ASTROGLIAL AND MICROGLIAL CELLS IN THE DEVELOPING RAT HIPPOCAMPUS. A HISTOCHEMICAL AND IMMUNOCYTOCHEMICAL STUDY*

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The development of astro- and microglial cells in the postnatal hippocampus were examined. A total of 34 rats were sacrificed at postnatal day 0, 3, 6, 9, 12, 15, and 18. After perfusion with 4% paraformaldehyde, brain sections were cut on a vibratome and reacted histochemically for the microglial enzyme nucleoside diphosphatase (NDPase) or immunohistochemically for glial fibrillary acidic protein (GFAP) or vimentin (VIM).

The presence of radial GFAP+ and VIM+ fibers at the early postnatal ages were supplemented from day 6 by the appearance of a more stellate type of *astroglial cells* with long slender processes. Typical stellate GFAP+ and VIM+ astroglial cells were first observed at day 9. From then and up to day 18 these cells gradually lost their VIM immunoreactivity, while retaining a distribution similar to that observed in the adult rat. The astroglial expression of VIM was most protracted in fascia dentata (FD). NDPase+ *microglial cells* were observed in the hippocampus proper (HP) at the day of birth. During the first week NDPase+ cells were predominantly found in str. lacunosum-moleculare. From day 9 the cells became homogeneously distributed in all layers of HP, except in the developing mossy fiber layer in CA3, where significantly fewer microglial cells were present. In FD, microglial cells were virtually absent during the first postnatal week, but from day 9, the hilus (CA4) and the molecular layer became progressively populated. Even at day 18 it was, however, possible to discern a zone innermost in the molecular layer without microglial cells.

We conclude that the postnatal hippocampus and fascia dentata become populated by microglial cells in an area and time sequential manner, likely to reflect the maturation of the cell layers and nerve connections. A similar relationship apparently exists for the astrocytes, as exemplified by the protracted VIM+ of dentate astrocytes.