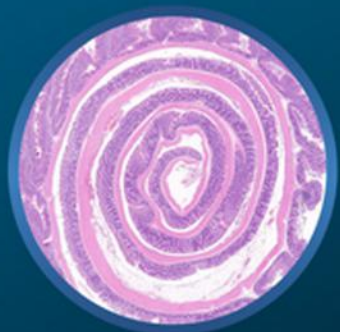
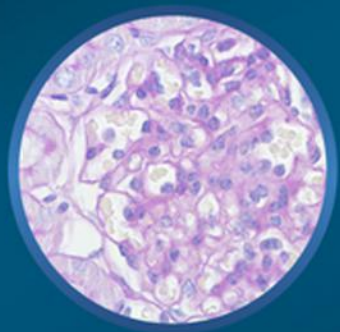
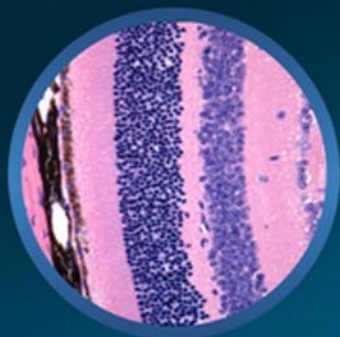


A Practical Guide to the Histology of the Mouse

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WILEY Blackwell

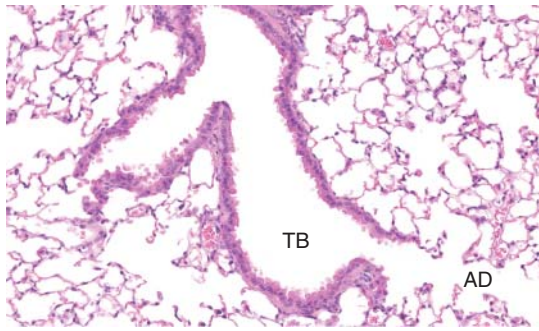


Figure 11.24 In the mouse lung, the terminal bronchiole (TB) leads into the alveolar duct (AD). The terminal bronchiole is predominantly lined by non ciliated Clara cells which have distinctive apical cytoplasmic blebs.

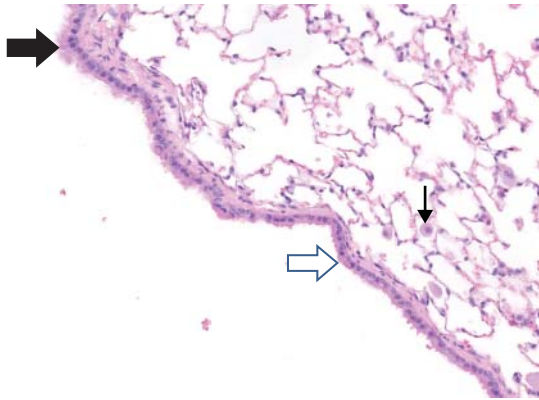


Figure 11.25 Distally in the bronchiolar system the ciliated epithelium (thick black arrow) is replaced by predominantly non-ciliated Clara cells (thick white arrow). Occasional macrophages (thin arrow) can normally be seen within alveoli.

repair (Kelly *et al.* 2012). Alveolar pores called the pores of Kohn link the alveoli and maintain an equal pressure between linked alveoli and prevent collapse (Suarez *et al.* 2012) – these cannot be visualized with standard light microscopic techniques.

