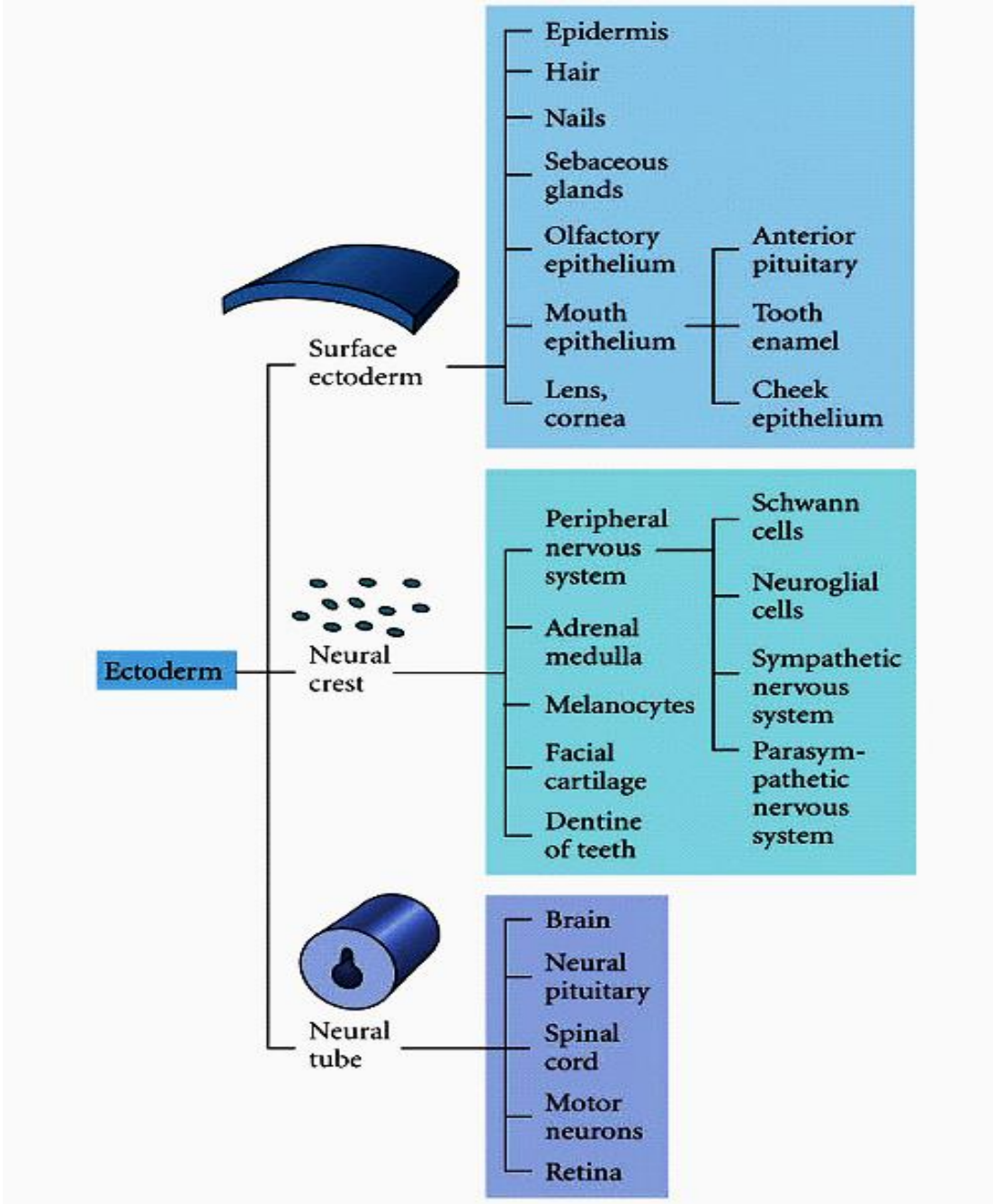
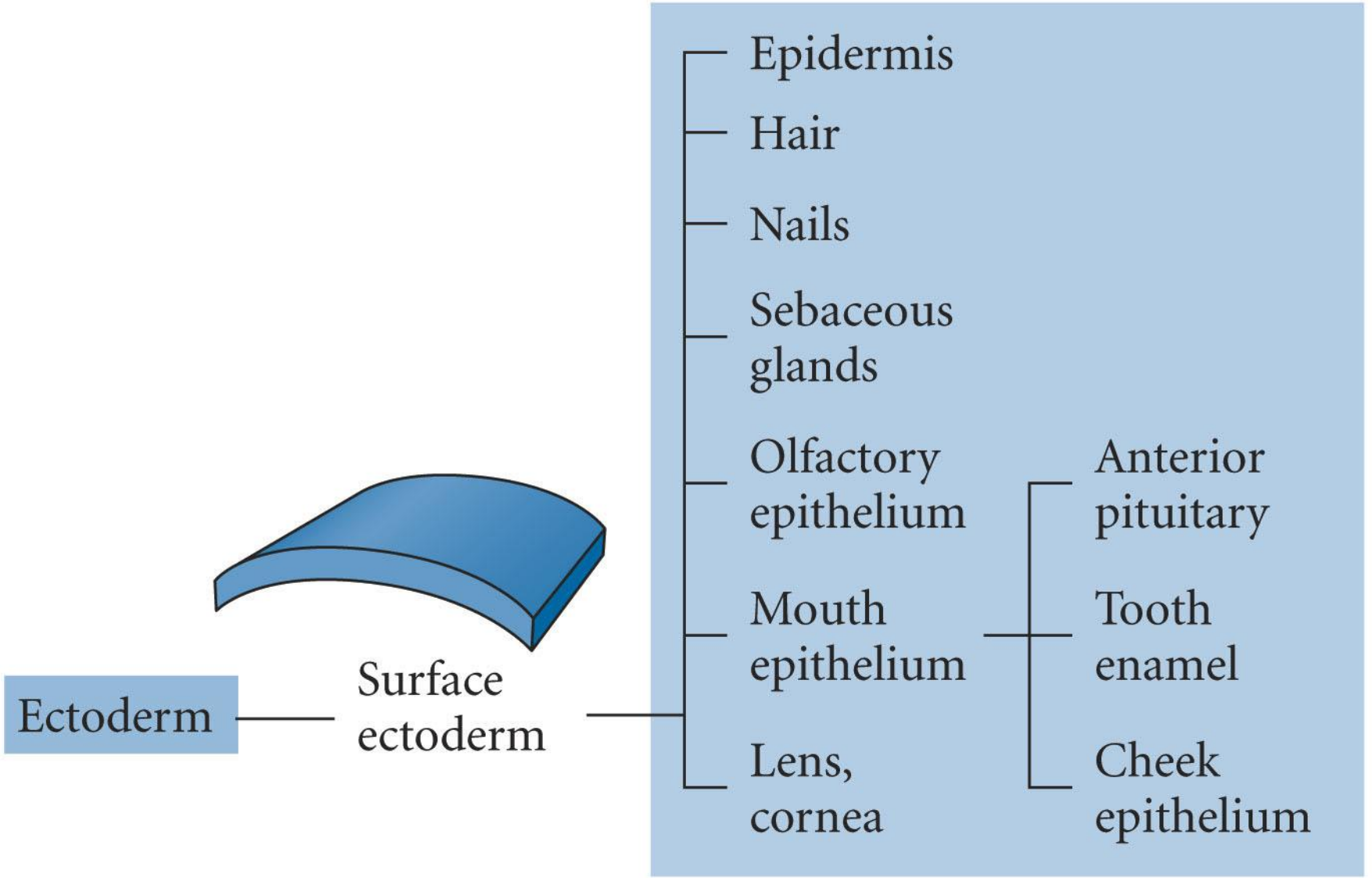
Neurulación

Derivados ectodérmicos

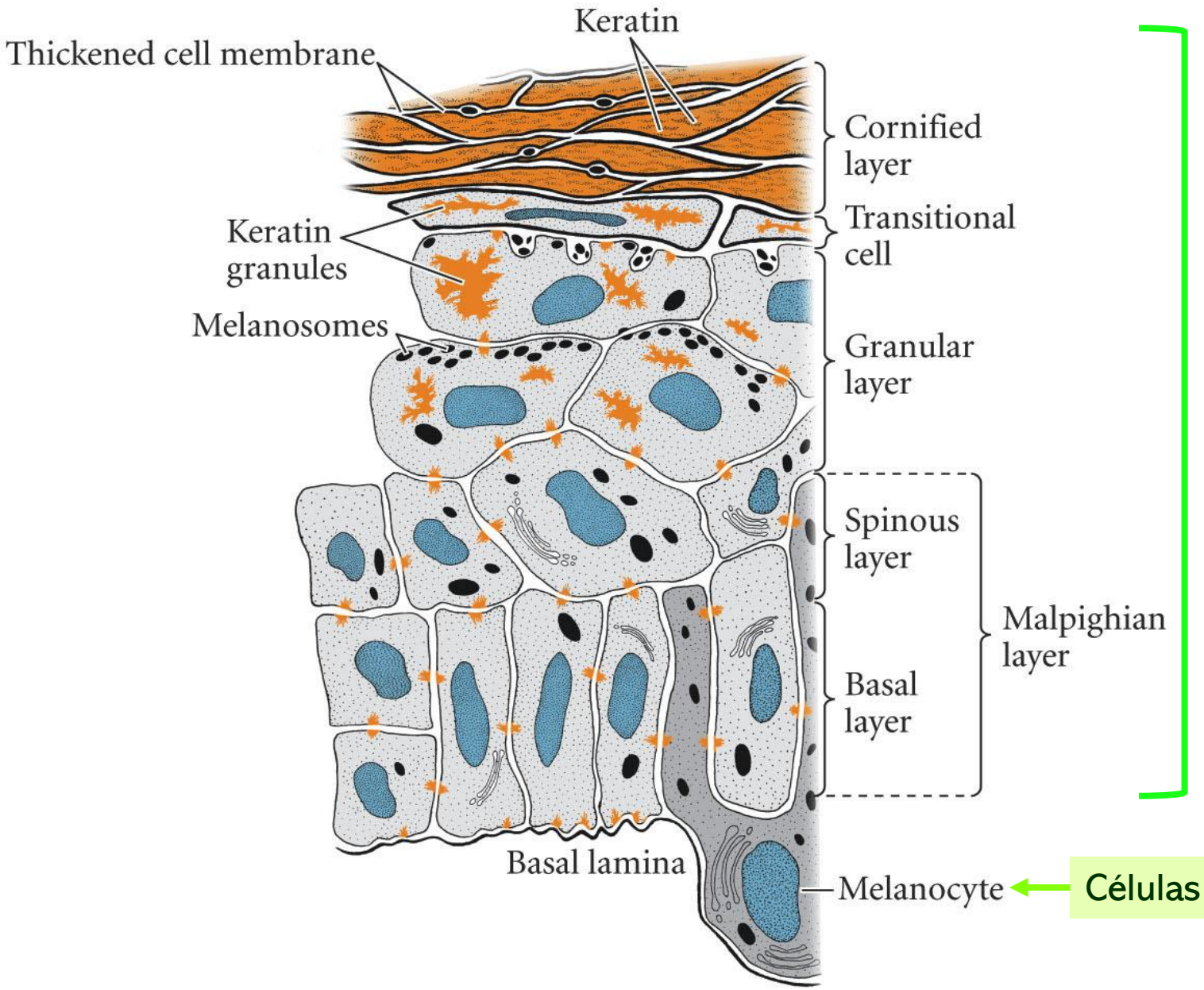


Derivados ectodérmicos



DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.1 (Part 1)

Derivados ectodérmicos



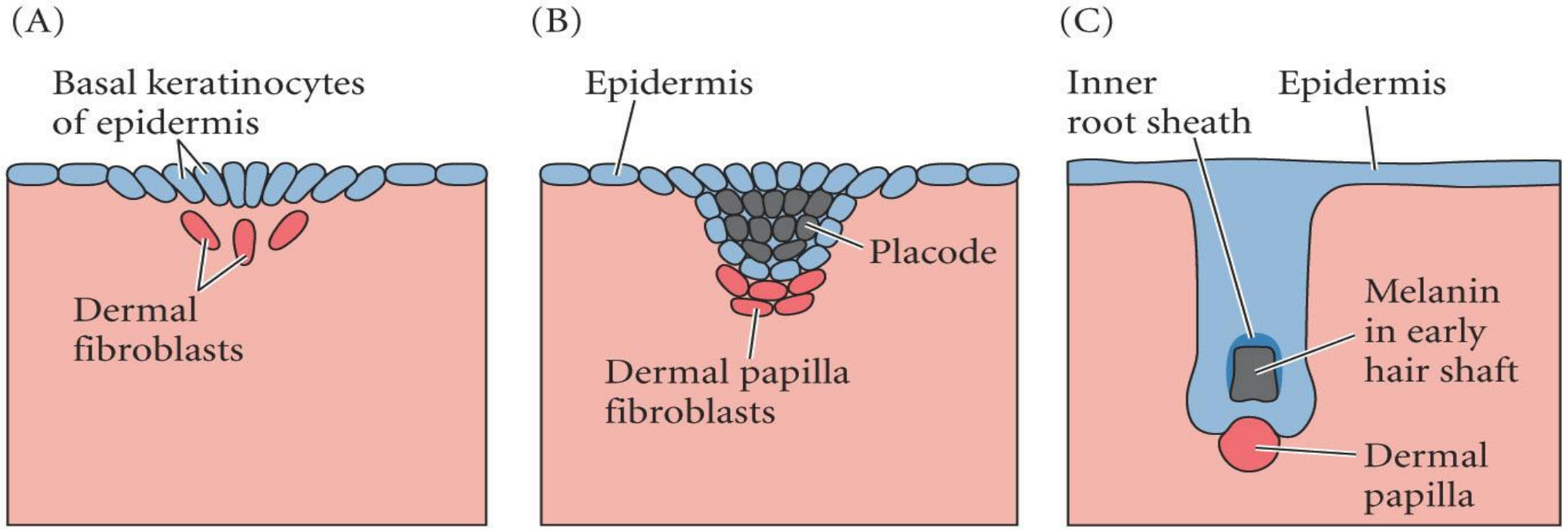
Ectodermo cutáneo

Epidermis

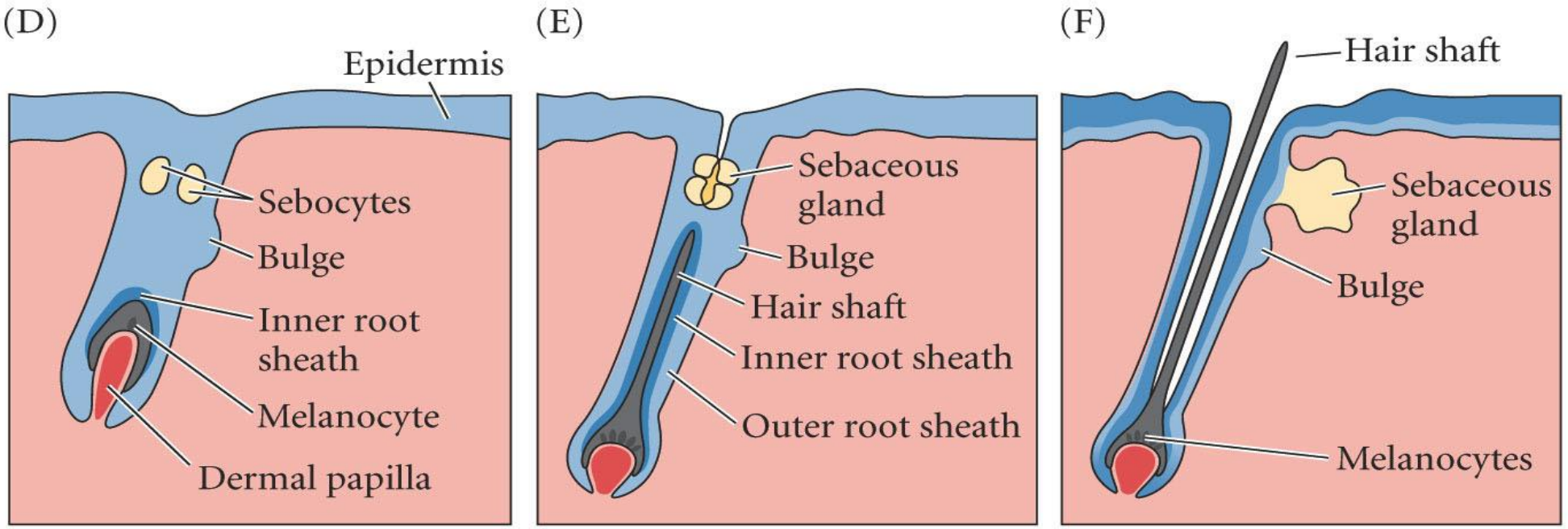
Células de la cresta neural

DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.33 © 2006 Sinauer Associates, Inc.

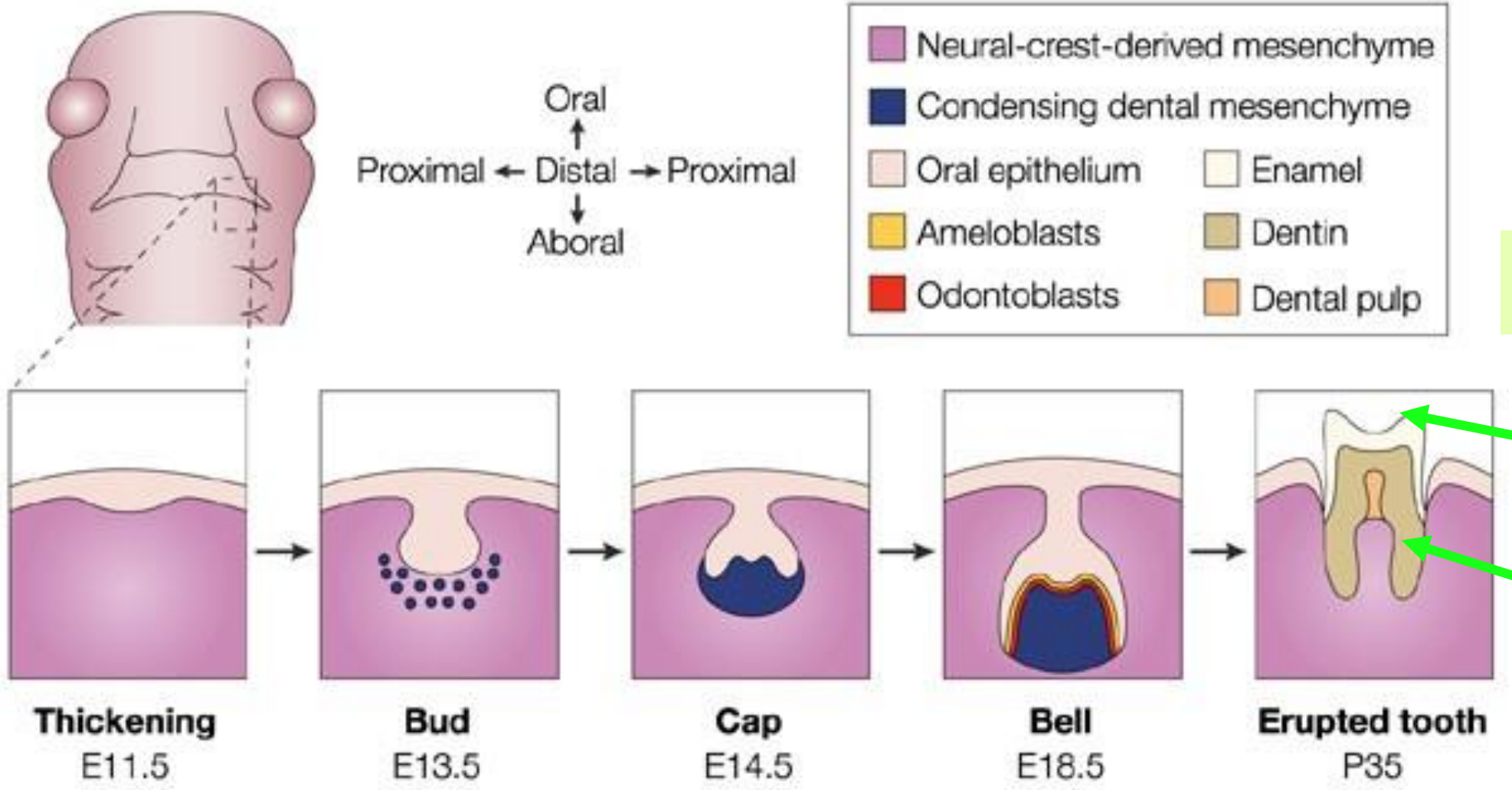
Formación del folículo piloso y las glándulas asociadas



Formación del folículo piloso y las glándulas asociadas



Formación de los dientes

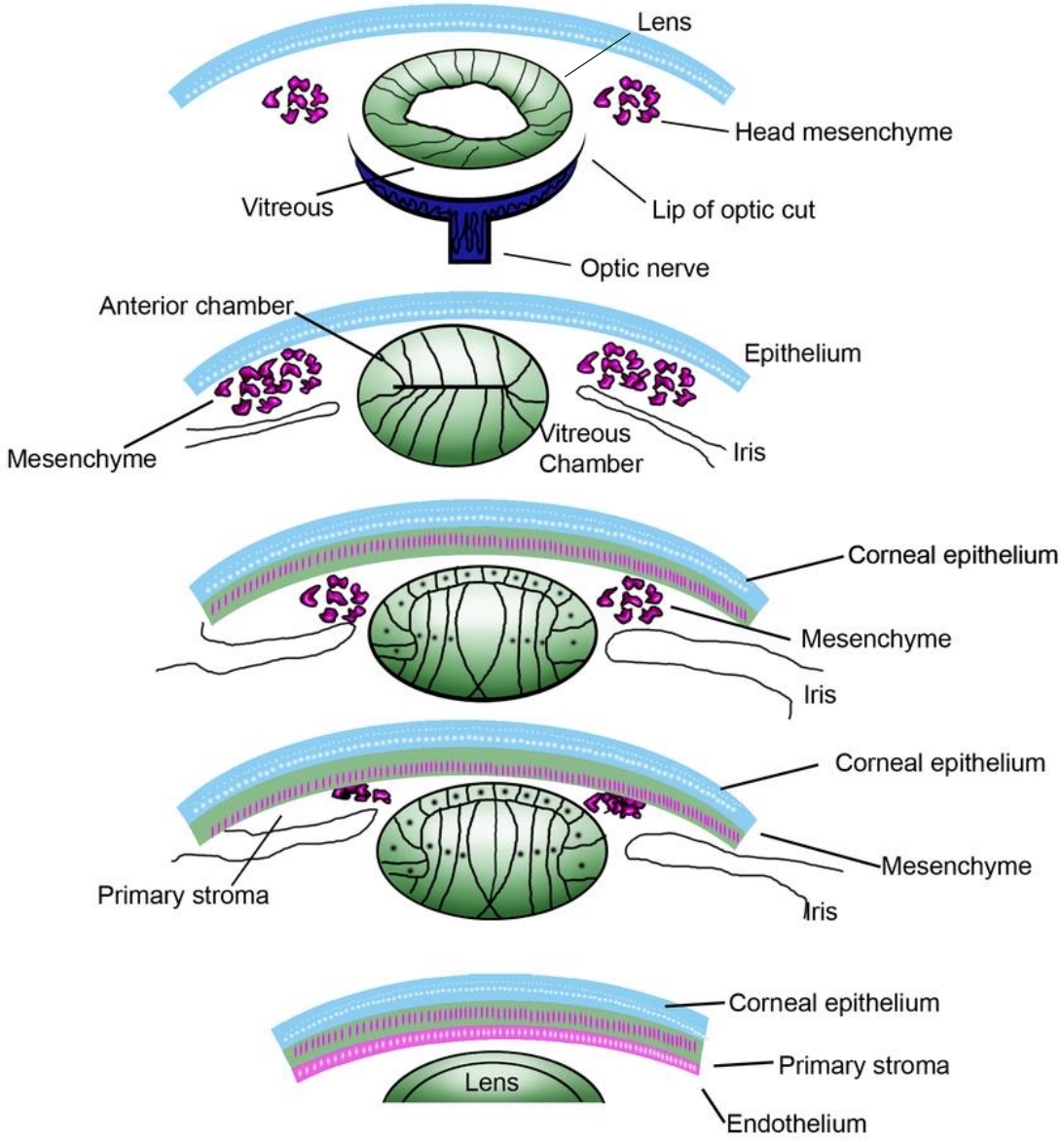


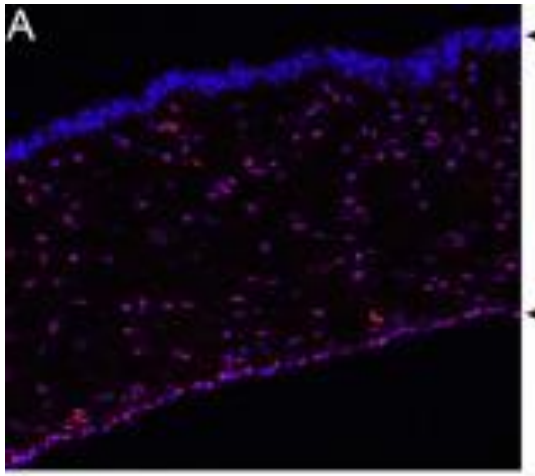
Ectodermo cutáneo

Epidermis

Células de la cresta neural

Formación de la córnea y lentes de los ojos





Epithelium ← Ectoderm

Stroma (keratocytes) } Neural crest

← Endothelium

B

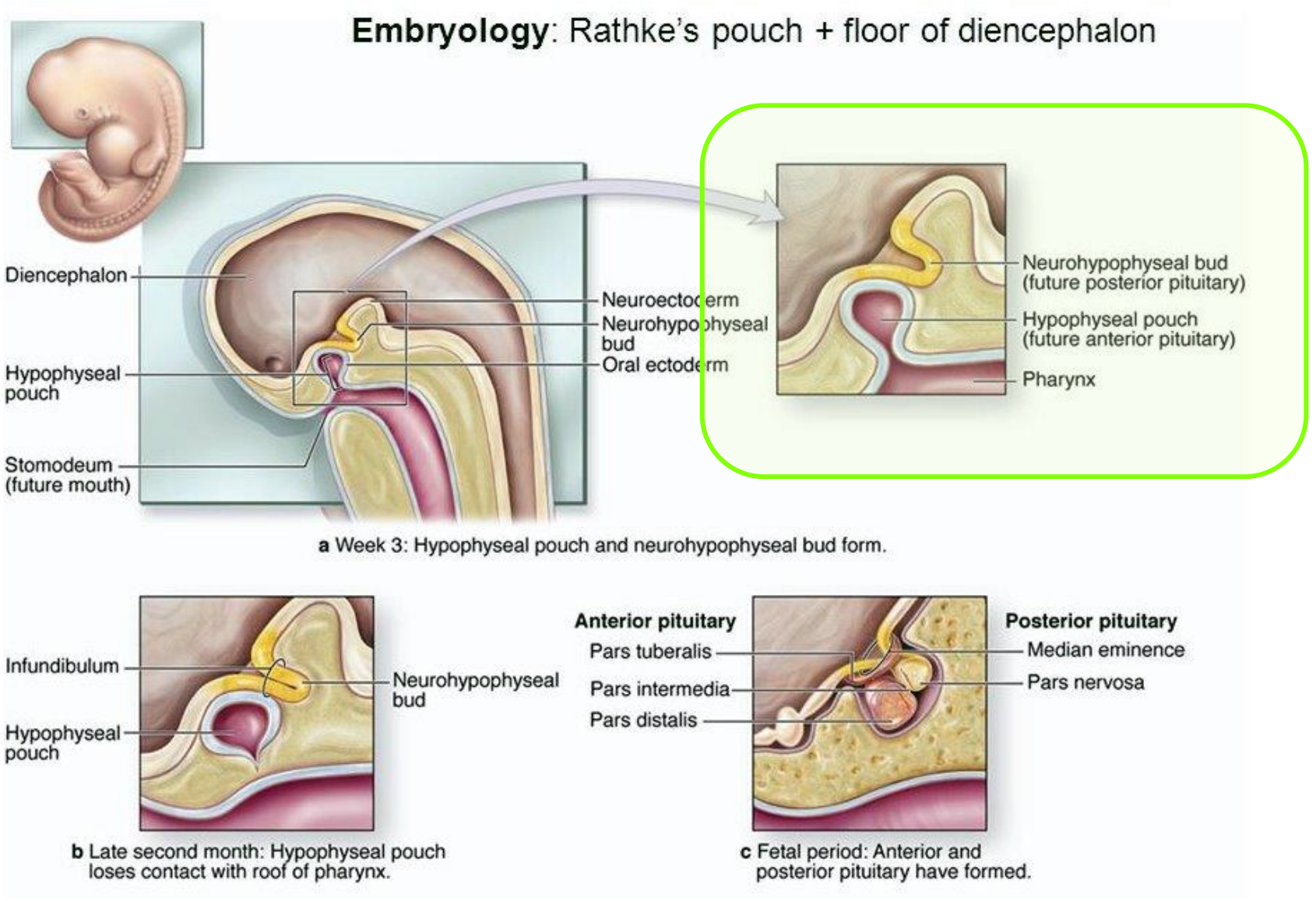
Ectoderm

→ Ocular surface ectoderm → **Corneal epithelium**, Lens, Limbus, conjunctival, and eyelid epithelium

