



NTP Nonneoplastic Lesion Atlas

Brain – Dysplasia

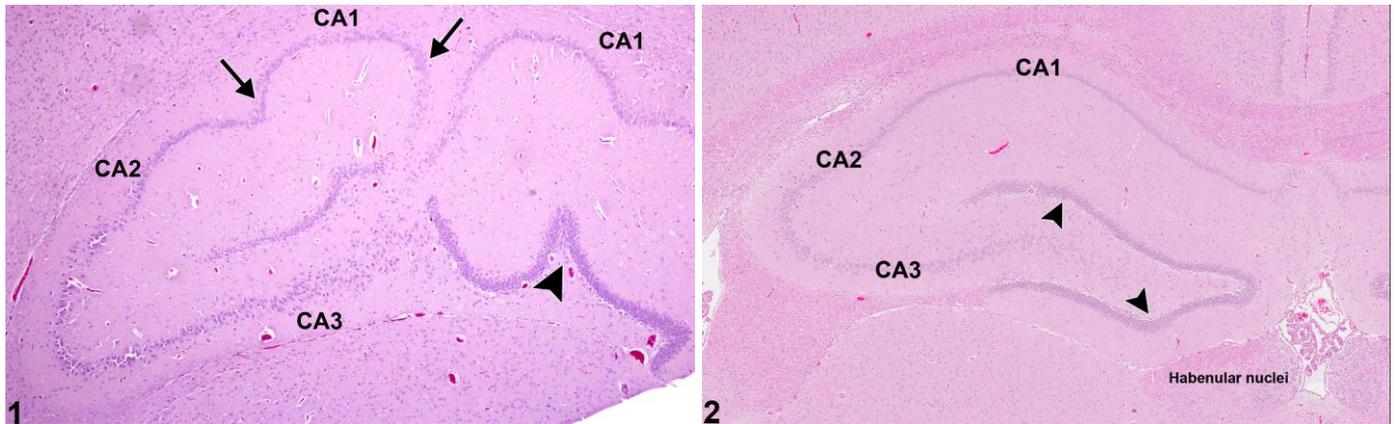


Figure Legend: **Figure 1** Incidental hippocampal dysplasia in a female F344/N rat from a chronic study. Note the abnormal undulation of the CA1 region (arrows) and the distortion of the dentate gyrus (arrowhead) compared with that in Figure 2. **Figure 2** Normal hippocampus in a rat. Dentate gyrus is indicated by the arrowheads. Image provided courtesy Dr. D. Rao.

Comment: With the increasing use of generational toxicity studies, recognizing neural dysplasia is becoming increasingly important. Dysplasias include developmental abnormalities in size, organization, and location of various elements of the neural structures. Figure 1 shows, at low magnification, the appearance of uncommonly recognized incidental rodent hippocampal dysplasia. In this dramatic example, note the abnormal undulating CA1 region (arrows) and malformed dentate gyrus (arrowhead). CA3 appears relatively normal. Figure 2, labeled for comparison, shows normal rat hippocampal structure. Dysplastic neuronal lesions are usually encountered in the cortex, hippocampus, and cerebellum, but any part of the brain can be affected. In most cases, effects, if any, are not detected clinically but could account for abnormal clinical neurologic signs such as seizures in individual animals. Models of neural dysplasia in rats include treatment with methylazoxymethanol acetate followed by induction of epileptiform seizures by pilocarpine.

Recommendation: Whenever present in NTP studies, this lesion should be diagnosed and the subsite included in the diagnosis. Severity grading is not required.



NTP Nonneoplastic Lesion Atlas

Brain – Dysplasia

References:

Colciaghi F, Finardi A, Frasca A, Balosso S, Nobili P, Carriero G, Locatelli D, Vezzani A, Battaglia G. 2011. Status epilepticus-induced pathologic plasticity in a rat model of focal cortical dysplasia. *Brain* 134:2828–2843.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/21482549>

Kaufmann W, Groters S. 2006. Developmental neuropathology in DNT studies—a sensitive tool for the detection and characterization of developmental neurotoxicants. *Reprod Toxicol* 22:196–213.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/16781841>

Park K, Chu K, Jung K, Kim J, Kang K, Lee S, Park H, Kim M, Lee S, Roh J. 2010. Role of cortical dysplasia in epileptogenesis following prolonged febrile seizure. *Epilepsia* 51:1809–1819.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/20738387>

Authors:

Peter Little, DVM, MS, PhD, DACVP
Neuropathology Consultant
Experimental Pathology Laboratories, Inc.
Research Triangle Park, NC

Deepa B. Rao, BVSc, MS, PhD, DABT, DACVP
NTP Pathologist (Contractor)
Integrated Laboratory Systems, Inc.
Research Triangle Park, NC