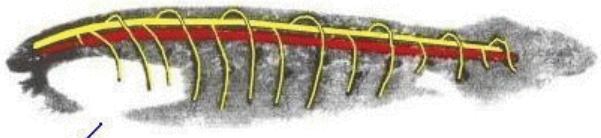
Anatomy 9535b — BRAINS OF VARIOUS VERTEBRATE ANIMALS

Chordata; subphylum Cephalochordata:

Branchiostoma (Amphioxus; Lancelet)

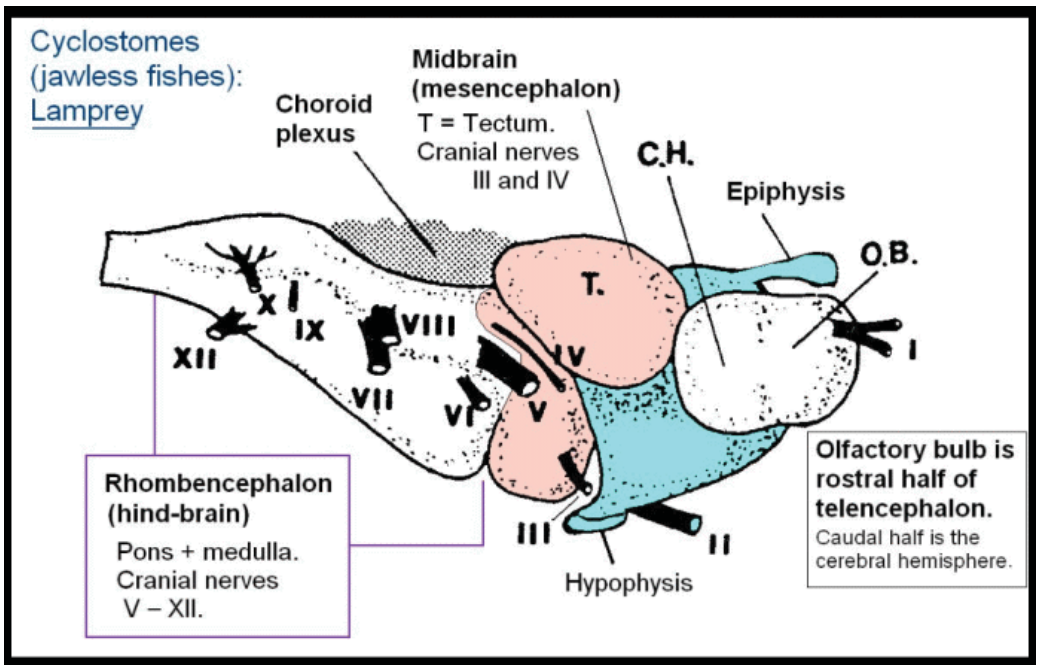
An almost headless animal

Hollow nerve cord dorsal to notochord



Mouth is ventral to anterior ends of nerve cord and notochord

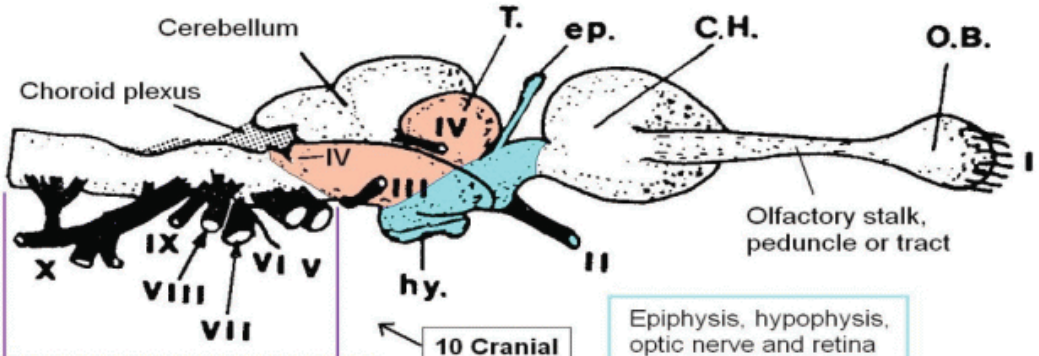
Alternating dorsal (sensory) and ventral (motor) nerves. Bipolar sensory neurons on dorsal surface of nerve cord.


