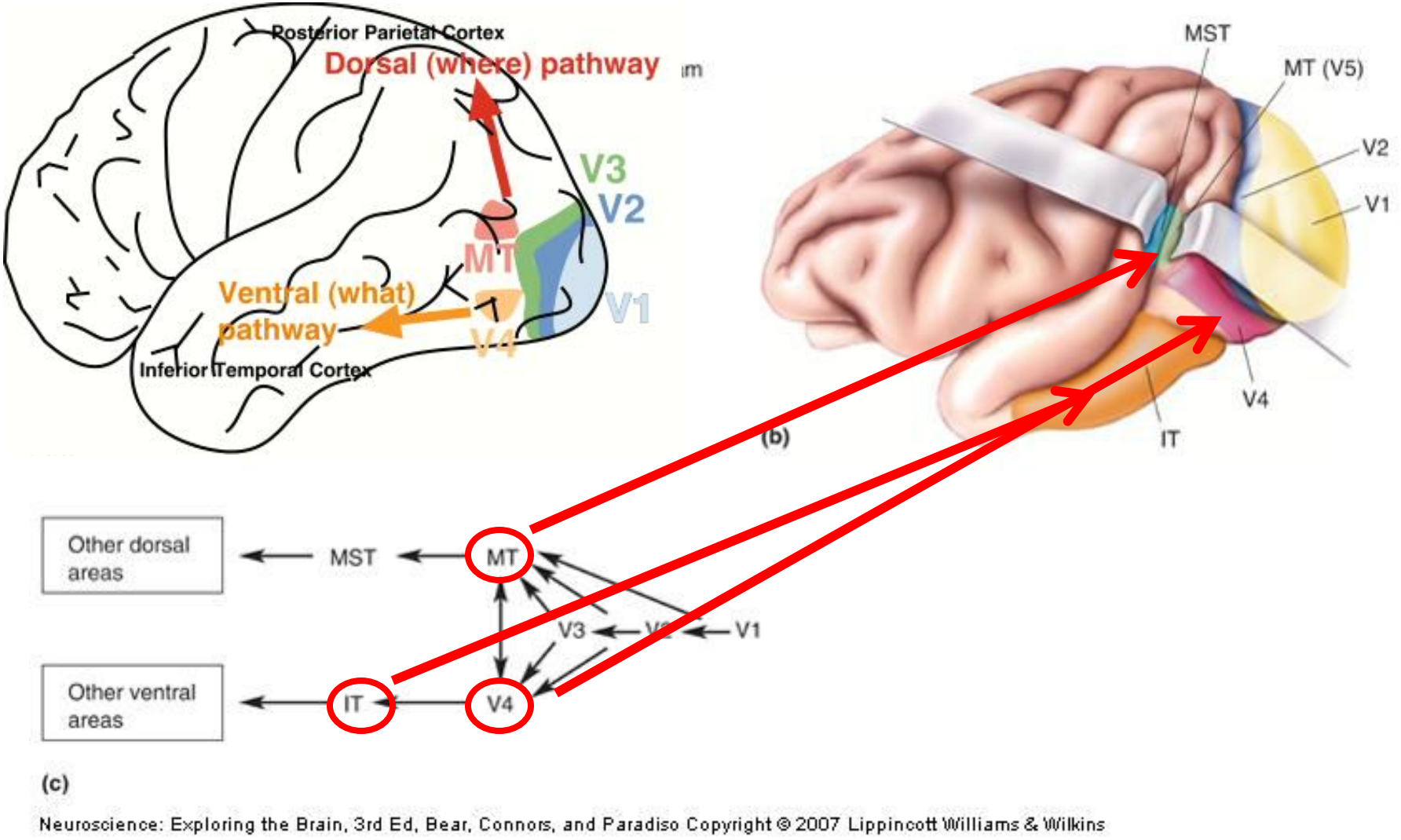




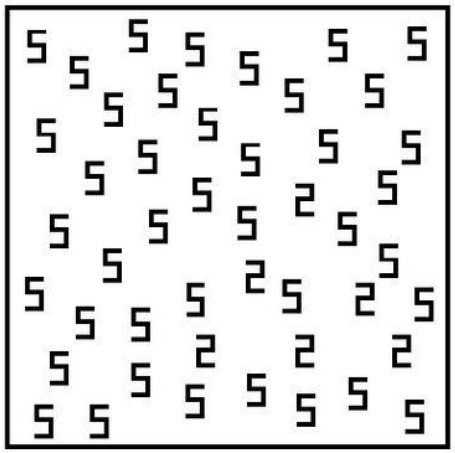
Cortexul vizual primar

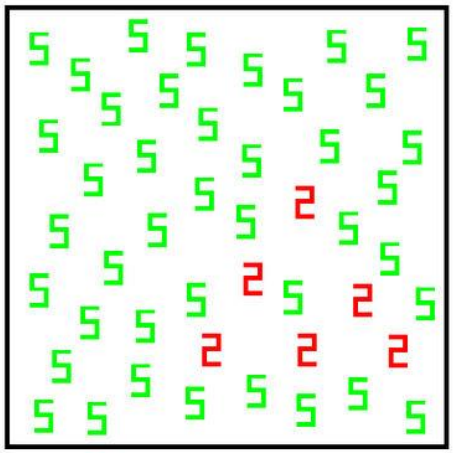


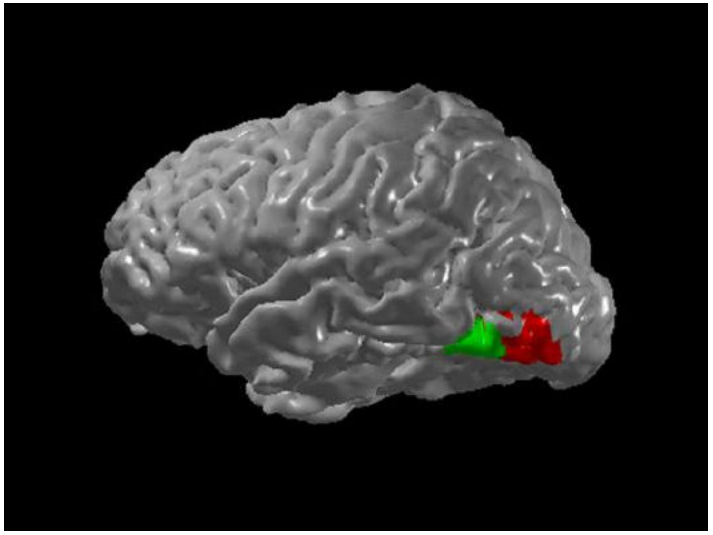
Procesarea vizuala secundara – output-ul V1



Sinestezia “numere – culori”