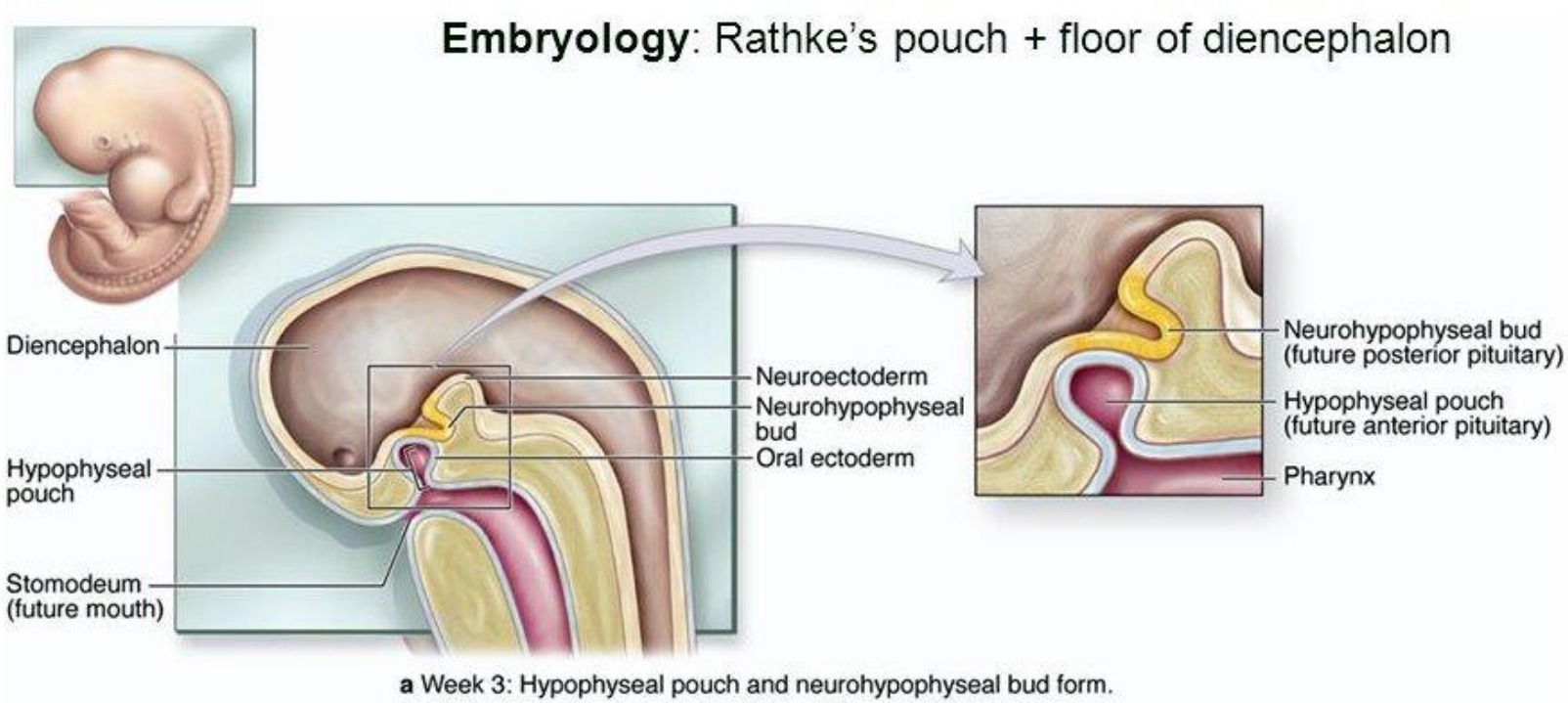
→ Neuroectoderm → Central nervous system

→ **Periocular neural crest** → Corneal endothelium keratocytes

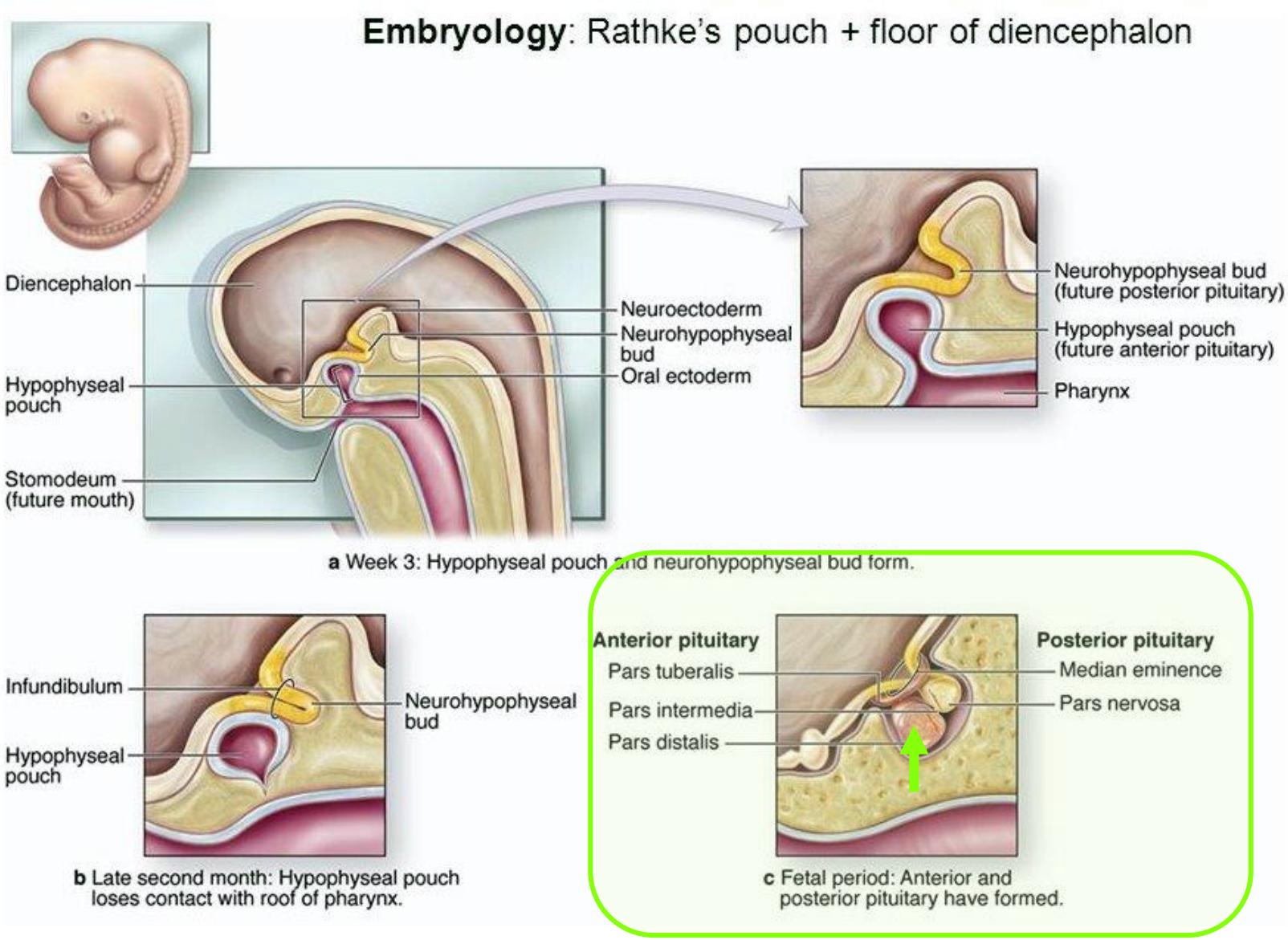
Formación de la adenohipófisis



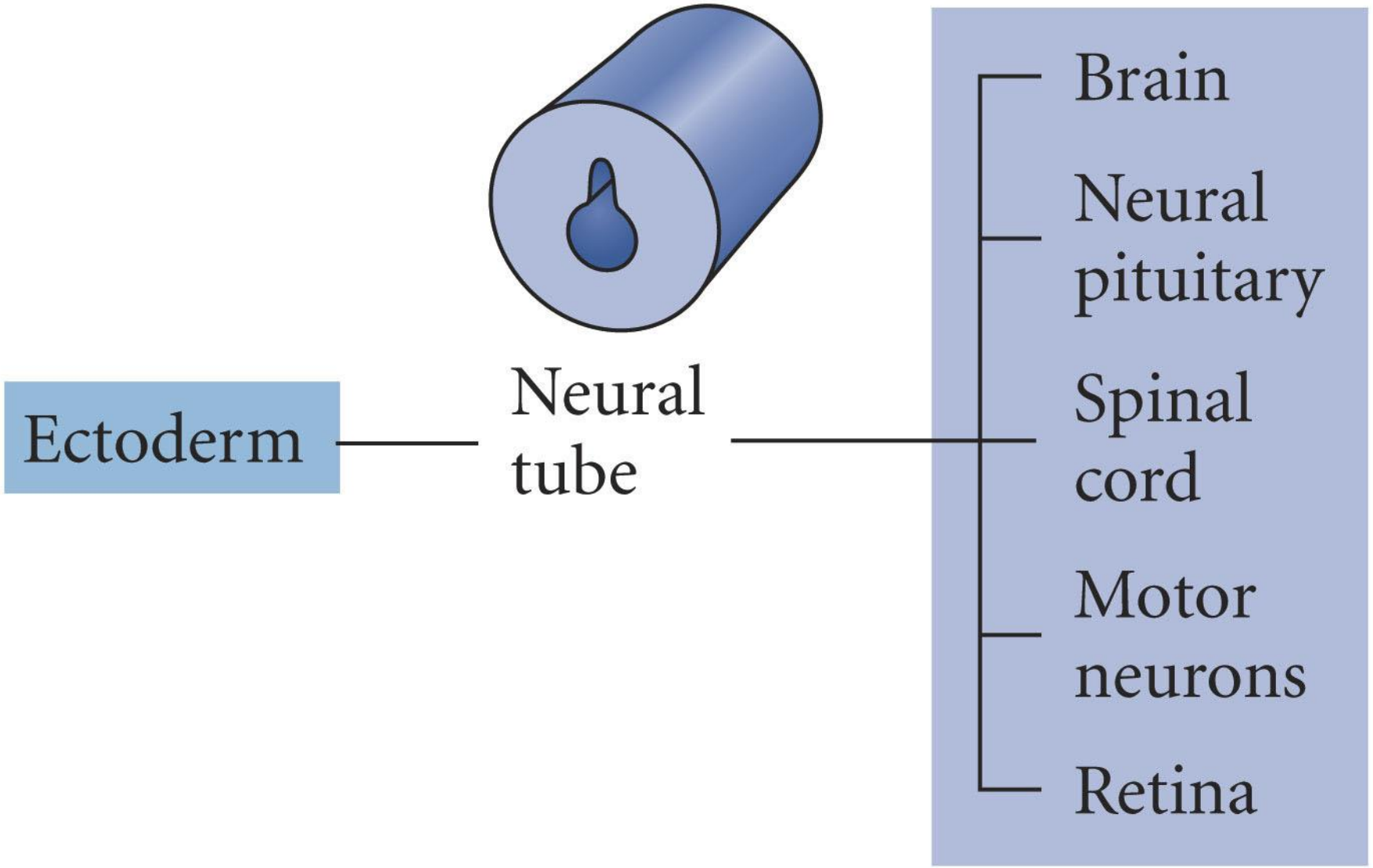
Formación de la adenohipófisis



Formación de la adenohipófisis

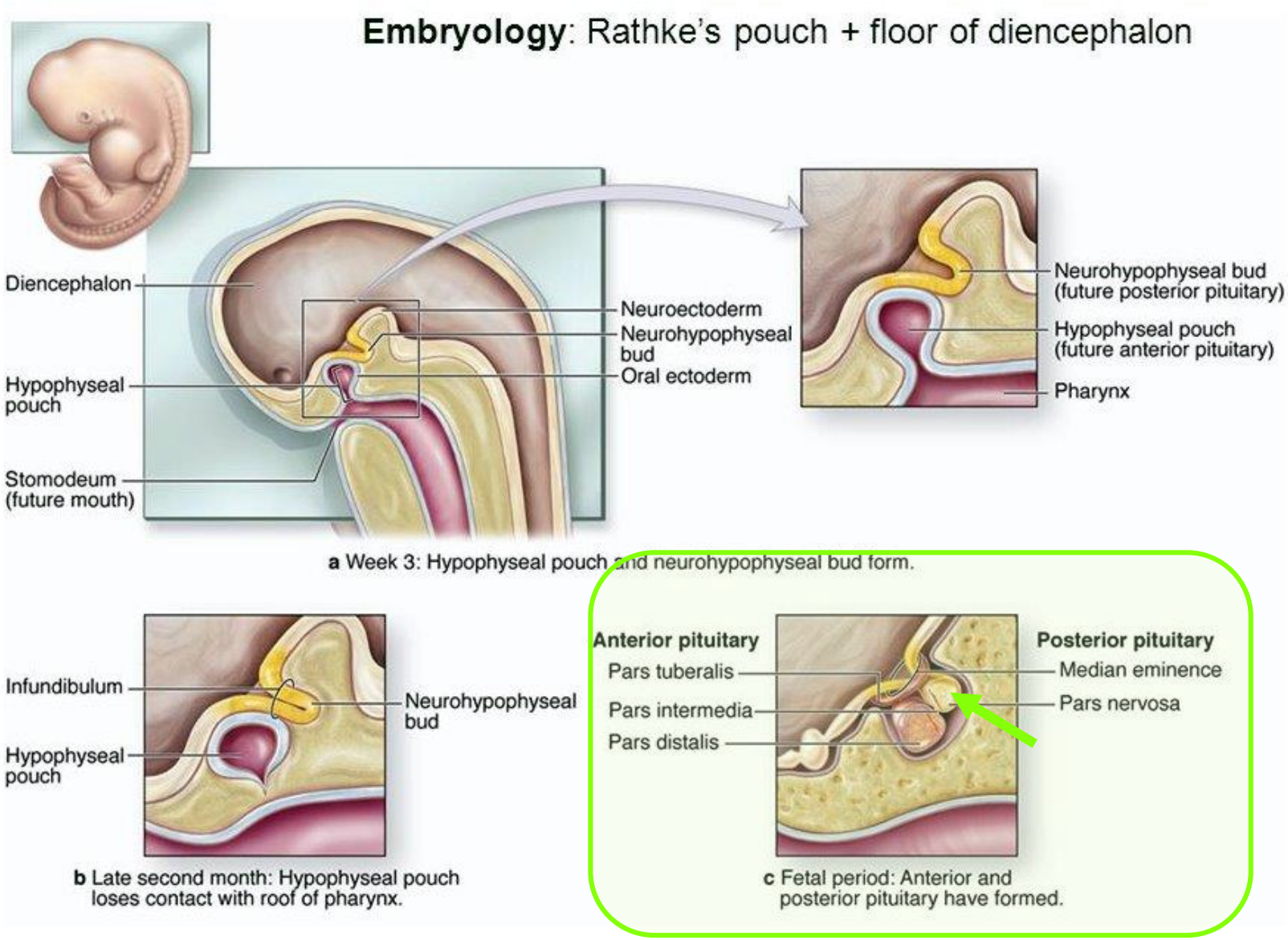


Derivados ectodérmicos

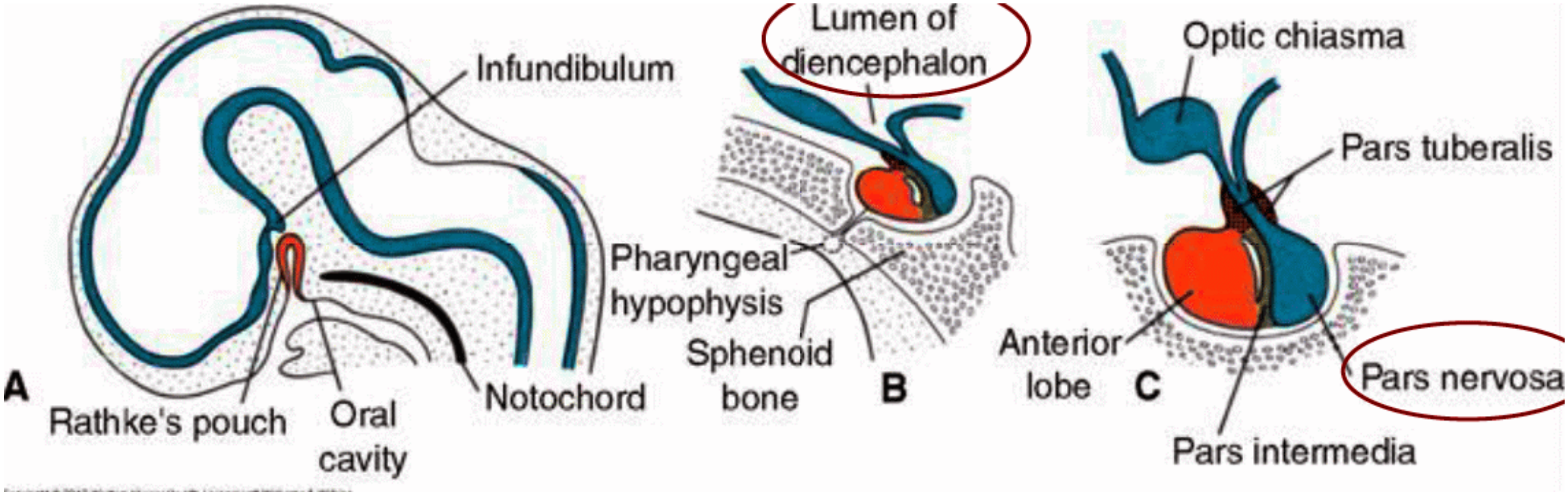


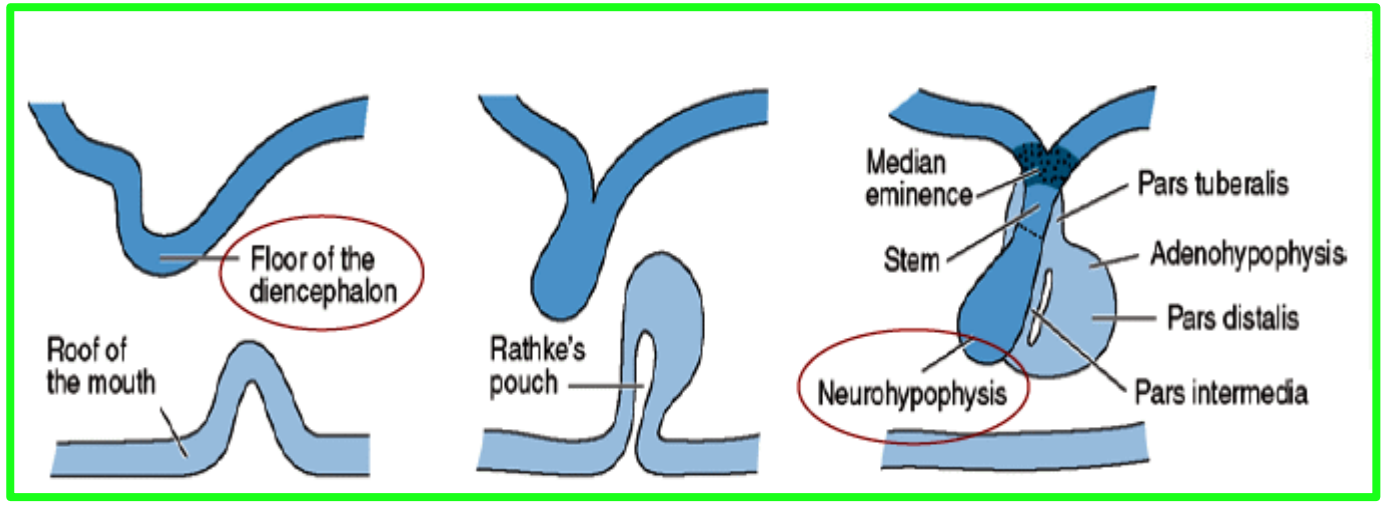
DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.1 (Part 3) © 2006 Sinauer Associates, Inc.

