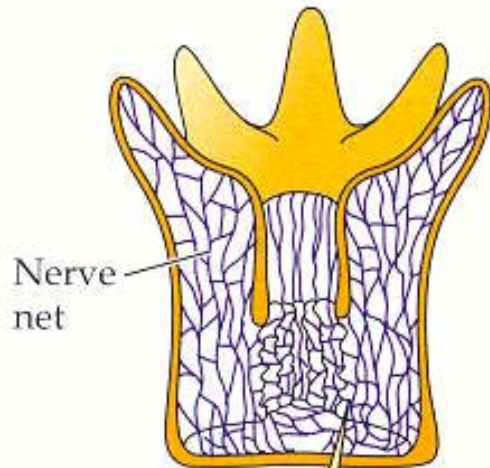


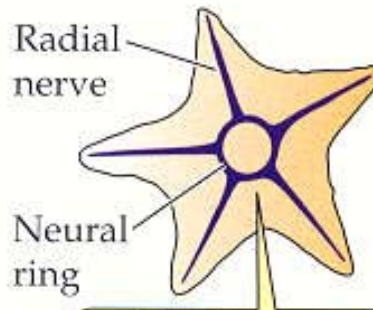
Nervový systém

(a) Sea anenome



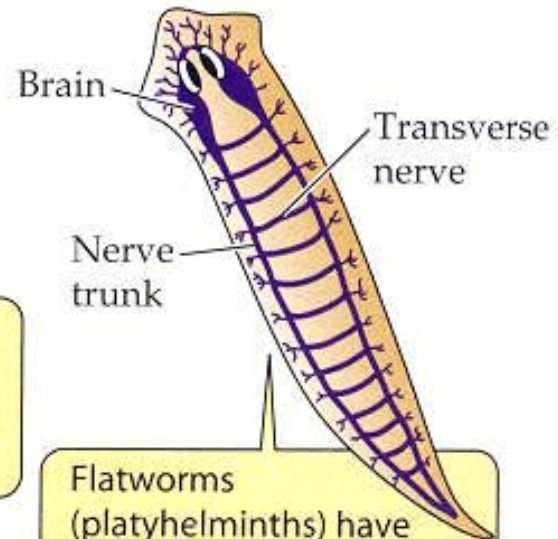
Cnidarians have radial symmetry and diffuse nervous systems based on nerve nets.

(b) Sea star



Echinoderm nervous systems are simple, perhaps because of their radial symmetry.

(c) Flatworm



Flatworms (platyhelminths) have bilateral symmetry and show both centralization with a ladderlike central nervous system and cephalization with a brain at the anterior end.

(d) Squid



- Funkční diferenciace uvnitř buněk
- Shlukování, ganglia, neuropile
- Centralizace, hierarchizace
- Cefalizace