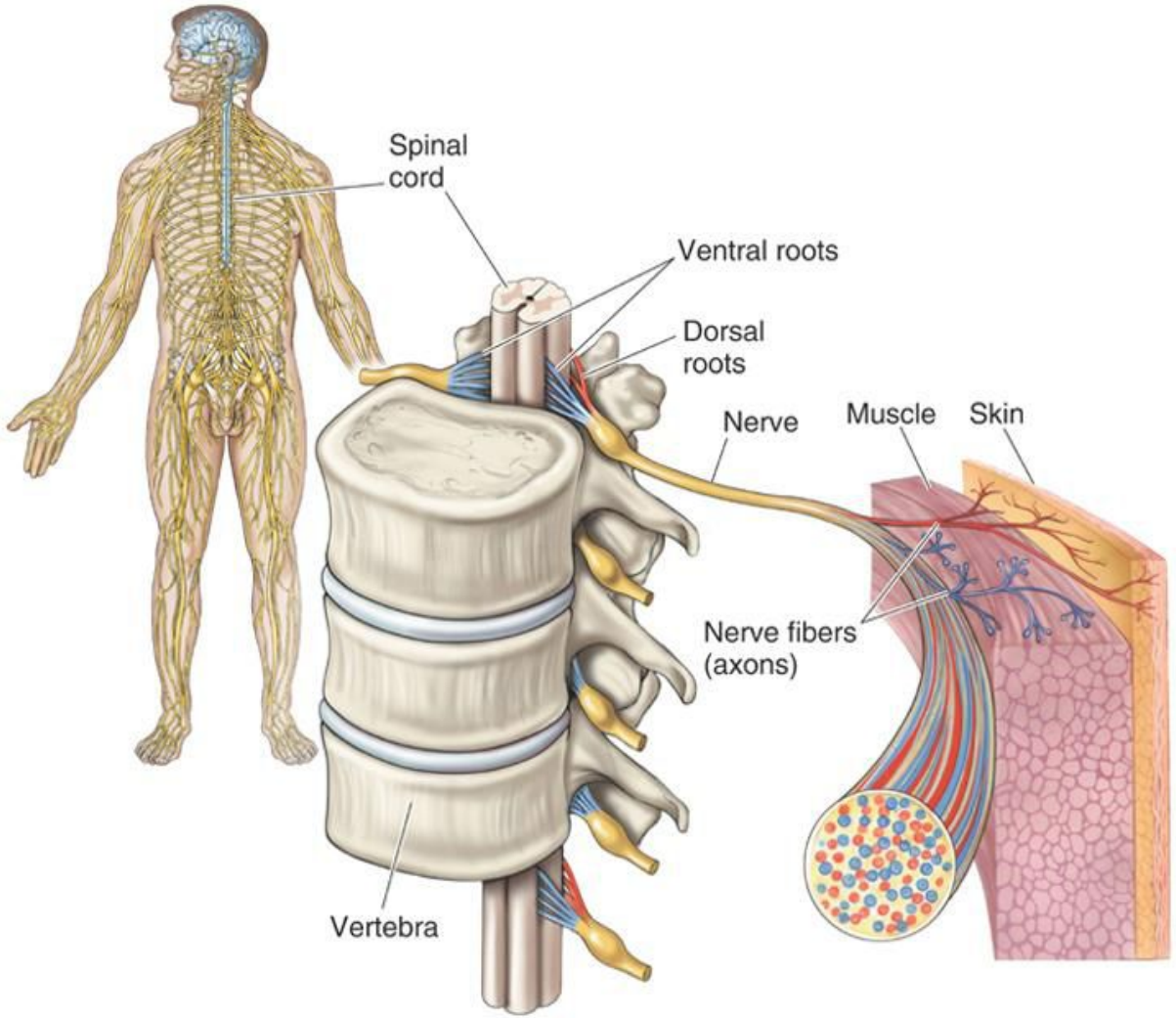


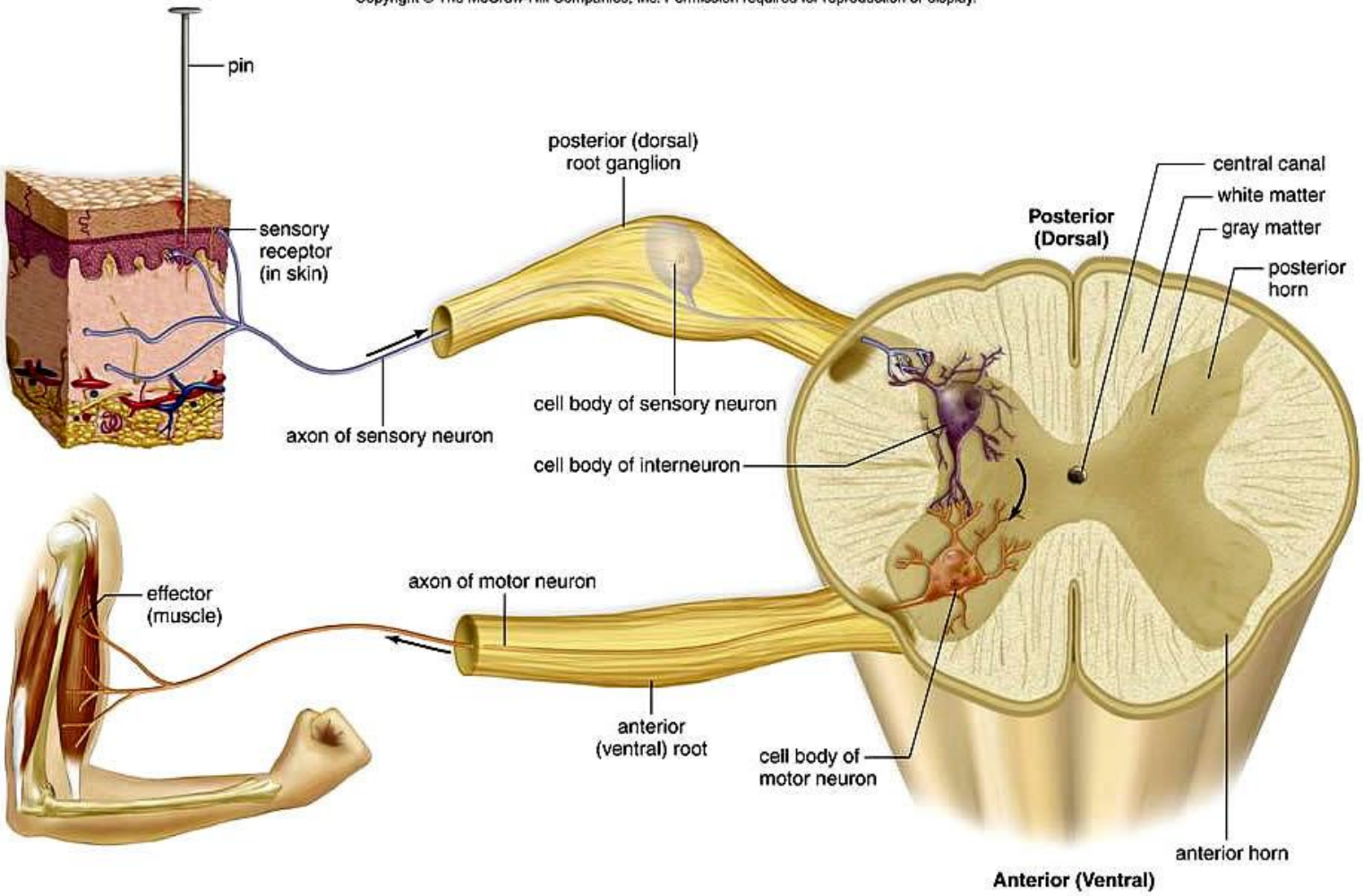
V. Analizatorul somatic

Analizatorul somatic

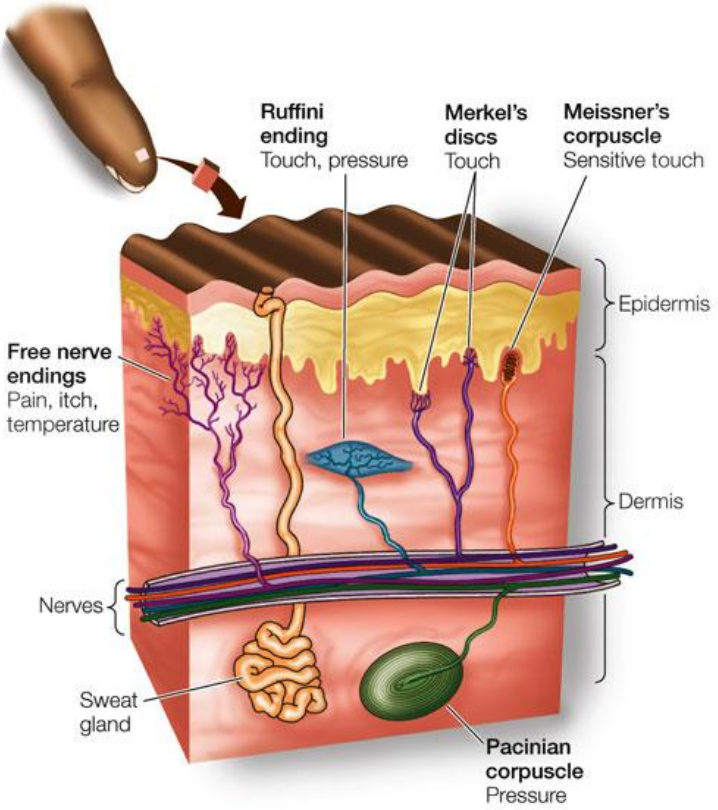
-receptorii sunt distribuiți pe toată suprafața