

## 94. Hippocampus (cat, HE)

There are two different specimens. One of them is an isolated temporal lobe from adult cat. The other is from a whole brain of a kitten. In this latter one the better side is labeled by red ink.

There are three areas to study:

- isocortex;
- hippocampus;
- the lower horn of the lateral ventricle, with the choroid plexus, the epithelial choroid lamina, and the teniae (fimbriae and terminal). There are some specimens, in which these latter structures were already not in the section plane. Note that in cat the hippocampus forms an arc and appears on the dorsal side of the thalamus, too (so-called „dorsal hippocampus”). It is widespread in the mammals in general, but does not exist in humans. Study the hippocampus found in the lower horn.

For the isocortex consult your manual of histology (specimen number 94). Try to follow the transition of the 6-layered isocortex into the 3-layered hippocampus, through 5 and 4 layered areas (presubiculum, subiculum, parasubiculum).

Of the layers of the hippocampus, there are 3 layers, which are well recognizable even in hematoxyline-eosine stained specimens. First is the **alveus hippocampi**, which is formed by the efferent axons of the hippocampus. Gradually emerging from the hippocampus these axons also form the fimbria and the fornix. The alveus faces the lumen of the lower horn. The next layer is formed by the **pyramidal cells** (in the Ammon's horn), large neurons, almost in one row. They are the perikarya the alvear axons take their origin from. The third layer to be recognized is formed by the **granular cells (in the dentate gyrus)**, small neurons in several rows. Both their look-out and their function resembles to that of the cerebellar granule cells: they mediate the effect of the perforant fascicle, one of the main afferent systems of the hippocampus.

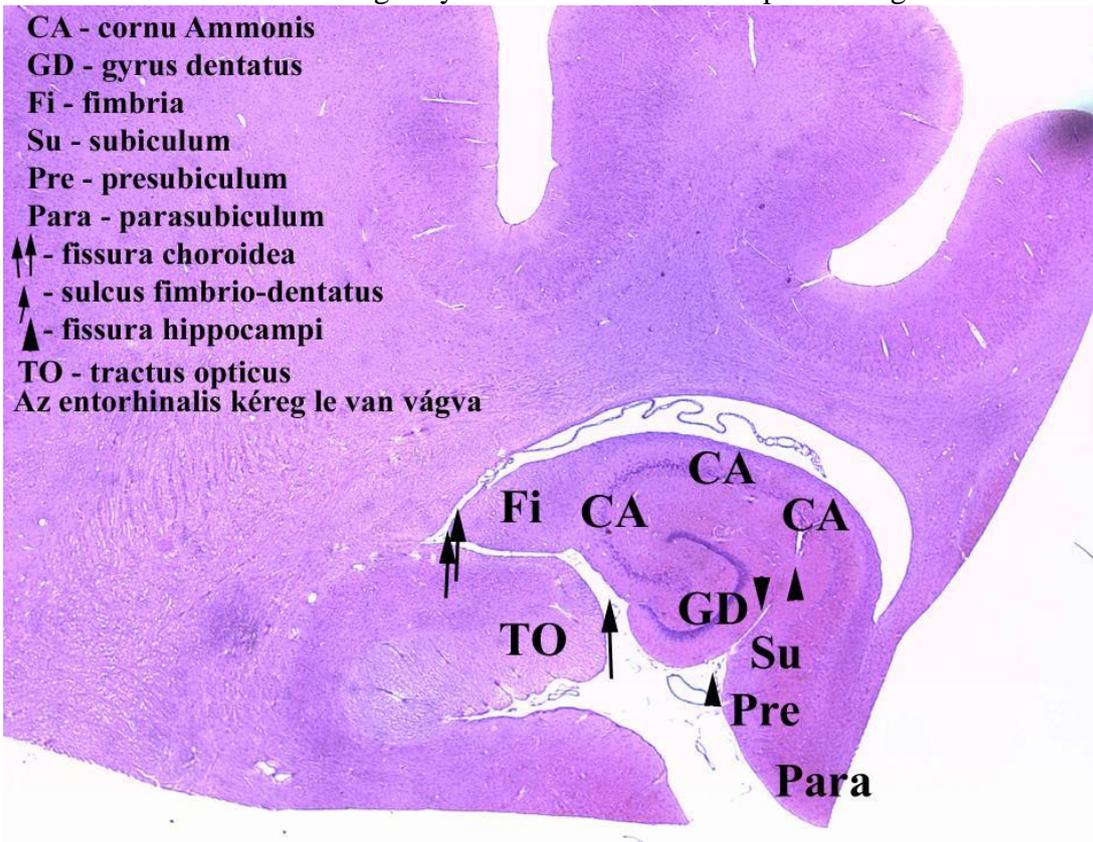
The positions of the other layers can be determined only approximately, related to the former ones. Silver impregnation is better for this purpose. There is another way to distinguish subdivisions: in the Ammon's horn comprises areas CA1 (i.e. latin: cornu Ammonis = Ammon's horn), CA2, CA3, CA4.