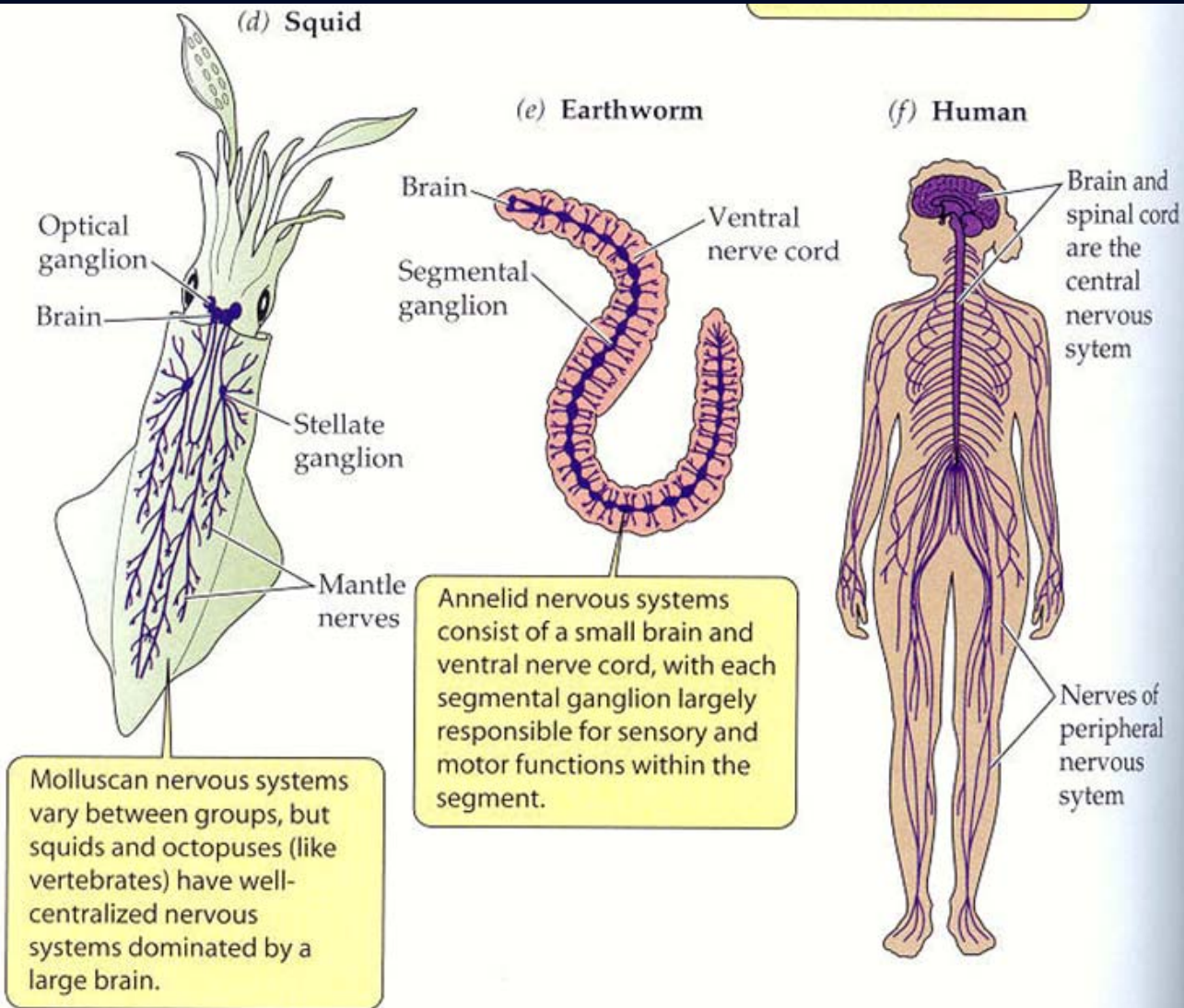
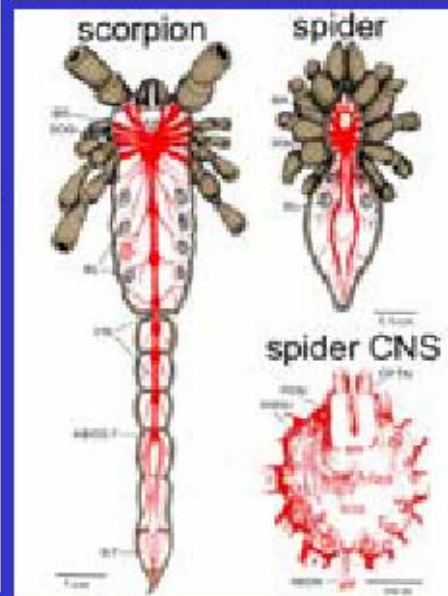
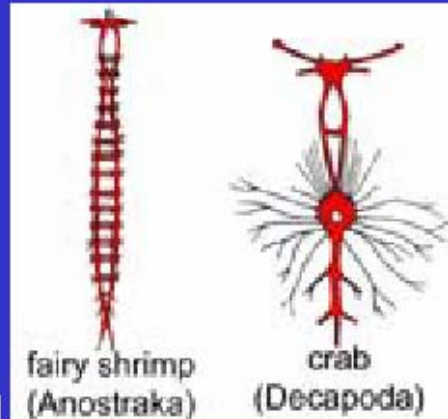
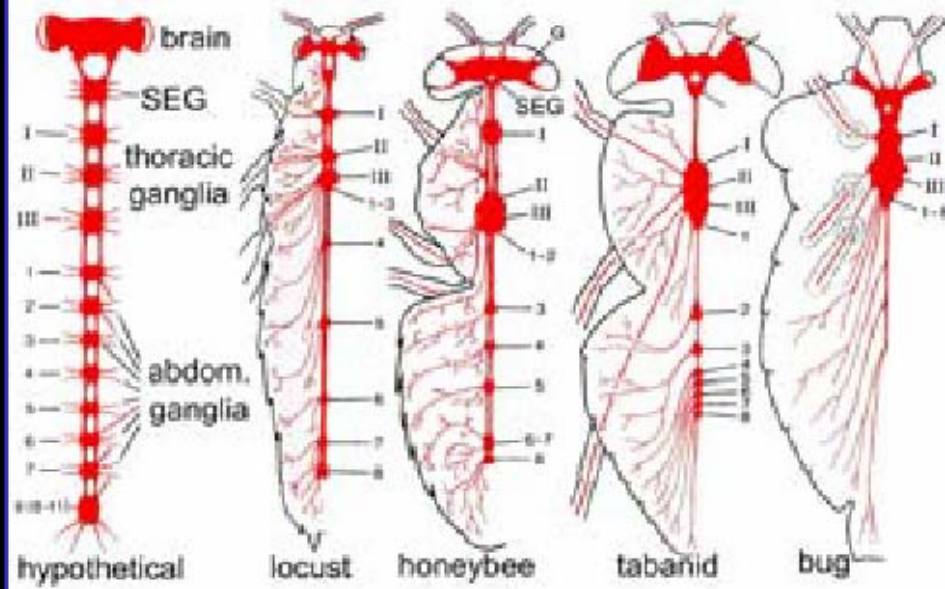
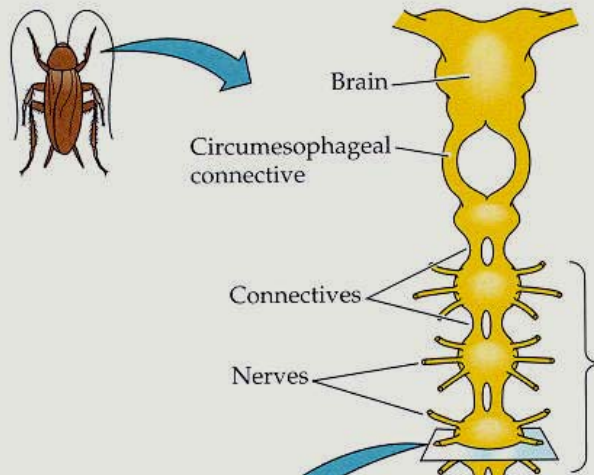


Figure 10.4 Nervous systems of different phyla (a) The sea anemone (phylum Cnidaria) has a nerve net. (b) The nervous system of a sea star (phylum Echinodermata) is radially symmetrical. (c–f) Flatworms (phylum Platyhelminthes) (c), squids (phylum Mollusca) (d), earthworms (phylum Annelida) (e), and humans (phylum Chordata) (f) all display central nervous systems that feature brains.

