The Study of the Projection of 5-Hydroxytryptamine (5-HT) Fibers in adult Rat Brain into Hippocampal Transplant

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In this paper 5-hydroxytryptamine (5-HT) immuno-histochemical method was used to study whether the 5-HT (5-hydroxytryptaminergic) fibers of the host brain could grow into the transplanted embryonic hippocampus. Rat embryonic (17th day) hippocampus (transplant) was used to transplant into adult rat (host) hippocampus. Ninety days after operation, the host was perfused and fixed, frozen sections were cut. Sections of hippocampus containing the transplant were stained for 5-HT immunohistochemical reaction, and then observed under microscope. Our results were: In the host hippocampus proper the molecular layer and lower portion of the granular cell layer of the dentate gyrus, there were diffused, brownish colored 5-HT positive fibers. These positive fibers, all are of diameter about 0.5μm. In the host hippocampus adjacent to the transplant, there were quite densely gathered 5-HT positive fibers. In the transplant some comparatively thin brownish 5-HT positive fibers were observed. There were also a few rather thick fibers, with diameter greater than 1μm. They were located mainly in the cellular layer and molecular layer, comparing with host hippocampus, the number of fibers were much fewer. These fibers, some were isolated single fibers threads, some showed flower shape or in plexiform. Such kind of plexiform terminal was never found in the hippocampus of the host. The above result indicated that 5-HT fibers in the brain of the host could grow into the transplanted embryo hippocampus, and the 5-HT fibers ingrowth may establish synaptic relation with certain neurons of the transplanted hippocampus.