corpului şi la nivelul organelor interne

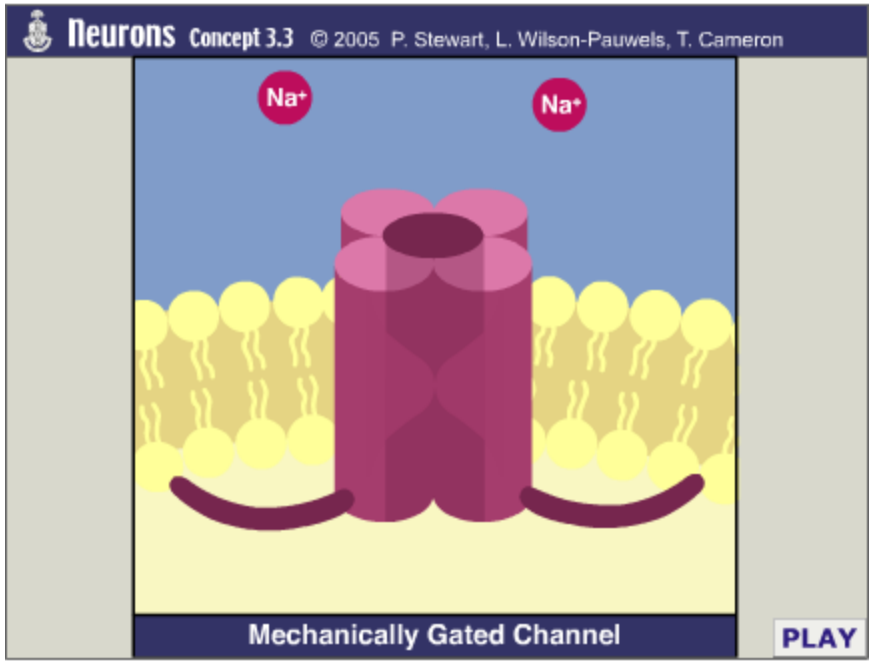
-receptionează informații legate de stimuli tactili, termici, dureroşi (nocicepție) precum şi de poziția corpului (proprioceptie)





