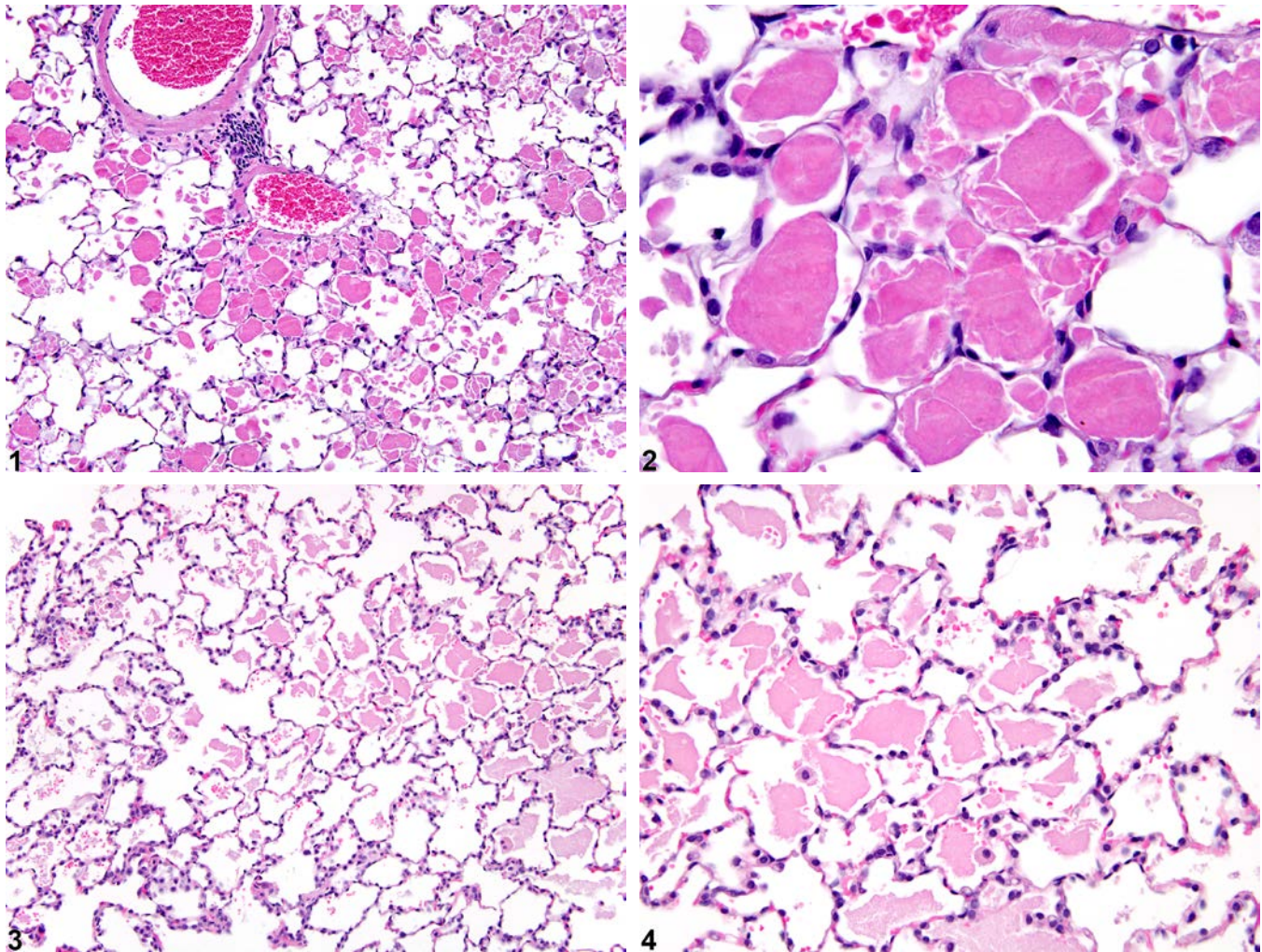
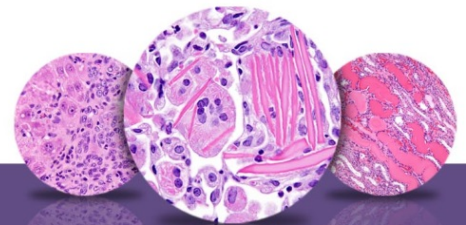