The alveolus is the functional structure of the lung. The alveolar epithelium is made up of flattened squamous pulmonary type-1 cells and cuboidal type-2 pneumocytes (Figure 11.26). The type-1 pneumocytes are involved in gaseous exchange whereas the type-2 pneumocytes produce surfactant. Oxygen and carbon dioxide must cross

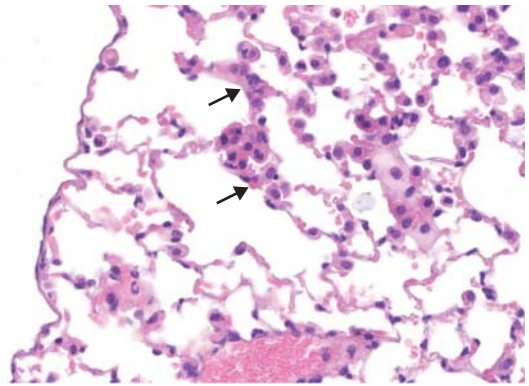


Figure 11.26 The alveolar epithelium is made up of flattened squamous pulmonary type-1 cells and cuboidal type-2 pneumocytes (arrows). Type 2 pneumocytes may be hard to identify in normal lung but become prominent when they undergo hyperplasia.

the alveolar wall during gas exchange. Surfactant is composed of phospholipids, which reduce surface tension when the alveolus deflates and prevents alveolar collapse. The bronchoalveolar junction is important in inhalation toxicity studies as this is the first area that the inhaled air and compound will encounter as it travels down the respiratory tract. The inhaled air in the alveolus has close proximity to the alveolar surface epithelium in particular with the red blood cells of the small alveolar blood vessels. Alveolar macrophages lie free in the alveolar space (Figure 11.25). Some alveolar macrophages may be located within the connective tissue of all respiratory passageways. Alveolar macrophages are responsible for engulfing foreign material within the lung. Myofibroblasts within the alveolar walls control the alveolar volume. The lymphoid tissue in the lung is called bronchus-associated lymphoid tissue (BALT) and is barely visible in the healthy mouse lung. The BALT becomes prominent in respiratory infections, particularly viral infections (Figure 11.27).

11.5.3 Background lesions in the lung

Small foci made up of osteoid or bone with mineralization or calcification are common in the

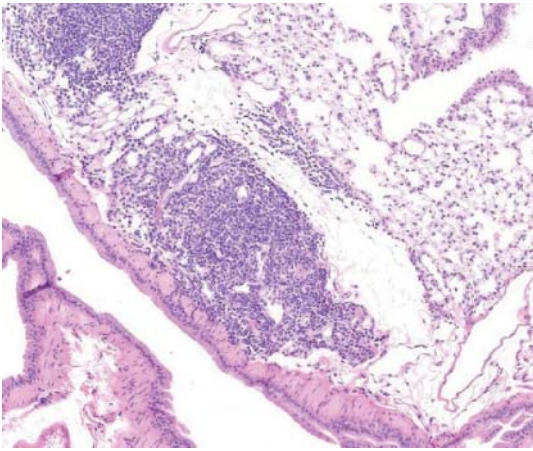


Figure 11.27 The BALT becomes prominent in respiratory infections, particularly viral infections.

mouse lung (Figure 11.28). There is usually no reaction in the surrounding lung tissue. The walls of the major pulmonary veins of the lungs in mice contain cardiac muscle (Percy and Barthold 2007) (Figure 11.29). Focal accumulations of macrophages (alveolar histiocytosis) (Figure 11.30) are a common incidental finding in the lungs (Renne *et al.* 2009) and can be observed in subpleural areas of

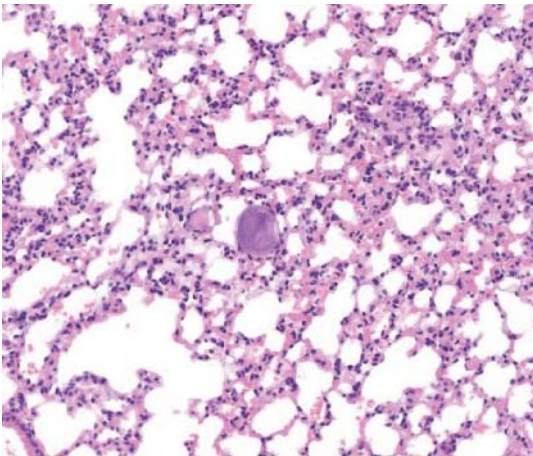


Figure 11.28 Small foci made up of osteoid or bone with mineralization or calcification are common in the mouse lung.

