Anotaci

The claustrum is a telencephalic subcortical structure. It is a thin sheet of grey matter underneath the inner part of the neocortex. It is on both sides of the brain, and can be found below the insular cortex, which deep to the temporal and parietal lobes at the deepest point of the lateral fissure, and above the outside of the putamen, which is a sub-structure of the basal ganglia. The sheet is approximately one to several millimeters thick, and can cover up to a couple centimeters length wise depending on the animal.

One interesting aspect about the claustrum is the lack of cell types. In most parts of the brain, especially in the cortical regions, there is considerable differentiation of cell types, giving way to a number of functions. In the claustrum, as Dr. Crick and others pointed out, there are three main types of cells.[7] The first, which is deemed Type 1, is large with spine-covered dendritic processes. These cells receive input as well as project back toward various regions, both laterally and medially. The other two types of cells do not have spines, but can be told apart based on the cell body size. However, both are restricted to the claustrum and, thus, are labeled interneurons.

It is clear that the claustrum projects to, and receives projections from, a number of cortices, including the primary motor, premotor,prefrontal, auditory, and visual, among others. In one study conducted in France by Judith Tanne-Gariepy et al. (9), these projections were traced back to segregated areas, including differentiated areas along the dorsoventral axis for the pre-supplementary motor area and supplementary motor area – proper. Projections from the claustrum to various sub-regions of the motor cortex were shown to overlap somewhat, but did show a degree of local segregation.[5][6] The truly interesting thing about the claustrum, however, is how it can take in multiple information modalities[*disambiguation needed*], including motor, visual, and auditory. It has even been shown that the same cells can process information across all these types, even though there is some semblance of segregation across a single type of information.

There has also been a number of interesting studies looking at the proteins inside the claustrum. In one experiment performed at the University of South Carolina by J.R. Augustine et al.,[8] researchers looked at calcium-binding proteins in the rhesus monkey claustrum, including calbindin D28K, parvalbumin, and carretinin. After removing the brains and properly preserving them, the group used variousantibodies and antiserums to detect the presence of the proteins. The calbindin proteins were shown as likely elements in the inhibitory circuitry of the claustrum, while the calretinin most likely served as calcium buffer to maintain homeostasis. Another study looked at the serotonergic innervation in the claustrum.[9] The clear conclusion here was that, in the ventral claustrum where the visual projections are, the stained axons were short and arranged randomly. However, in the dorsal, non-visual section, of the claustrum, the fibers ran consistently in long lengths along the dorsal-ventral direction. Like many of the other studies, this is a good first step toward determining the true functions of the claustrum, although there is still much room for work.