Around the hippocampus **fissures** can be identified: *choroid fissure*, which separates it from above, and opens into the lower horn is the choroid tela has been removed. Between the Ammon's horn and the dentate gyrus there is a groove, the *hippocampal groove*. It was a deep fissure between the pial surfaces of the aforementioned structures, but their surfaces later fused, so in adults only a series of vessels marks its former position. There is a third, shallow groove, the *dentate-fimbrial groove*, formed by the emergence of the fimbria.

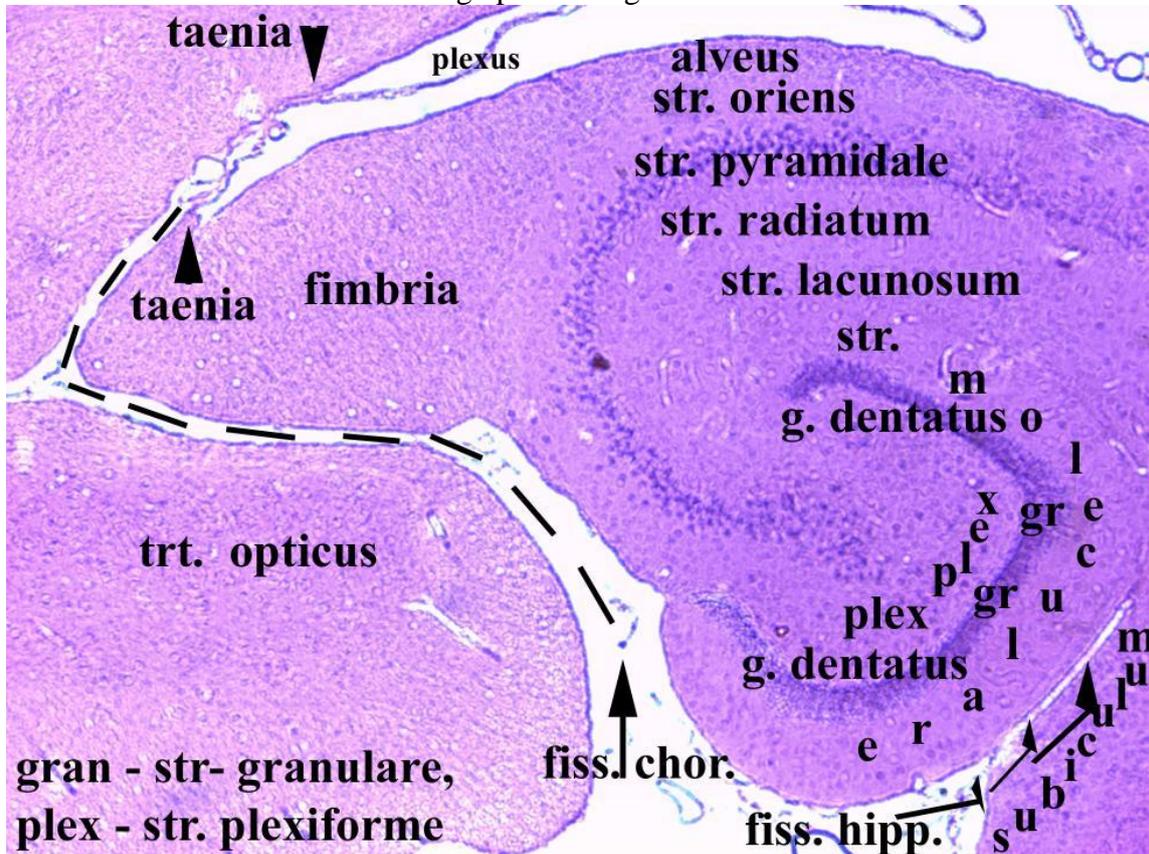
The **choroid epithelial lamina** formed by a simple cuboidal epithelium lying on pial connective tissue. This epithelium continues into the ependyma lining the ventricles, actually, a modified ependyma. It is a brain wall but reduced (and not retarded in thickening!!). The original neural tube is multilayered everywhere, only later some areas derived from the roof plate, become reduced in a prosencephalic and a rhombencephalic zone into monolayered (i.e. simple) epithelium in a prosencephalic and a rhombencephalic area. Where this lamina emerges from the brain substance, it has a little thickened rim, it is (correctly: it is to be, following the removal of the lamina) the *taenia*. On the other side of the lamina the tissue of the pia mater (here: *tela choroidea*) is found with the vessels of the plexus chorioideus, and the choroid-epithelium, modified ependyma.