Formación de la neurohipófisis

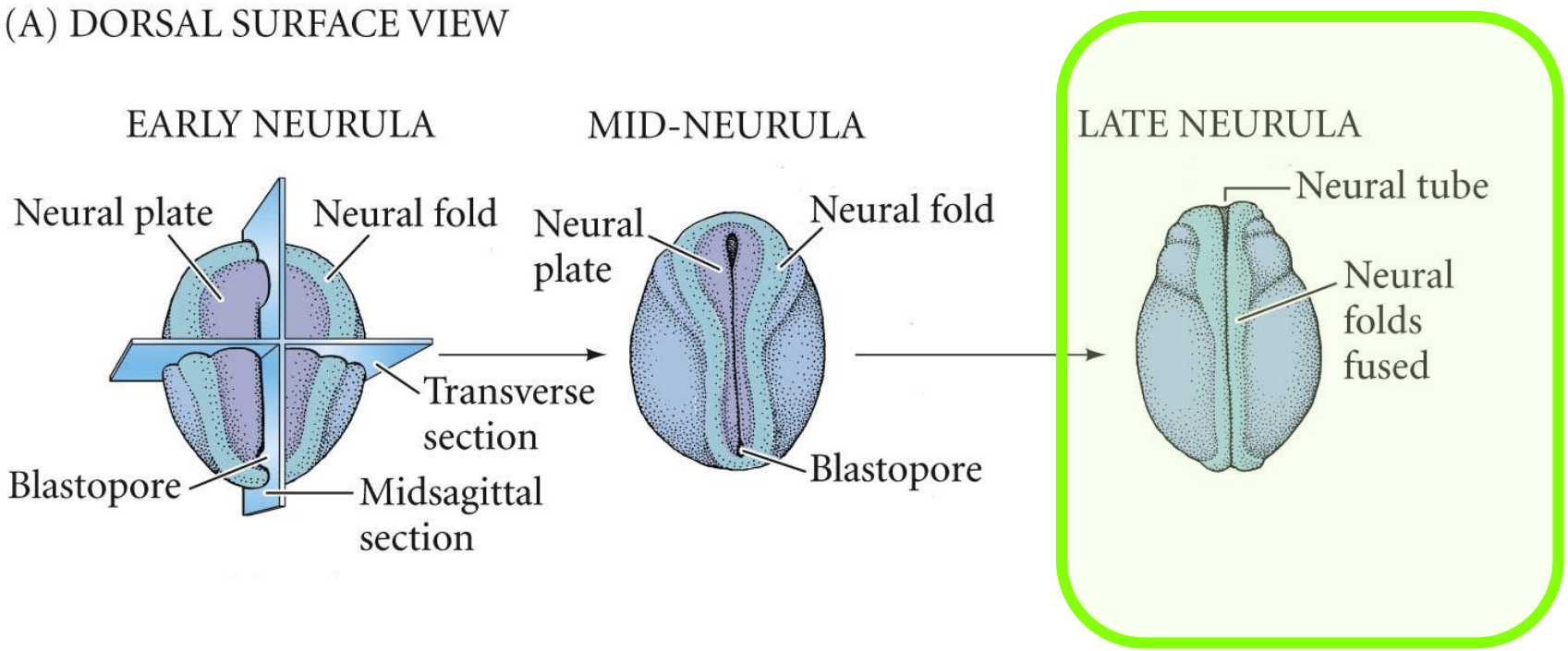


Formación de la neurohipófisis



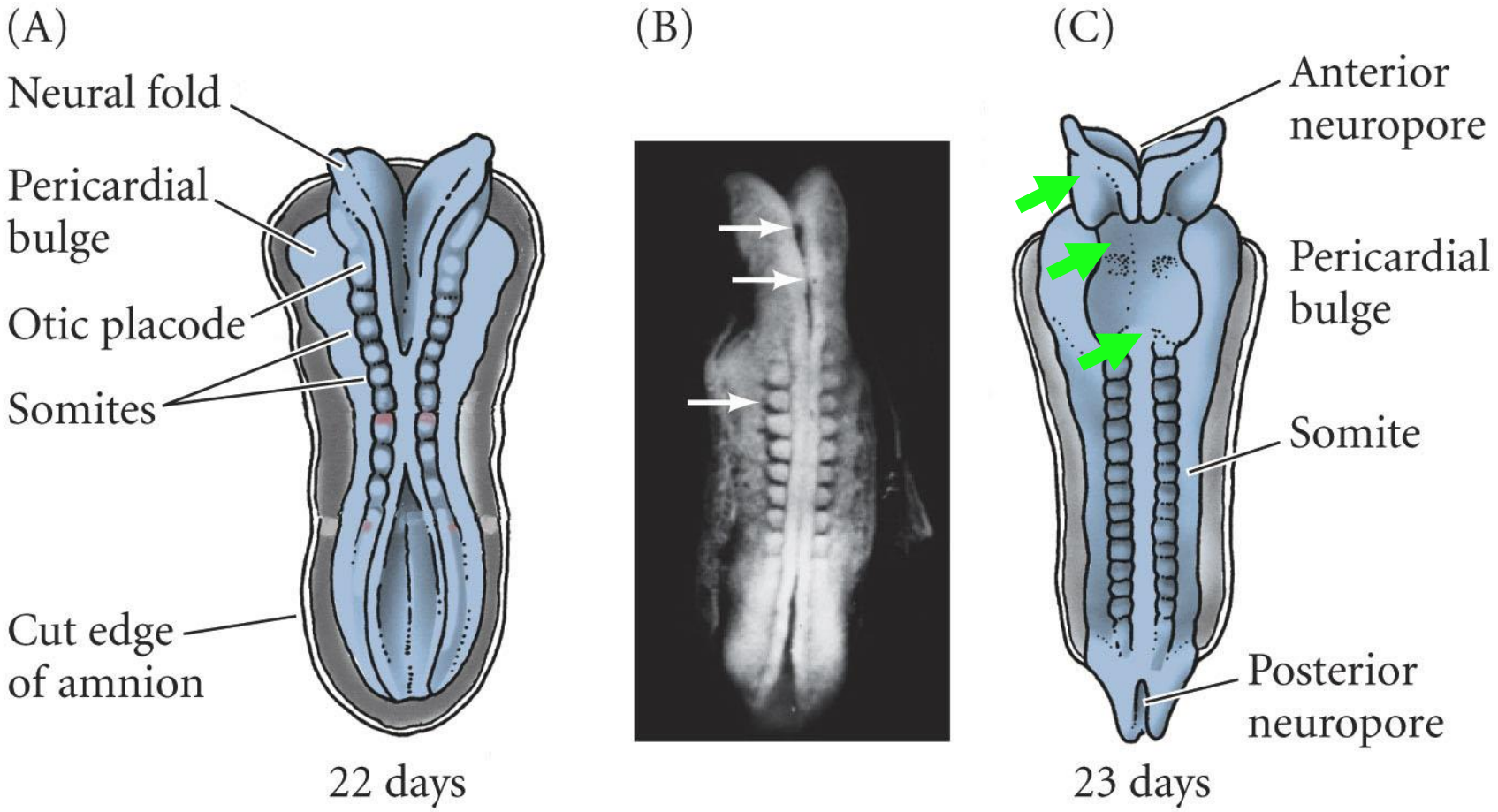


Formación del cerebro

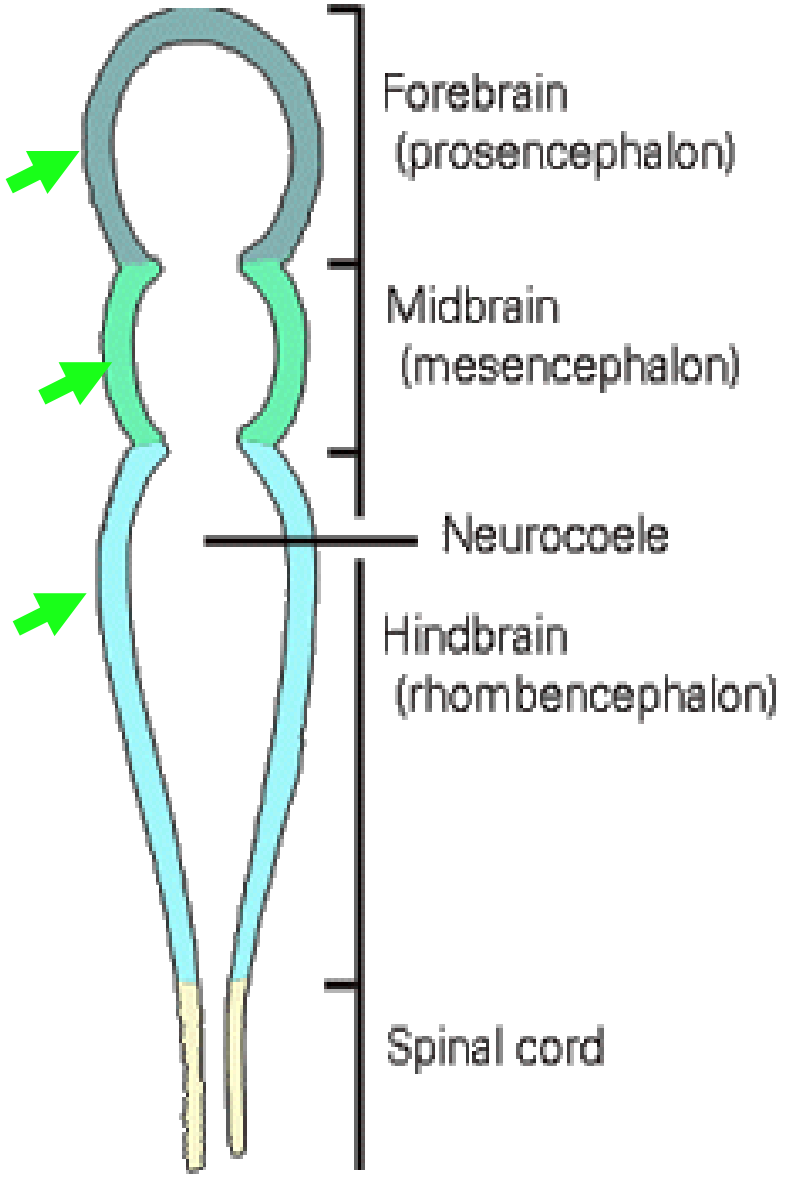


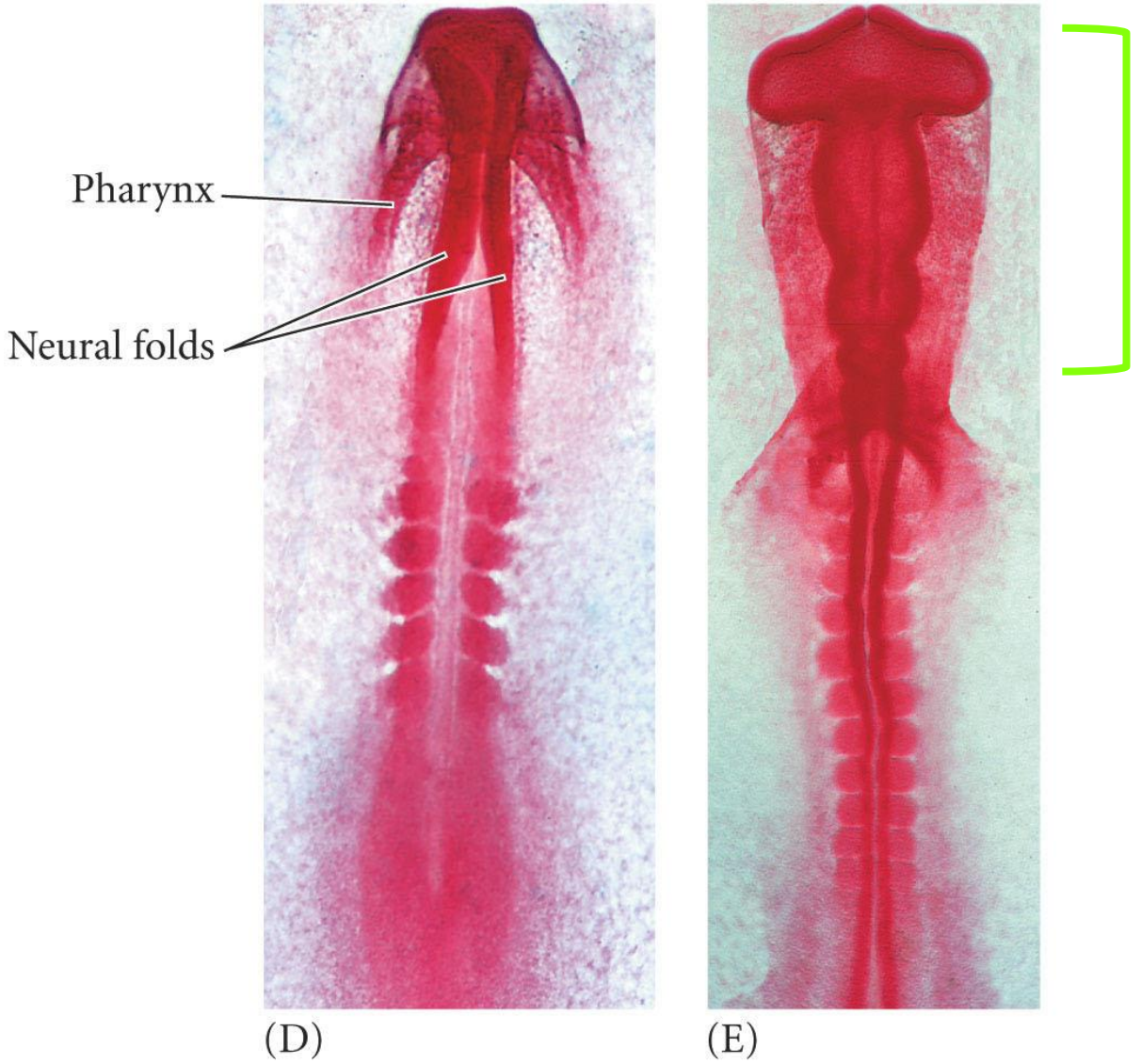
DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.4 (Part 1) © 2006 Sinauer Associates, Inc.