# NTP Nonneoplastic Lesion Atlas

## Lung – Proteinosis



**Figure Legend:** **Figure 1** Lung, Alveolus - Proteinosis in a male B6C3F1/N mouse from a chronic study. There is amorphous, brightly eosinophilic material (proteinosis) within the alveoli. **Figure 2** Lung, Alveolus - Proteinosis in a male B6C3F1/N mouse from a chronic study (higher magnification of Figure 1). Little to no inflammation is associated with the amorphous, brightly eosinophilic material (proteinosis) in the alveoli. **Figure 3** Lung, Alveolus - Proteinosis in a male B6C3F1 mouse from a subchronic study. There is amorphous, eosinophilic material (proteinosis) within the alveoli. **Figure 4** Lung, Alveolus - Proteinosis in a male F344/N rat from a subchronic study (higher magnification of Figure 3). Scattered alveolar macrophages are associated with the amorphous, eosinophilic material (proteinosis) in the alveoli.



# NTP Nonneoplastic Lesion Atlas

## *Lung – Proteinosis*

**Comment:** Alveolar proteinosis (Figure 1, Figure 2, Figure 3, and Figure 4) is characterized by brightly eosinophilic, amorphous, periodic acid-Schiff–positive material that is free within the alveoli. Typically, little inflammation is associated with the material, but there may be increased numbers of macrophages. The distribution may be focal, with few alveoli affected; patchy, affecting portions of lung lobes; or diffuse, affecting entire lobes. The material is thought to comprise lipids and pulmonary proteins. The pathogenesis of the lesion is not known but may be caused by increased surfactant production and/or decreased clearance due to macrophage impairment. Alveolar proteinosis must be distinguished from edema fluid, which is more homogeneous, does not stain as brightly or deeply eosinophilic with hematoxylin and eosin, and is periodic acid-Schiff negative. Alveolar proteinosis may be seen with exposure to various dust particles (e.g., quartz). The lesion appears to be more common in rats than in mice.

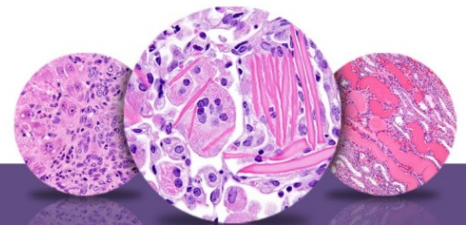
**Recommendation:** Lung - Proteinosis should be diagnosed whenever present and graded based on the extent of the lesion. Since alveolar macrophages are often increased in association with this lesion, they need not be diagnosed separately unless they comprise a significant component of the lesion. Inflammation should be diagnosed separately since it is not typically associated with this lesion. Proteinosis that is secondary to a neoplasm should not be diagnosed but may be described in the pathology narrative.

### **References:**

Boorman GA, Eustis SL. 1990. Lung. 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, 339-367.

Dixon D, Herbert RA, Sills RC, Boorman GA. 1999. Lungs, pleura, and mediastinum. In: Pathology of the Mouse: Reference and Atlas (Maronpot RR, ed). Cache River Press, Vienna, IL, 293-332.

Hook GER. 1991. Alveolar proteinosis and phospholipidoses of the lungs. Toxicol Pathol 19:482-513. Abstract: <http://tpx.sagepub.com/content/19/4-1/482.refs>



# NTP Nonneoplastic Lesion Atlas

## *Lung – Proteinosis*

### **Authors:**

Mark F. Cesta, DVM, PhD, DACVP  
Staff Scientist/NTP Pathologist  
NTP Pathology Group  
National Toxicology Program  
National Institute of Environmental Health Sciences  
Research Triangle Park, NC

Darlene Dixon, DVM, PhD, DACVP  
Group Leader  
Molecular Pathogenesis Group  
National Toxicology Program  
National Institute of Environmental Health Sciences  
Research Triangle Park, NC

Ronald A. Herbert, DVM, PhD  
Group Leader/NTP Pathologist  
Pathology Support Group  
National Toxicology Program  
National Institute of Environmental Health Sciences  
Research Triangle Park, NC

Lauren M. Staska, DVM, PhD, DACVP  
Senior Pathologist  
WIL Research  
Hillsborough, NC