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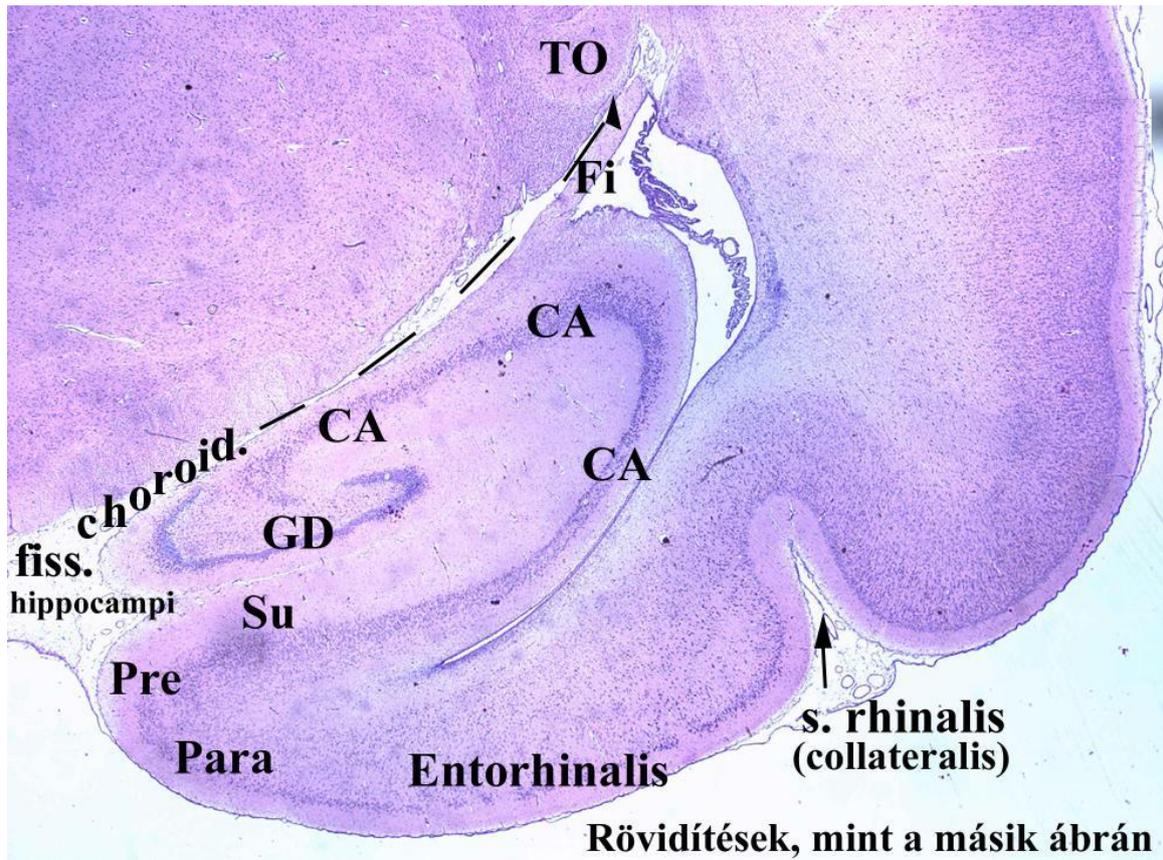
1. Slide demonstrating only the inferior horn – low power magnification.



1. High power magnification.



2. Slide demonstrating the whole brain – low power magnification.



2. High power magnification.

