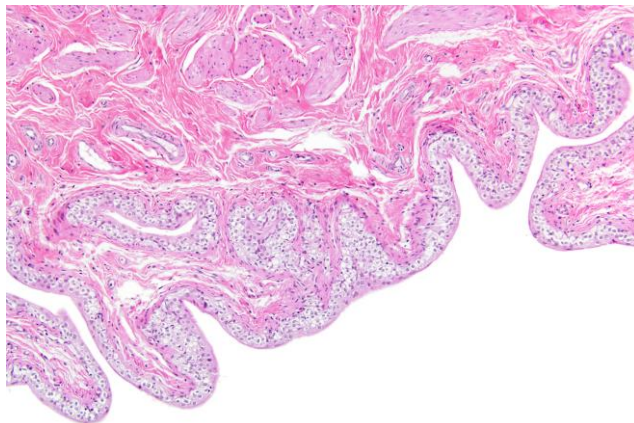
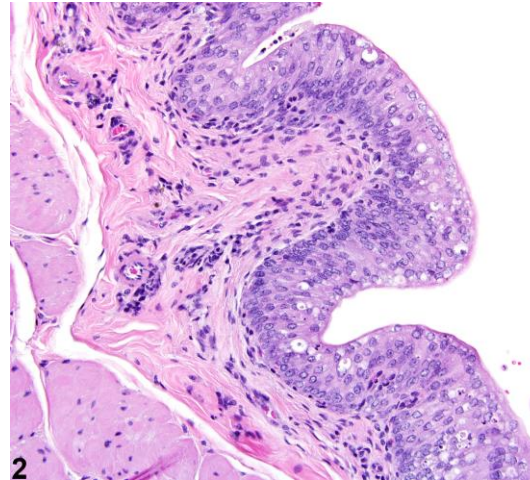
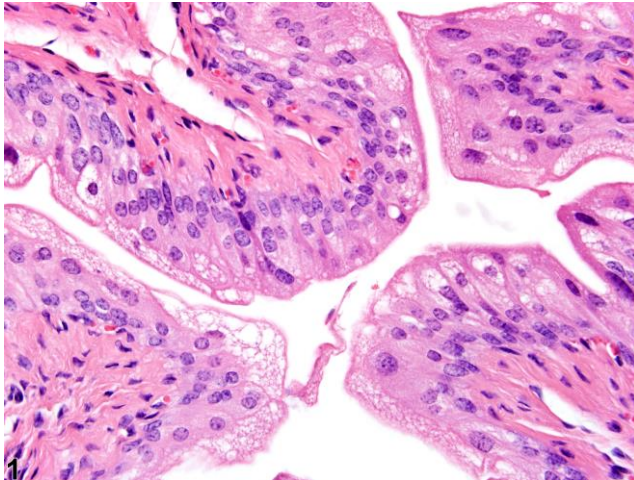




NTP Nonneoplastic Lesion Atlas

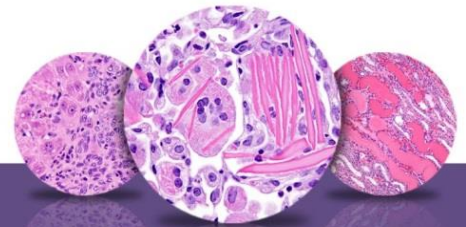
Urinary bladder – Vacuolization, cytoplasmic



3

Figure Legend: **Figure 1** Cytoplasmic vacuolation. Clear vacuoles are present in urothelial “umbrella” cells from a male B6C3F1 mouse in an acute study. **Figure 2** Cytoplasmic vacuolation of more superficial urothelial cells from a female Harlan Sprague-Dawley rat in a chronic study. **Figure 3** Diffuse artifactual vacuolation of basal urothelial cells from a male F344/N rat in a chronic study.

Comment: Cytoplasmic vacuolation of urothelial cells is regarded as a nonspecific lesion that may occur secondary to cell injury by a variety of bladder toxicants or carcinogens. It may or may not be related to degeneration. Vacuolation is usually noted in “umbrella” cells or more superficial urothelial cells (Figure 1 and Figure 2). Uniform urothelial cell vacuolation (typically within the basal cell layer) may be an artifact resulting from autolysis (Figure 3).



NTP Nonneoplastic Lesion Atlas

Urinary bladder – Vacuolization, cytoplasmic

Recommendation: Cytoplasmic vacuolation should be diagnosed and given a severity grade.

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>

Authors:

John Curtis Seely, DVM, DACVP
Senior Pathologist
Experimental Pathology Laboratories, Inc.
Research Triangle Park, NC

Abraham Nyska, DVM, Diplomate ECVP, Fellow IATP
Expert in Toxicologic Pathology
Visiting Full Professor of Pathology
Sackler School of Medicine, Tel Aviv University
Timrat Israel