Formación del cerebro

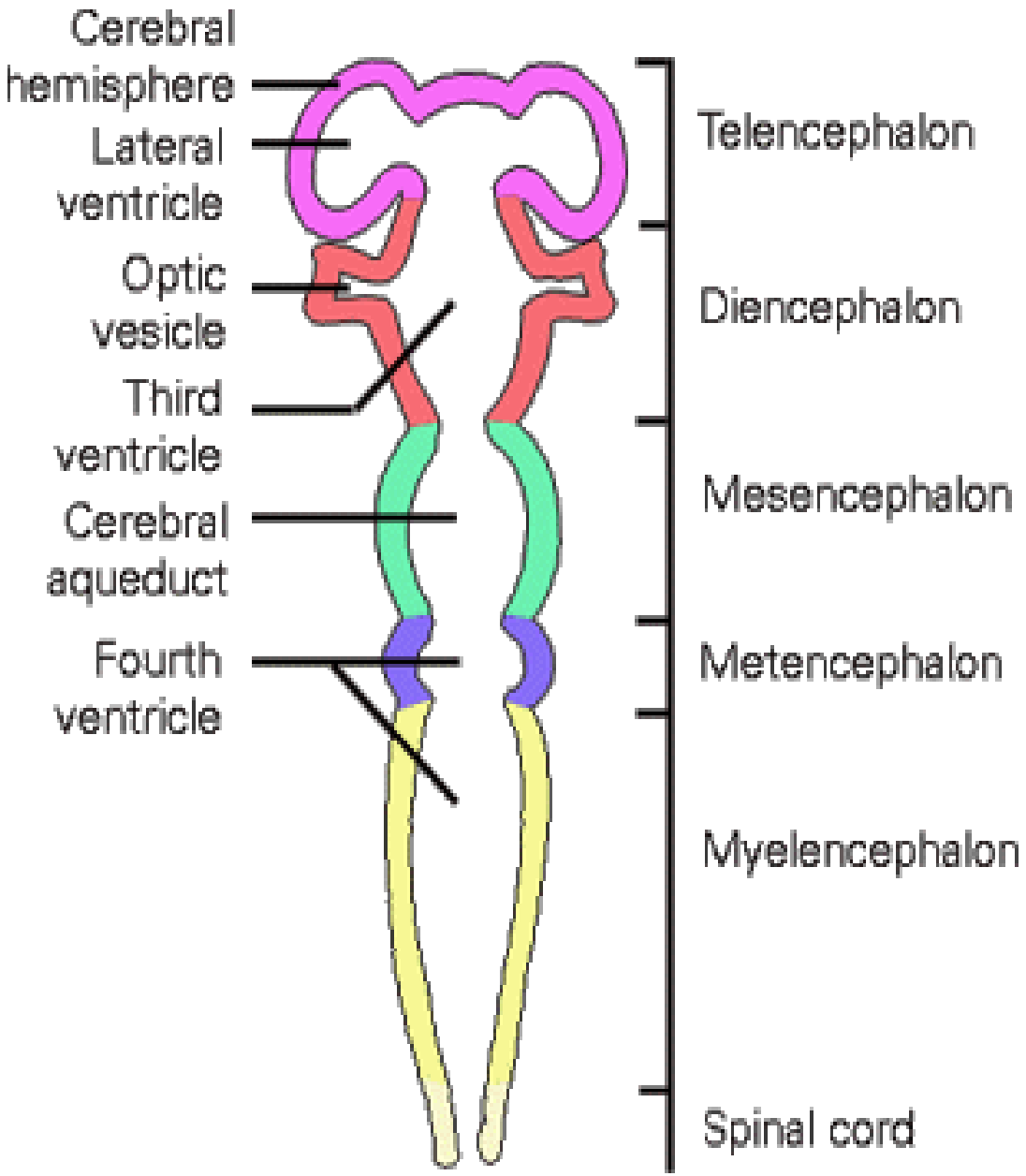


Formación del cerebro

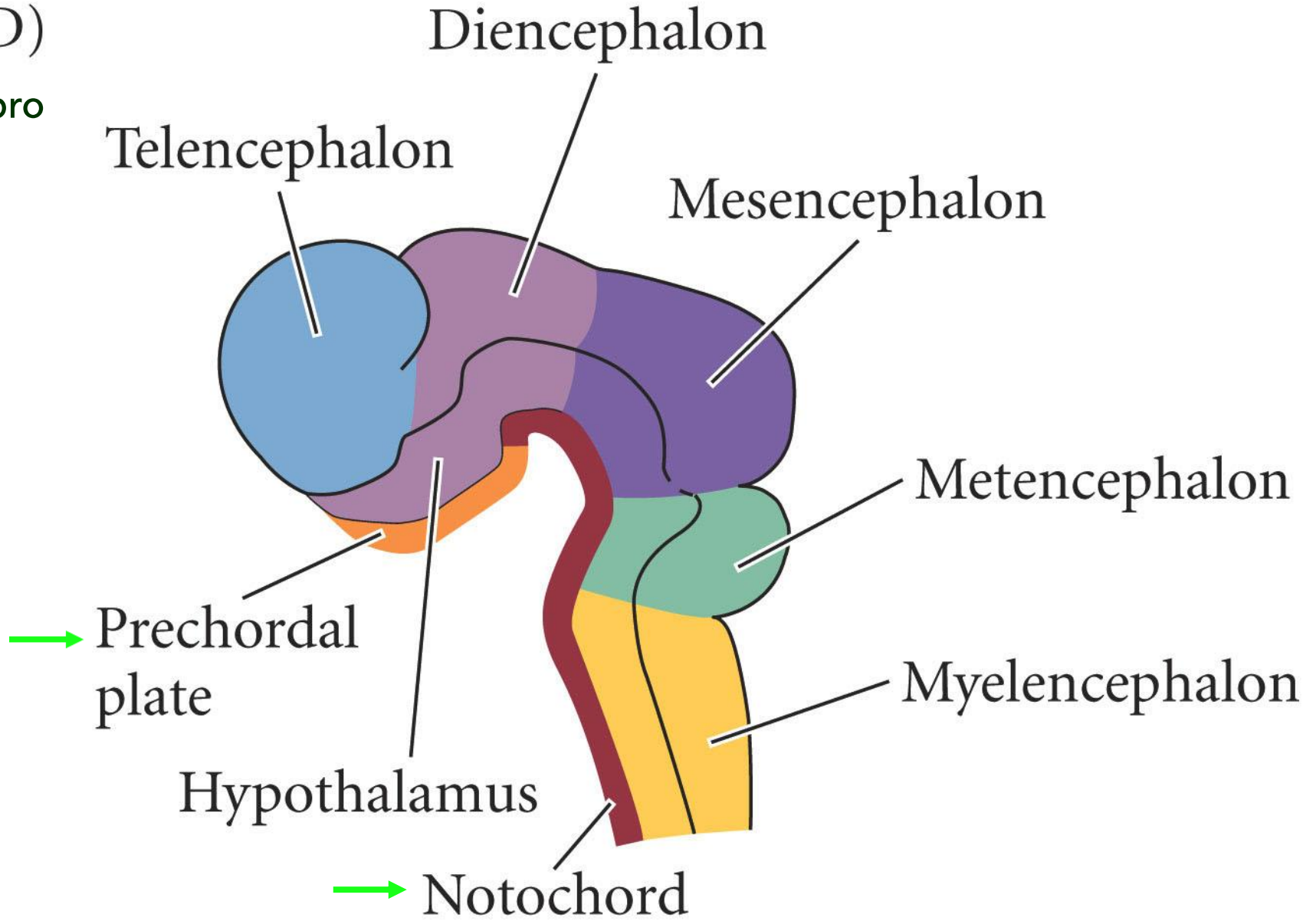




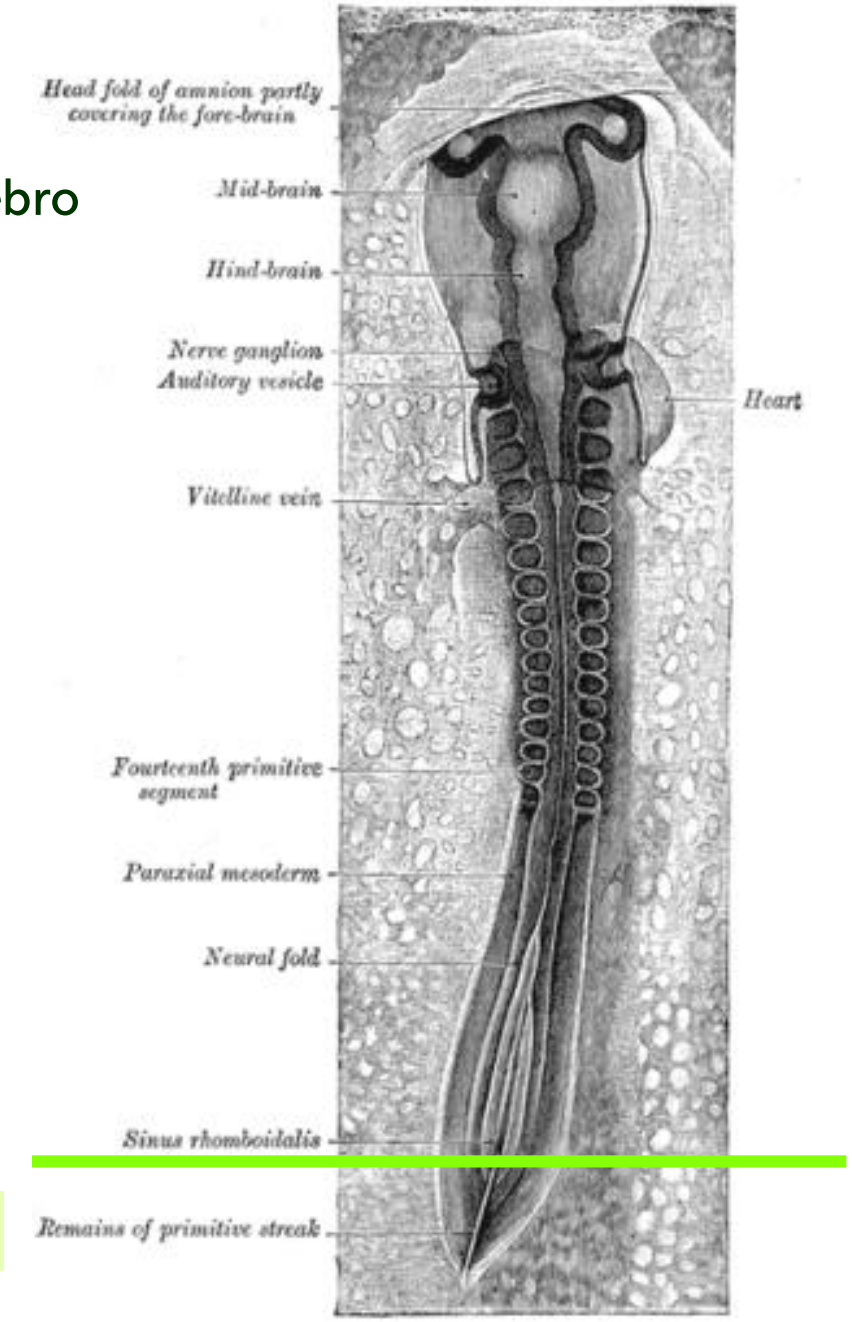
Formación del cerebro

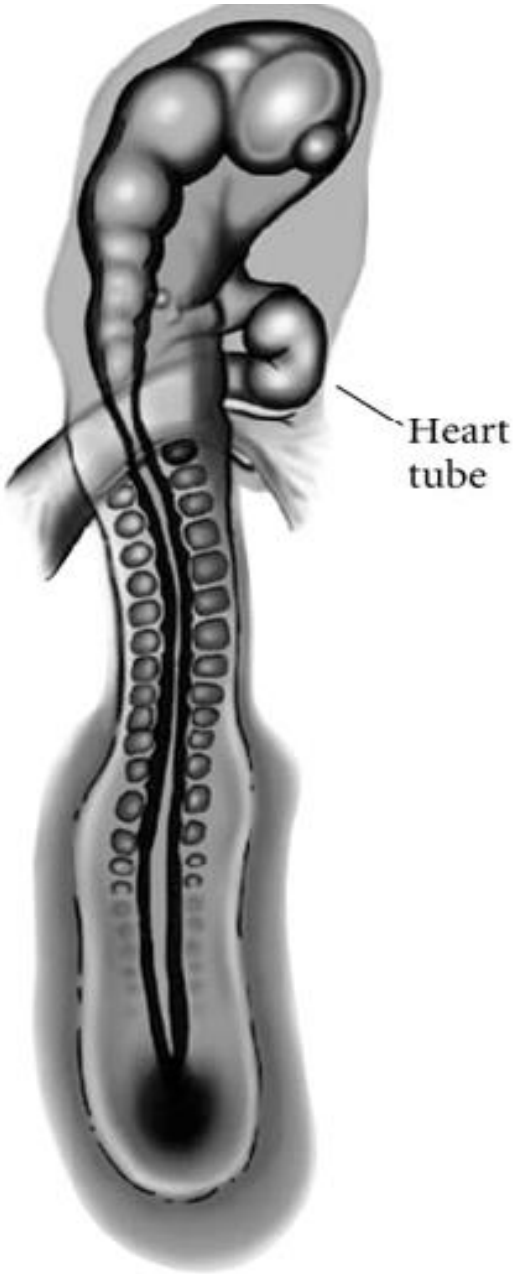


Formación del cerebro



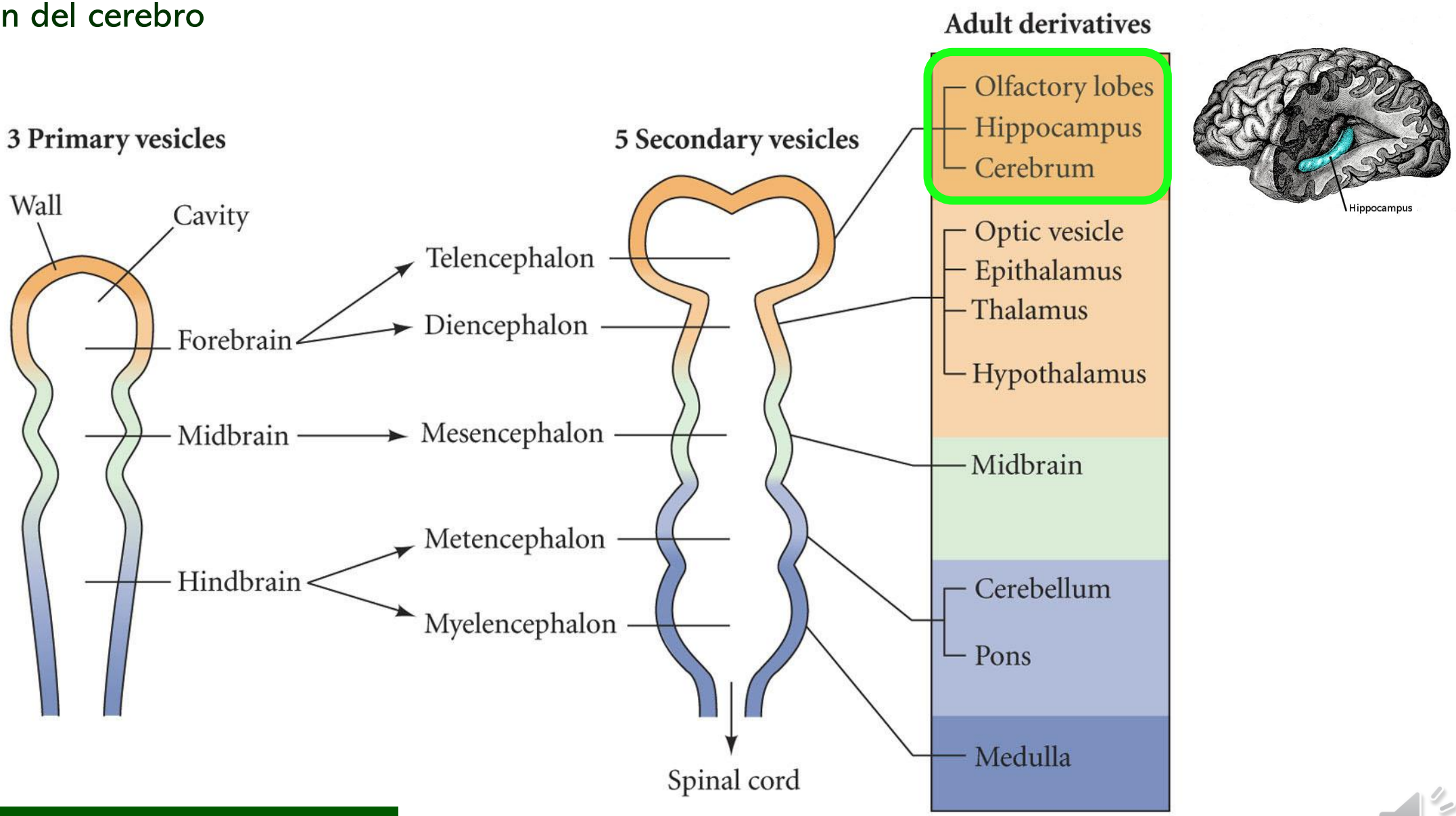
Formación del cerebro





Línea primitiva

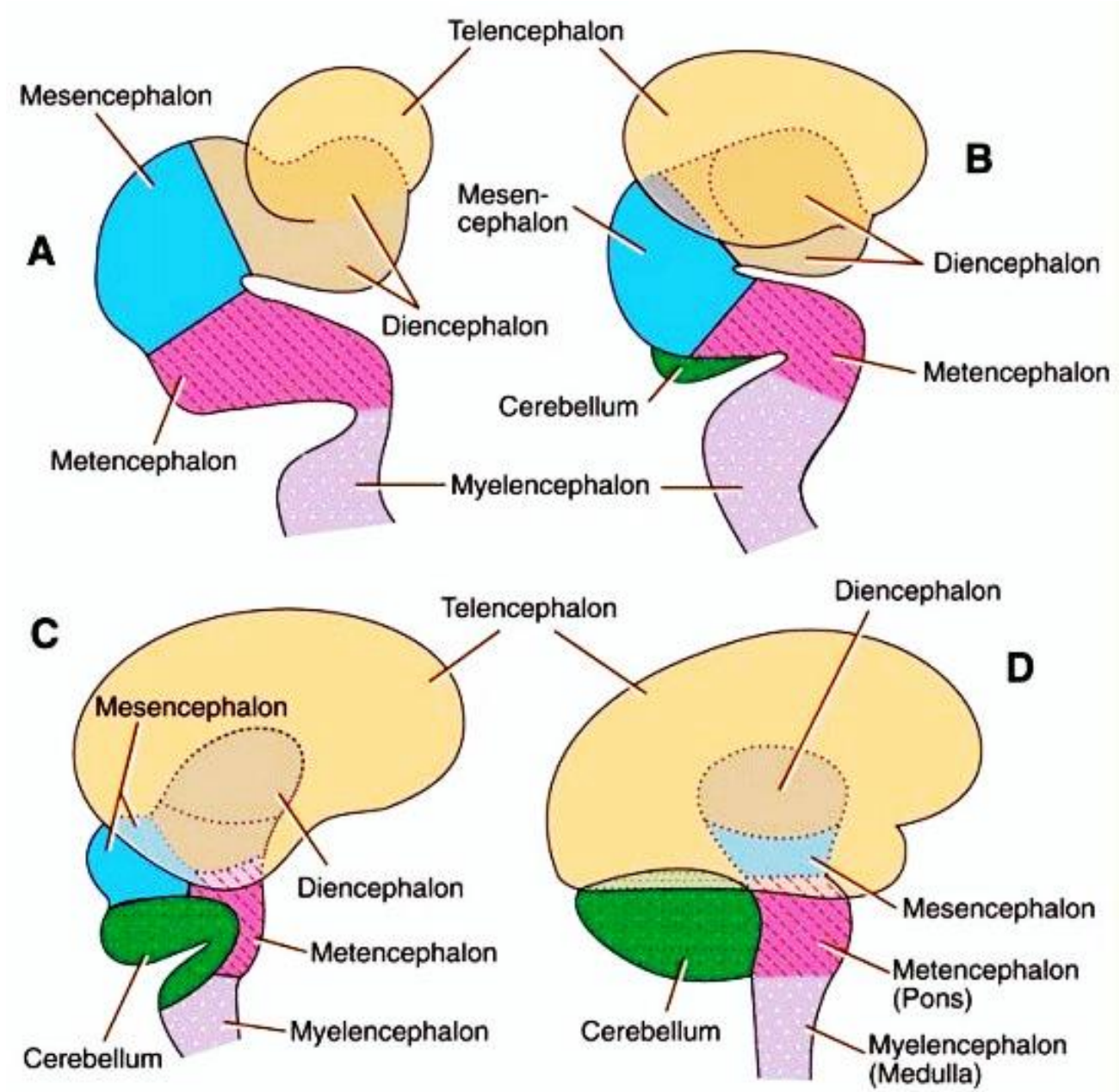
Formación del cerebro

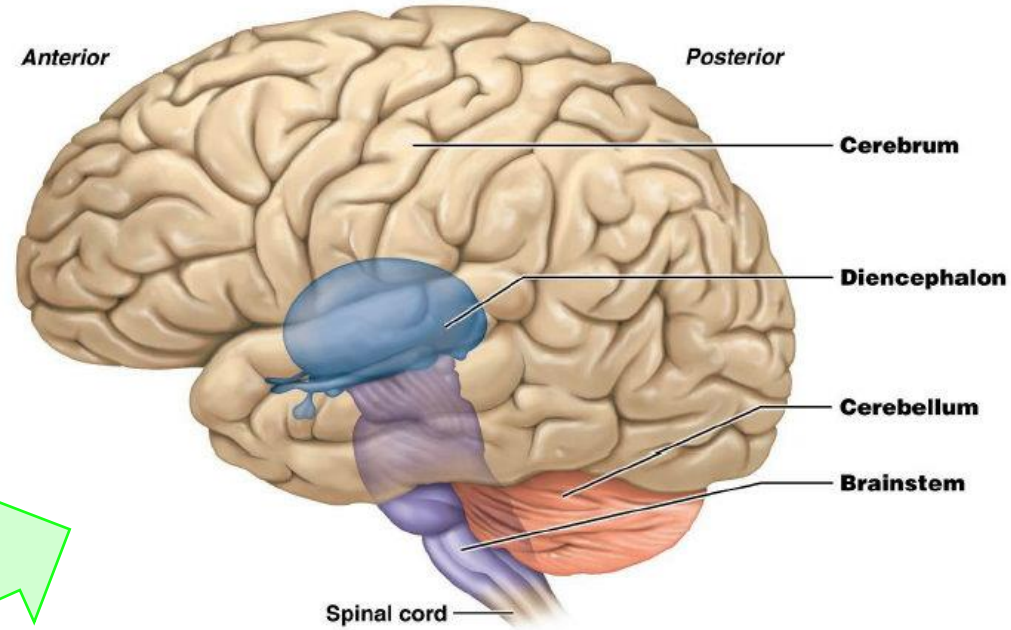


DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.9 © 2006 Sinauer Associates, Inc.

Cerebro anterior, telencéfalo

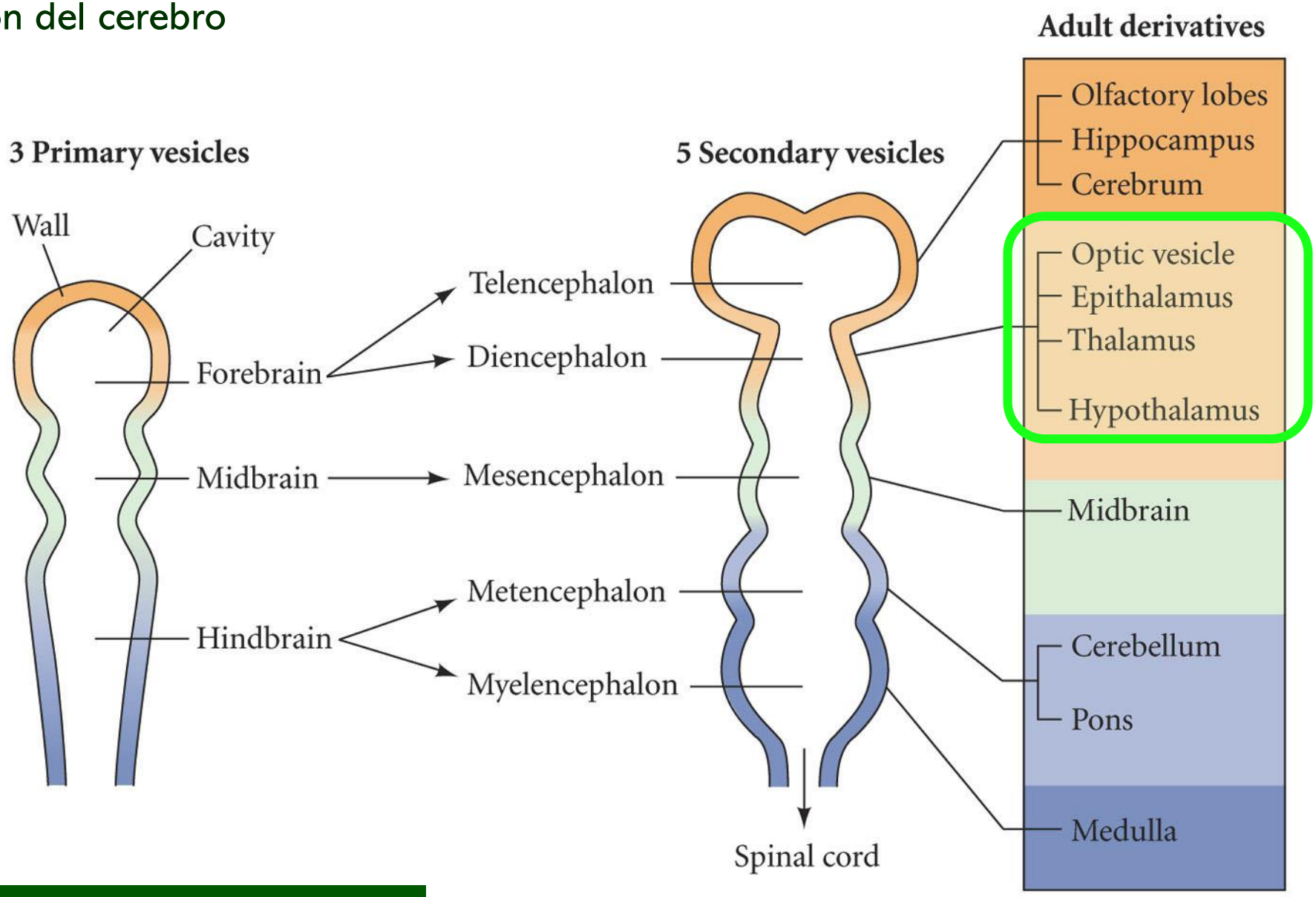
Formación del cerebro





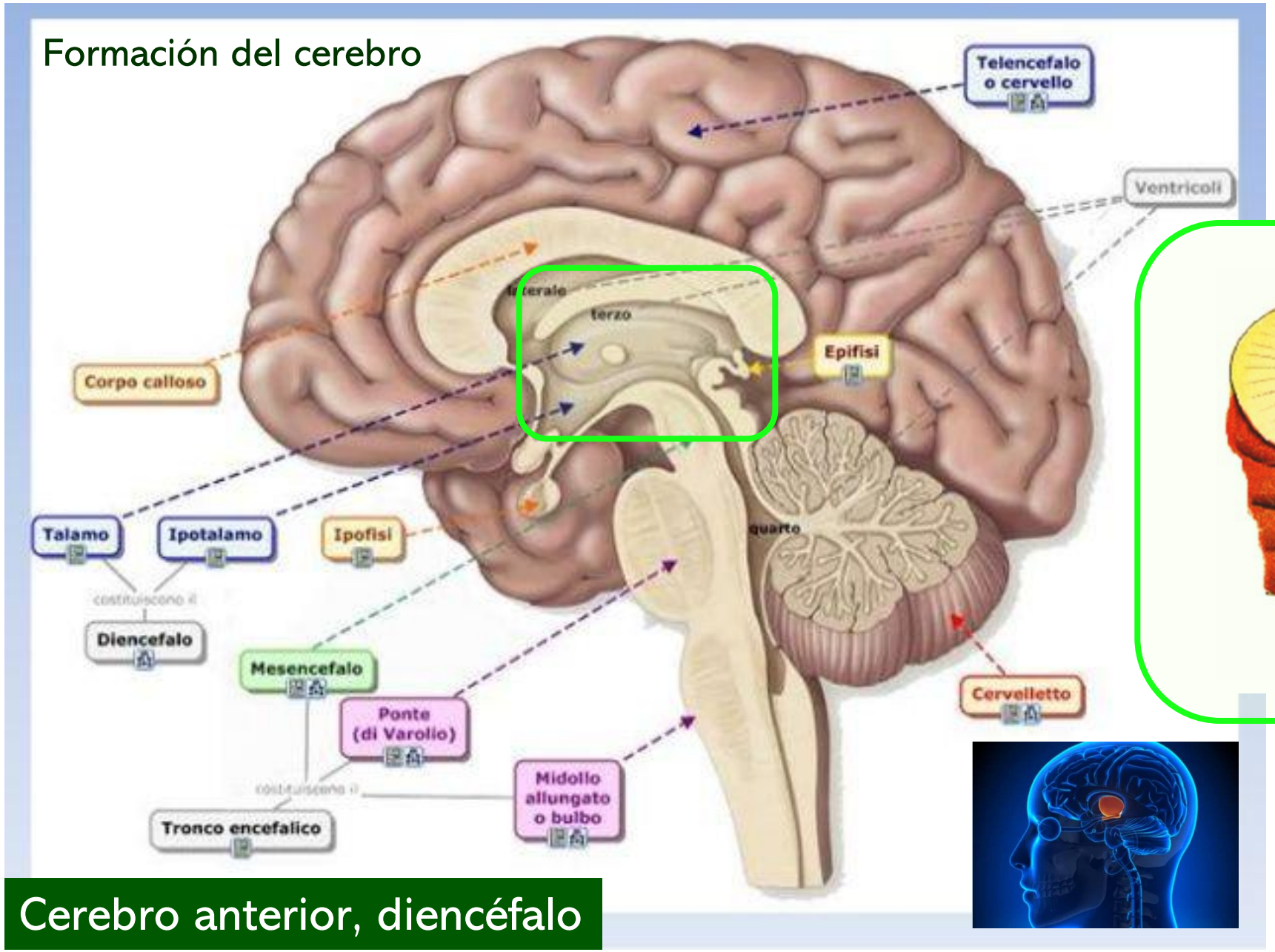
Cerebro anterior, telencéfalo

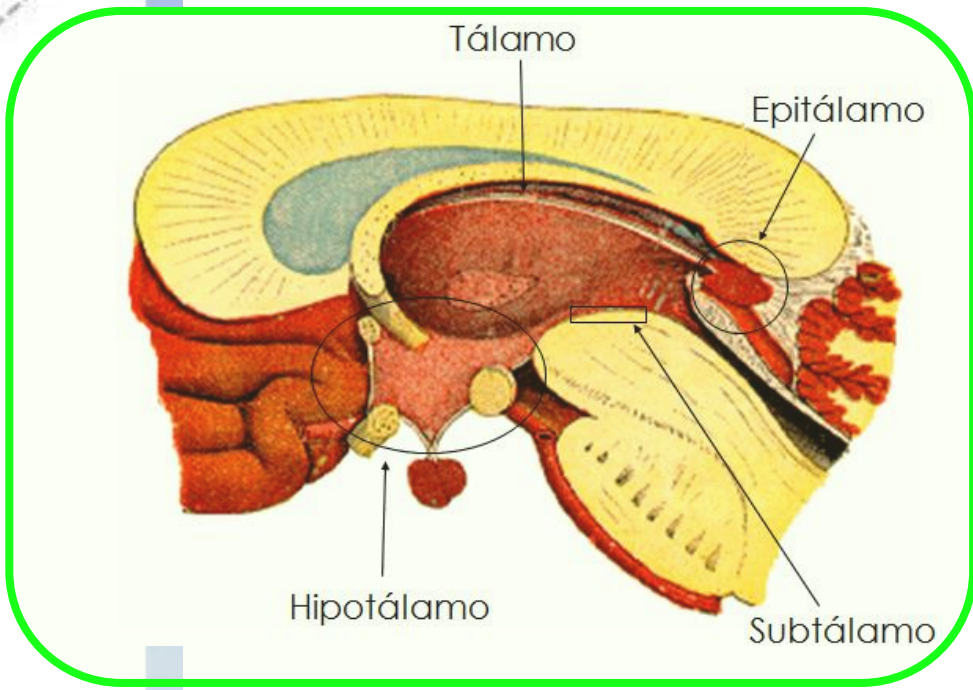
Formación del cerebro



DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.9 © 2006 Sinauer Associates, Inc.

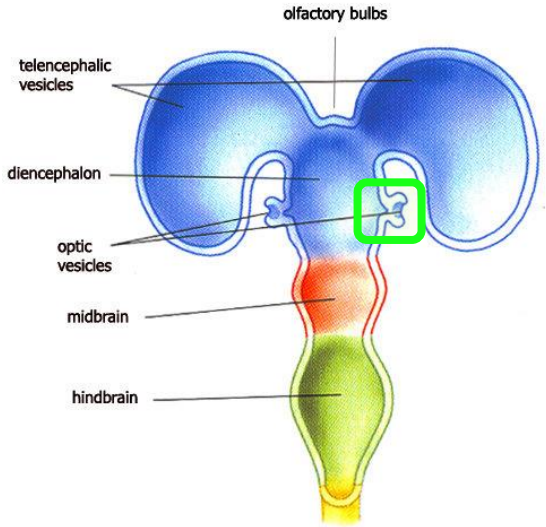
Cerebro anterior, diencéfalo

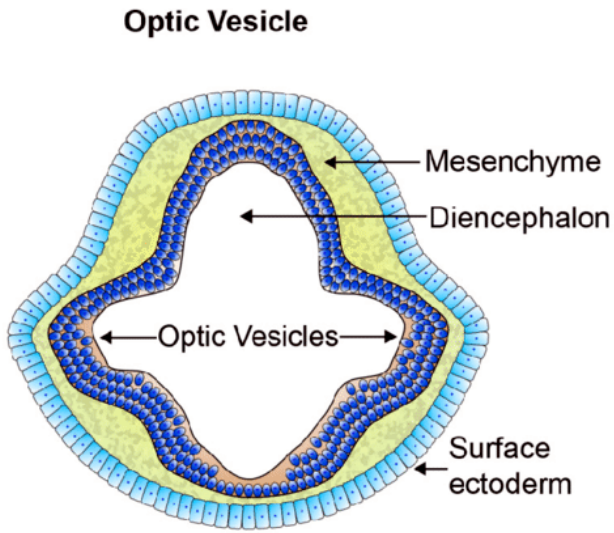


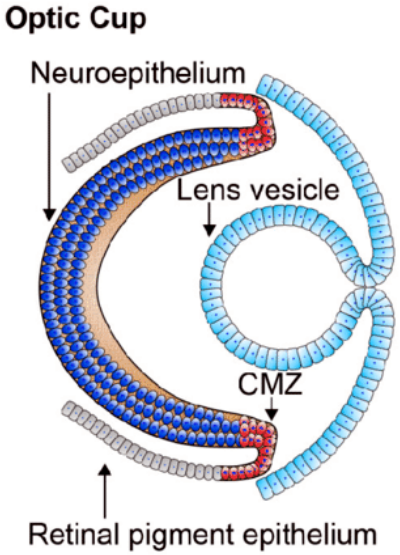


Cerebro anterior, diencéfalo

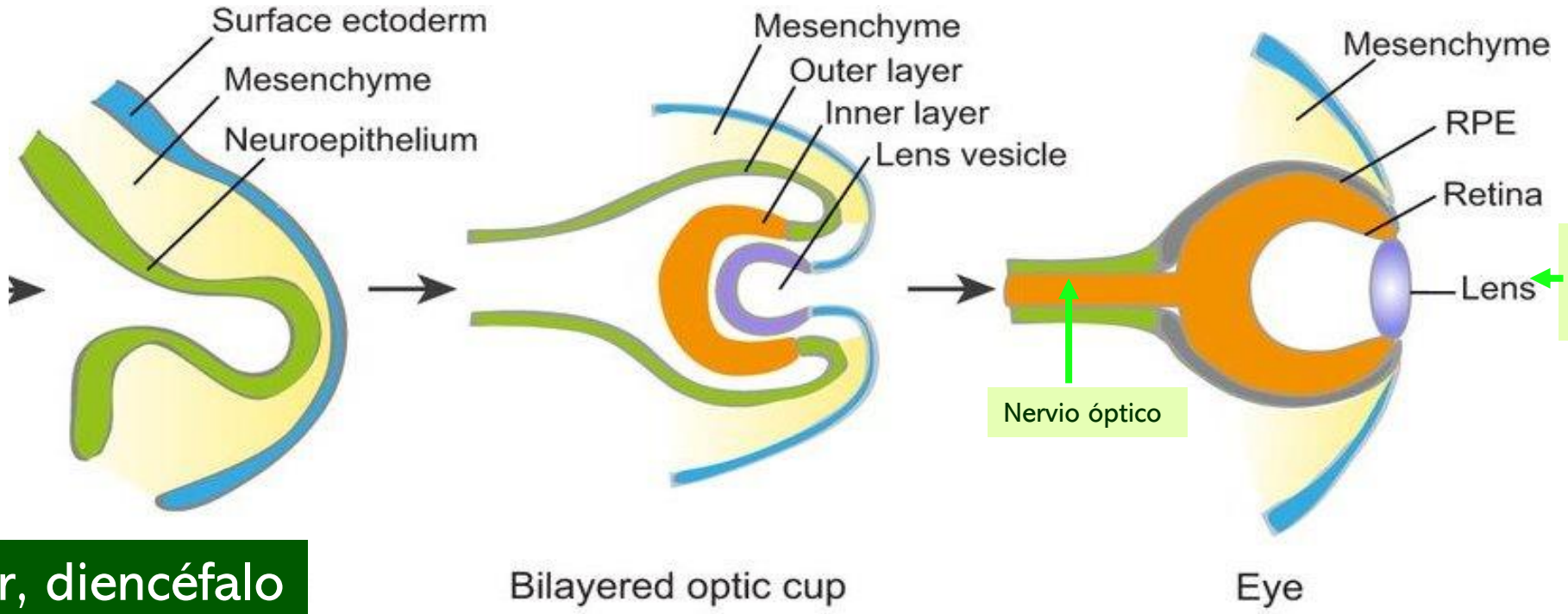
Derivados ectodérmicos







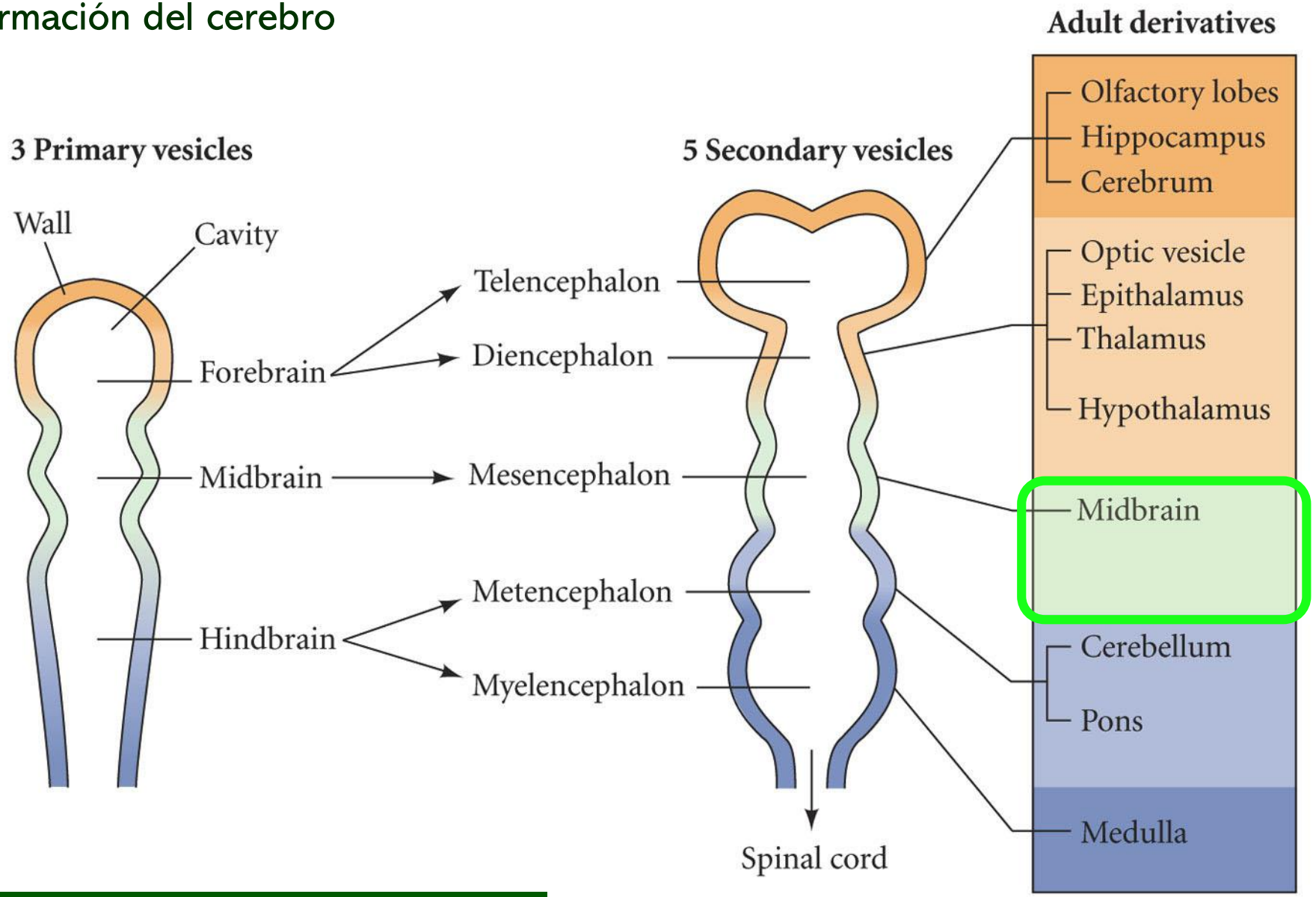
Vesícula óptica

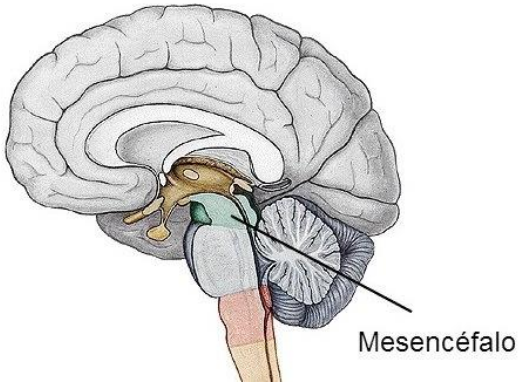


Ectodermo cutáneo

Cerebro anterior, diencéfalo

Formación del cerebro



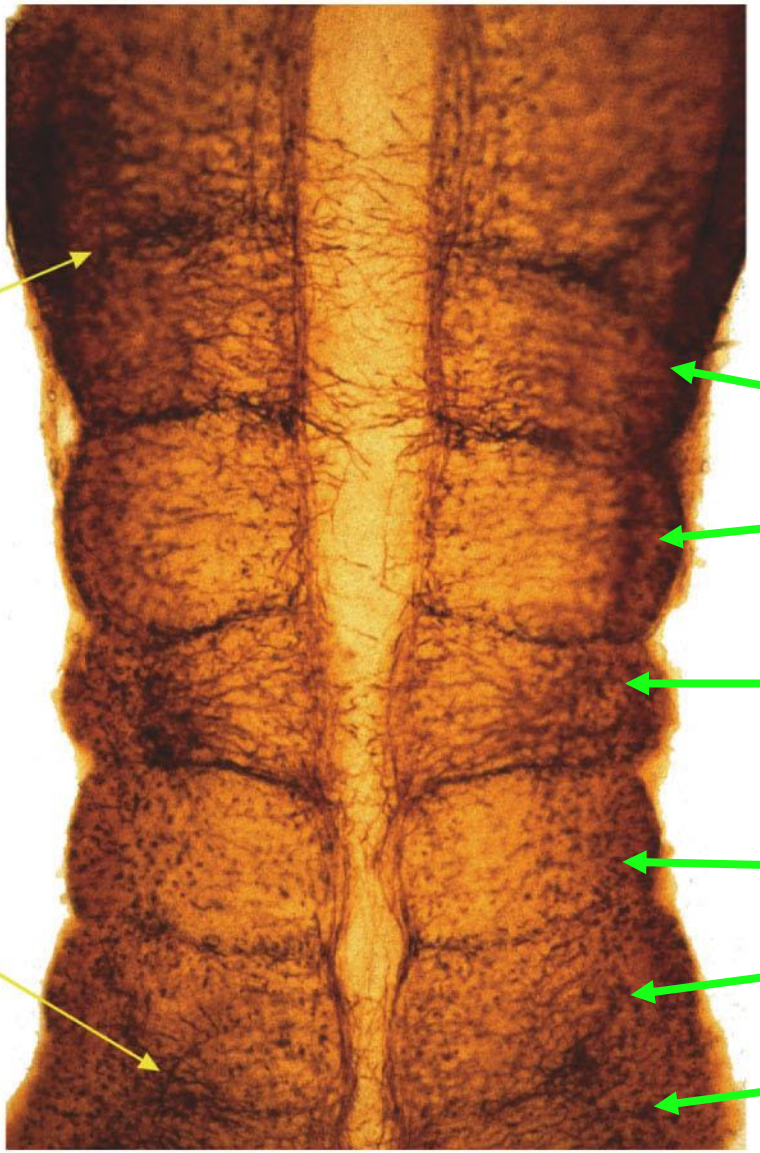


Cerebro medio, mesencéfalo

DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.9 © 2006 Sinauer Associates, Inc.