Cyclostomes
(jawless fishes):
Lamprey
Choroid
plexus
Midbrain
(mesencephalon)
T = Tectum.
Cranial nerves
III and IV
C.H.
Epiphysis
O.B.
T.
X
IX
VIII
XII
VII
VI
V
IV
III
II
I
Hypophysis
Rhombencephalon
(hind-brain)
Pons + medulla.
Cranial nerves
V – XII.
Olfactory bulb is
rostral half of
telencephalon.
Caudal half is the
cerebral hemisphere.

Elasmobranchs
(cartilaginous fishes)
Dogfish.

ep. = Epiphysis
hy. = Hypophysis
T = Tectum

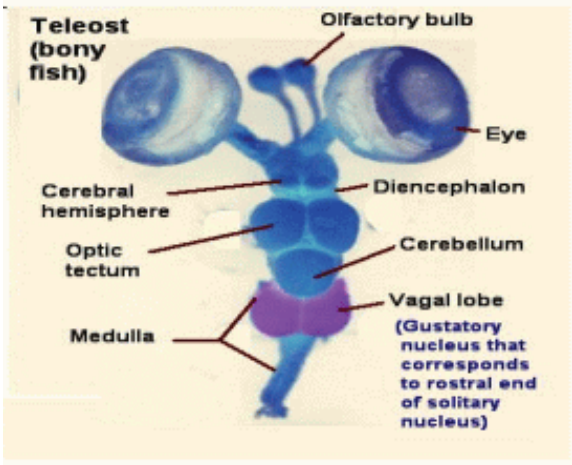
Telencephalon



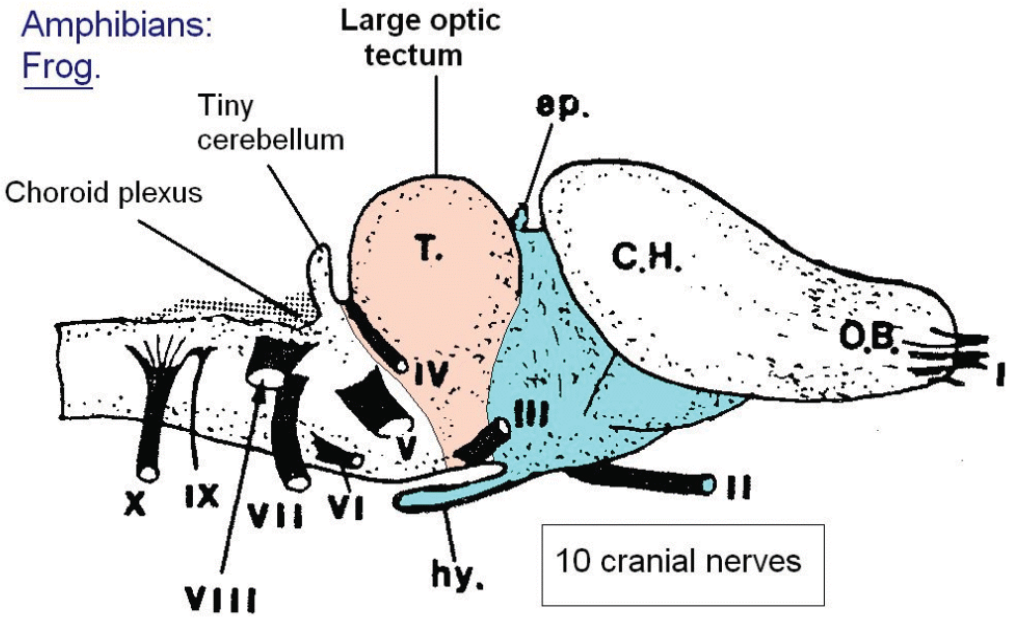
10 Cranial nerves

Rhombencephalon (hind-brain)
Myelencephalon = Medulla
Metencephalon = Pons + Cerebellum

