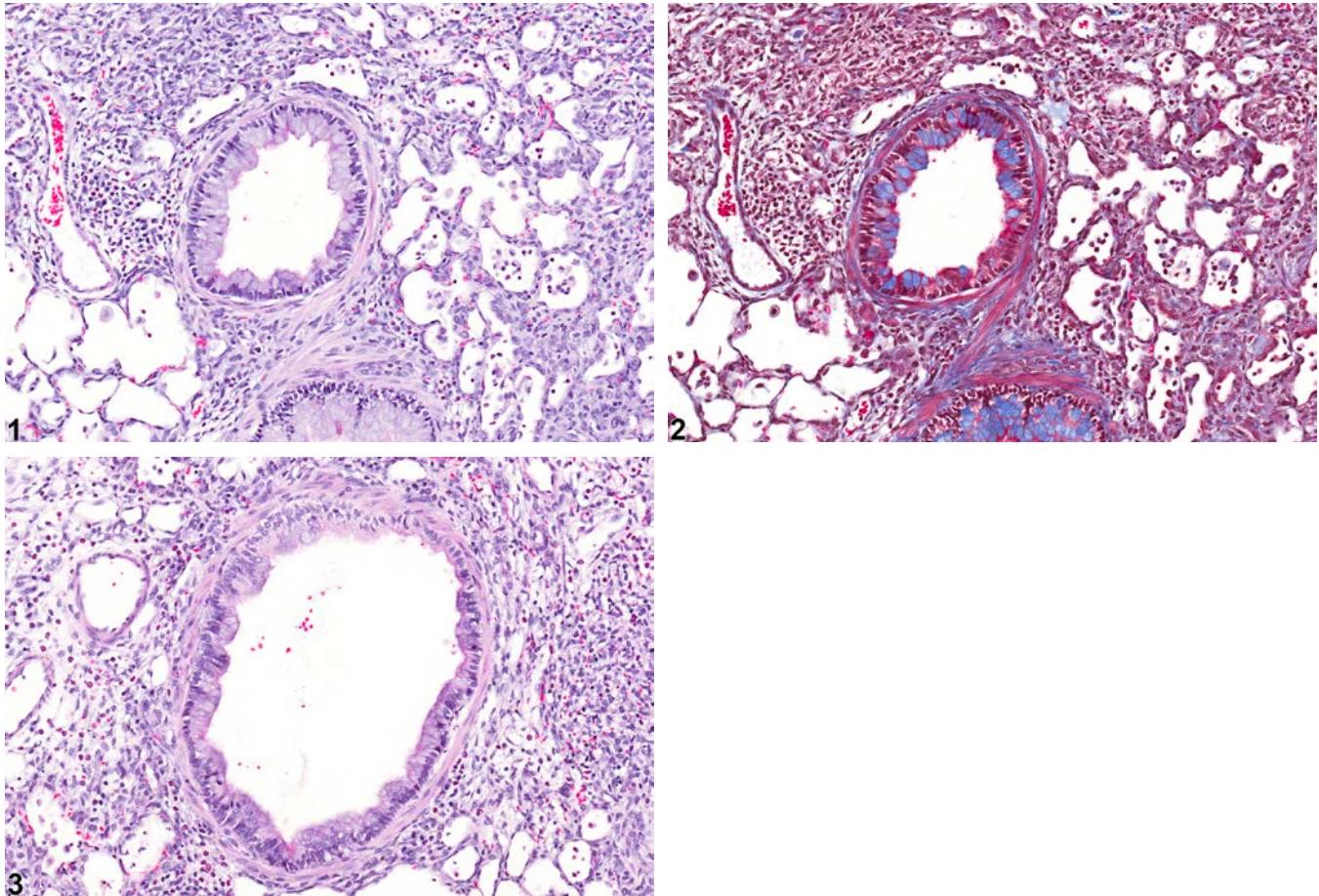


# NTP Nonneoplastic Lesion Atlas

## *Lung – Metaplasia, Goblet Cell*



**Figure Legend:** **Figure 1** Lung, Bronchiole - Metaplasia, Goblet cell from a male Sprague-Dawley rat in an acute study. The majority of the cells in this airway are goblet cells. Image provided courtesy of Dr. J. Bonner. **Figure 2** Lung, Bronchiole - Metaplasia, Goblet cell from a male Sprague-Dawley rat in an acute study (same airway as in Figure 5). The vacuoles stain blue with Mason's trichrome stain. Image provided courtesy of Dr. J. Bonner. **Figure 3** Lung, Bronchiole - Metaplasia, Goblet cell from a male Sprague-Dawley rat in an acute study. Scattered cells contain a single, large, cytoplasmic vacuole. Image provided courtesy of Dr. J. Bonner.

**Comment:** There has been much debate regarding the proper term for this lesion (metaplasia vs. hyperplasia), but since goblet cells are not normally present in the epithelium of the smaller airways and are not normally visible in the upper airways, it should be diagnosed as goblet cell metaplasia in NTP



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studies. Rats and mice have very low numbers of goblet (mucous) cells in their lungs. Under normal conditions, <1-2% of the epithelial cells of the mainstem bronchi, primary bronchi, and lobar bronchi (up to approximately the sixth-generation airway) are goblet cells. No goblet cells have been identified in the segmental bronchi (generations 7–11) or in the terminal bronchioles.

Goblet cell metaplasia is characterized by the presence of goblet cells (above the normal number; see above) in the epithelium lining the bronchi or bronchioles (Figure 1, Figure 2, and Figure 3). Goblet cell metaplasia may occur in association with infectious agents or exposure to inhaled irritants in both rats and mice. It is frequently seen concurrently with inflammation and, less frequently, fibrosis, though it may be seen in the absence of these lesions. Mucus can be stained with the Alcian blue method, which can facilitate the identification of this lesion. Mucus also stains blue with the Mason's trichrome staining method (Figure 2), but this stain is not typically used to identify goblet cells, and Alcian blue is preferred.

**Recommendation:** The preferred terminology for this lesion is Lung – Metaplasia, Goblet cell. This lesion should be recorded and graded when present. The location of the metaplasia (i.e., bronchus or bronchiole) should be indicated in the diagnosis as a site modifier. If the lesion is present in more than one location, the site modifier may be omitted and the locations described in the pathology narrative. Associated lesions, such as inflammation and bronchiolar epithelial hyperplasia, should be diagnosed and graded separately.

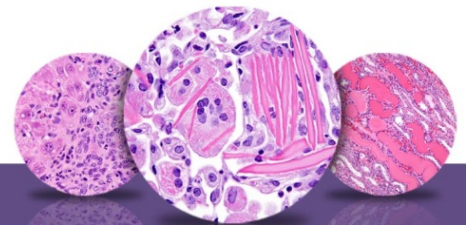
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