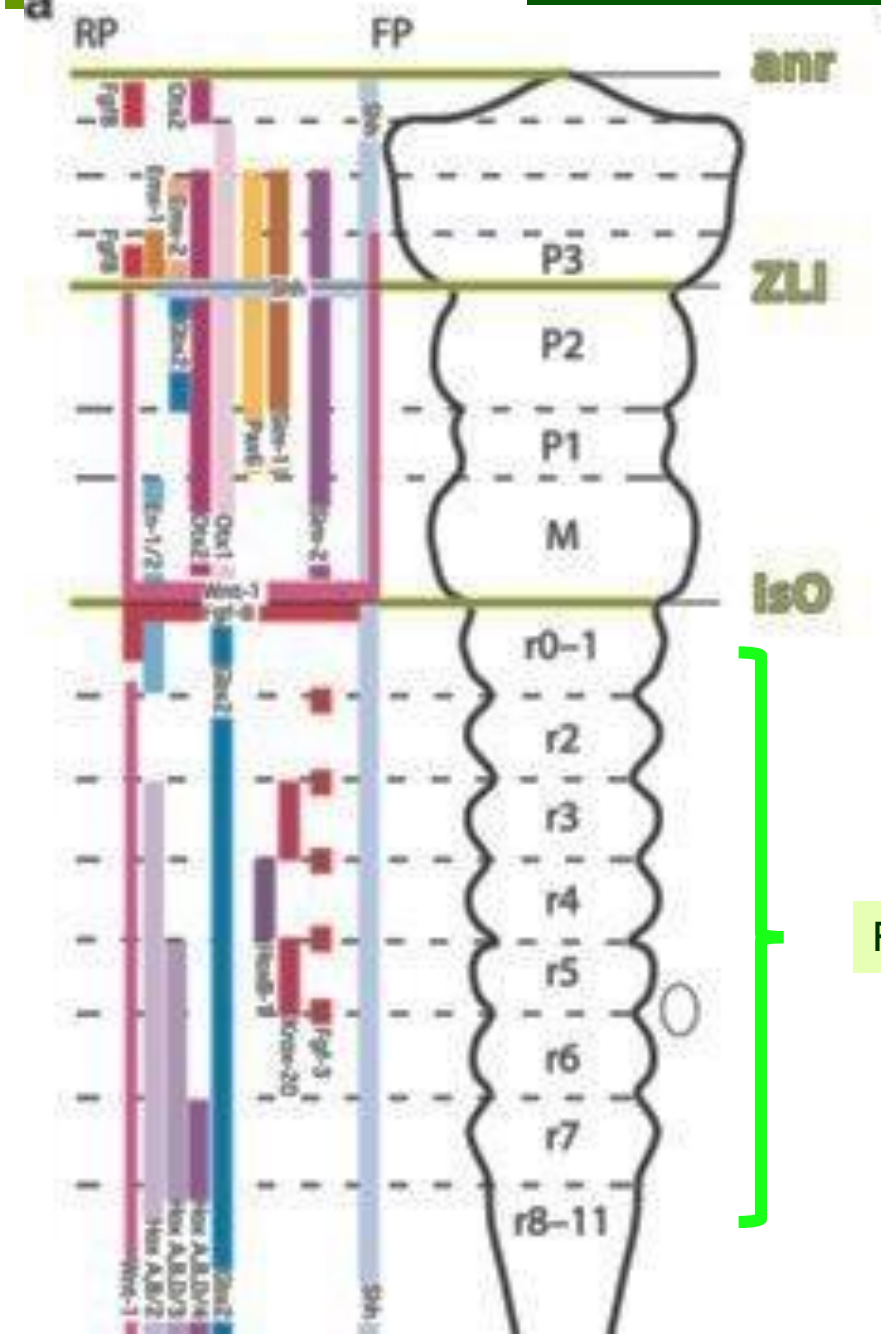
Formación del cerebro

Cerebro posterior, rombencéfalo

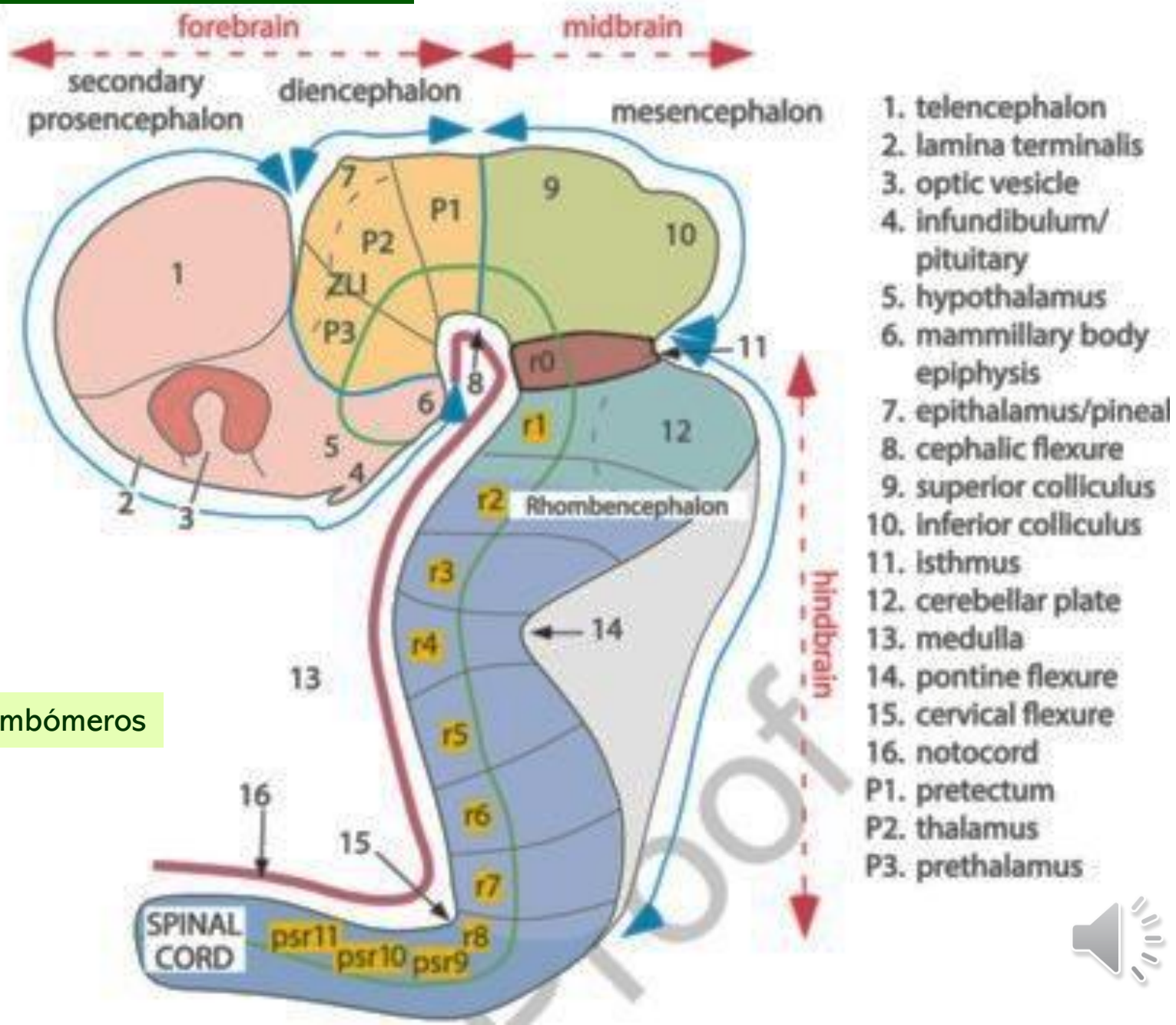


DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.10 © 2006 Sinauer Associates, Inc.