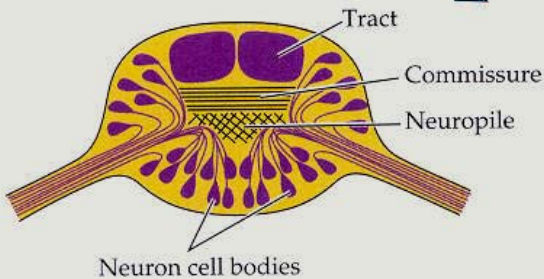
CNS concentration and ganglia fusion



(a) Dorsal view of the central nervous system

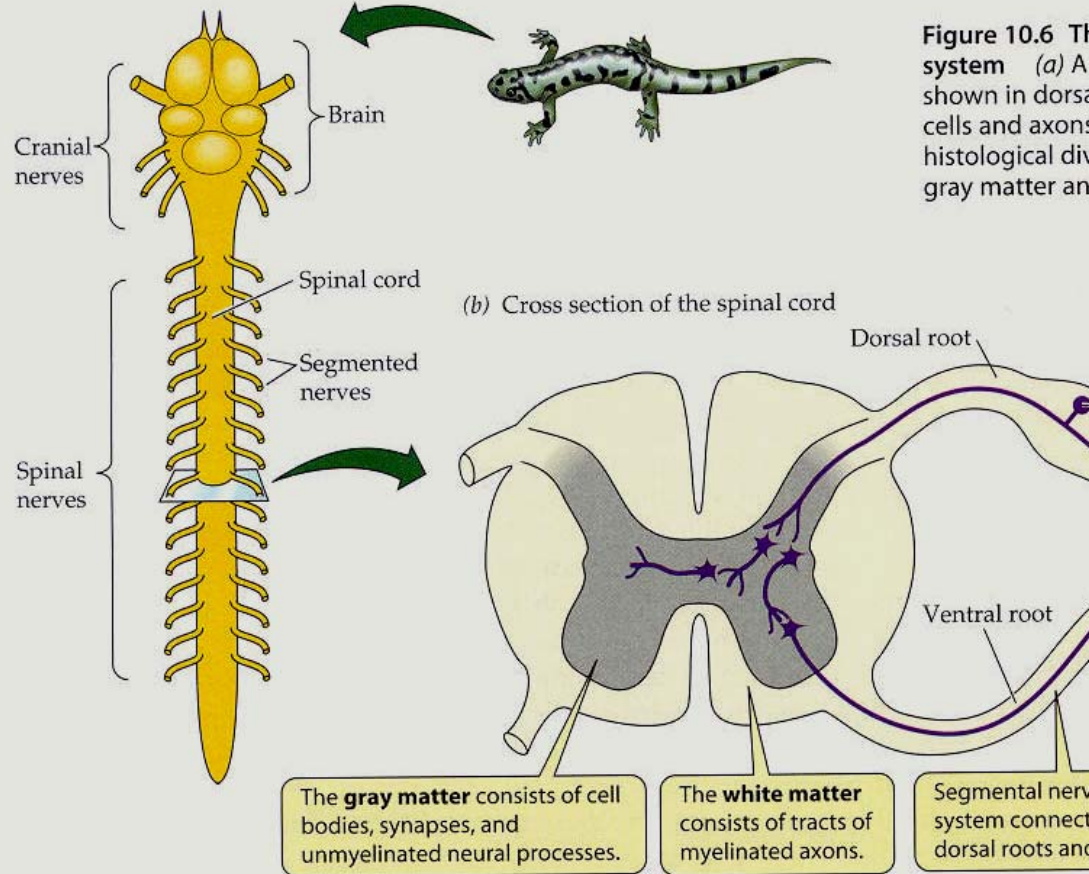


(b) Cross section of a ganglion

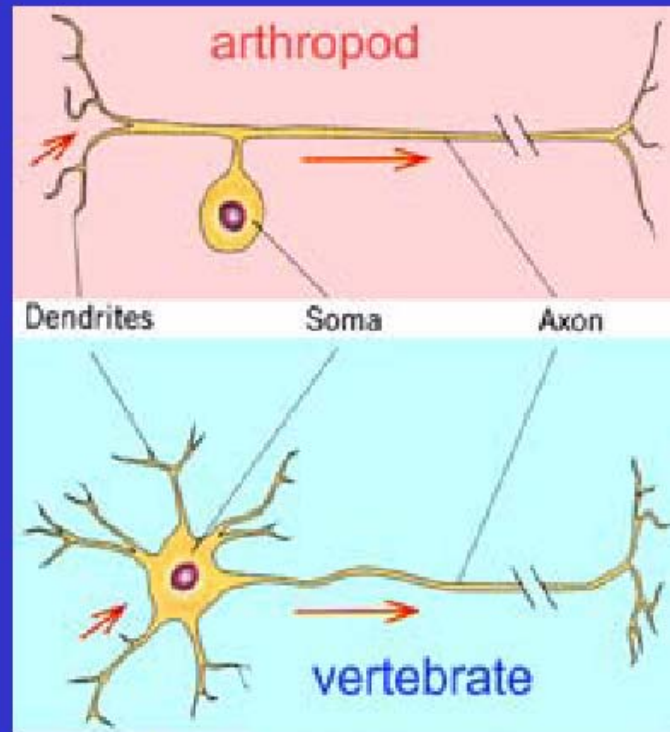


Oddělení těl a spojů

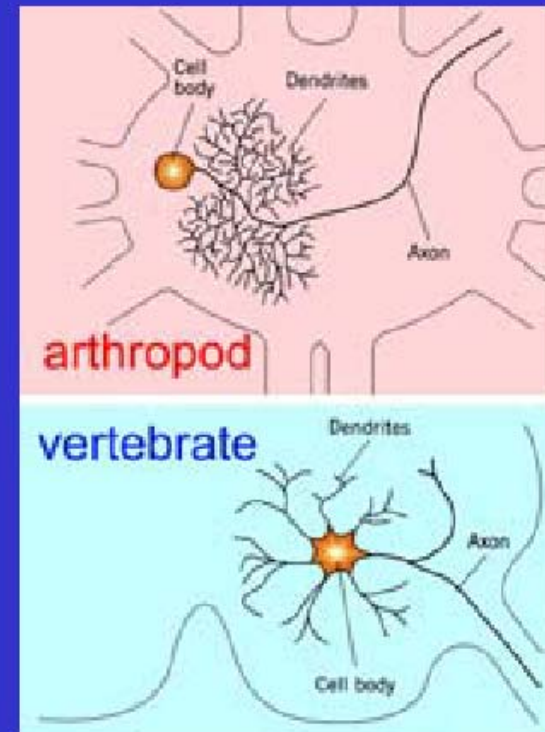
Figure 10.6 The central nervous system (a) A lizard is shown in dorsal view. The brain, spinal cord, and cranial and spinal nerves are shown in histological detail. The gray matter and white matter are shown.



