

NTP Nonneoplastic Lesion Atlas

Kidney, Renal Tubule – Degeneration

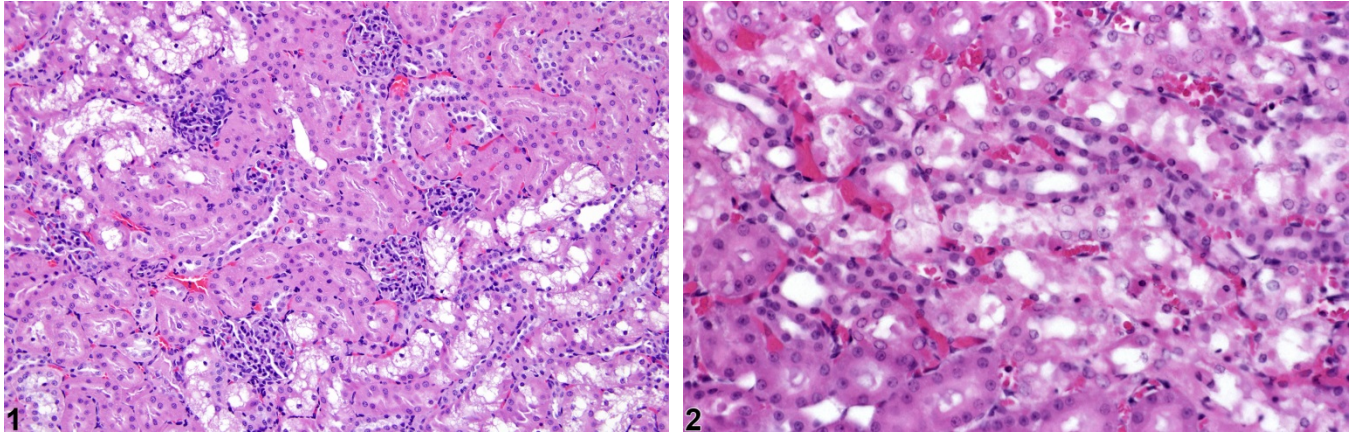
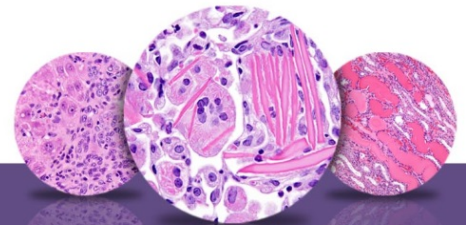


Figure Legend: **Figure 1** Kidney, Renal tubule - Degeneration in a male Tg.Ac (FVB/N) hemizygous mouse from a subchronic study. The degeneration of cortical tubule epithelial cells is characterized by vacuolation of the cytoplasm and pyknosis of the nuclei. **Figure 2** Kidney, Renal tubule - Degeneration in a female F344/N rat from a subchronic study. In this case, the degeneration is characterized by tubule cells with an eosinophilic tinctorial change and cytoplasmic vacuolation.

Comment: Degeneration is a nonspecific entity that can arise from any number of etiologies that perturb cell function and is often an early indicator of necrosis. Degeneration, in some cases, is preceded by vacuolation (Figure 1). In general, degeneration is characterized by several morphologic and variable cell features, such as cell swelling with or without cytoplasmic vacuolation and pale-staining and fragmented cytoplasm (Figure 2). Degeneration must be distinguished from apoptosis, which represents the normal process of cell turnover in the kidney. Necrosis generally includes cell swelling, nuclear pyknosis and/or karyorrhexis, and cellular sloughing. Degeneration may be either reversible or irreversible.

Recommendation: Degeneration should be diagnosed and graded. If applicable, the location of the affected tubule(s) should be included as a site modifier in the diagnosis. Associated lesions, such as inflammation or regeneration, should not be diagnosed separately unless warranted by severity but should be described in the pathology narrative.



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Reference:

Frazier KS, Seely JC, Hard GC, Betton G, Burnett R, Nakatsuji S, Nishikawa A, Durchfeld-Meyer B, Bube A. 2012. Proliferative and non-proliferative lesions in the rat and mouse urinary system. *Toxicol Pathol* 40:14S-86S.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/22637735>

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