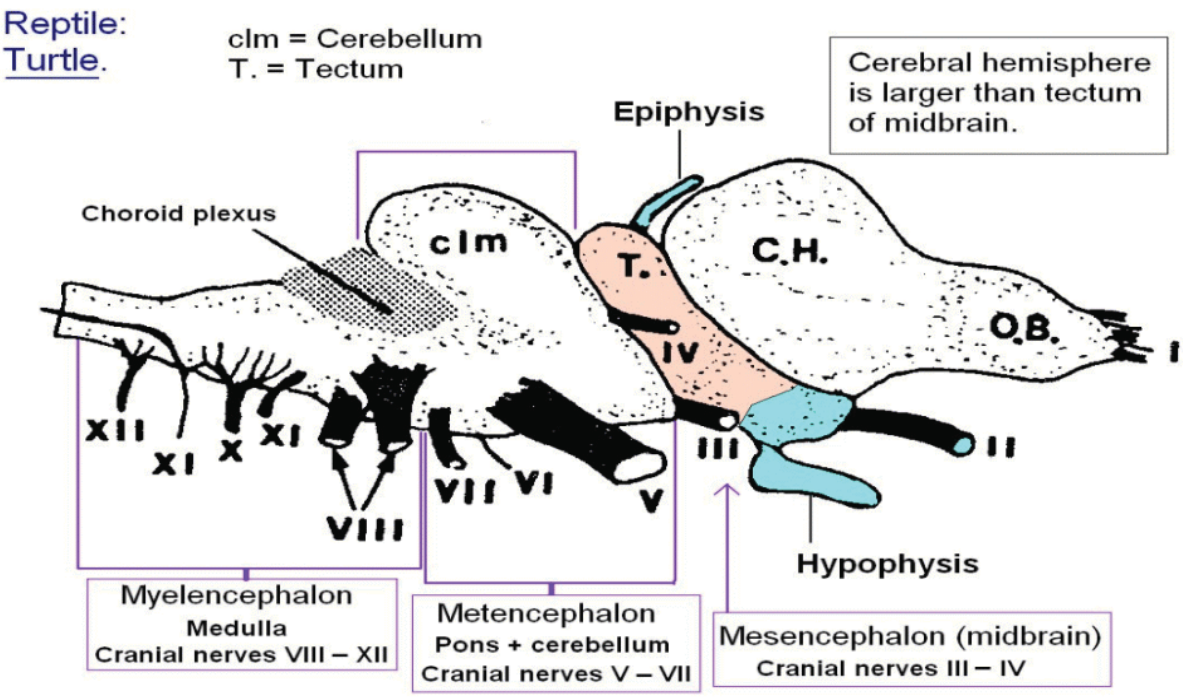
Epiphysis, hypophysis, optic nerve and retina are outgrowths of the diencephalon



(Catfishorotherfishwithbarbels)