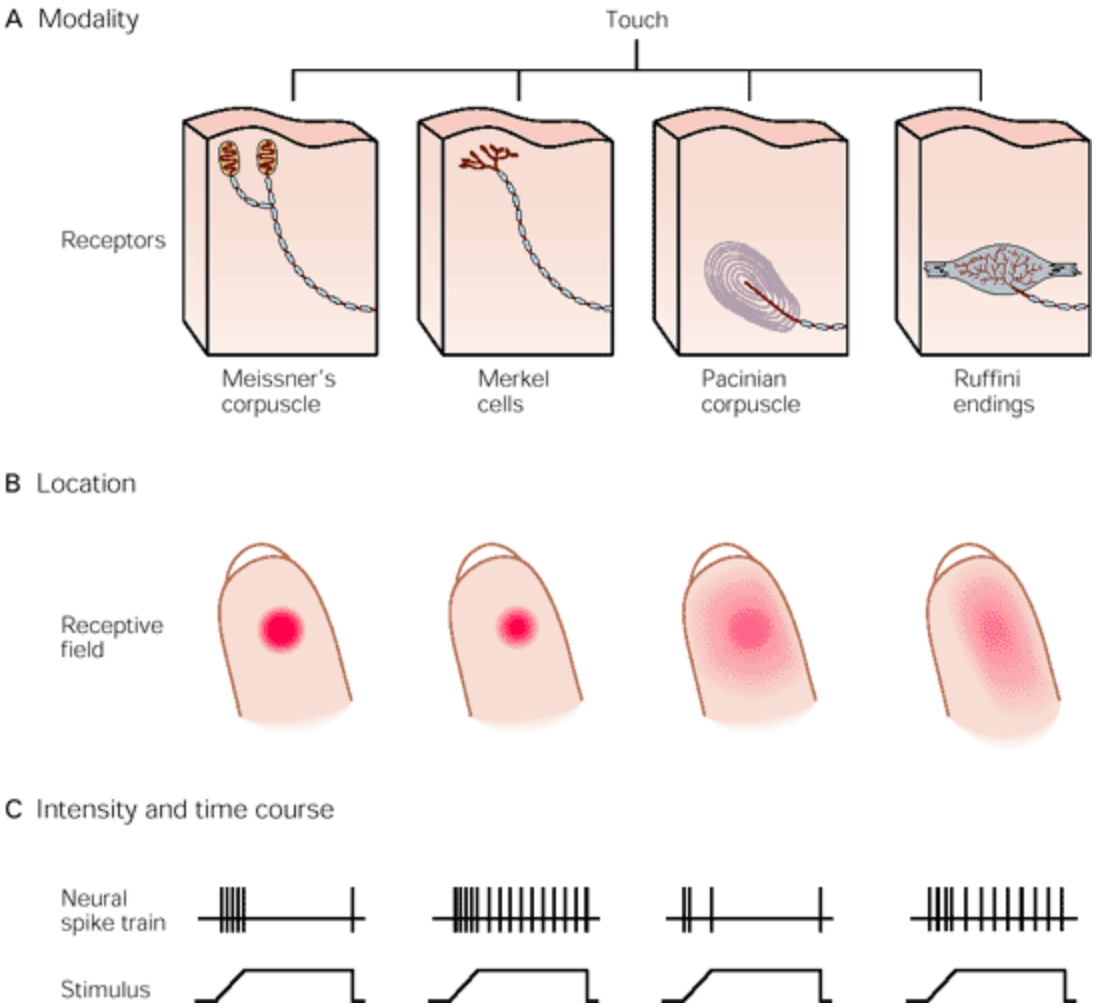
Mecanoreceptori tactili



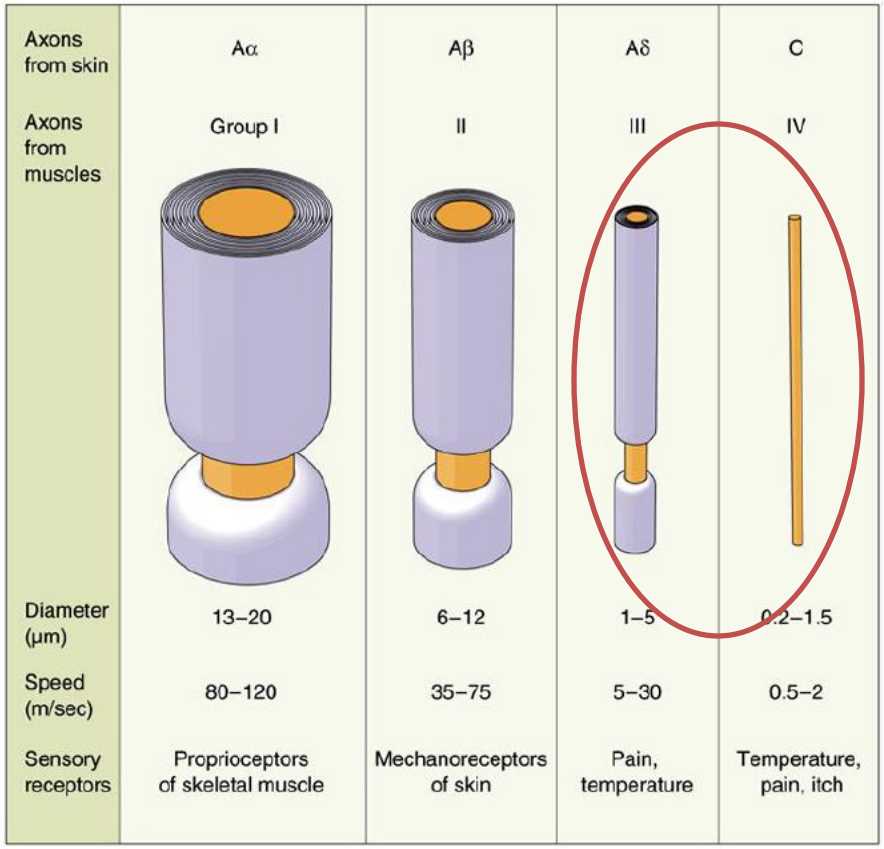


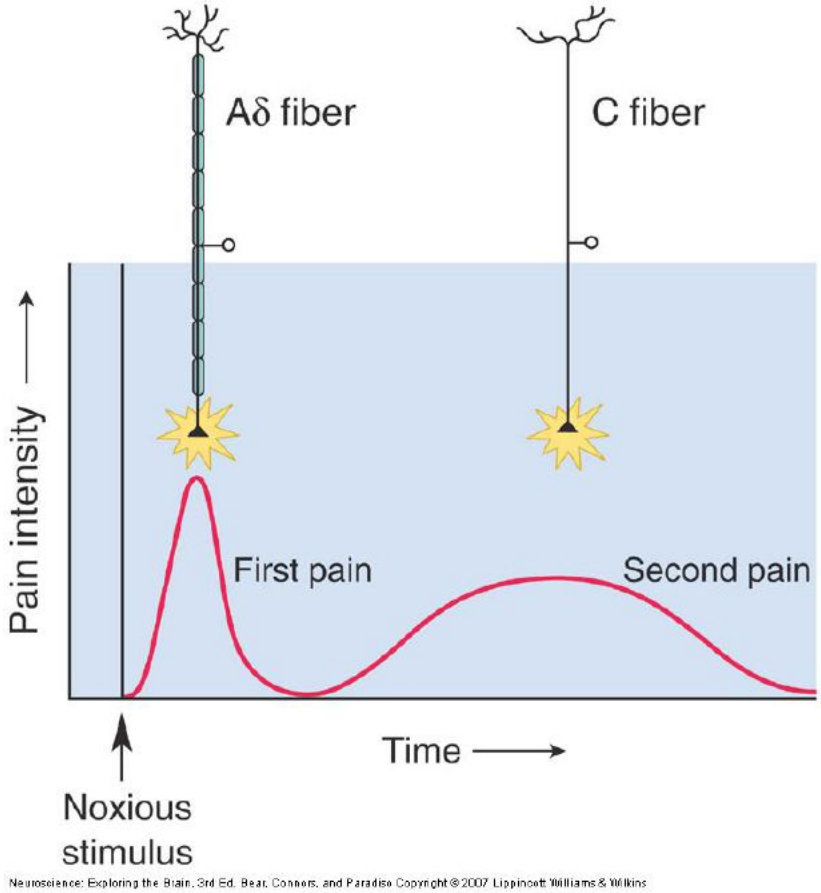
FE 8e, Figure 45.6

Tipuri de mecano-receptori cutanați

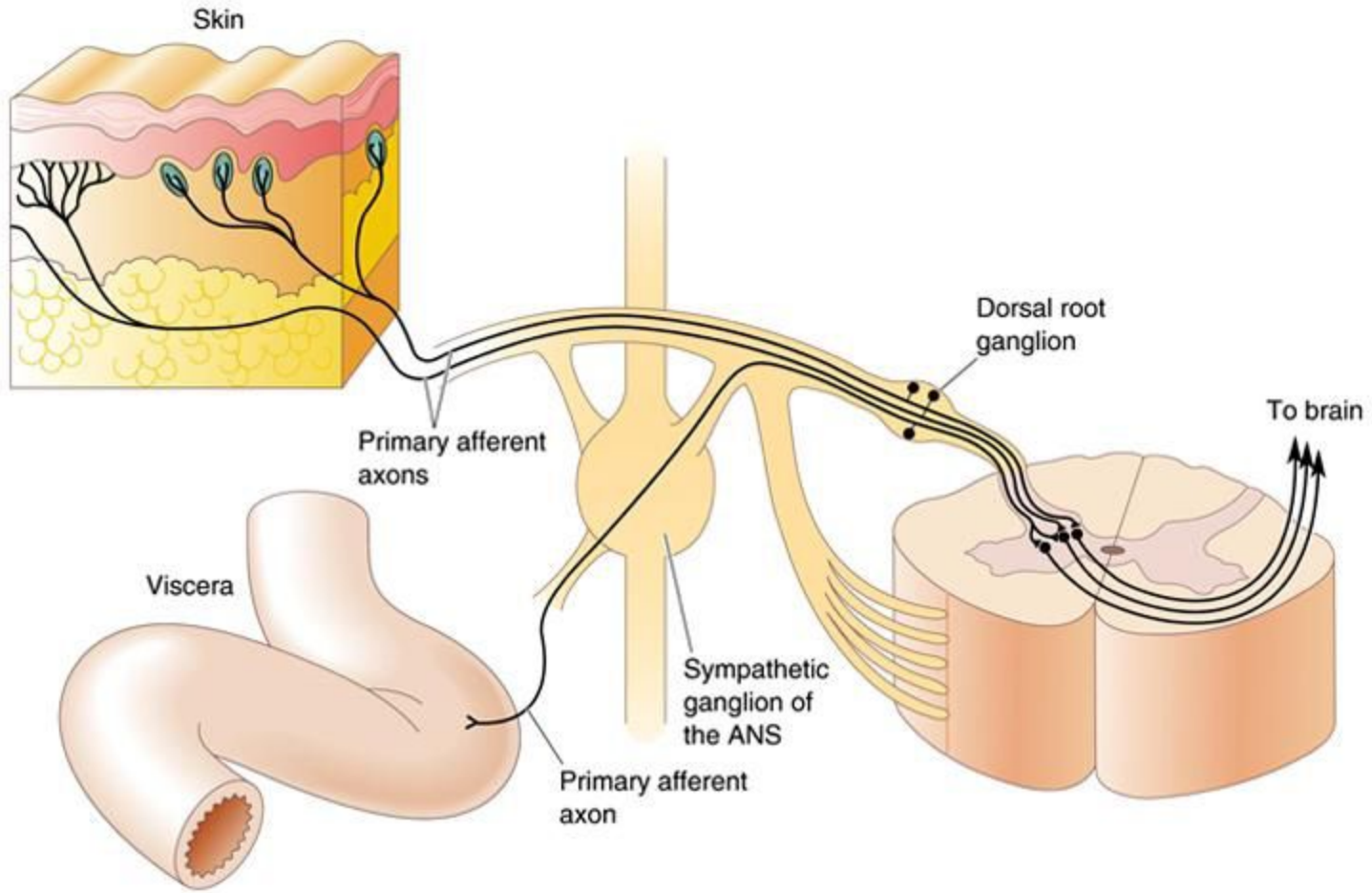


