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GRANULE CELLS WITH BASAL DENDRITES FOLLOWING STATUS EPILEPTICUS ARE NEWLY GENERATED GRAN-ULE CELLS

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Rationale: Granule cells with hilar basal dendrites are found after status epilepticus (SE) in three models of temporal lobe epilepsy. These granule cells are commonly located at or very near the hilar border. This region is the same general location where precursor cells give rise to newly born granule cells after SE. The aim of this study was to determine whether some of the granule cells with basal dendrites following SE are newly generated. Methods: Sections of the hippocampal dentate gyrus from rats with kainate- or pilocarpine-induced SE were immunolabeled with antibodies to TOAD-64. This protein is an early postmitotic, cytoplasmic marker transiently expressed in neurons following their birth. Results: TOAD-64 immunolabeling was found within the perikaryal cytoplasm and throughout the dendritic and axonal arbors of granule cells at the hilar border as previously described (Parent et al., J. Neurosci., 1997). The mossy fibers in stratum lucidum of CA3 were labeled as well as the proximal apical dendrites of granule cells that extend into the molecular layer. Granule cells with hilar basal dendrites were commonly observed in these preparations. In addition, granule cells with recurrent and split basal dendrites were found. Conclusion: These data show that a marker for immature neurons, TOAD-64, is found in many granule cells that have hilar basal dendrites. Due to technical limitations, it was not possible to determine whether all of the immunolabeled granule cells have basal dendrites. Nonetheless, these results support the hypothesis that at least some of the granule cells with basal dendrites are newly born. [Support by NIH Grants NS 02006 and 35628, UC Irvine, and the March of Dimes.]