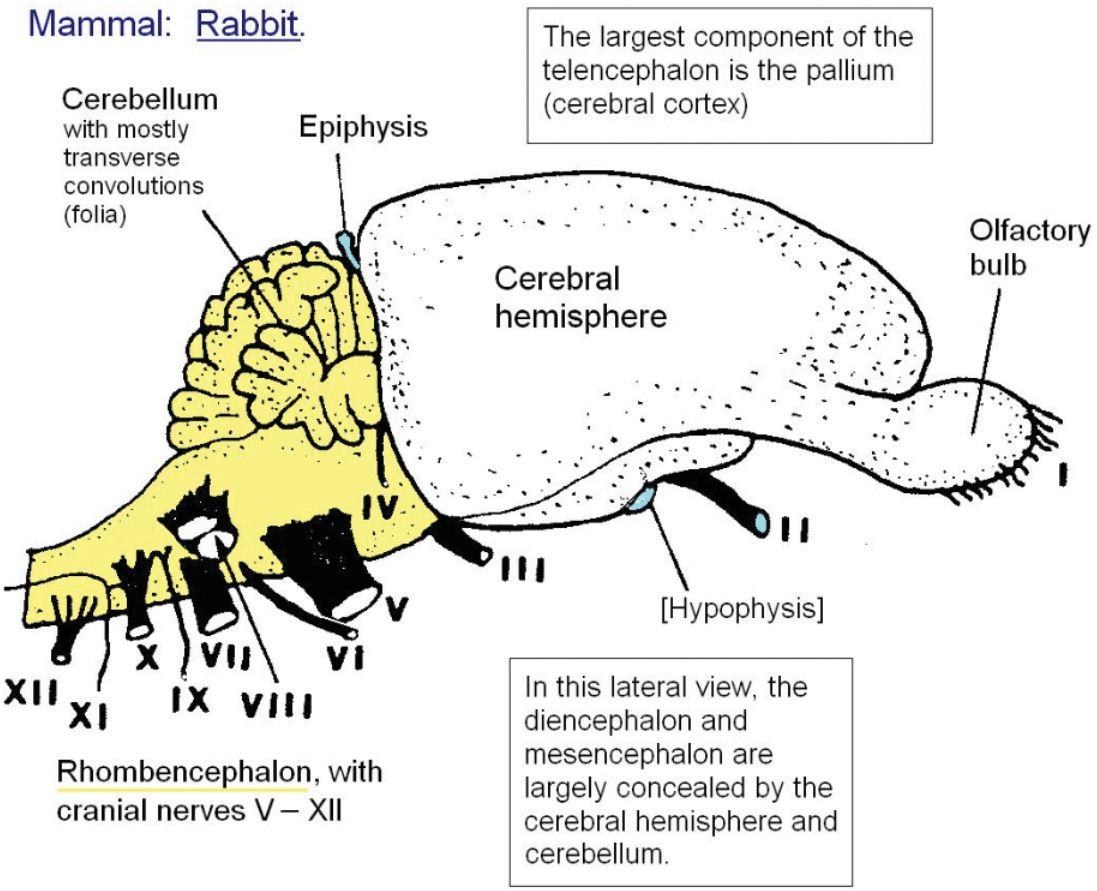


Optic tectum corresponds to superior colliculus of mammals but has a more complex organization, and controls the frog's visually guided movements.



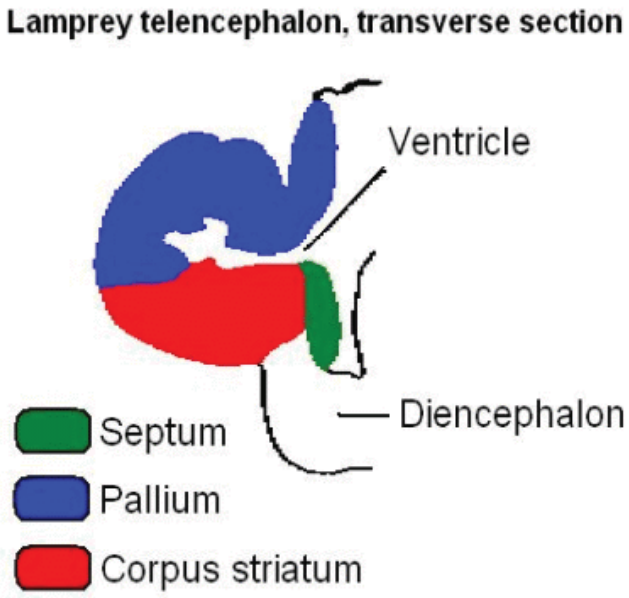
Twelve cranial nerves, as in mammals.
Do you know their names and principal functions?