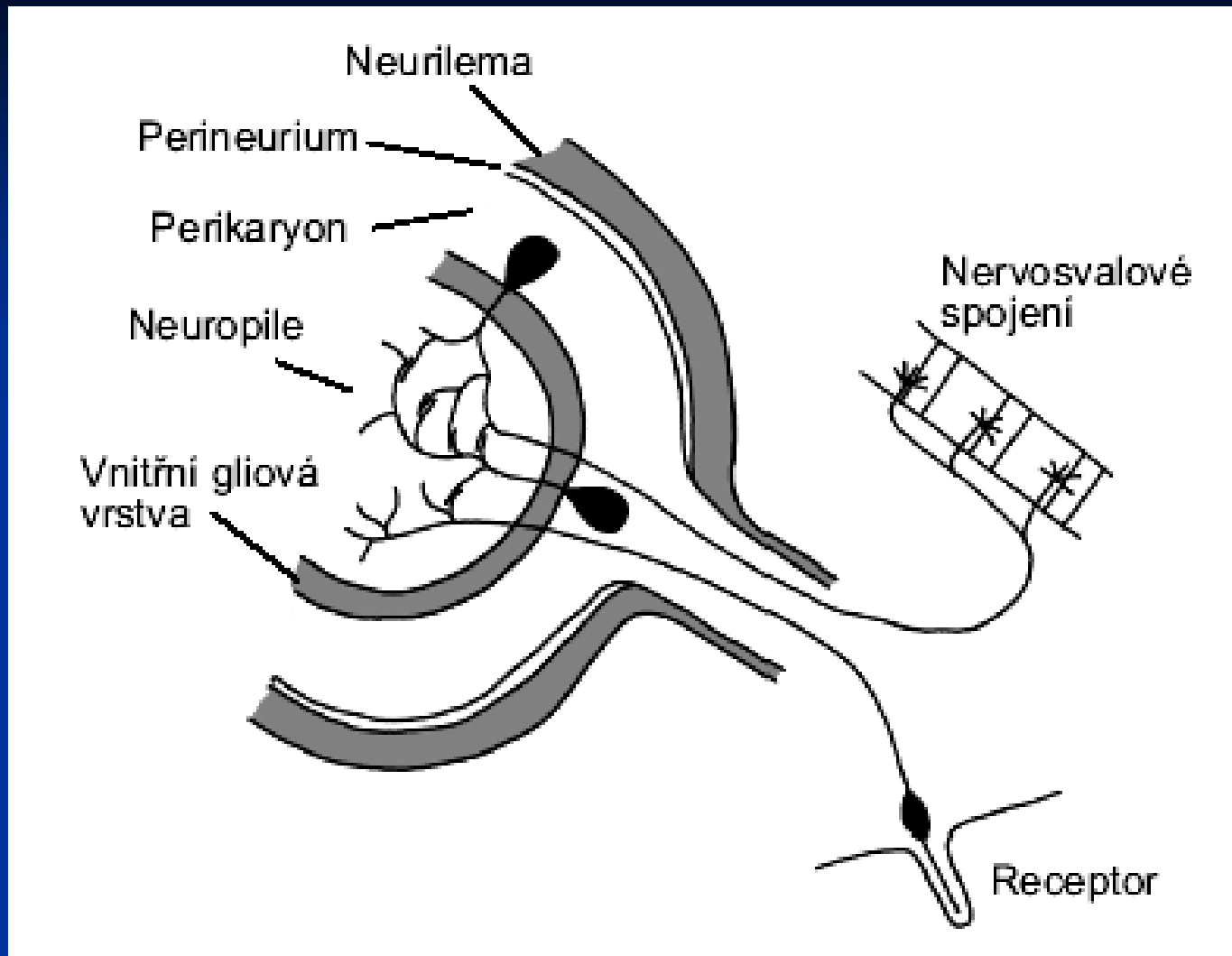
Rozdíly v pozici těla neuronu.



interneurons

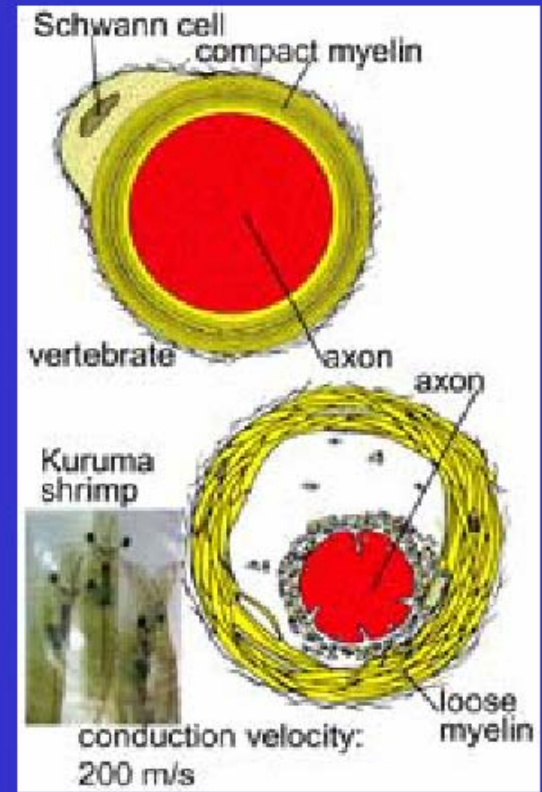
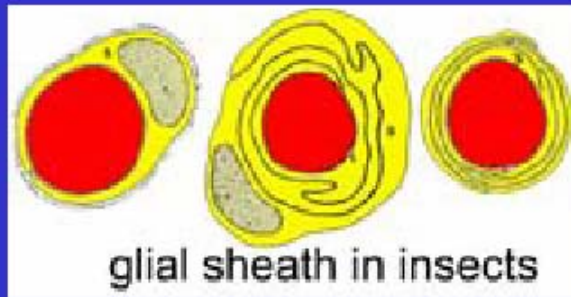