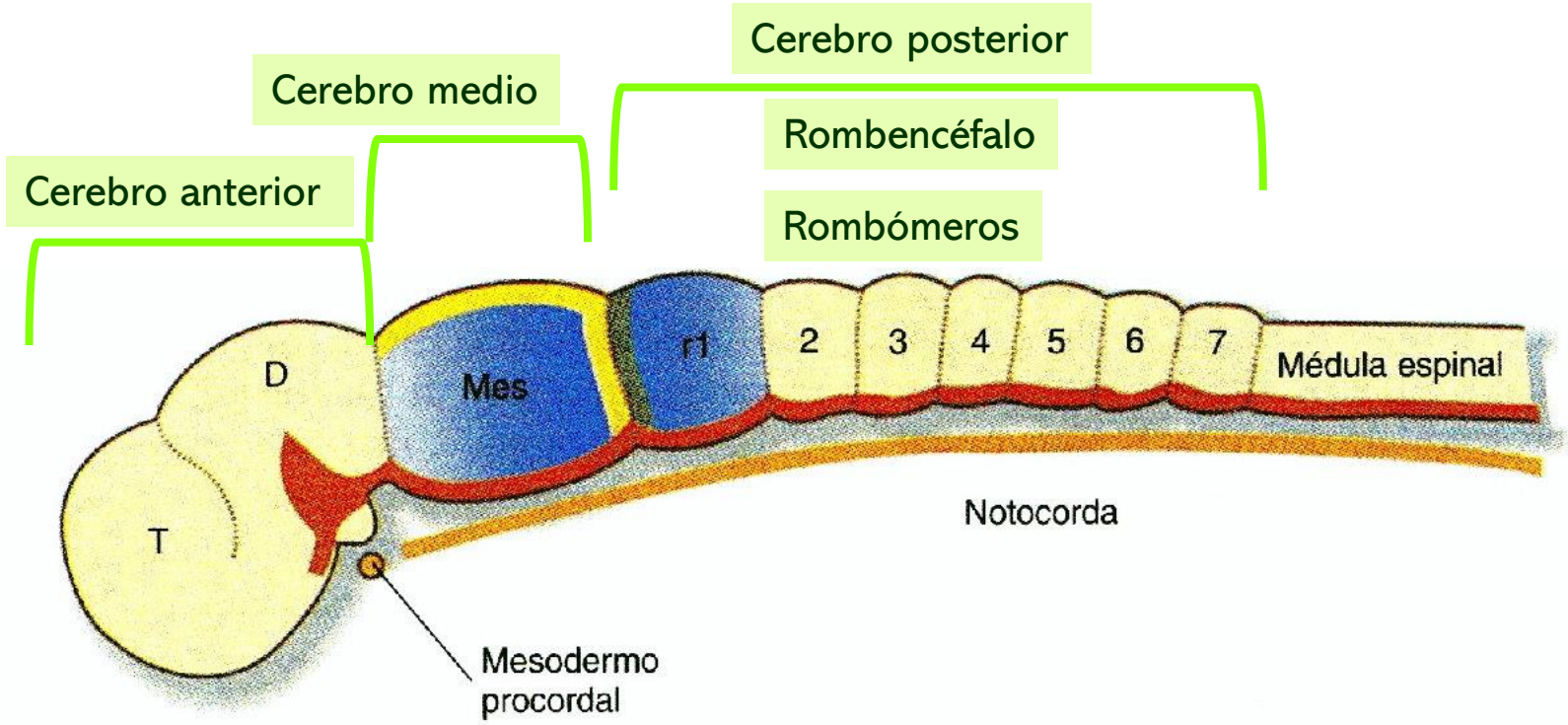
Cerebro posterior, rombencéfalo

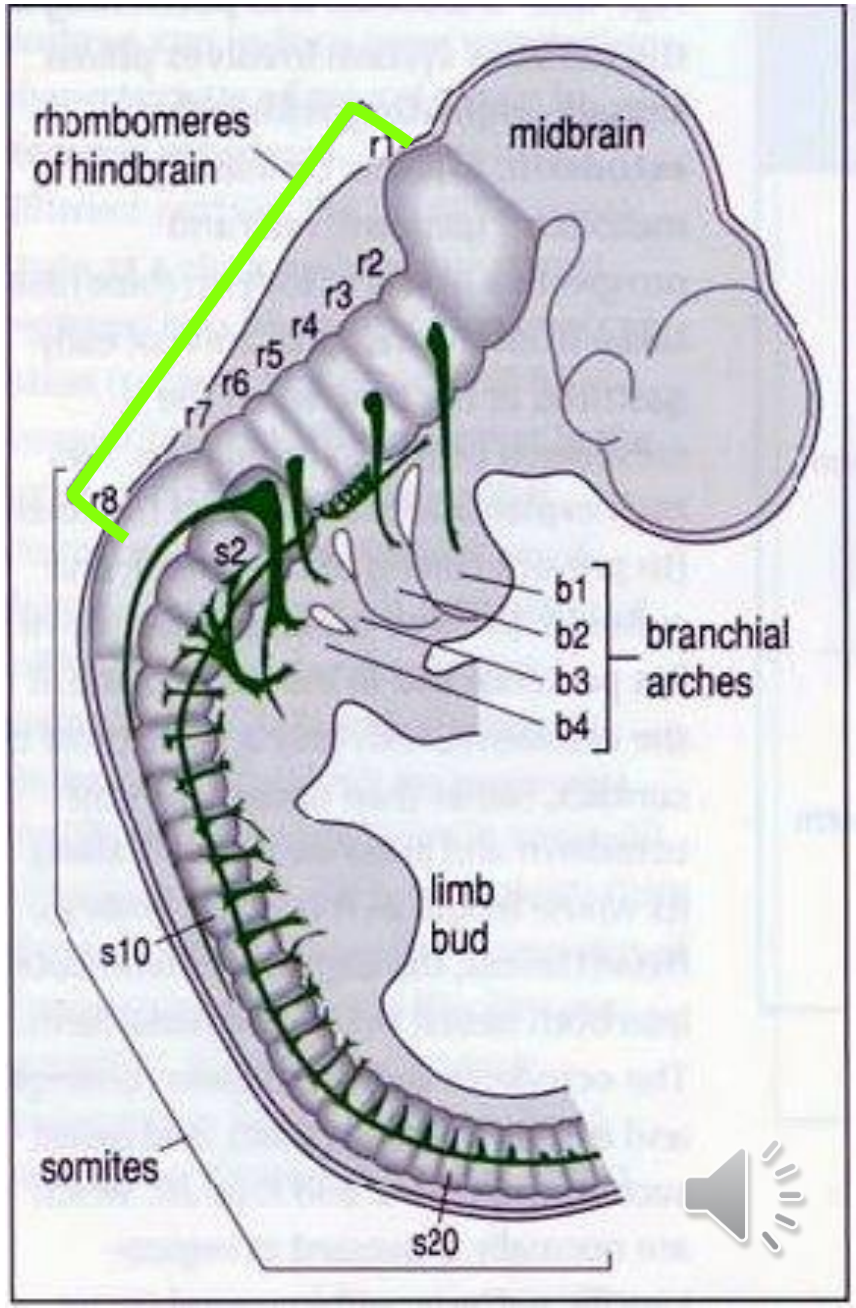


Rombómeros



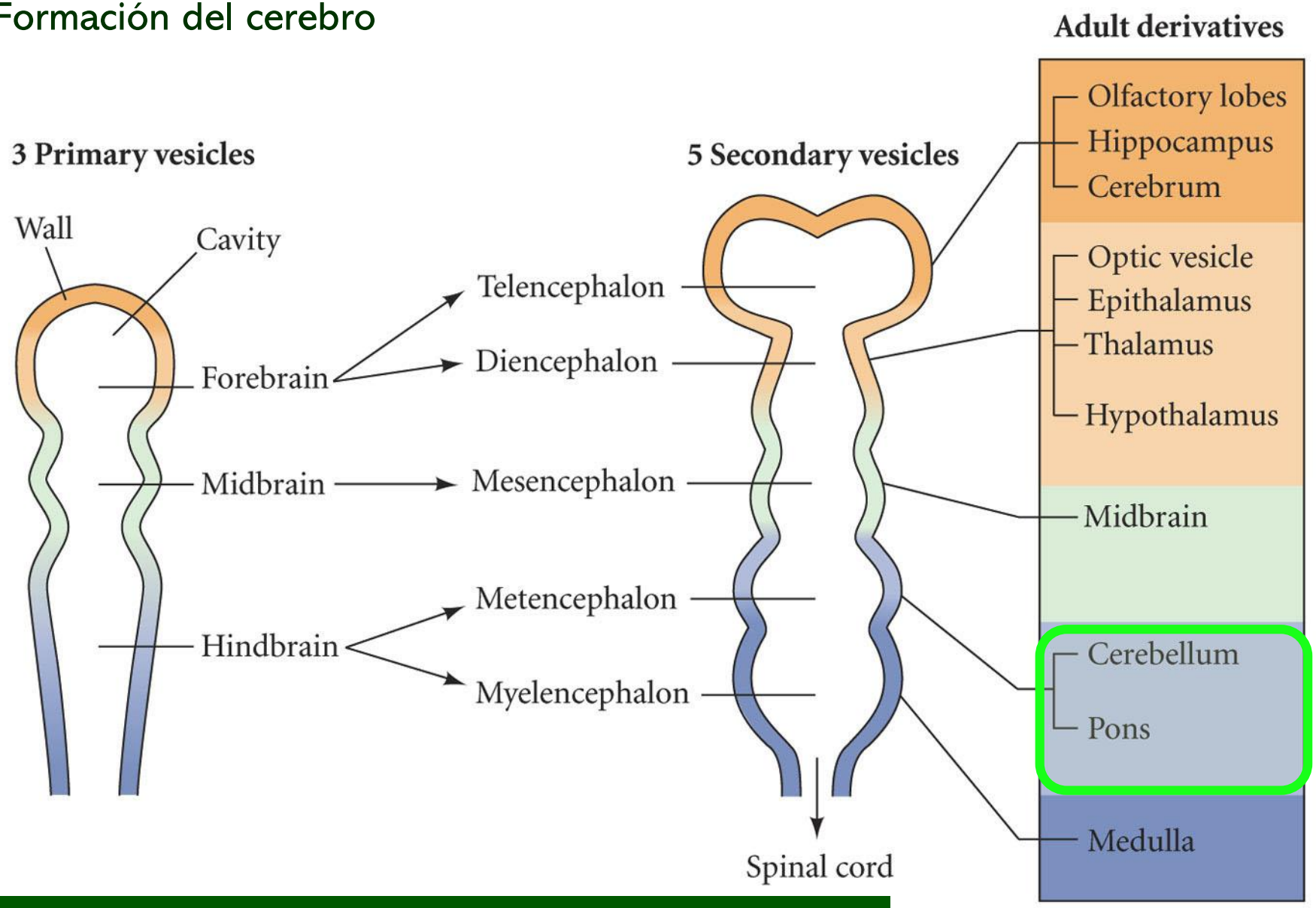
Formación del cerebro

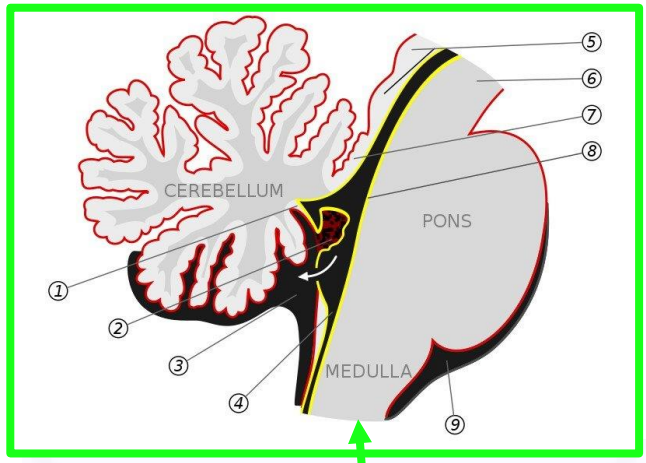


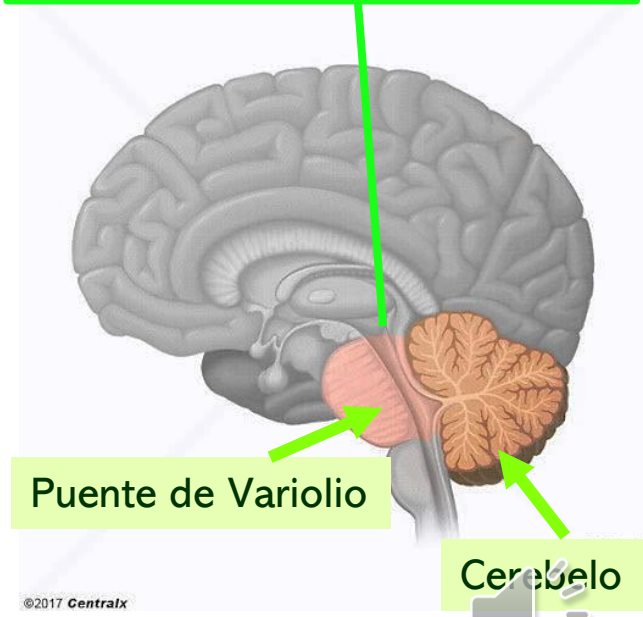


Cerebro posterior, rombencéfalo

Formación del cerebro

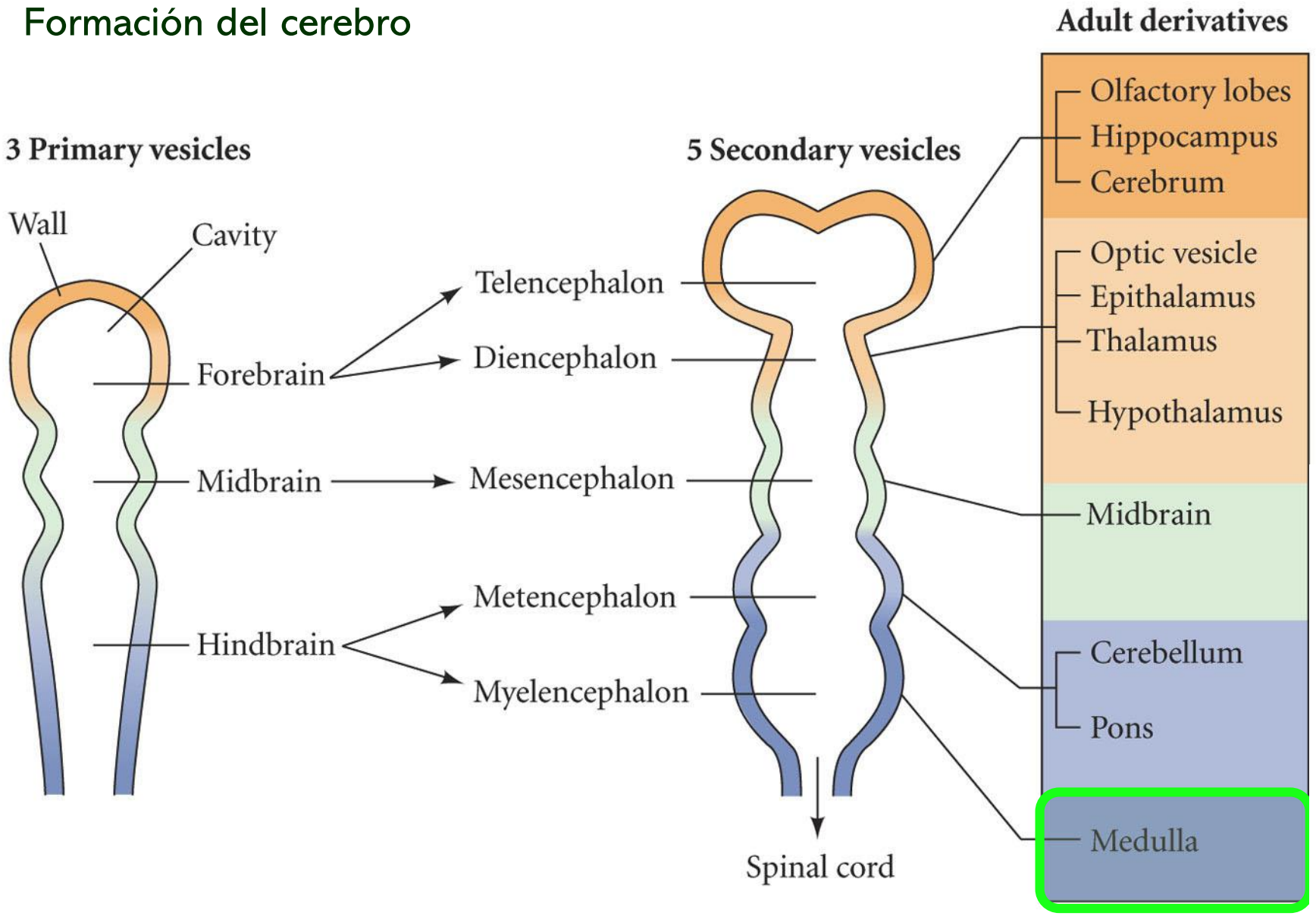


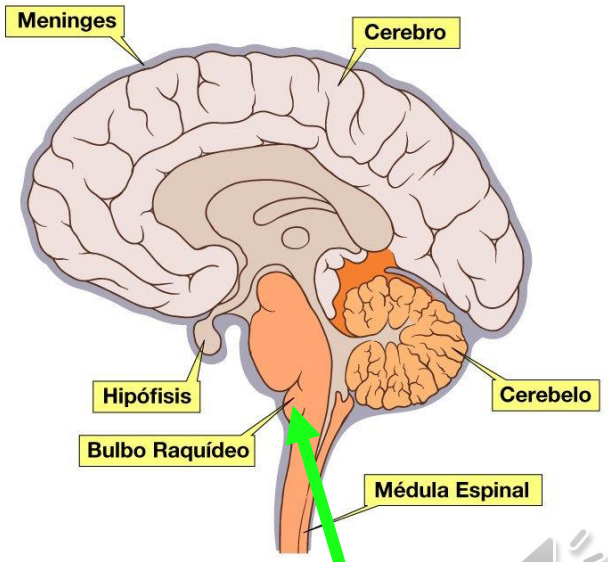




Cerebro posterior, rombencéfalo, metencéfalo

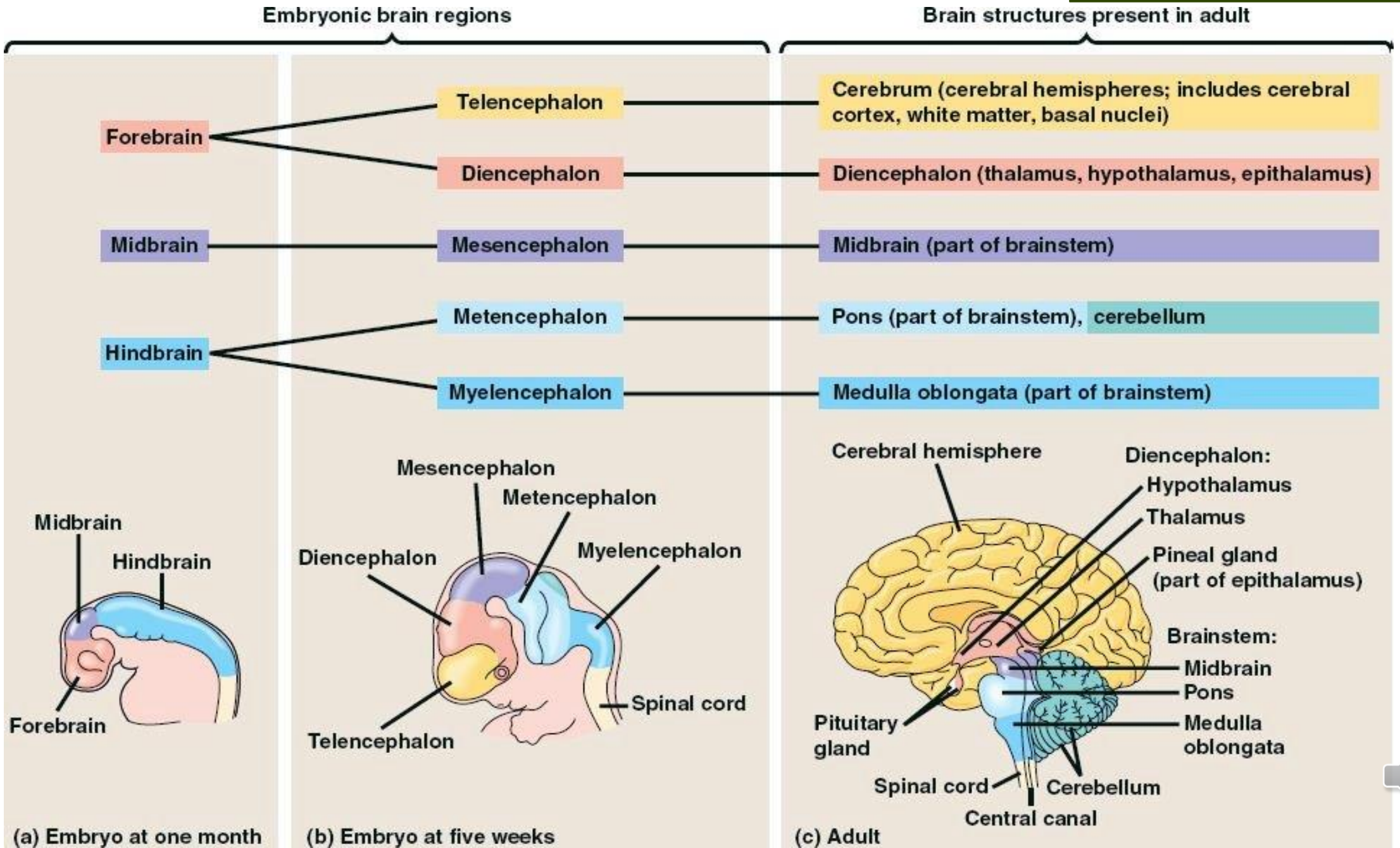
Formación del cerebro

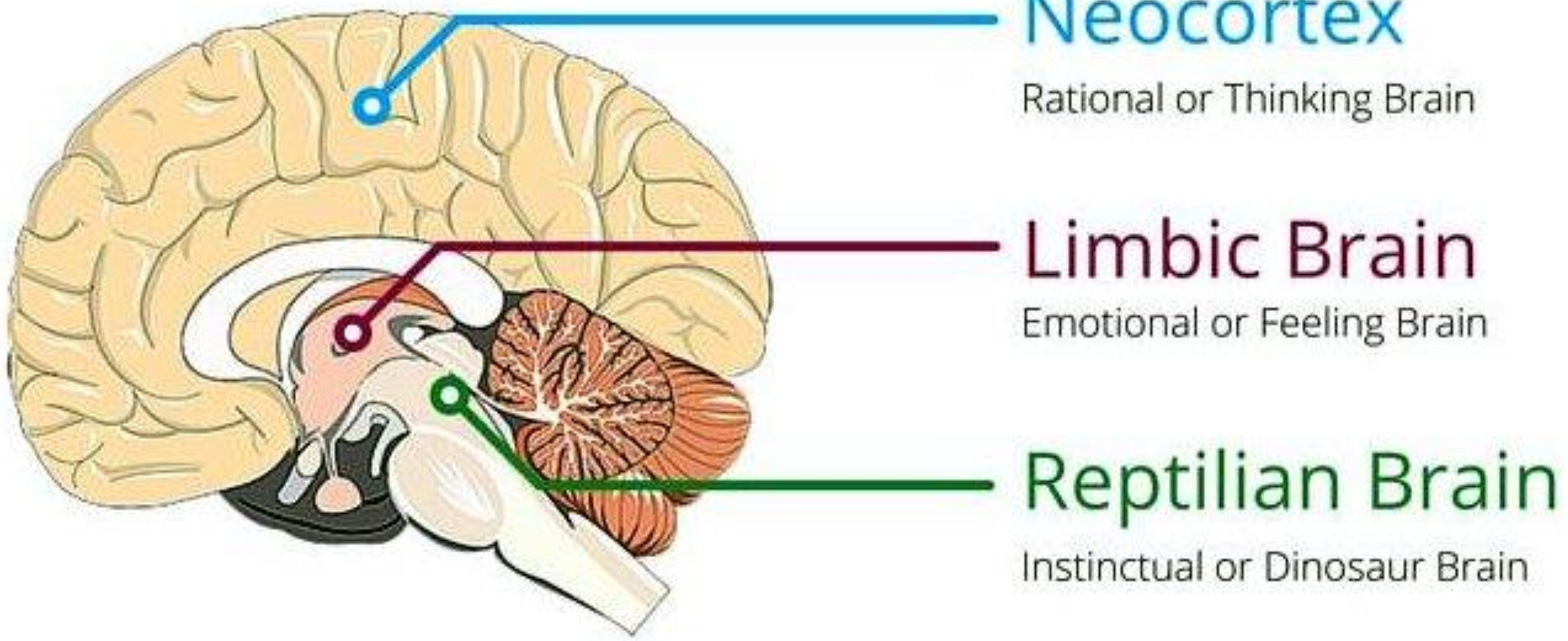


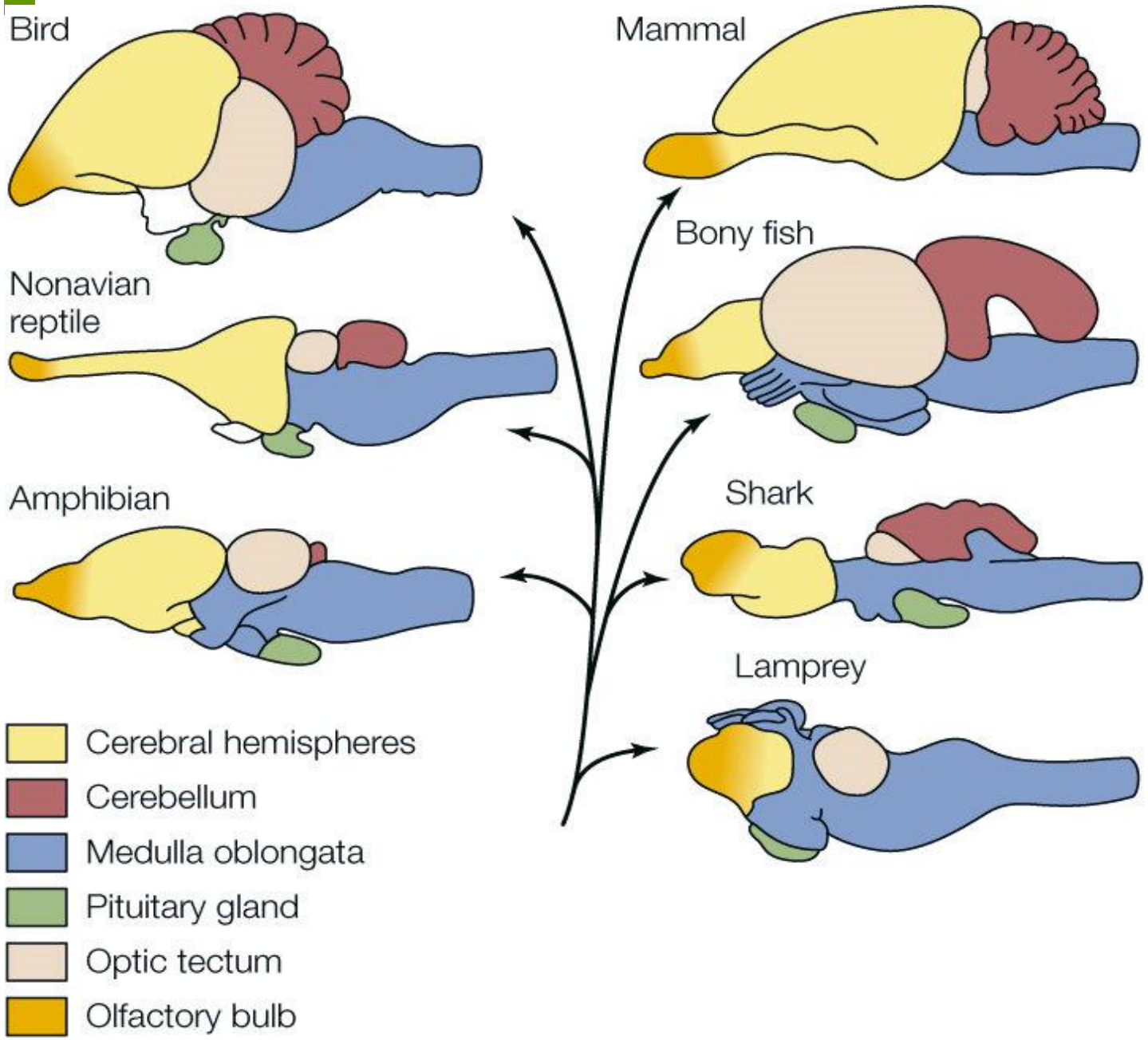


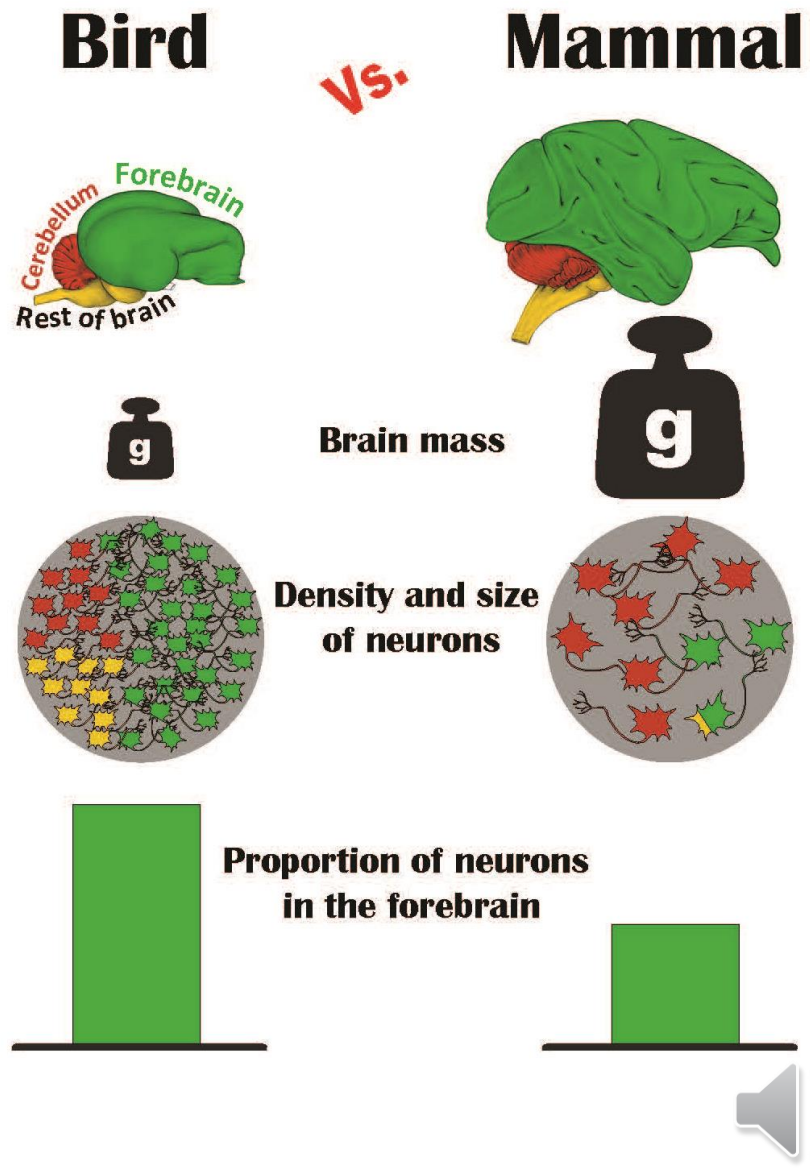
Cerebro posterior, rombencéfalo, mielencéfalo

Bulbo raquídeo

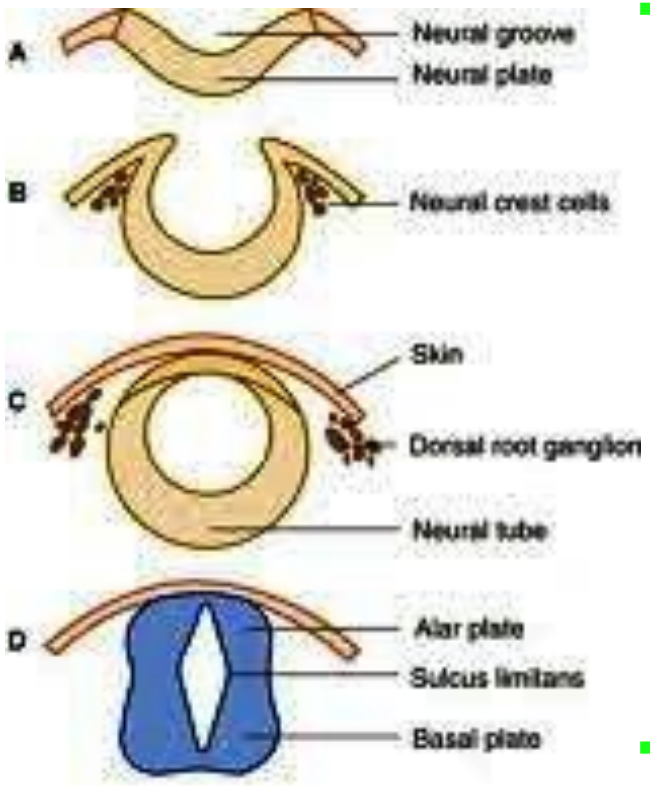

Embryonic brain regions
Brain structures present in adult
Forebrain
Midbrain
Hindbrain
Telencephalon
Diencephalon
Mesencephalon
Metencephalon
Myelencephalon
Cerebrum (cerebral hemispheres; includes cerebral cortex, white matter, basal nuclei)
Diencephalon (thalamus, hypothalamus, epithalamus)
Midbrain (part of brainstem)
Pons (part of brainstem), cerebellum
Medulla oblongata (part of brainstem)
Midbrain
Hindbrain
Forebrain
(a) Embryo at one month
Mesencephalon
Metencephalon
Diencephalon
Myelencephalon
Spinal cord
Telencephalon
(b) Embryo at five weeks
Cerebral hemisphere
Diencephalon:
Hypothalamus
Thalamus
Pineal gland
(part of epithalamus)
Brainstem:
Midbrain
Pons
Medulla
oblongata
Pituitary
gland
Spinal cord
Cerebellum
Central canal
(c) Adult


Neocortex
Rational or Thinking Brain
Limbic Brain
Emotional or Feeling Brain
Reptilian Brain
Instinctual or Dinosaur Brain


Bird
Mammal
Bony fish
Nonavian reptile
Amphibian
Shark
Lamprey
Cerebral hemispheres
Cerebellum
Medulla oblongata
Pituitary gland
Optic tectum
Olfactory bulb

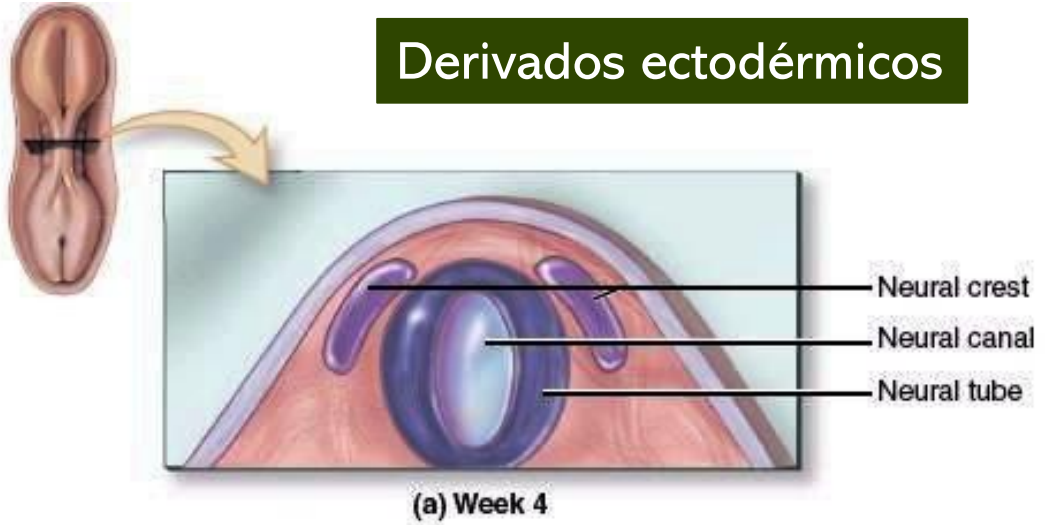

Bird
Vs.
Mammal
Cerebellum
Forebrain
Rest of brain
g
Brain mass
g
Density and size of neurons
Proportion of neurons in the forebrain