Clasificarea neuronilor somato-senzitivi în funcție de tipul de axon

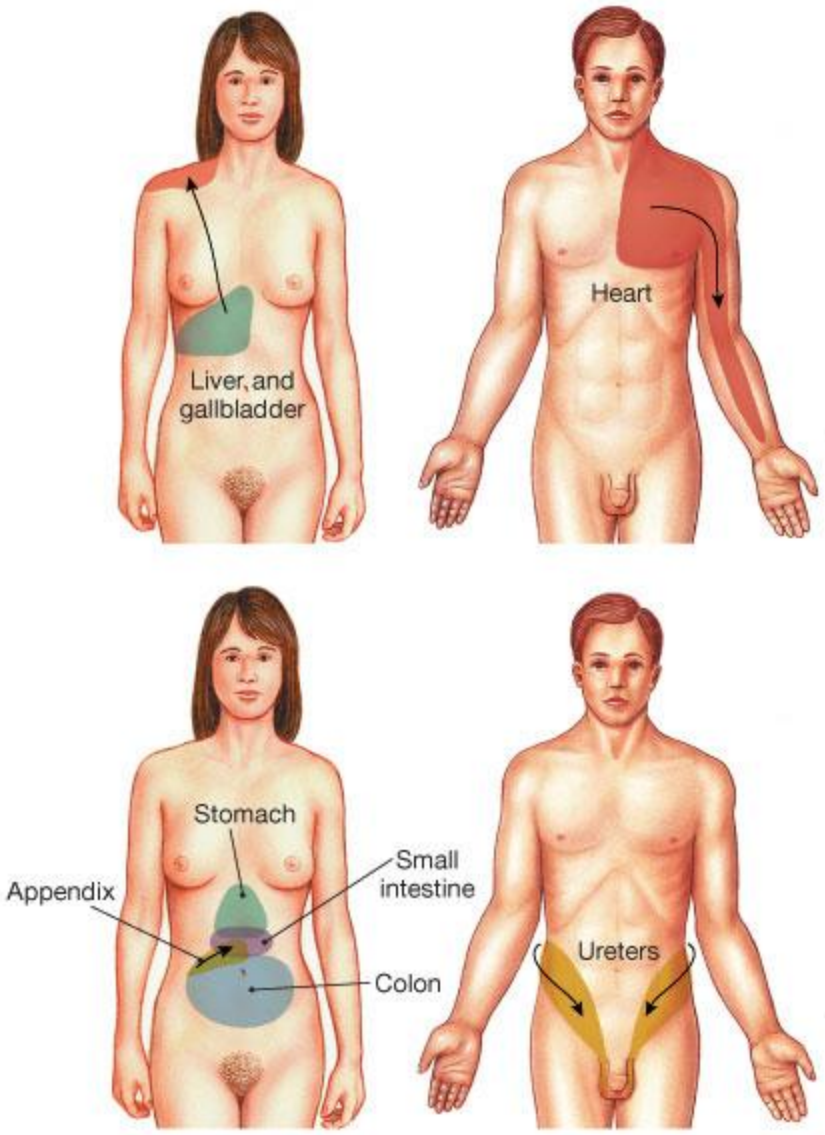




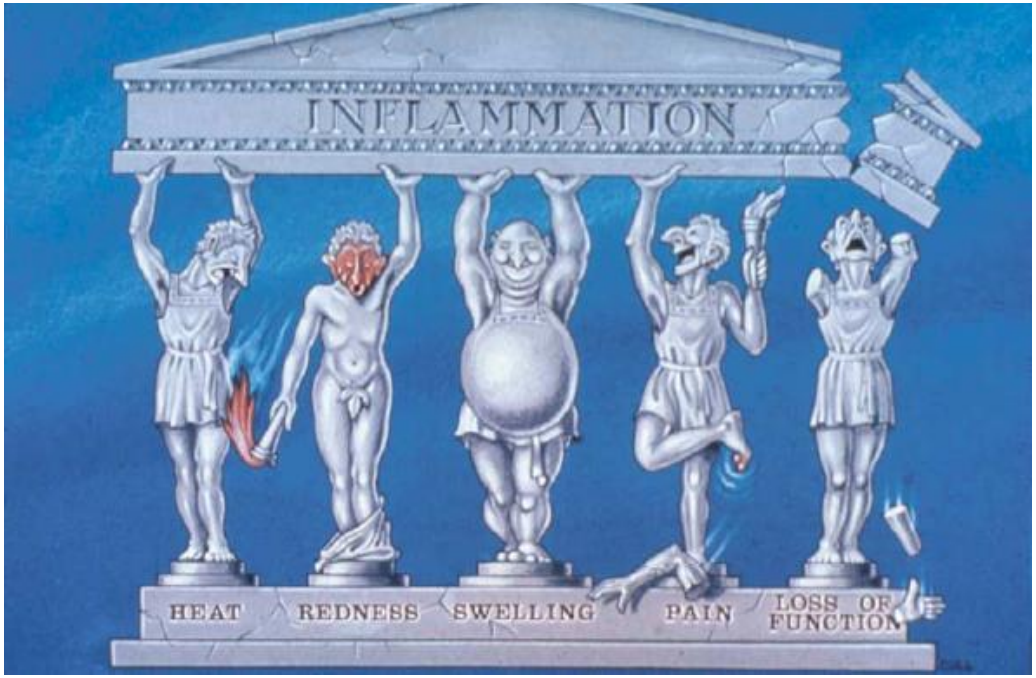
Mecanismul durerii reflectate



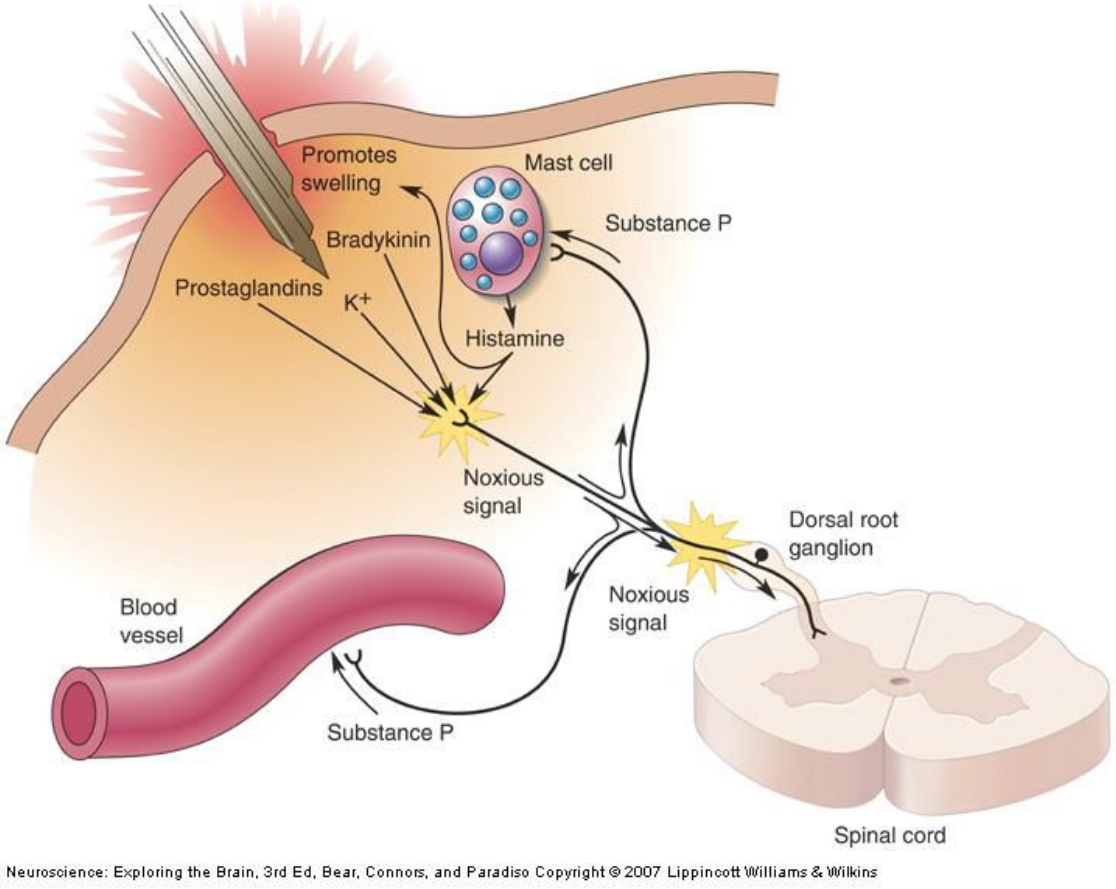
Mecanismul durerii reflectate



