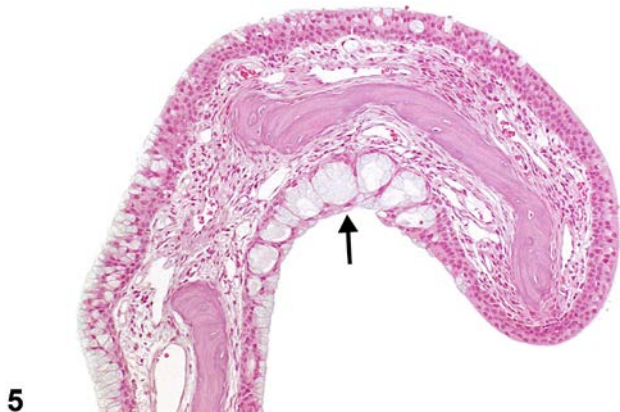
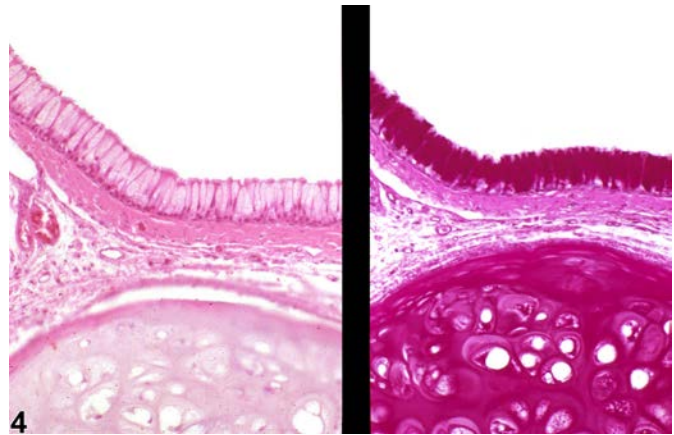
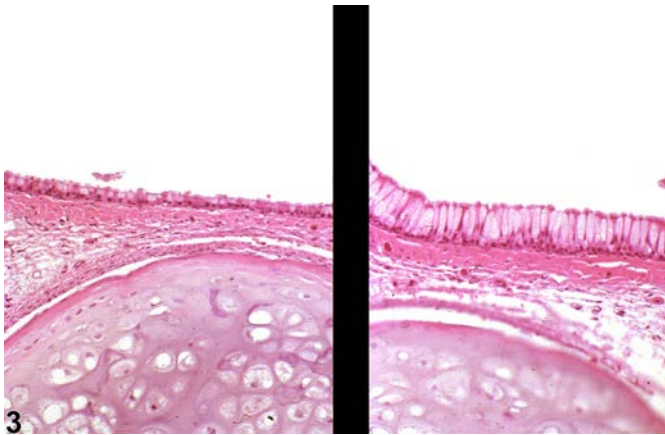
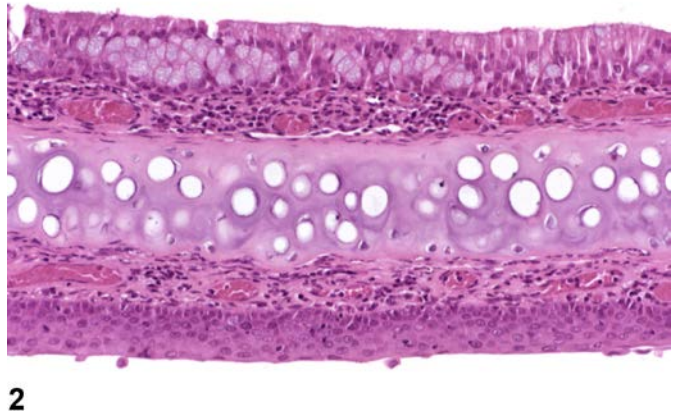
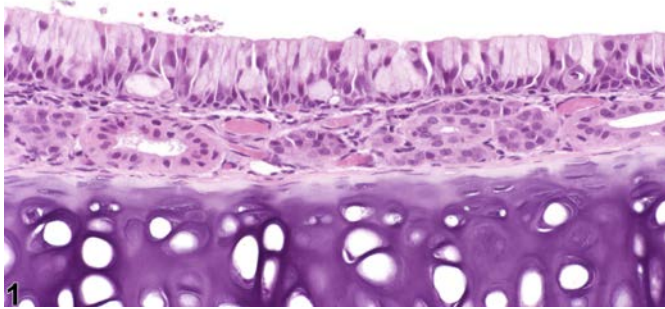