Derivados ectodérmicos

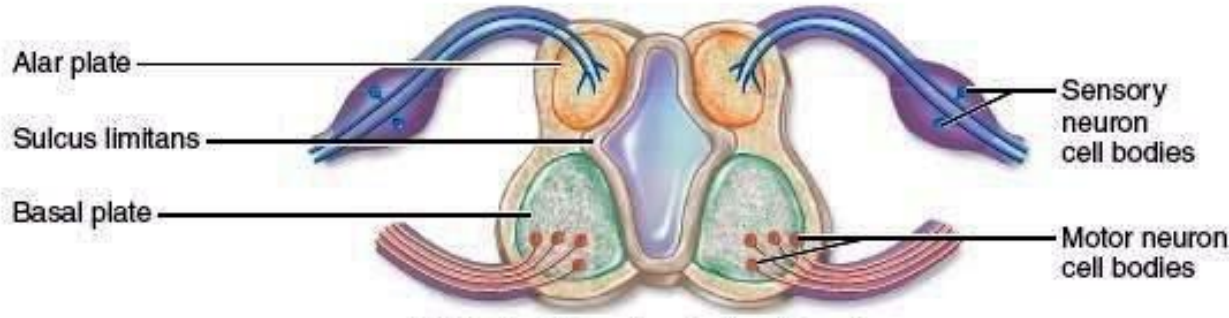


Formación del tubo neural

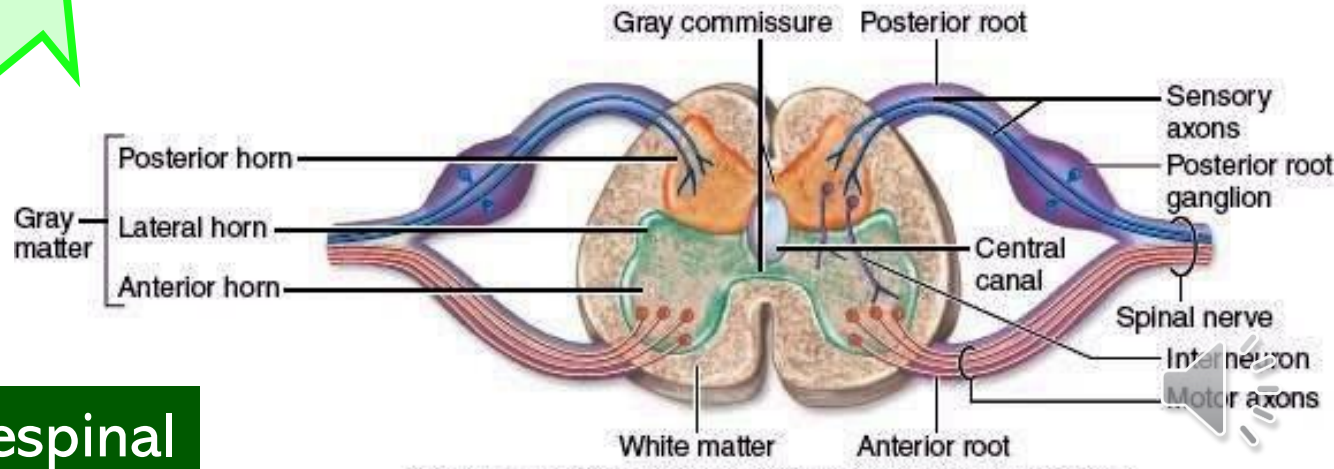
Desarrollo de la médula espinal



(a) Week 4

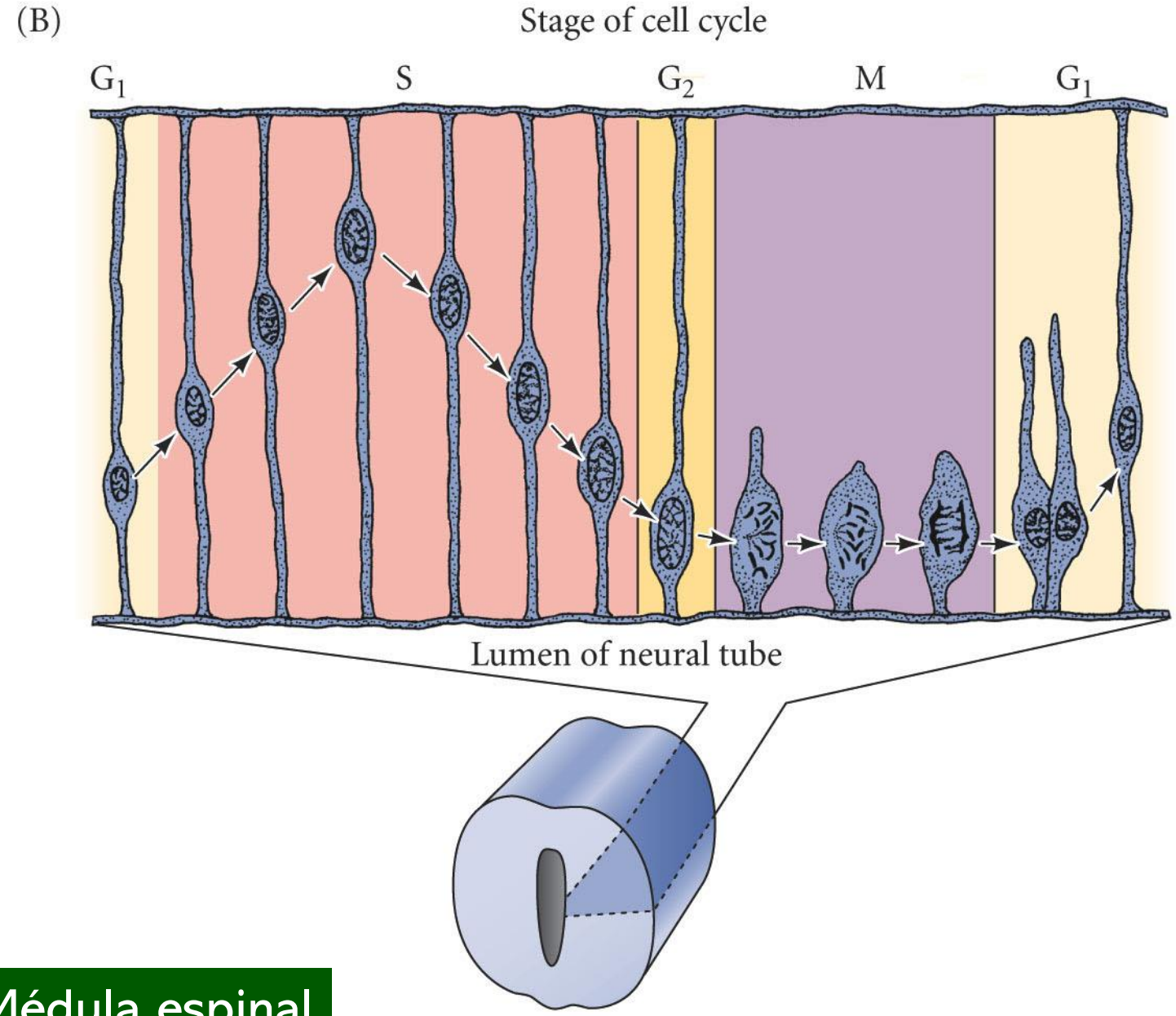


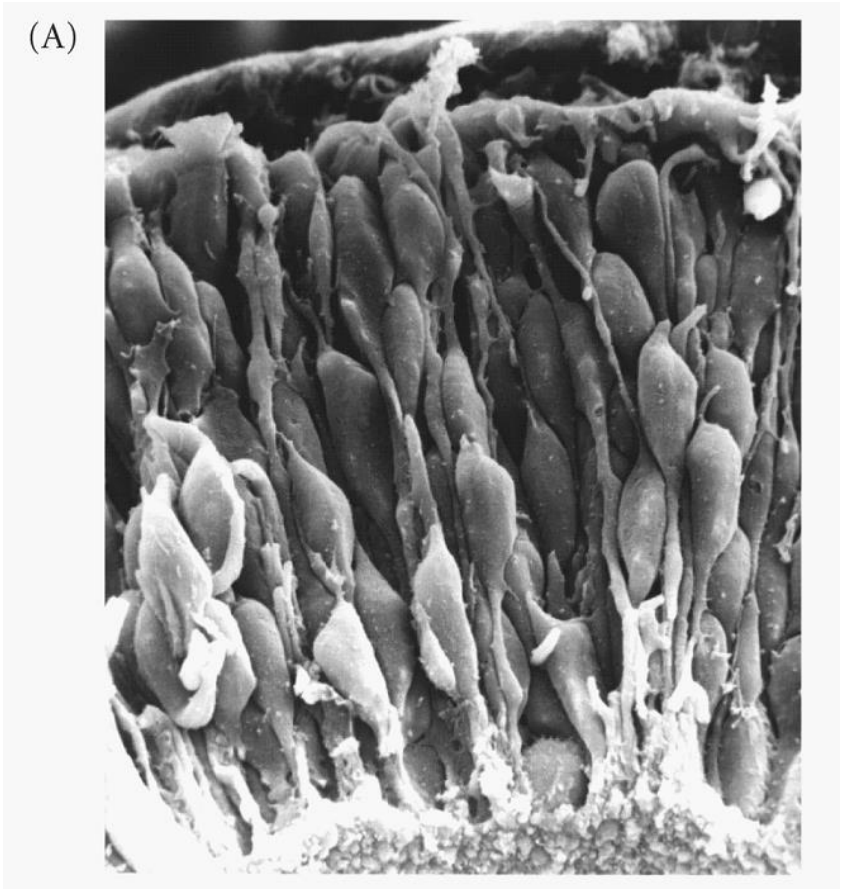
(b) Week 6: Basal and alar plates form



(c) Week 9: Gray horns form from basal and alar plates

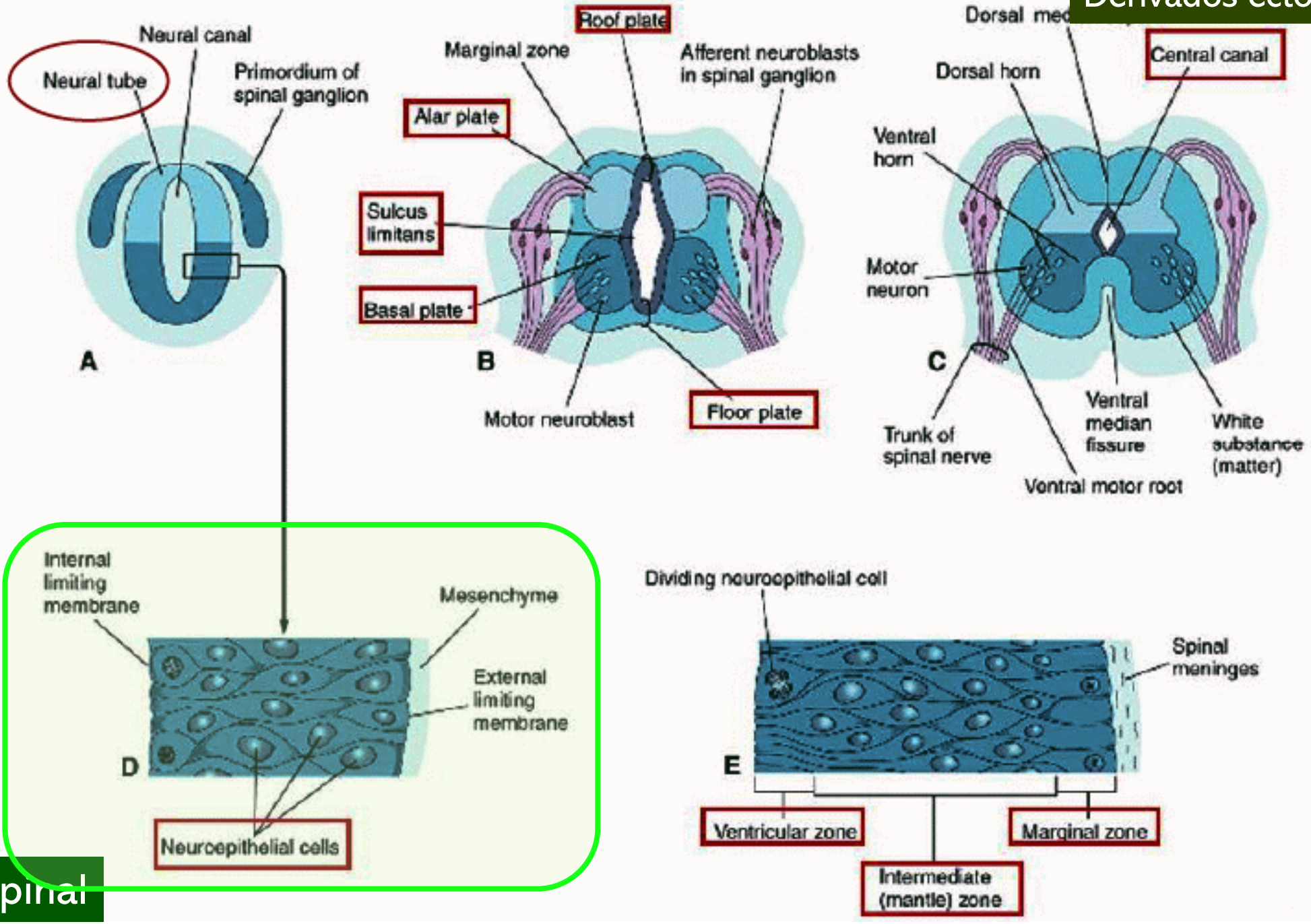
Médula espinal

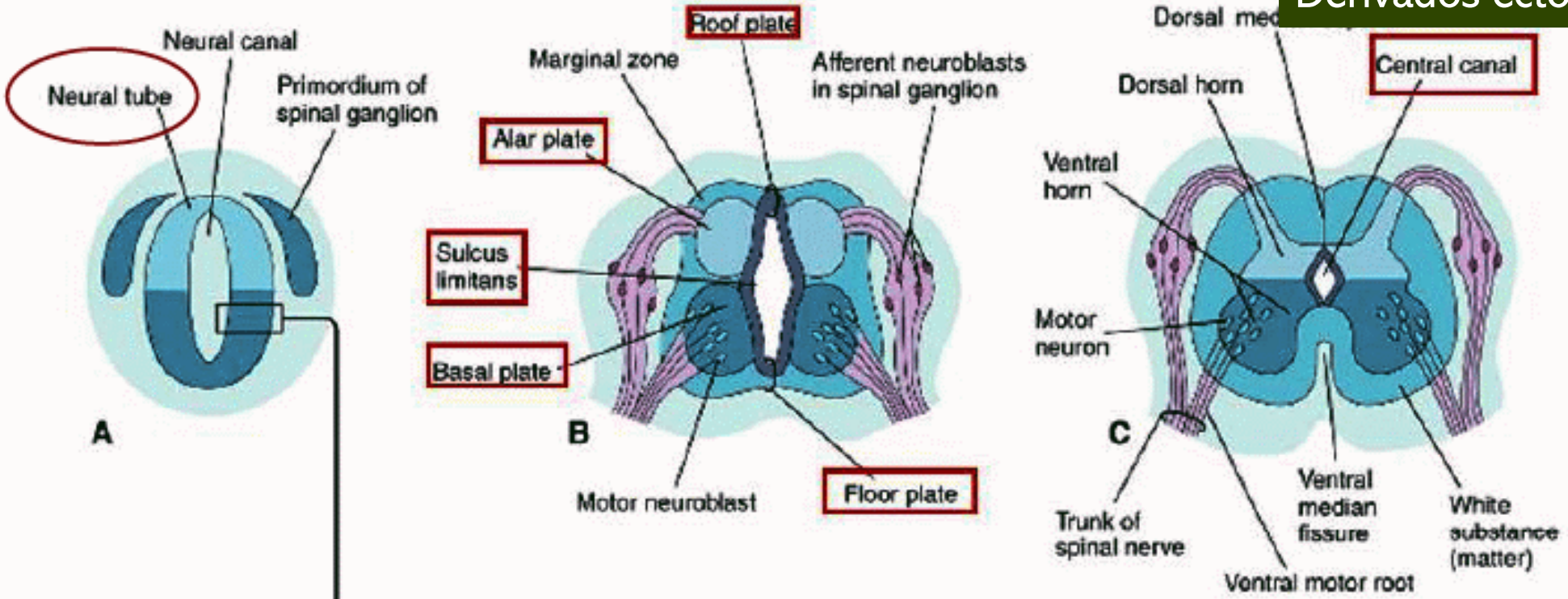


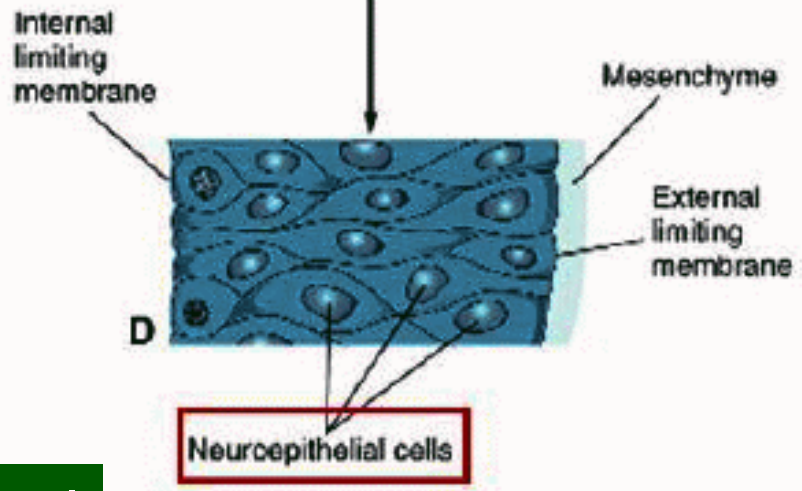


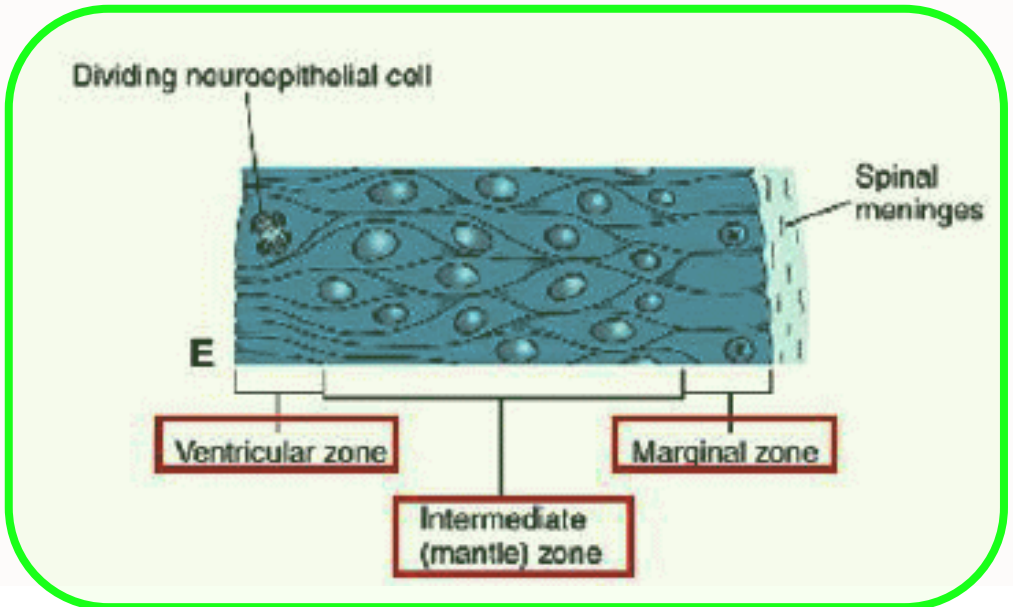
Médula espinal

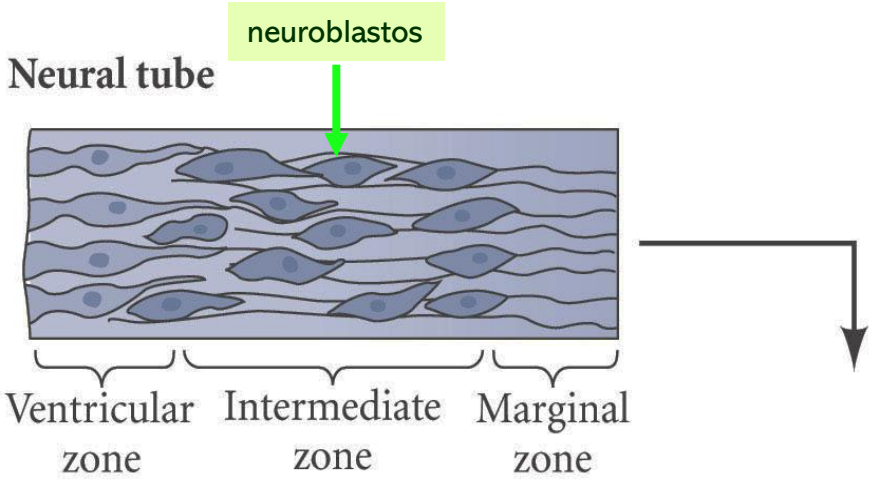
DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.15 (Part 2) © 2006 Sinauer Associates, Inc.

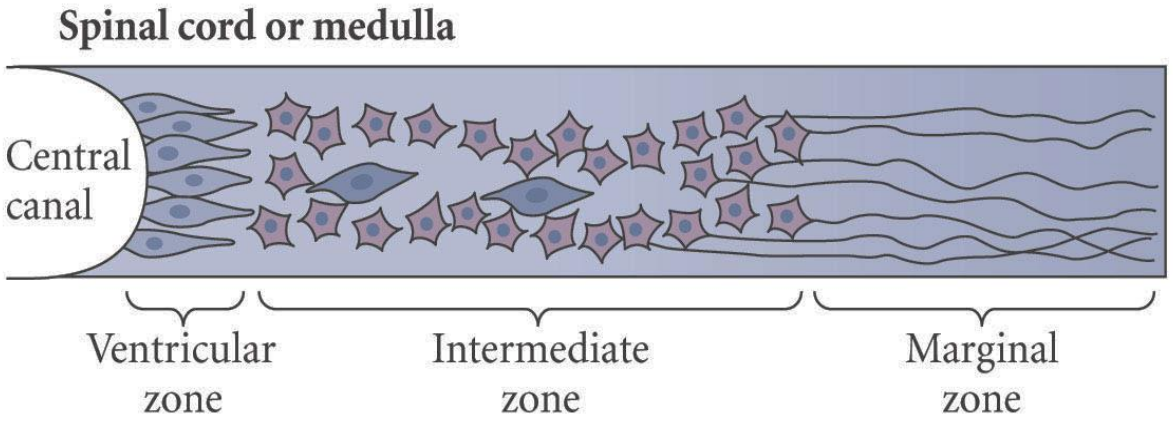

Neural canal
Neural tube
Primordium of spinal ganglion
A
Roof plate
Marginal zone
Afferent neuroblasts in spinal ganglion
Alar plate
Sulcus limitans
Basal plate
B
Motor neuroblast
Floor plate
Dorsal horn
Central canal
Ventral horn
Motor neuron
C
Trunk of spinal nerve
Ventral median fissure
White substance (matter)
Ventral motor root
Internal limiting membrane
Mesenchyme
External limiting membrane
D
Neurcepithelial cells
Dividing neuroepithelial cell
Spinal meninges
E
Ventricular zone
Marginal zone
Intermediate (mantle) zone

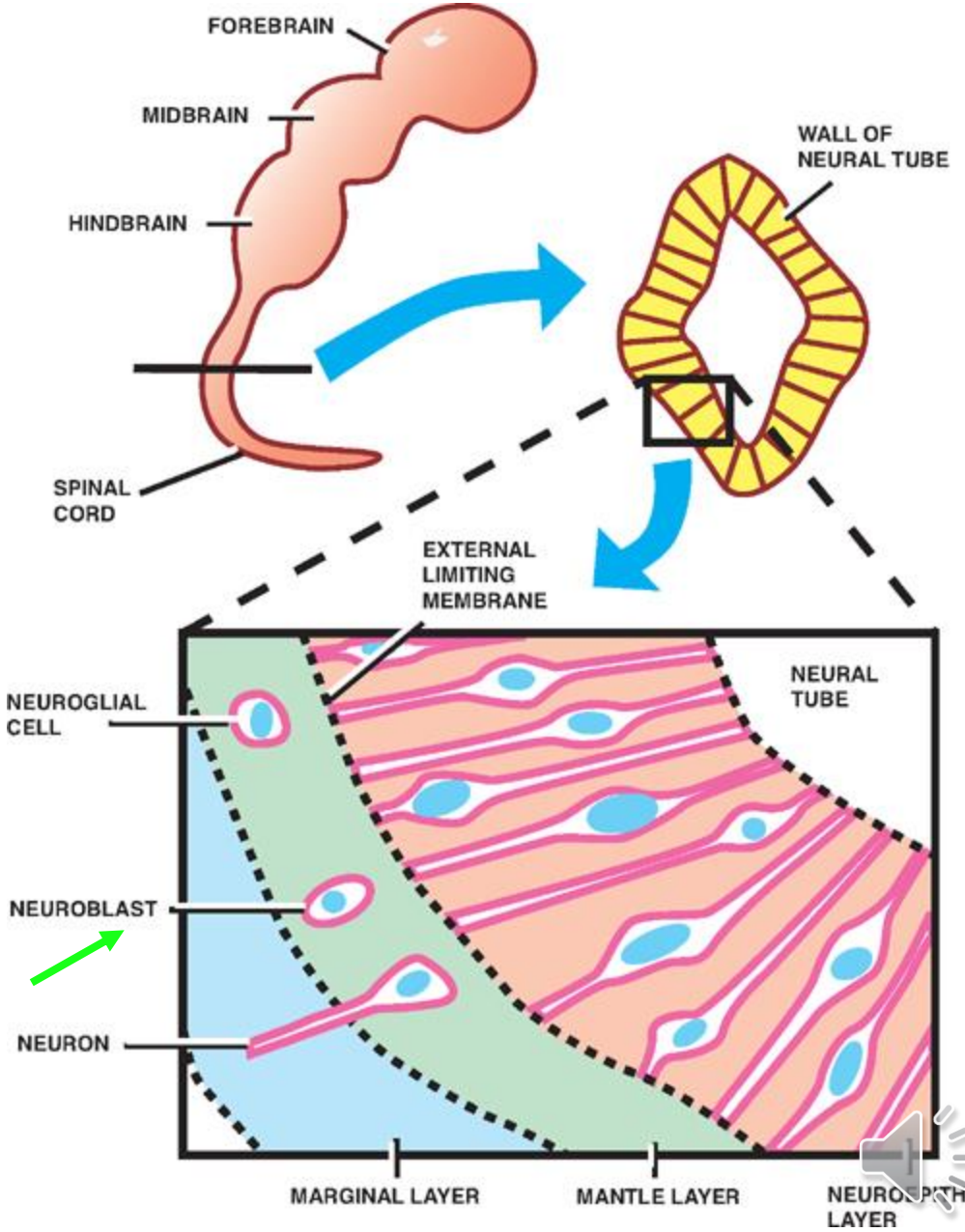

Neural canal
Neural tube
Primordium of spinal ganglion
A
Roof plate
Marginal zone
Afferent neuroblasts in spinal ganglion
Alar plate
Sulcus limitans
Basal plate
B
Motor neuroblast
Floor plate
Dorsal mec
Central canal
Dorsal horn
Ventral horn
Motor neuron
C
Trunk of spinal nerve
Ventral median fissure
White substance (matter)
Ventral motor root


Internal limiting membrane
Mesenchyme
External limiting membrane
D
Neurcepithelial cells


Dividing neuroepithelial cell
Spinal meninges
E
Ventricular zone
Marginal zone
Intermediate (mantle) zone



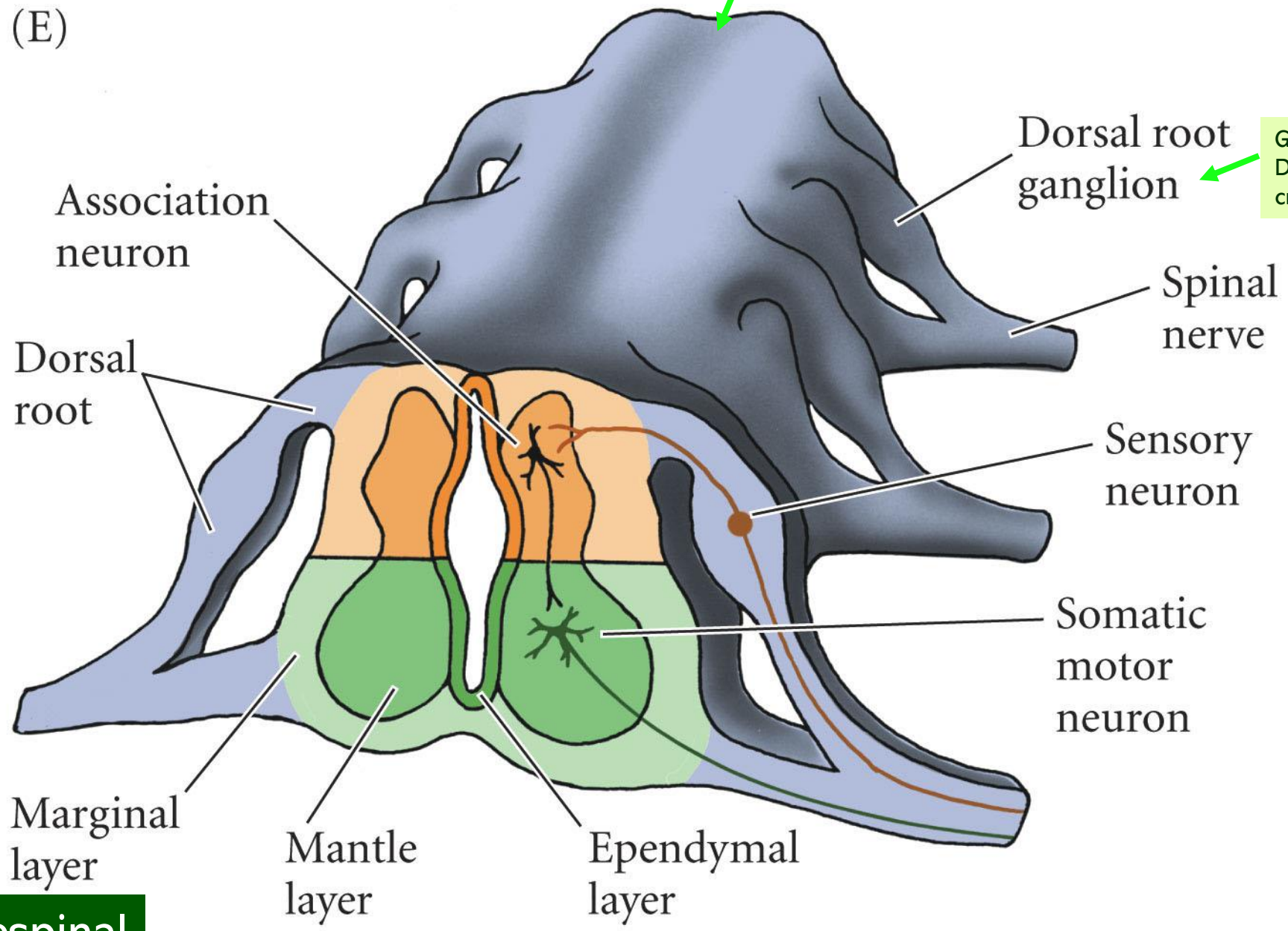




DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 12.16 (Part 1) © 2006 Sinauer Associates, Inc.

