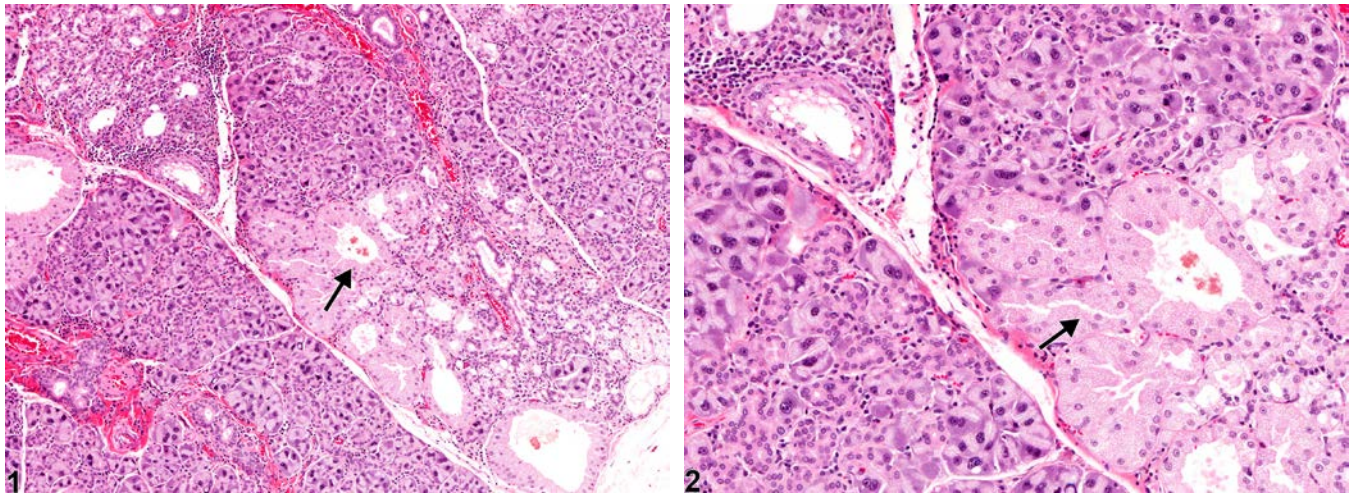




# NTP Nonneoplastic Lesion Atlas

## Lacrimal Gland – Metaplasia, Harderian



**Figure Legend:** **Figure 1** Lacrimal gland - Metaplasia, Harderian in a male Osborne-Mendel rat from a chronic study. Metaplasia, Harderian (arrow) is characterized by a focus of tubules resembling Harderian gland alveoli. **Figure 2** Lacrimal gland - Metaplasia, Harderian in a male Osborne-Mendel rat from a chronic study (higher magnification of Figure 1). Metaplasia, Harderian (arrow) is characterized by tubules lined by cuboidal cells with pale, foamy to vacuolated cytoplasm resembling Harderian gland alveoli.

**Comment:** Clusters of tubules lined by cuboidal cells with pale, foamy to vacuolated cytoplasm (resembling Harderian gland alveoli) can occur in the lacrimal glands of rats and mice, especially rats (Figure 1 and Figure 2). This “harderization” is more prominent in the exorbital lacrimal gland (the lacrimal gland usually sampled for histology) than in the intraorbital lacrimal gland. Incidence and severity of this change increase with age, and it is more common and extensive in male than in female rats. The increased Harderian gland–type development in the lacrimal glands of male versus female rats is one feature of the prominent sexual dimorphism of this tissue in this species. In mice, this change appears to be more frequent in females than in males. The metabolic and functional characteristics of these cells have not been characterized, and it is unknown whether this represents a true metaplastic or a degenerative change.

**Recommendation:** This finding should be diagnosed as “lacrimal gland – metaplasia, Harderian” and assigned a severity grade. It should be diagnosed only if there are treatment-related differences in



# NTP Nonneoplastic Lesion Atlas

## *Lacrimal Gland – Metaplasia, Harderian*

incidence and/or severity. “Ectopic Harderian gland” and “ectopic tissue” are considered inappropriate terms because they suggest a developmental anomaly.