motor neurons



Neuropile bezobratlých – krevně mozková bariéra

Členovci bez pravé myelinizace



Types of neurons

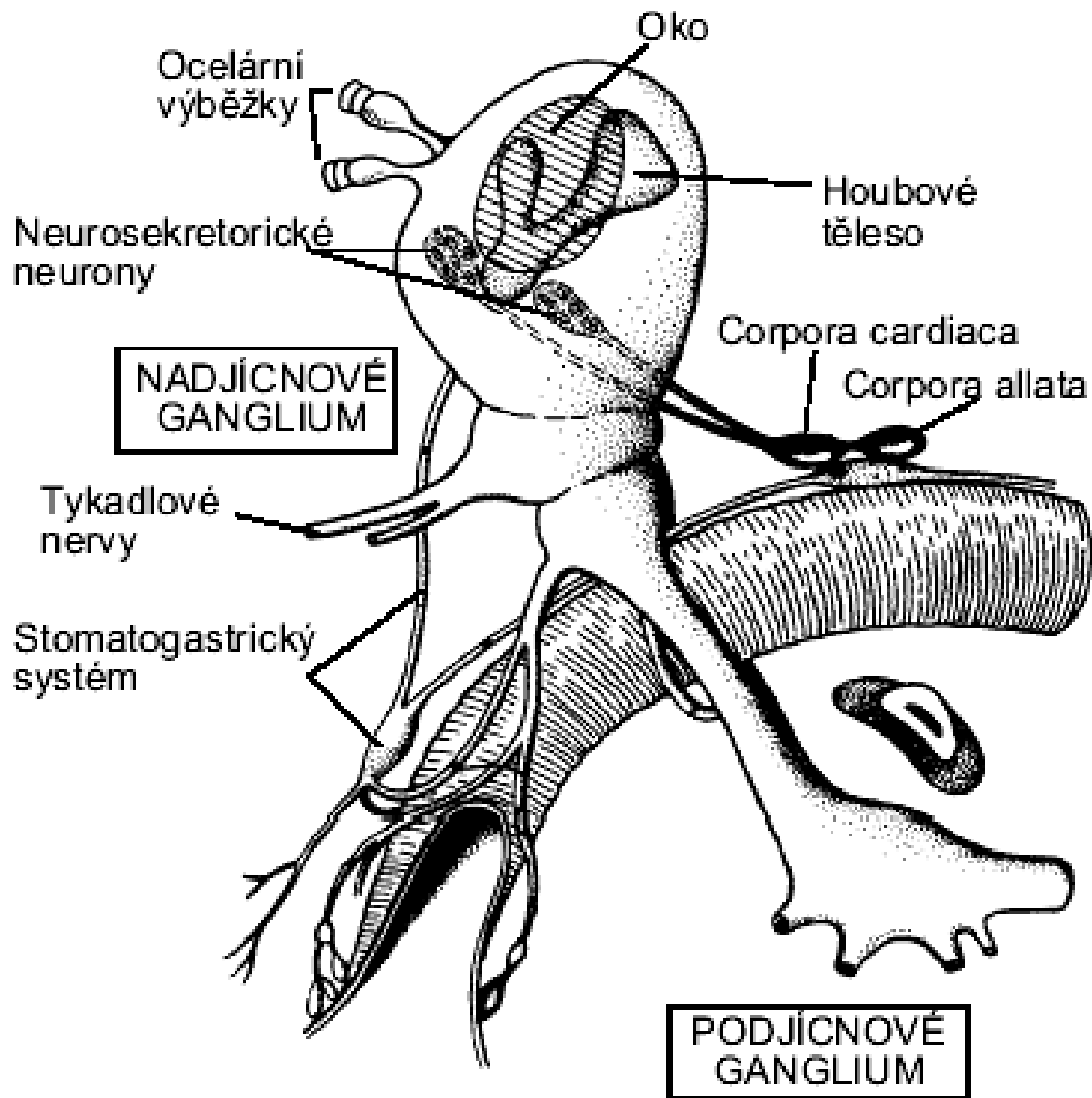
- sensory (afferents)
- interneurons
 - local
 - projection
- motor (efferents)
- neurosecretory

Neurosekrece

- Neurotransmittery (Ach, dopamin, histamin, GABA)
- Neuromodulátory (proctolin, octopamin)
- Neurohormony (PTTH, antidiuretický, AKH...)

