

Meeting abstract

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## Neurodegeneration and plastic changes in parahippocampal regions of the rat after kainic acid-induced epilepsy

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The subiculum is the main output region of the hippocampus receiving input from the CA1 region and projecting to deep layers of the entorhinal cortex (EC), septum, mamillary nuclei, and the amygdala. It remains largely preserved in temporal lobe epilepsy (TLE) and therefore may be importantly involved in the generation of epileptic activity arising from the hippocampus. We characterized neurons of the subicular-EC complex and its projections in the kainic acid (KA) model for TLE using neuropeptides, calcium binding proteins, GAD-67 and the vesicular GABA and glutamate transporters as markers. We observed severe losses of interneurons and principal neurons in layer III of the EC and in the proximal subiculum accompanied by signs of reactive gliosis. The number of parvalbumin-ir interneurons was reduced in the subicular pyramidal cell layer and the deep layers of the EC. After 28 d the number of calretinin-ir neurons was reduced in EC layers III to VI, as was the diffuse calretinin-ir in the subiculum molecular layer and the EC, suggesting degeneration of respective calretinin containing projections. In all parahippocampal areas, increases in NPY mRNA in pyramidal cells and of NPY-ir axons were seen at the late intervals after KA. In the molecular layer and layer I of the EC, diffuse labeling for SOM-ir overlapped with that of NPY. The number of GAD67-ir interneurons was reduced in the inner molecular layer and pyramidal layer of the subiculum and in the EC at late timepoints, but also diffuse labeling for GAD67 and VGAT was enhanced in the molecular and pyramidal cell layers of the subiculum and in EC layer I. Our data indicate losses

in neurons projecting from the EC to the subiculum. Similarly, projections from the subiculum to the deep layers of the EC seem to degenerate. Pyramidal neurons of the subiculum become immunoreactive for several neuropeptides. Inhibitory neurons projecting to distal dendrites of subicular principal cells sprout as judged by increased numbers of GAD-67, VGAT, SOM and NPY-ir fibers.

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