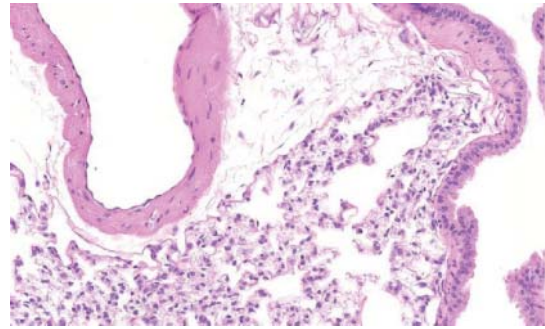


Figure 11.29 The walls of the major pulmonary veins of the lungs in mice contain cardiac muscle. Note this animal was perfused via the heart giving the alveolar septae an empty appearance.

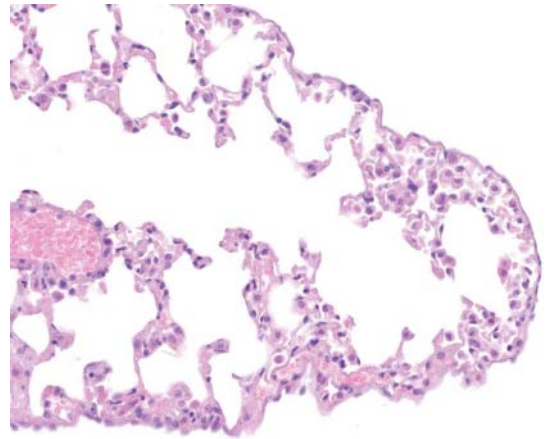


Figure 11.30 Focal accumulations of macrophages (alveolar histiocytosis) are a common incidental finding in the lungs and can be observed in subpleural areas of ageing mouse lungs.

ageing mice lungs. Laryngeal and tracheal cartilage displays age-related mineralization and occasionally ossification. Lymphoid aggregates are commonly found in the mediastinal tissue of normal mice (Figure 11.31). Agonal haemorrhage may be related to the method of euthanasia and can be distinguished from pathological haemorrhage by the absence of any other pathology including inflammation and the absence of pigmented macrophages, which would indicate chronicity (Figure 11.32).

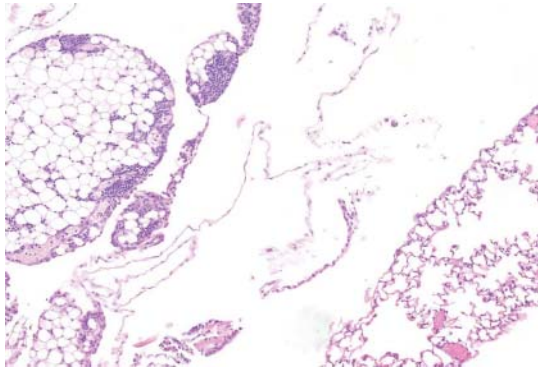


Figure 11.31 Lymphoid aggregates are commonly seen in the mediastinal tissue and around the pleura.

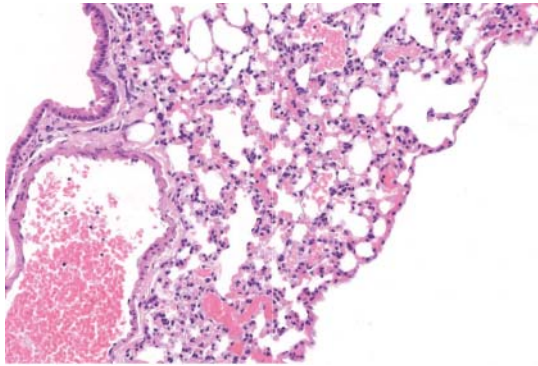


Figure 11.32 Agonal haemorrhage and congestion is common in mouse lungs and may be related to the method of euthanasia. It can be distinguished from pathological haemorrhage by the absence of pigmented macrophages or inflammation.

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