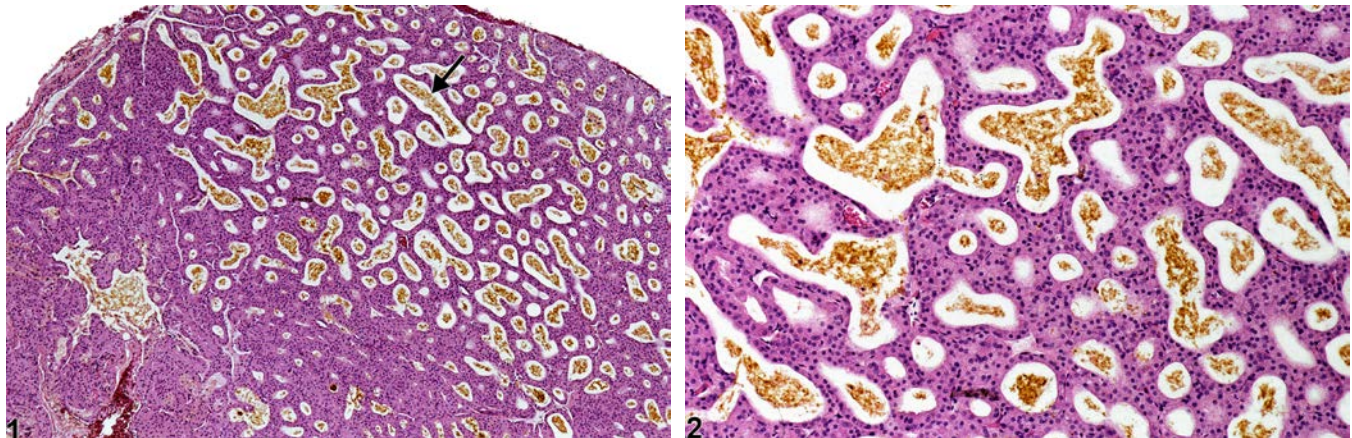


# NTP Nonneoplastic Lesion Atlas

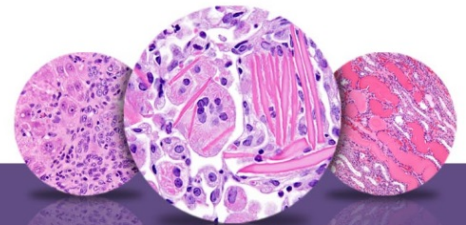
## Harderian Gland - Pigment



**Figure Legend:** **Figure 1** Harderian gland - Pigment in a female F344/N rat from a subchronic study. There are golden to dark brown amorphous clumps or laminated concretions of pigment (likely porphyrin) in the acinar lumens (arrow). **Figure 2** Harderian gland - Pigment in a female F344/N rat from a subchronic study (higher magnification of Figure 1). This higher magnification image shows the intra-acinar pigment in greater detail.

**Comment:** Lipids are the primary secretory products of the rodent Harderian gland, but porphyrin pigment is also synthesized and secreted. Porphyrin pigment occurs as golden to dark brown amorphous clumps or laminated concretions in the alveolar lumens (Figure 1 and Figure 2). Porphyrin secretion increases with age, and excessive production results in “red tears” (chromodacyorrhea). Incidentally occurring porphyrin deposits are generally more prominent in the Harderian glands of female rats and mice. Increased porphyrin secretion can also be a treatment-related effect following administration of various chemical agents.

**Recommendation:** Since porphyrin pigment is a normal finding in rodent Harderian glands, pigment should be diagnosed and assigned a severity grade only if there are treatment-related differences in incidence and/or severity. It should also be diagnosed if the pathologists feels the pigment is composed of something other than porphyrin (e.g., hemosiderin or lipofuscin). Definitive pigment identification is often difficult in histologic sections, even with a battery of special stains. Therefore, it is recommended that a diagnosis of pigment (as opposed to diagnosing the type of pigment, e.g., hemosiderin or lipofuscin) is most appropriate. The pathology narrative should describe the morphologic features of the pigmentation. Not all pigments have to be diagnosed, as some are ubiquitous in aging animals or



# NTP Nonneoplastic Lesion Atlas

## *Harderian Gland - Pigment*

related to some other disease process and not toxicologically meaningful. The pathologist should use his or her judgment in deciding whether or not secondary deposits of pigment are prominent enough to warrant a separate diagnosis.

### **References:**

Beaumont SD. 2002. Ocular disorders of pet mice and rats. *Vet Clin Exot Anim* 5:311-324.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/12170635>

Botts S, Jokinen M, Gaillard ET, Elwell MR, Mann PC. 1999. Salivary, Harderian, and lacrimal glands. In: *Pathology of the Mouse: Reference and Atlas* (Maronpot RR, Boorman GA, Gaul BW, eds). Cache River Press, Vienna, IL, 49-79.  
Abstract: <http://www.cacheriverpress.com/books/pathmouse.htm>

Brownschidle CM, Niewenhuis RJ. 1978. Ultrastructure of the Harderian gland in male albino rats. *Anat Rec* 190:735-754.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/637321>

Chieffi G, Chieffi Bacconi G, Di Matteo L, D'Istria M, Minucci S, Varriale B. 1996. Cell biology of the Harderian gland. *Int Rev Cytol* 168:1-180.  
Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/8843648>

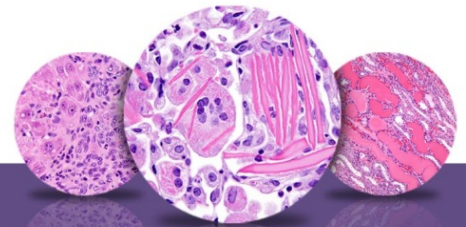
Djeridane Y. 1994. The Harderian gland and its excretory duct in the Wistar rat. A histological and ultrastructural study. *J Anat* 184:553-566.  
Abstract: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1259964/>

Greaves P. 2007. Nervous system and special sense organs. In: *Histopathology of Preclinical Toxicity Studies: Interpretation and Relevance in Drug Safety Evaluation*, 3rd ed. Academic Press, San Diego, CA, 861-933.  
Abstract: <http://www.sciencedirect.com/science/book/9780444527714>

Iwai H, Tagawa Y, Hayasaka I, Hayasaka I, Yanai T, Masegi T. 2000. Effects of atropine sulfate on rat Harderian glands: Correlation between morphological changes and porphyrin levels. *J Toxicol Sci* 25:151-159.  
Abstract: <http://europepmc.org/abstract/MED/10987121>

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.

Payne AP. 1994. The Harderian gland: A tercentennial review. *J Anat* 185:1-49.  
Abstract: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1166813/>



# NTP Nonneoplastic Lesion Atlas

## *Harderian Gland - Pigment*

### References:

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>

Sakai T. 1981. The mammalian Harderian gland: Morphology, biochemistry, function, and phylogeny. *Arch Histol Jpn* 44:299-333.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/7030263>

Seely JC. 1987. The Harderian gland. *Lab Anim* 16:33-39.

Watanabe M. 1980. An autoradiographic, biochemical, and morphological study of the Harderian gland of the mouse. *J Morphol* 163:349-365.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/6990006>

Williams DL. 2002. Ocular disease in rats: A review. *Vet Ophthalmol* 5:183-192.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/12236869>

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