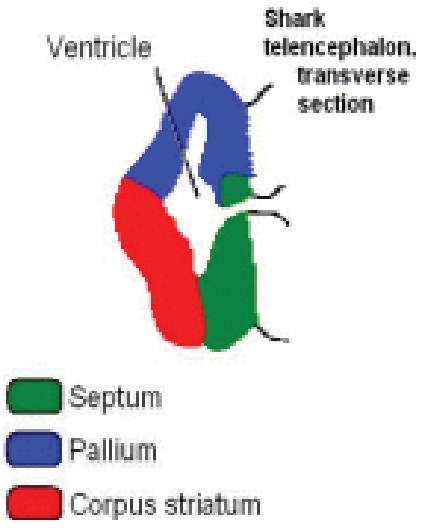
Mesencephalon
Diencephalon

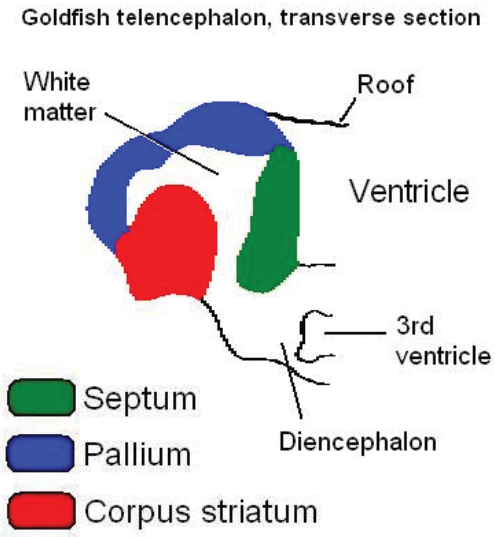


Rodents' brains are similar to those of lagomorphs (rabbits and hares). The superior colliculi of the midbrain receive most of the fibres from the retinas, but there is also a significant optic projection to the thalamus (diencephalon), which communicates with the cerebral cortex.

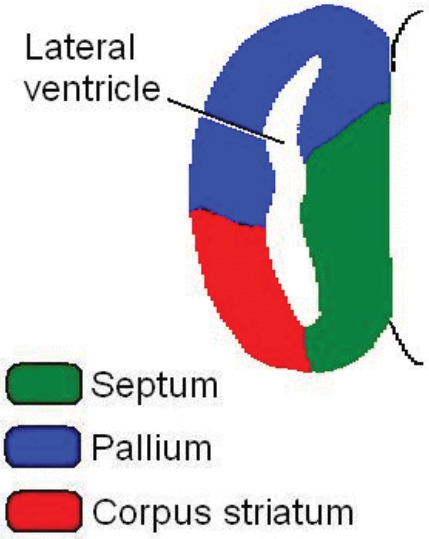
Evolution of the forebrain (prosencephalon = diencephalon + telencephalon)