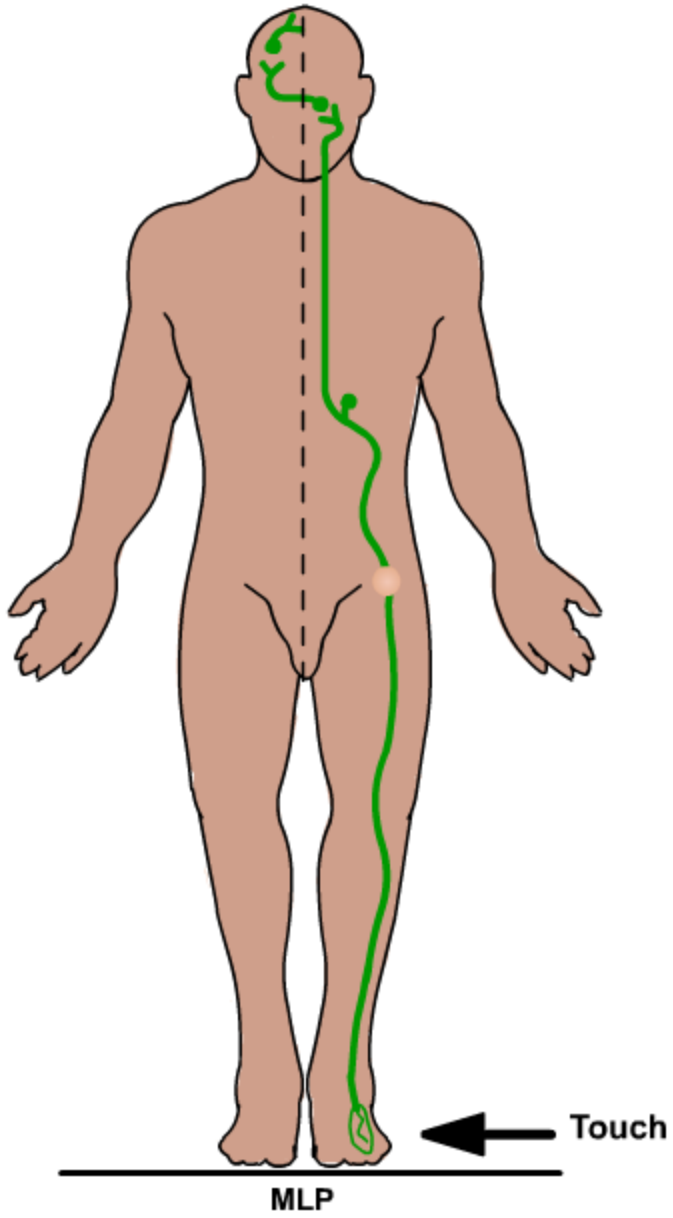

TIME
BUSH'S MILITARY RECORDS IS DISNEY MOUSETRAPPED?
THE SECRET KILLER
The surprising link between INFLAMMATION and HEART ATTACKS, CANCER, ALZHEIMER'S and other diseases
What you can do to fight it