# NTP Nonneoplastic Lesion Atlas

## *Nose – Hyperplasia, Goblet Cell*





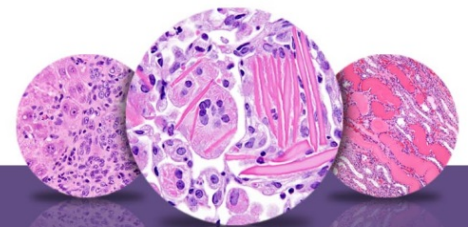
# NTP Nonneoplastic Lesion Atlas

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**Figure Legend:** **Figure 1** Nose, Respiratory epithelium - Hyperplasia, Goblet cell in a male F344/N rat from a chronic study. Goblet cells are increased in number in the epithelium lining the nasal septum. **Figure 2** Nose, Respiratory epithelium - Hyperplasia, Goblet cell in a male F344/N rat from a chronic study. Goblet cells are increased in number in the epithelium on one side of the nasal septum (top); the opposite side is lined by metaplastic squamous epithelium. **Figure 3** Nose, Respiratory epithelium - Hyperplasia, Goblet cell (right) and normal respiratory epithelium (left) of the nasopharyngeal duct in a male F344/N rat from a subchronic study. Image provided courtesy of Dr. R. Miller. **Figure 4** Nose, Respiratory epithelium - Hyperplasia, Goblet cell in the nasopharyngeal duct in a male F344/N rat from a subchronic study. Hematoxylin and eosin staining of goblet cell hyperplasia is on the left, and periodic acid–Schiff staining is on the right. Image provided courtesy of Dr. R. Miller. **Figure 5** Nose, Transitional epithelium - Hyperplasia, Goblet cell in a male F344/N rat from a chronic study. Increased numbers of goblet cells are present in the epithelium lining the turbinate, with coalescence of goblet cells on one side of the turbinate (arrow).

**Comment:** Goblet (mucous) cell hyperplasia (Figure 1, Figure 2, Figure 3, Figure 4, and Figure 5) is seen after exposure to some irritants and may be the only change noted in response to short-term exposure to a mild irritant. It is most often seen in areas of the nasal cavity that are lined by transitional and respiratory epithelium (levels I and II). The respiratory epithelium normally contains a few goblet cells; the term “metaplasia” may be more correct when the lesion is present in the transitional epithelium (which normally lacks goblet cells). However, to maintain consistency, the NTP prefers the term “hyperplasia” for this lesion, regardless of the epithelial type. The lesion is characterized by the presence of (in transitional epithelium) or increase in the number of (in respiratory epithelium) goblet cells in the epithelial lining. The goblet cells may form intraepithelial glands, or they may coalesce to form mucous cysts (Figure 5, arrow). Goblet cell hyperplasia has been seen in both short- and long-term studies. It is thought to be an adaptive response to irritant exposure and is not considered a preneoplastic change.

**Recommendation:** Goblet cell hyperplasia should be diagnosed whenever it is present and assigned a severity grade. The type of epithelium affected should be indicated in the diagnosis by a site modifier (e.g., respiratory epithelium or transitional epithelium). The goblet cells may be enlarged or



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hypertrophied, but goblet cell hypertrophy should not be concurrently diagnosed; rather, the hypertrophy should be described in the pathology narrative. Associated lesions, such as inflammation or epithelial hyperplasia, should be diagnosed separately.

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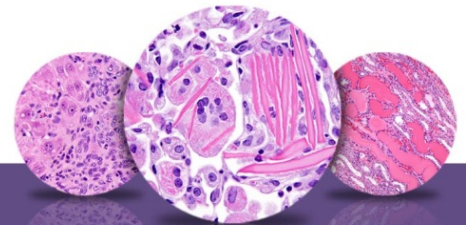
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National Toxicology Program  
U.S. Department of Health and Human Services



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