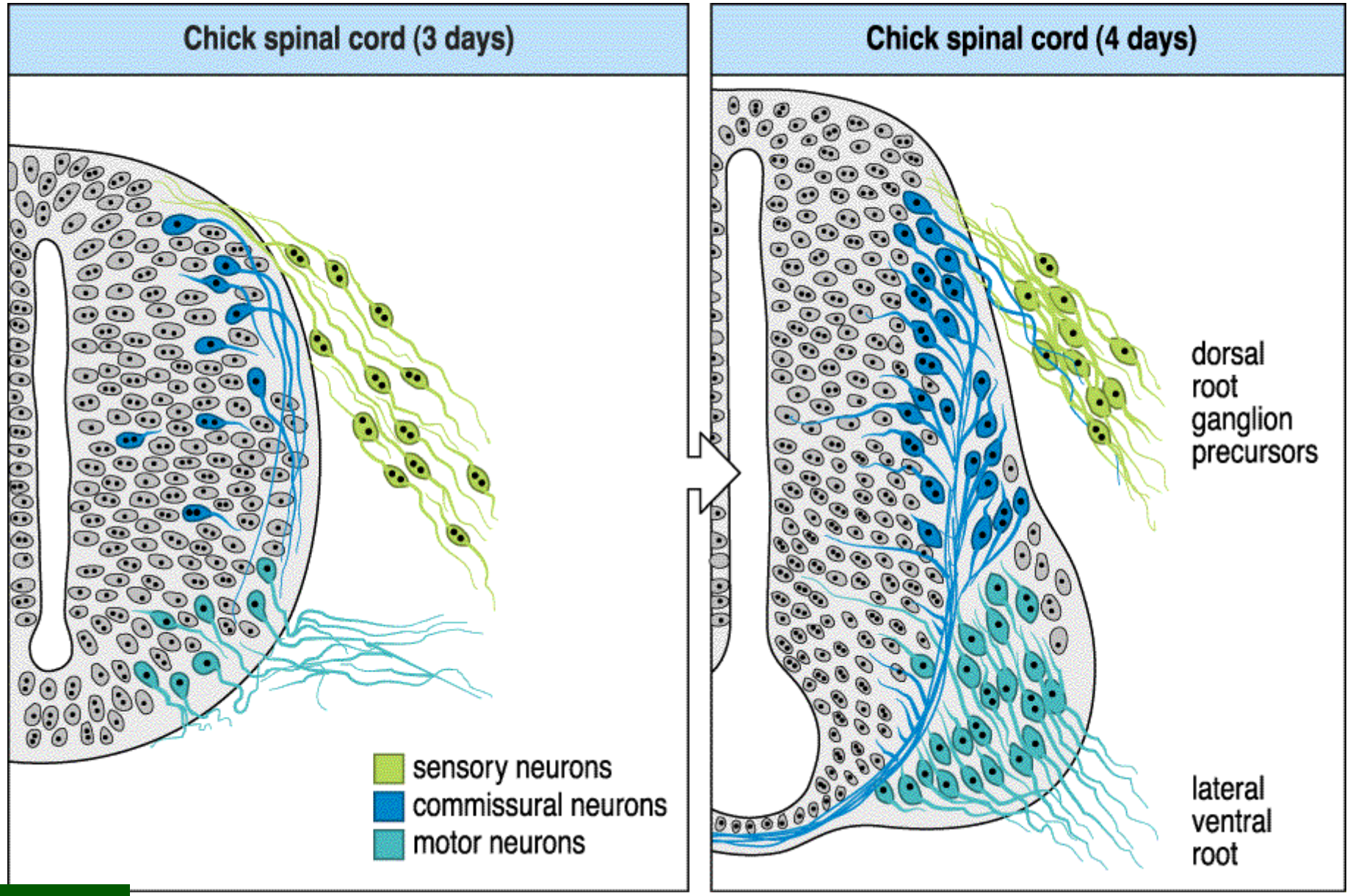
Médula espinal

Médula espinal

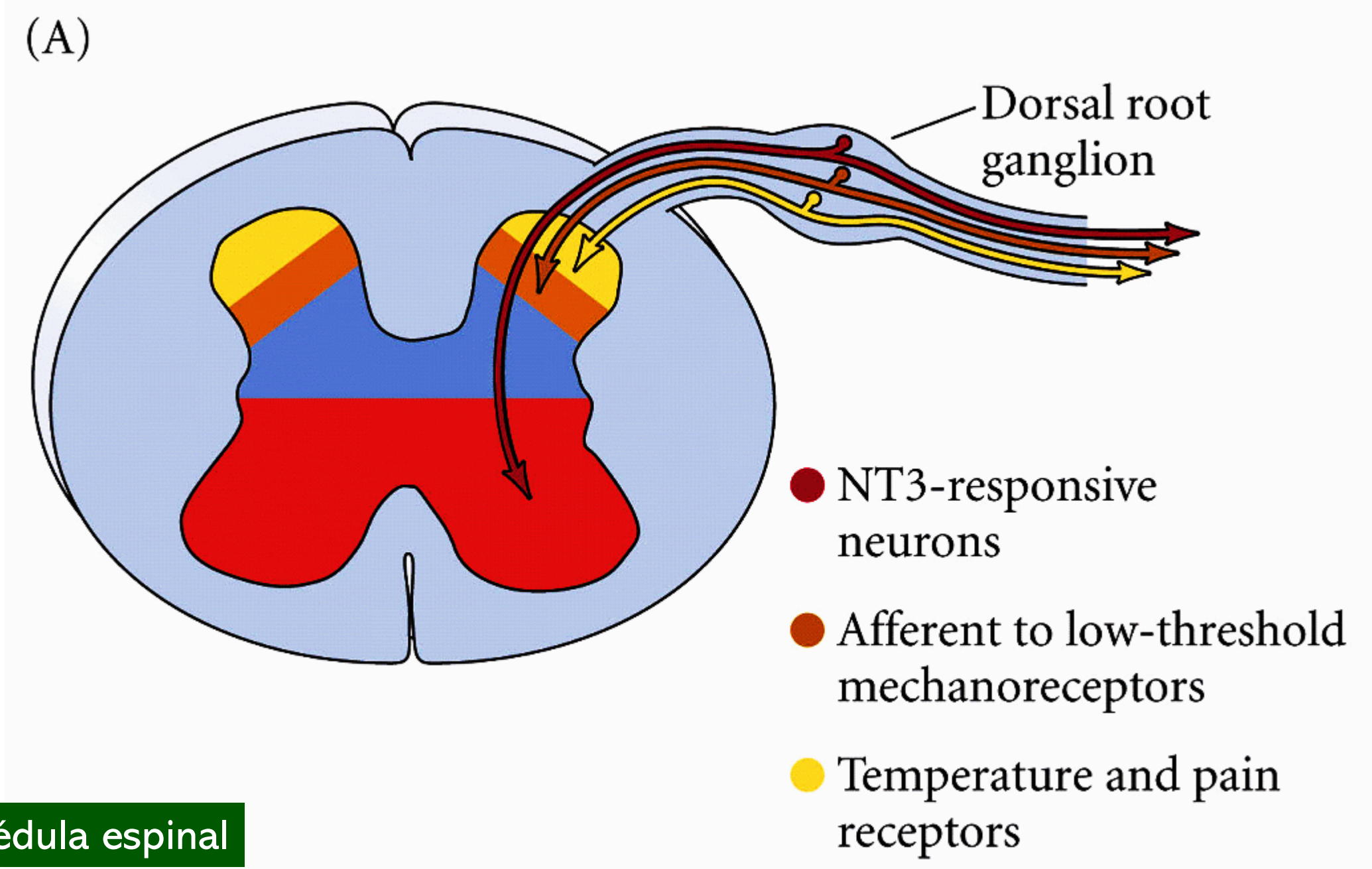


Ganglios radiculares dorsales
Derivados de las células de la cresta neural

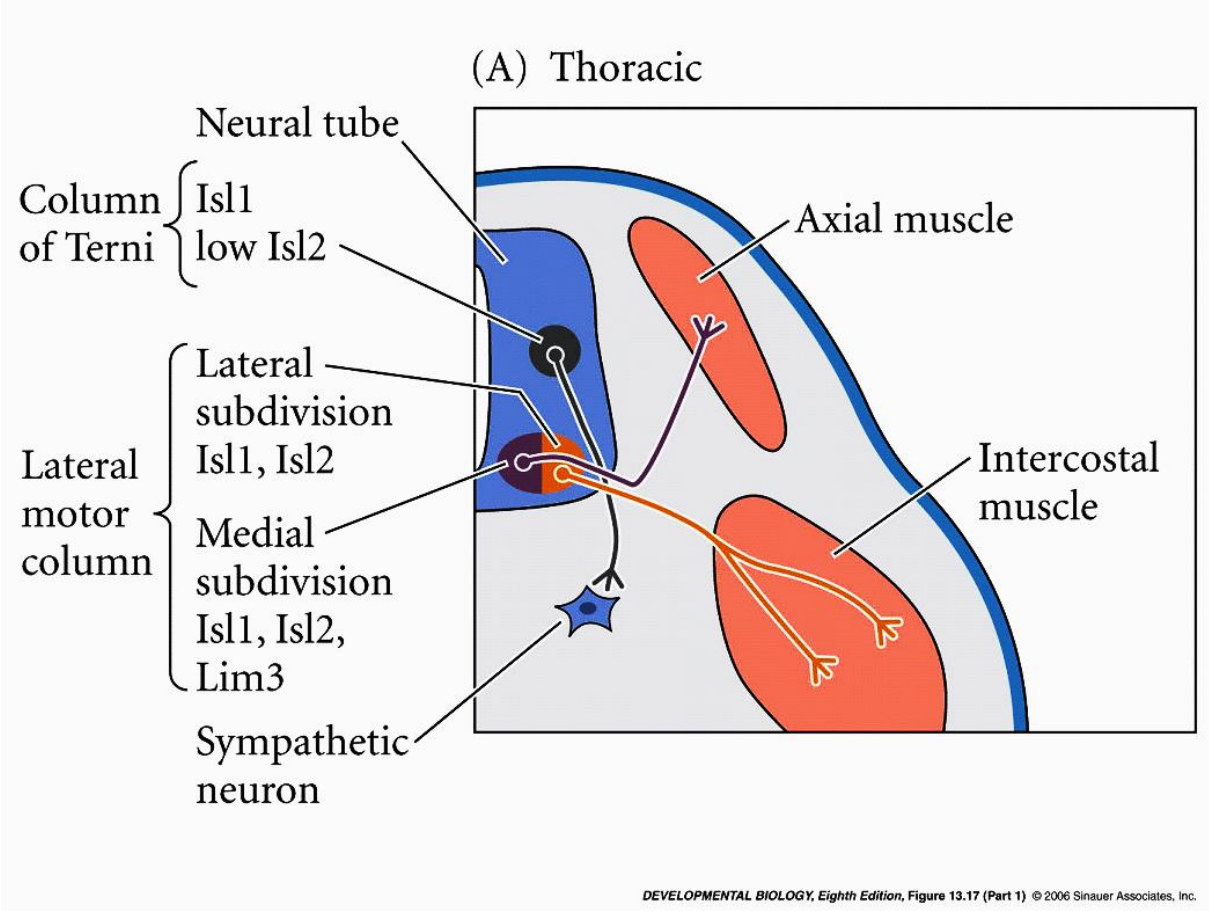
Médula espinal

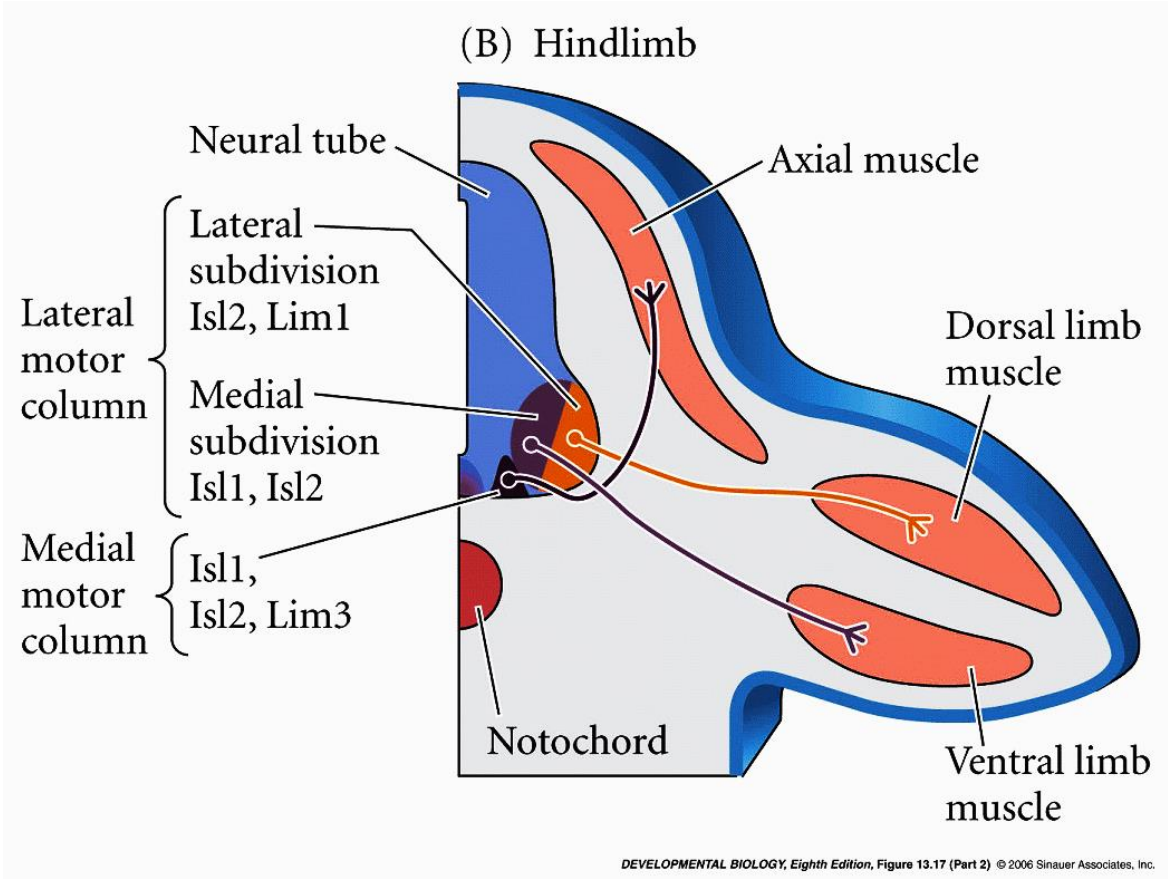


Médula espinal

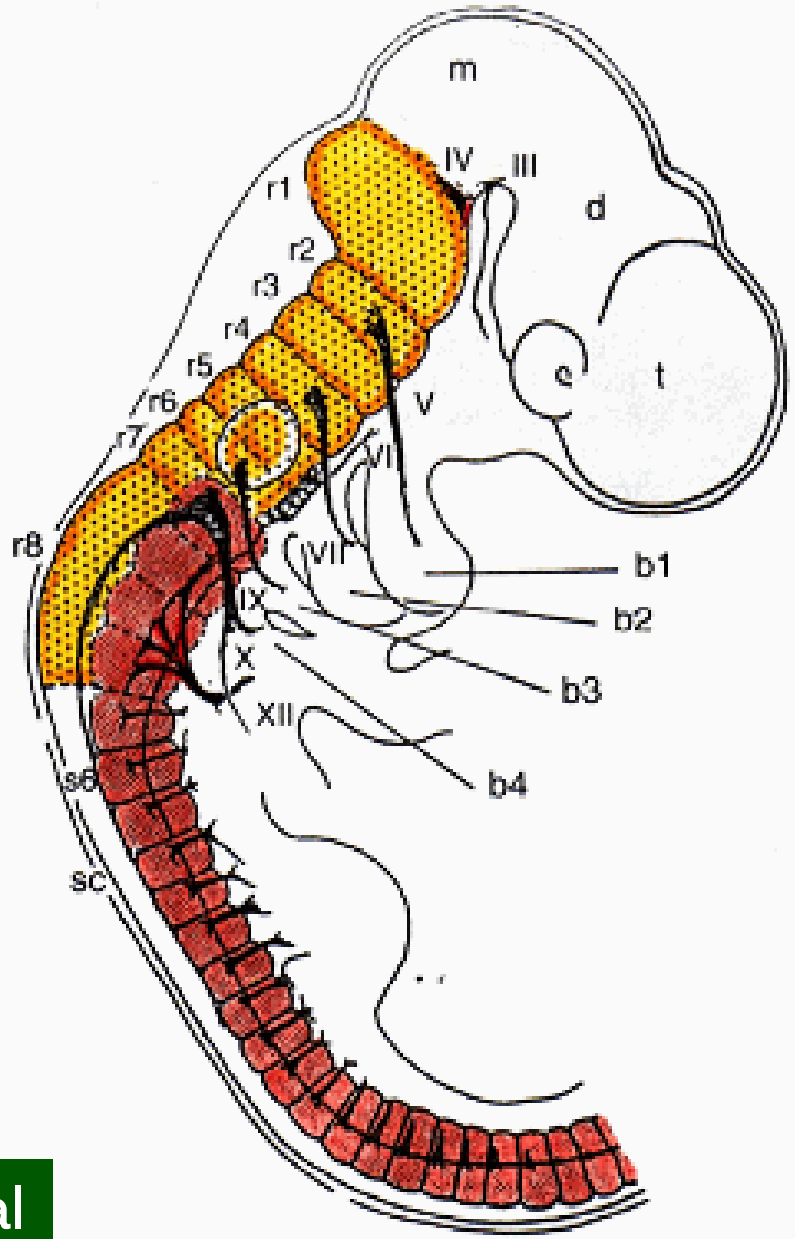


Médula espinal

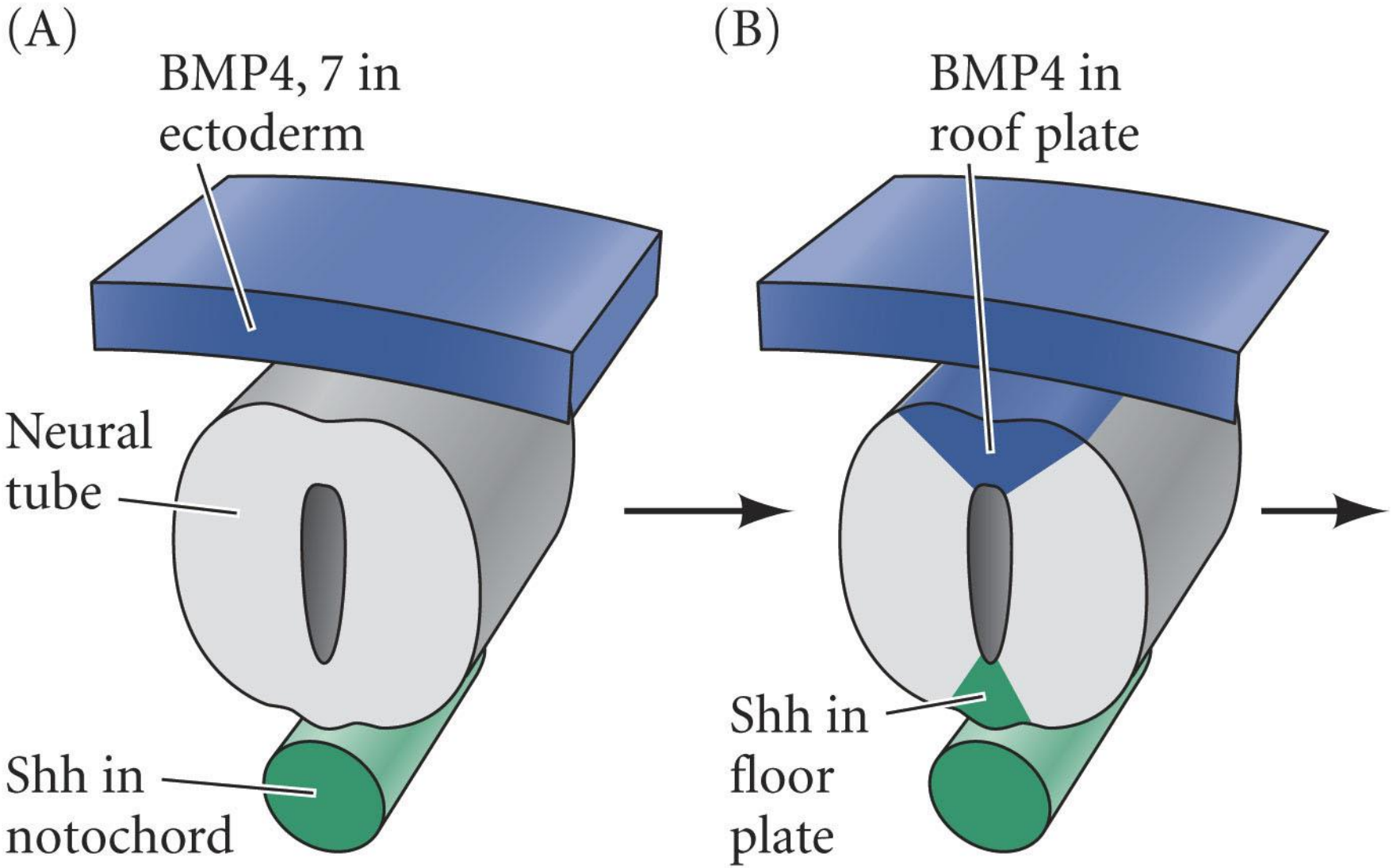


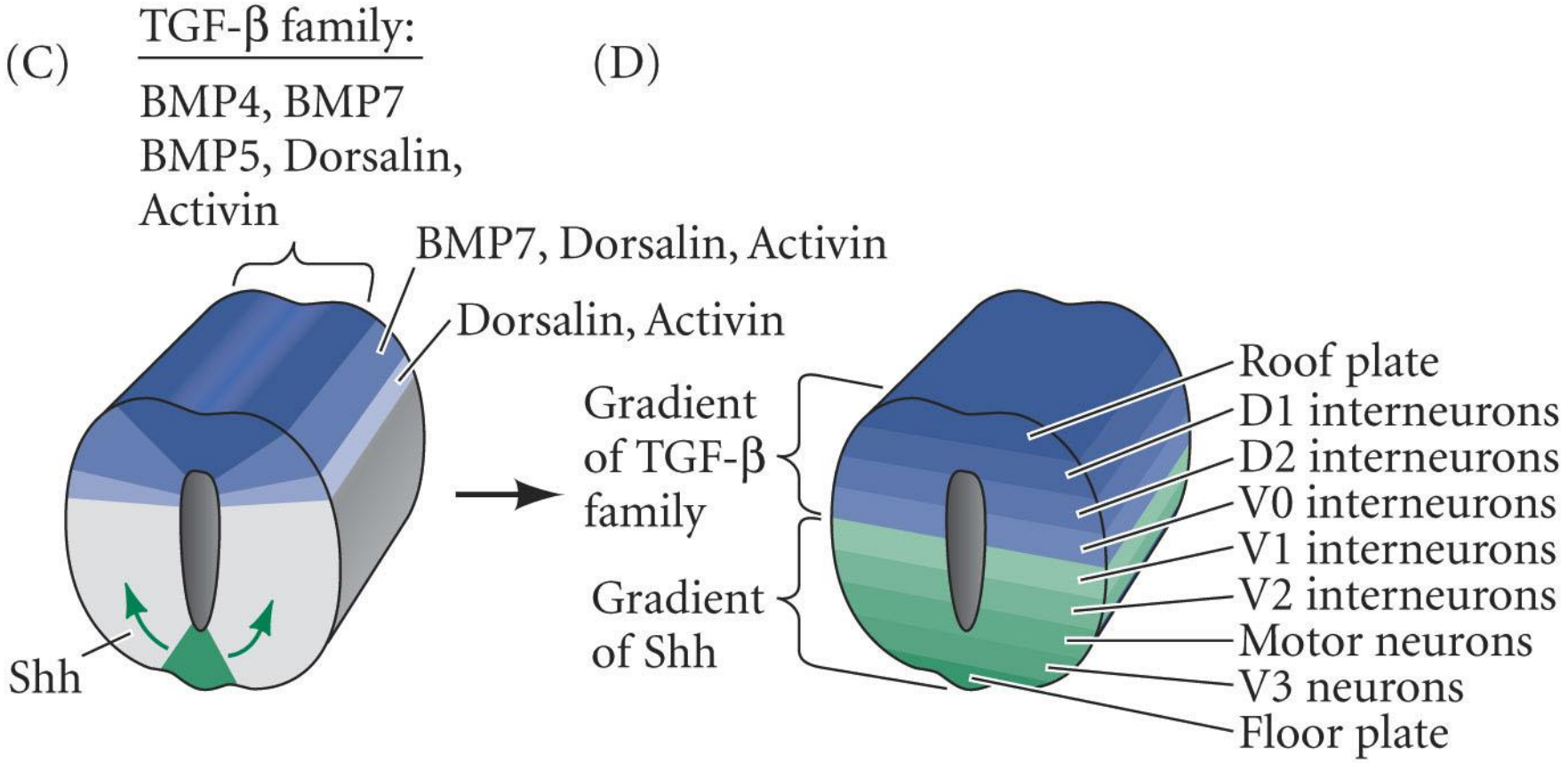


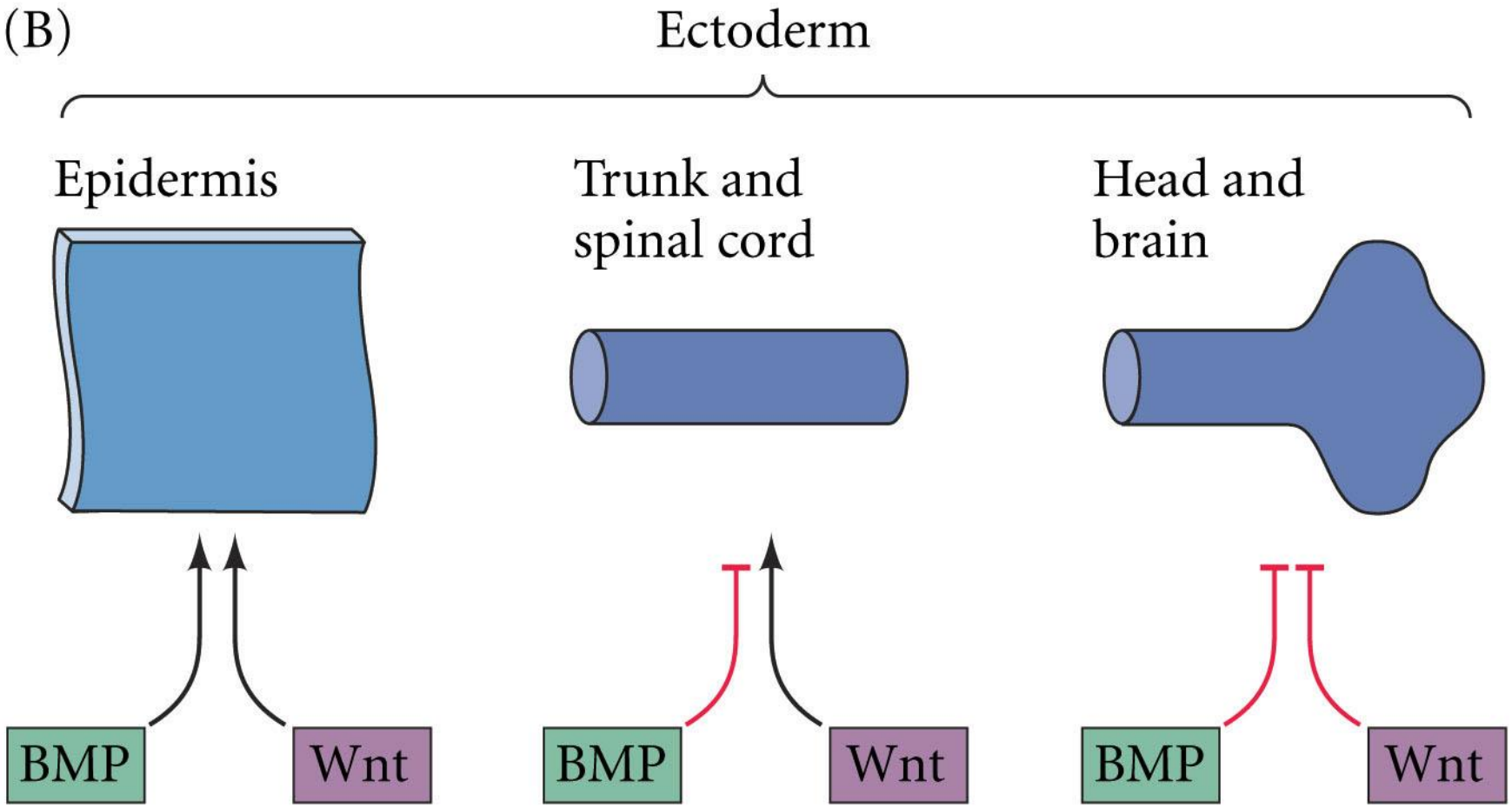
Médula espinal

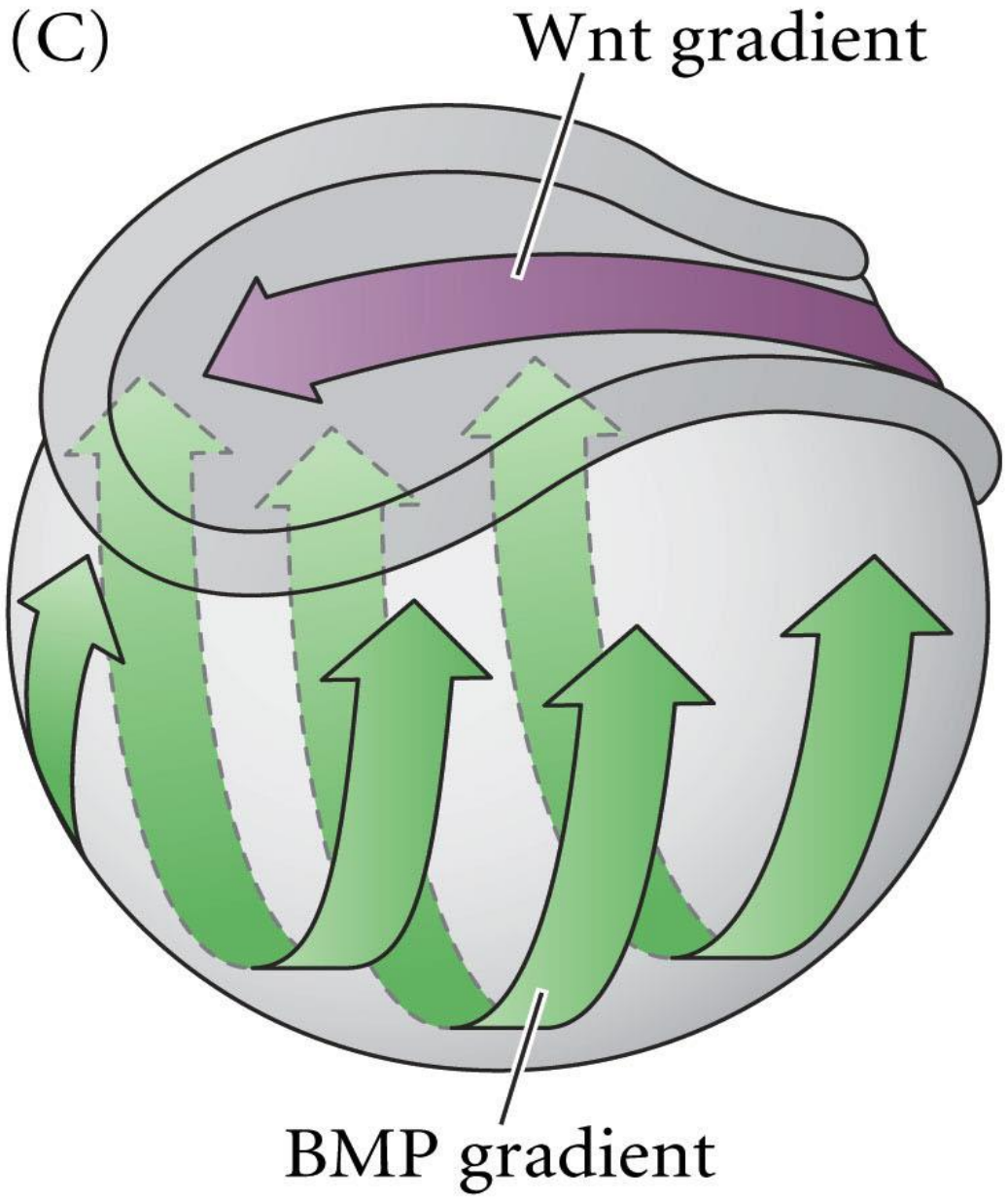


Cerebro y Médula espinal









Los productos de Wnt señalan la vía y la dirección postero-anterior del tubo neural

DEVELOPMENTAL BIOLOGY, Eighth Edition, Figure 10.40 (Part 2) © 2006 Sinauer Associates, Inc.

Derivados ectodérmicos