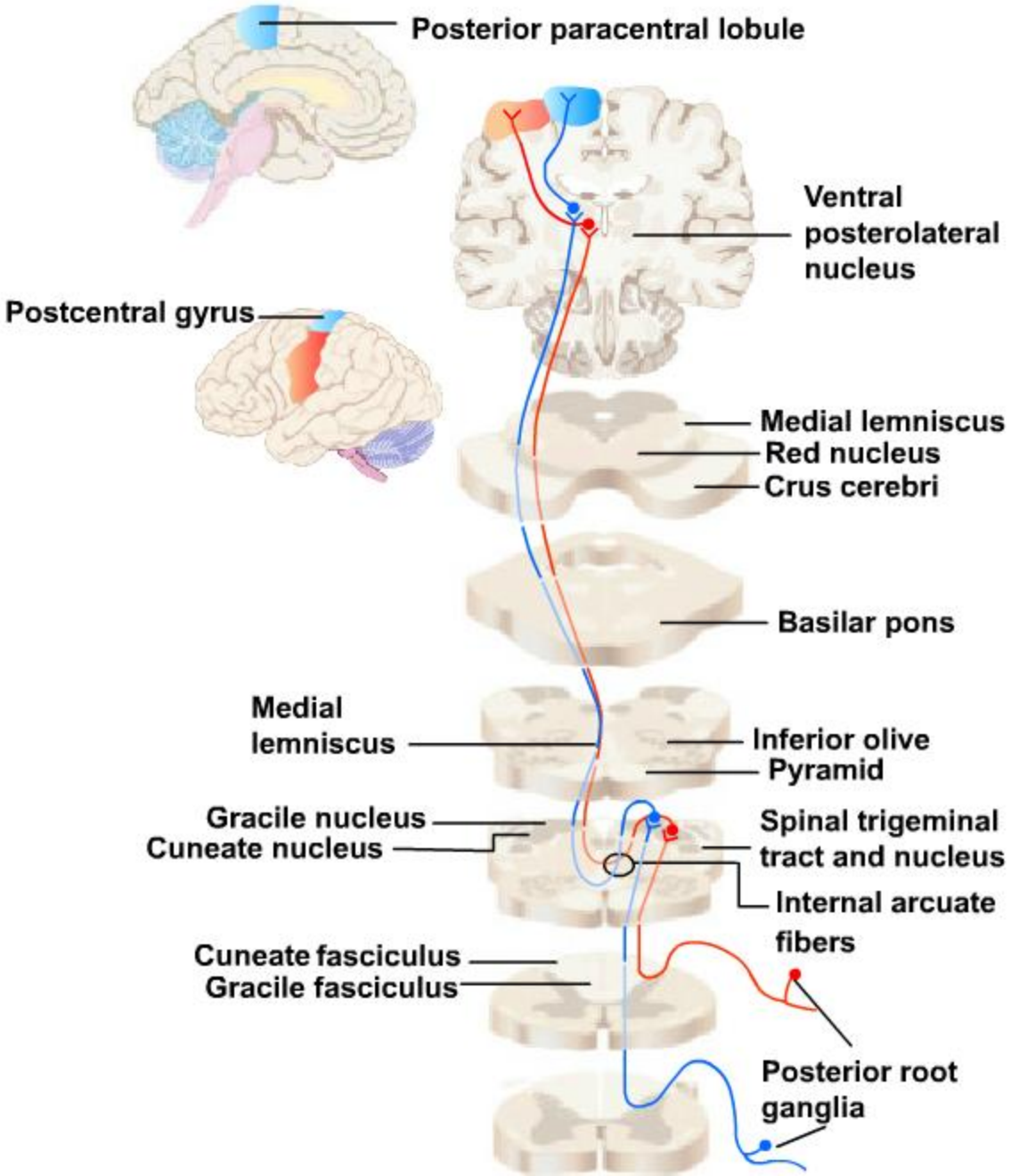

INFLAMMATION
HEAT
REDNESS
SWELLING
PAIN
LOSS OF FUNCTION

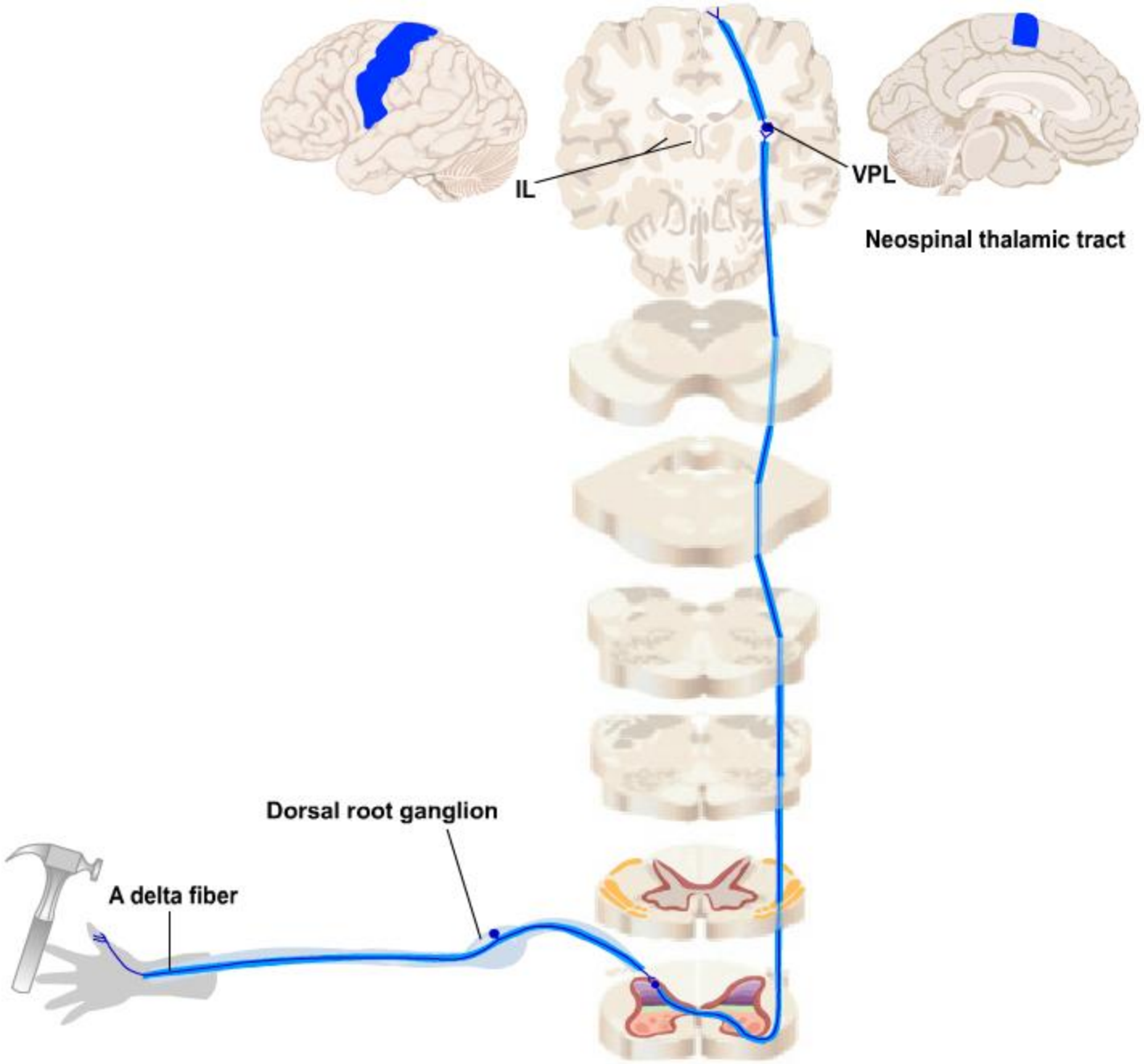
Sensibilizarea nociceptorilor primari în stări inflamatorii