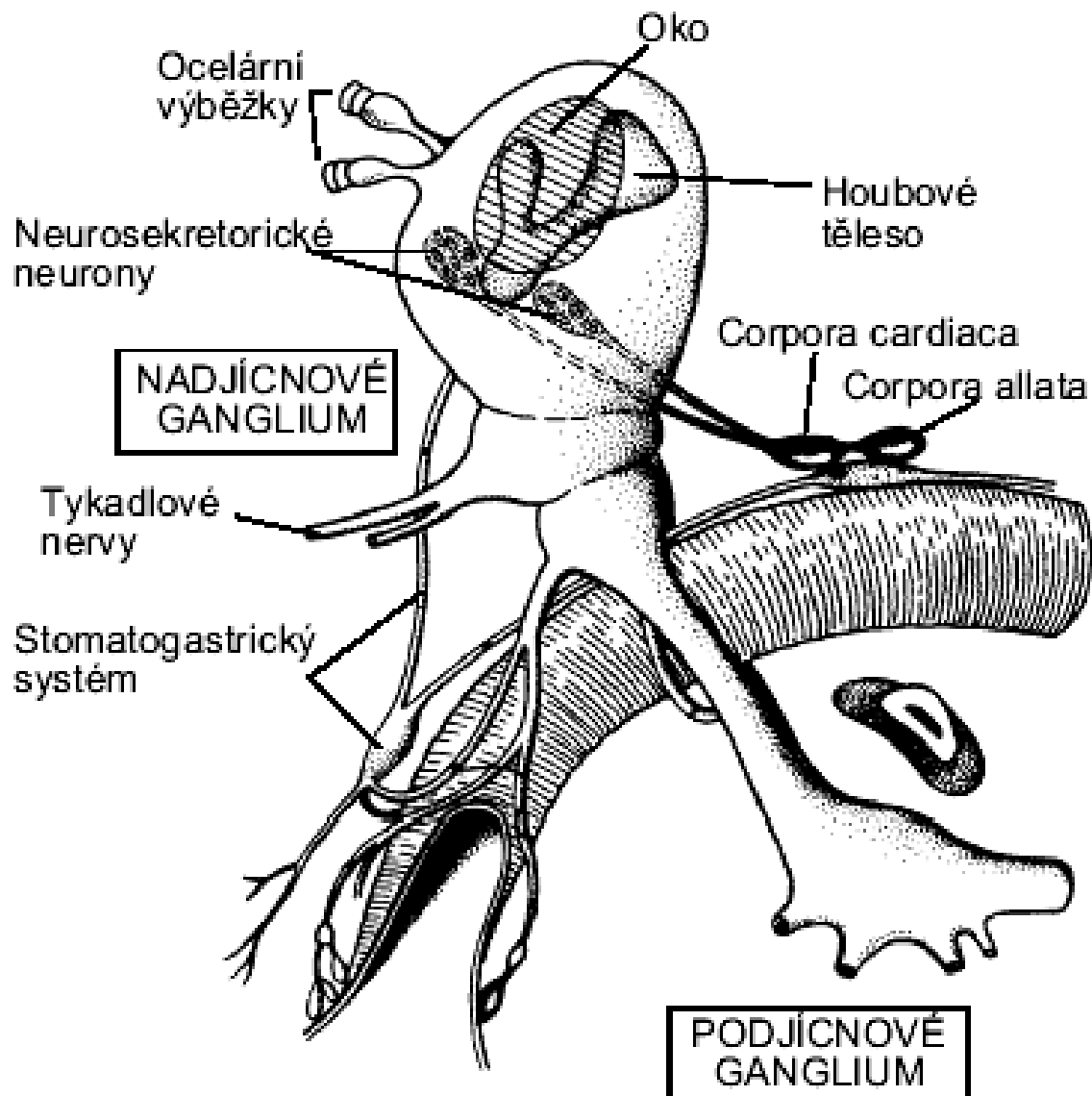
Viscerální, sympatický NS hmyzu

Stomatogastrický
Nepárové mediální ventrální
nervy
Kaudální symp. sst



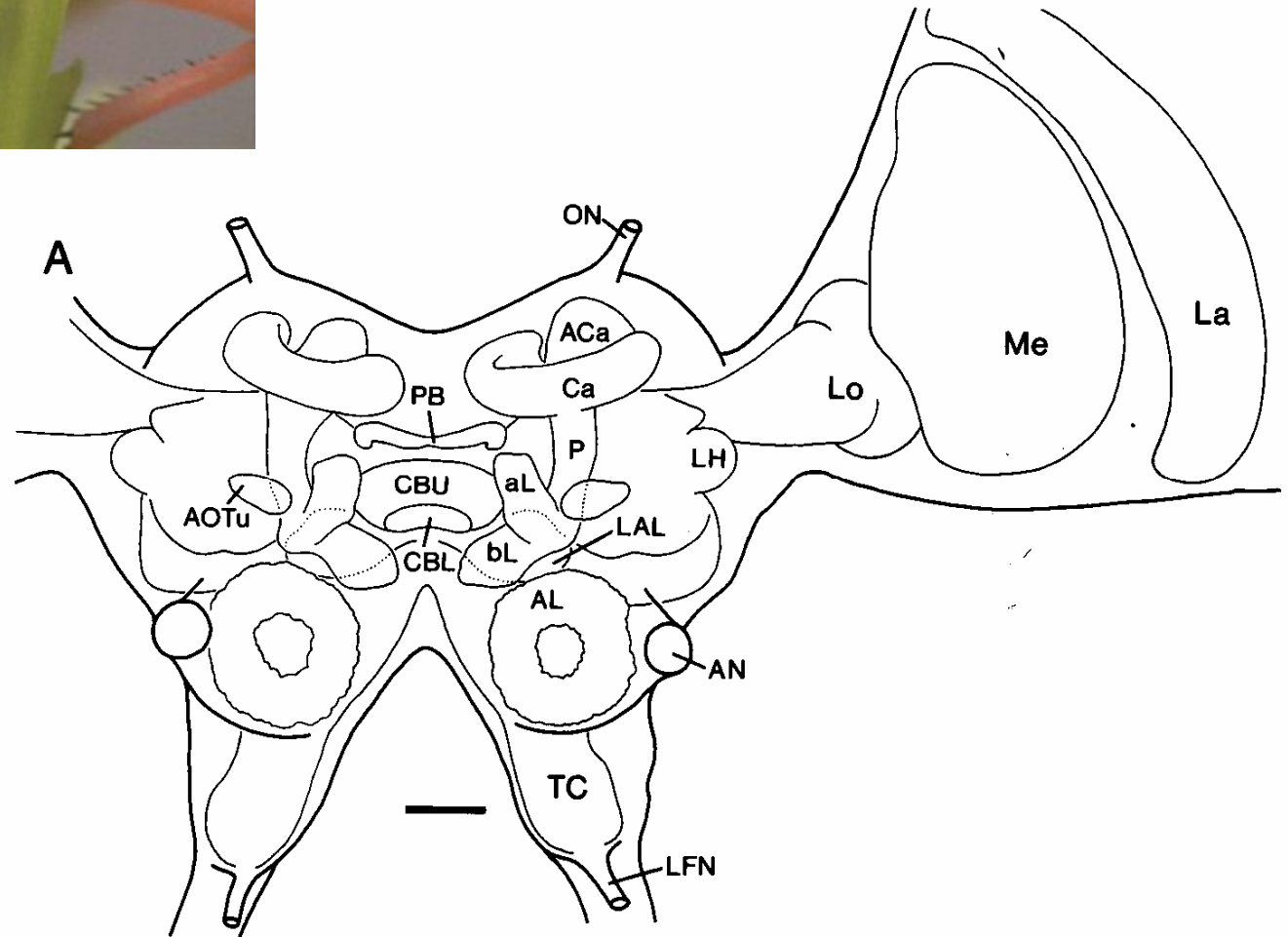
Mozek hmyzu

Autonomie vs. centrální řízení (inhibice)