### References:

Cornell-Bell AH, Sullivan DA, Allansmith MR. 1985. Gender-related differences in morphology of the lacrimal gland. *Invest Ophthalmol Vis Sci* 26:1170-1175.

Abstract: <http://www.iovs.org/content/26/8/1170.short>

Gaertner DJ, Lindsay JR, Stevens JO. 1988. Cytomegalic changes and “inclusions” in lacrimal glands of laboratory rats. *Lab Anim Sci* 38:79-82.

Abstract: <http://ebm.sagepub.com/content/101/1/164.short>

Geiss V, Yoshitomi K. 1999. Eyes. In: *Pathology of the Mouse: Reference and Atlas* (Maronpot RR, Boorman GA, Gaul BW, eds). Cache River Press, Vienna, IL, 471-489.

Abstract: <http://www.cacheriverpress.com/books/pathmouse.htm>

Krinke AL, Schaetti PR, Krinke GJ. 1994. Changes in the major ocular glands. In: *Pathobiology of the Aging Rat, Vol 1* (Mohr U, Dungworth DL, Capen CC, Carlton WW, Sundberg JP, Ward JM, eds). International Life Sciences Institute Press, Washington, DC, 109-119.

Krinke GJ, Schaetti PR, Krinke A. 1996. Nonneoplastic and neoplastic changes in the Harderian and lacrimal glands. In: *Pathobiology of the Aging Mouse, Vol 2* (Mohr U, Dungworth DL, Capen CC, Carlton WW, Sundberg JP, Ward JM, eds). International Life Sciences Institute Press, Washington, DC, 139-152.

National Toxicology Program. 1990 NTP TR-376. Toxicology and Carcinogenesis Studies of Allyl Glycidyl Ether (CAS No. 106-92-3) in Osborne-Mendel Rats and B6C3F<sub>1</sub> Mice (Inhalation Studies). NTP, Research Triangle Park, NC.

Abstract: <http://ntp.niehs.nih.gov/go/8892>

Percy DH, Wojcinski ZW, Schunk MK. 1989. Sequential changes in the Harderian and exorbital lacrimal glands in Wistar rats infected with sialodacryoadenitis virus. *Vet Pathol* 26:238-245.

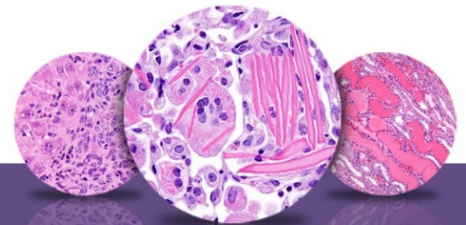
Full-text: <http://vet.sagepub.com/content/26/3/238.full.pdf>

Sashima M, Hatakeyama S, Satoh M, Suzuki A. 1989. Harderianization is another sexual dimorphism of rat exorbital lacrimal gland. *Acta Anat* 135:303-306.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/2801002>

Tier H. 1949. On the sizes of the nuclei in the glandula infraorbitalis of the white rat. *Acta Path Microbiol Scand* 26:620-625.

Abstract: <http://onlinelibrary.wiley.com/doi/10.1111/j.1699-0463.1949.tb00761.x/abstract>



# NTP Nonneoplastic Lesion Atlas

## *Lacrimal Gland – Metaplasia, Harderian*

### **References:**

Walker R. 1958. Age changes in the rat's extraorbital lacrimal gland. *Anat Rec* 132:49-69.  
Abstract: <http://onlinelibrary.wiley.com/doi/10.1002/ar.1091320104/abstract>

Yoshitomi K, Boorman GA. 1990. Eye and Associated Glands. In: *Pathology of the Fischer Rat: Reference and Atlas* (Boorman GA, Eustis SL, Elwell MR, Montgomery CA, MacKenzie WF, eds). Academic Press, San Diego, CA, 239-260.  
Abstract: <http://www.ncbi.nlm.nih.gov/nlmcatalog/9002563>

### **Author:**

Margarita M. Gruebbel, DVM, PhD, DACVP  
Senior Pathologist  
Experimental Pathology Laboratories, Inc.  
Research Triangle Park, NC