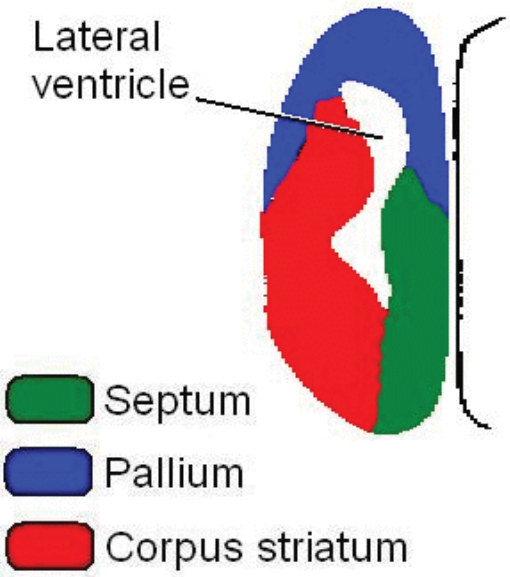


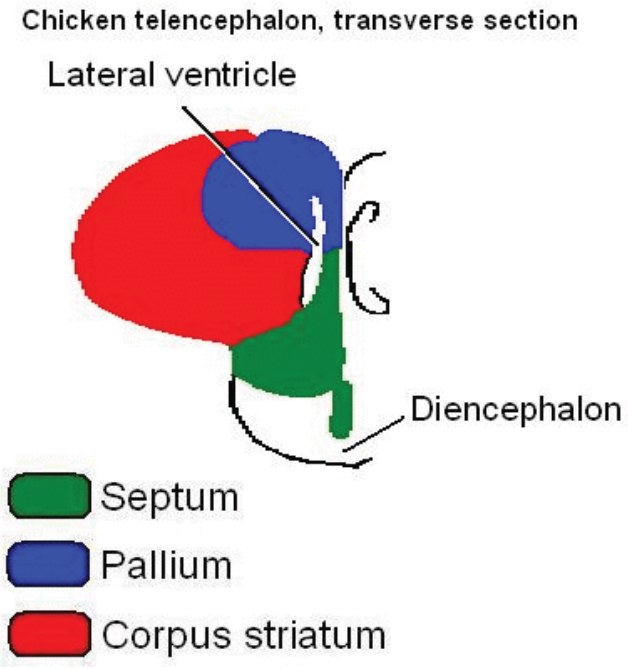


Frog telencephalon, transverse section

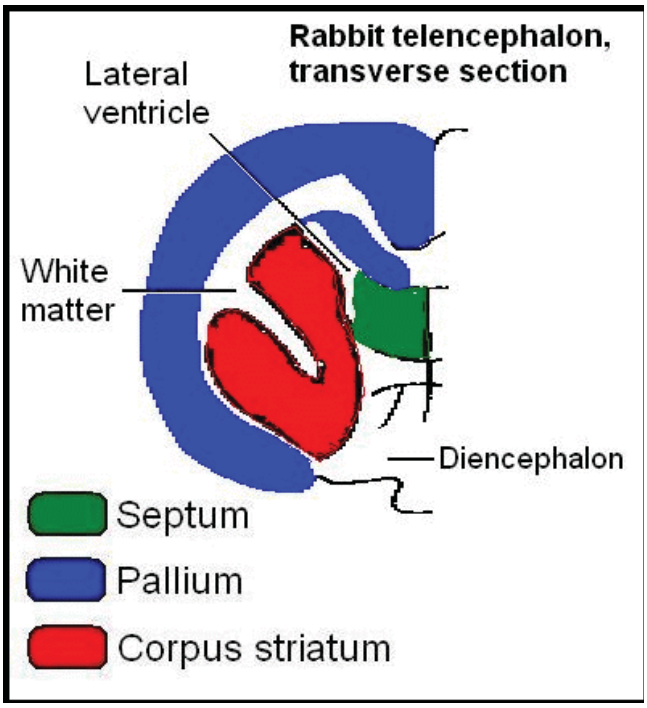


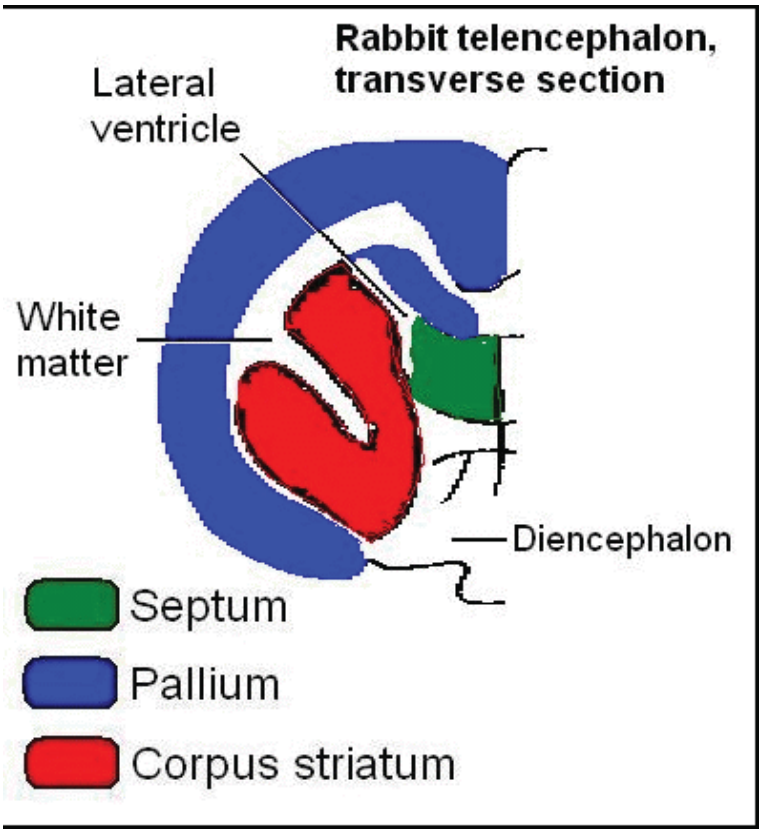
Turtle telencephalon, transverse section





This is the traditional story.
The large avian “hyperstriatum” may be more closely homologous to the cerebral cortex of mammals.


Rabbit telencephalon,
transverse section
Lateral
ventricle
White
matter
Diencephalon
Septum
Pallium
Corpus striatum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