Schistocerca gregaria





Manduca sexta

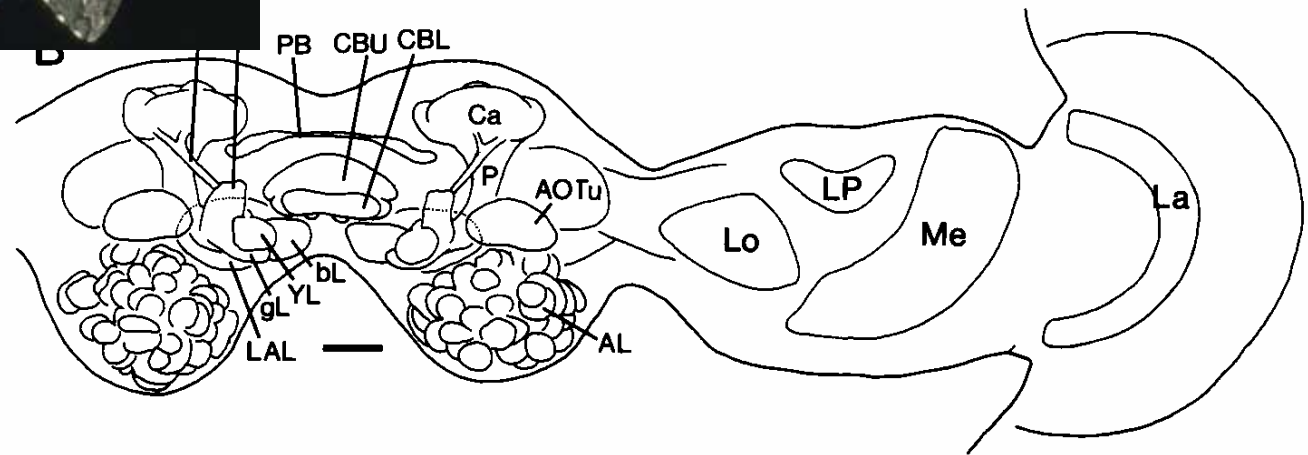
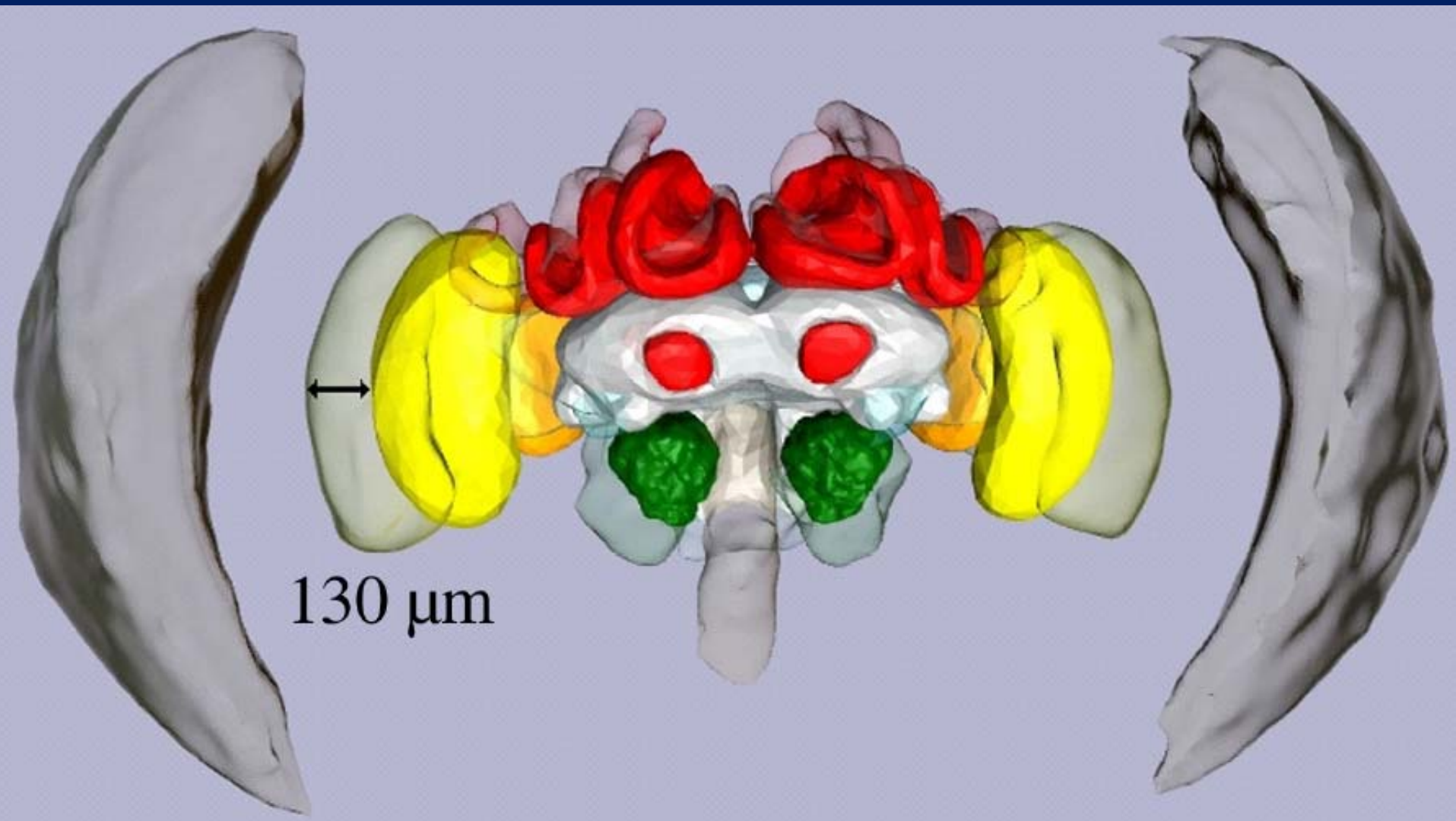
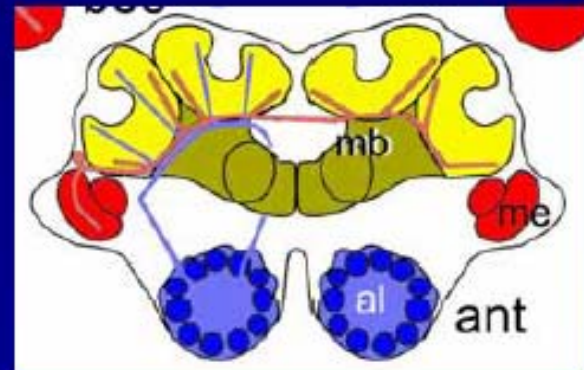
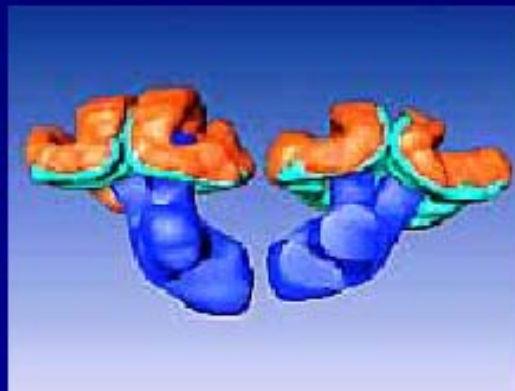
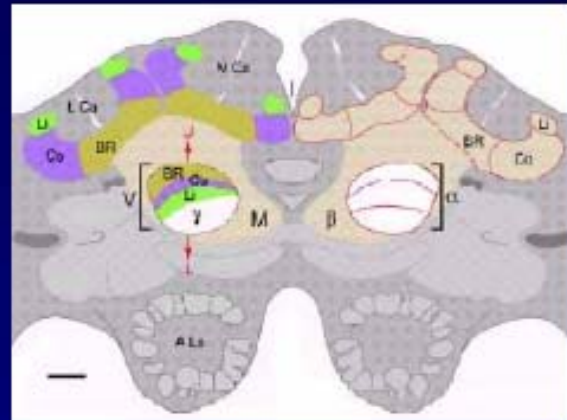