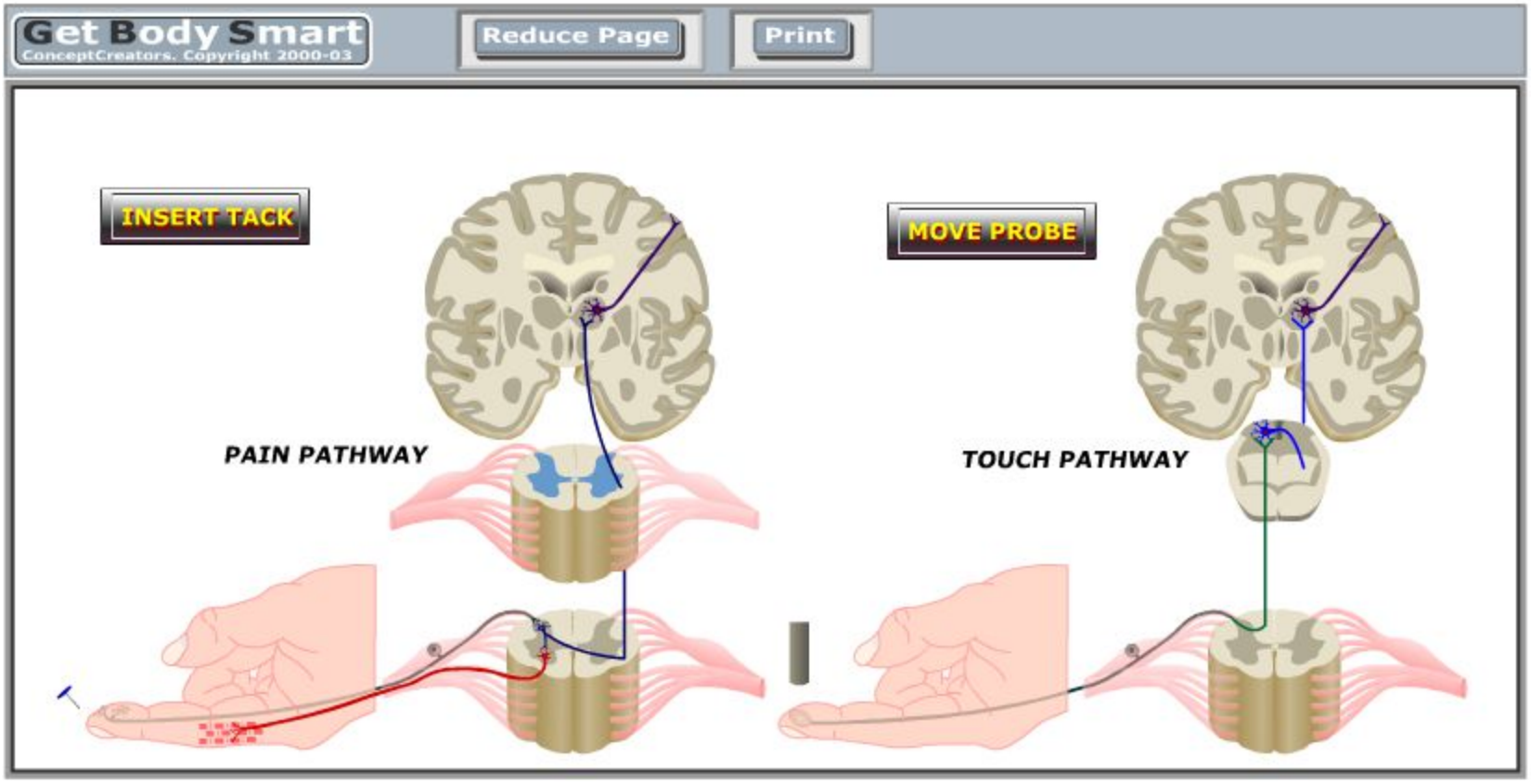


-imunocite (mastocite, macrofage) și alte celule rezidente (celule Schwann, plachete sangvine, etc…) eliberează o serie de mediatori inflamatori (PGE_2, histamină, NGF, etc…) care interacționează cu receptorii lor din membrana nociceptorilor


Touch
MLP


Posterior paracentral lobule
Ventral posterolateral nucleus
Postcentral gyrus
Medial lemniscus
Red nucleus
Crus cerebri
Basilar pons
Medial lemniscus
Inferior olive
Pyramid
Gracile nucleus
Cuneate nucleus
Spinal trigeminal tract and nucleus
Internal arcuate fibers
Cuneate fasciculus
Gracile fasciculus
Posterior root ganglia


IL
VPL
Neospinal thalamic tract
Dorsal root ganglion
A delta fiber


Get Body Smart
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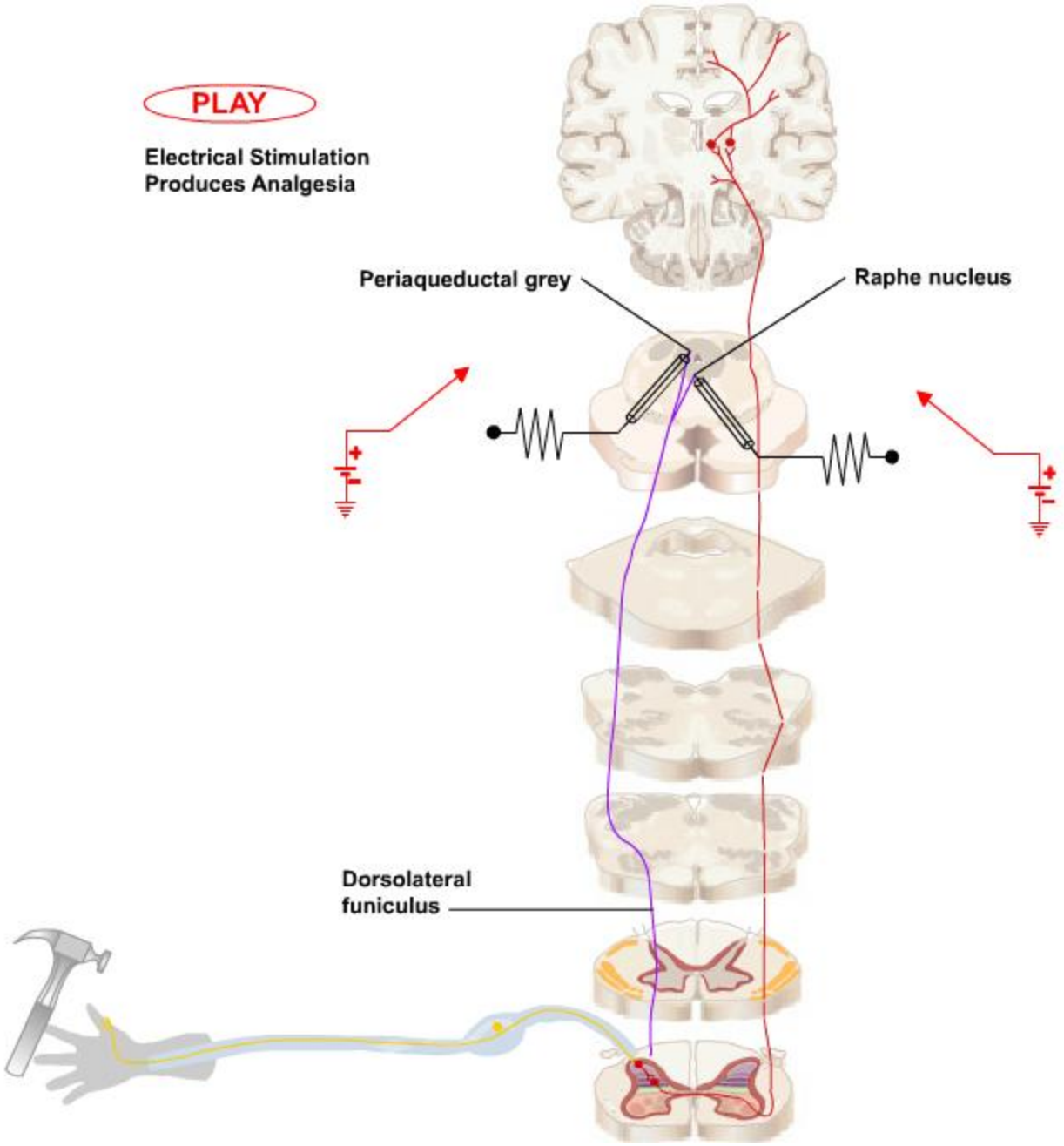
Reduce Page
Print
INSERT TACK
PAIN PATHWAY
MOVE PROBE
TOUCH PATHWAY


PLAY
Electrical Stimulation
Produces Analgesia
Periaqueductal grey
Raphe nucleus
Dorsolateral
funiculus

Sistemul serotonergic descendent de inhibare a semnalizarii durerii