Fig. 1: Neuropil structures in the insect brain. **A.** Frontal diagram of the brain of the locust *Schistocerca gregaria*. **B.** Horizontal view of the brain of the sphinx moth *Manduca sexta*. In both figures the left optic lobe has been omitted. The optic lobe consists of the lamina (La), the medulla (Me), and the lobula complex (Lo). In the moth, the lobula plate (LP) can be distinguished from the lobula proper. Subdivisions of the mushroom body are the calyx (Ca), the pedunculus (P), and the α - and β -lobe (aL, bL). In the locust mushroom body, an accessory calyx (ACa) and, in the moth, a secondary pedunculus (SP), a γ -lobe (gL), and a Y-lobe (YL) are present. The central complex consists of the upper and lower division of the central body (CBU, CBL) and the protocerebral bridge (PB). In **A**, the antennal, the ocellar and the labro-frontal nerves (AN, ON, LFN) are shown. Other brain areas: AL, antennal lobe; AOTu, anterior optic tubercle; LAL, lateral accessory lobe; LH, lateral horn of the protocerebrum; TC, tritocerebrum. Scale bar: 200 μ m.

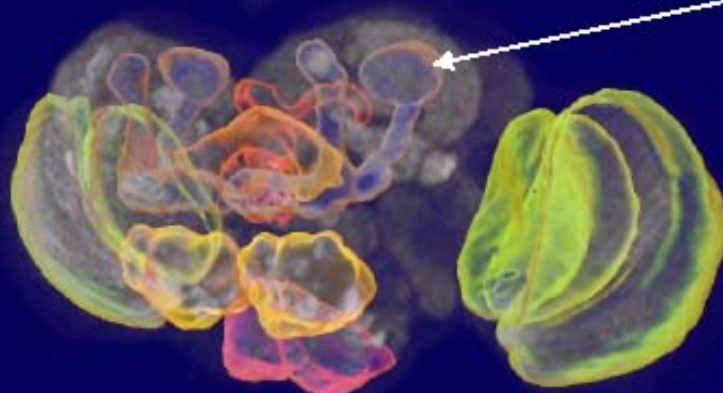


130 μm

Where is memory located in the honey bee brain?

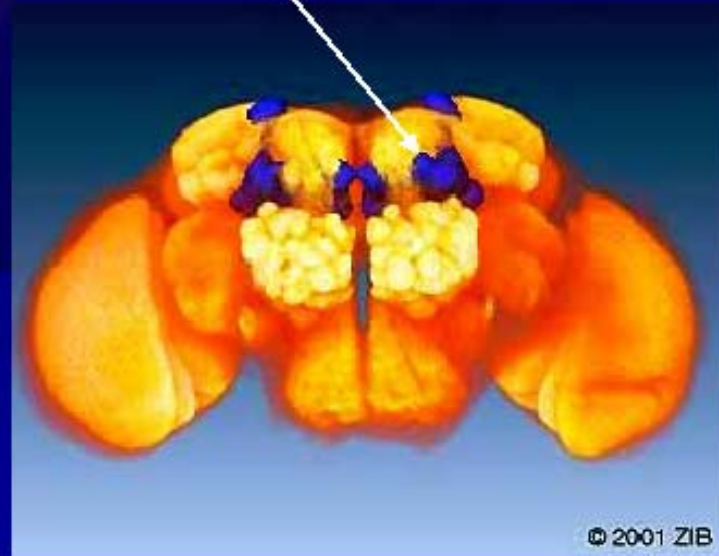
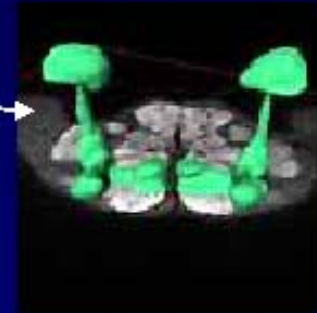


Drosophila brain anatomy



(c)2000 www.amiravis.com

mushroom
bodies



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