

Case 1. Tissue from a rhesus macaque.

MICROSCOPIC DESCRIPTION: Lung: Multifocally, bronchiolar walls are markedly expanded **(1pt)** by severe smooth muscle hyperplasia **(1pt)**, as well as infiltration by variable combinations of neutrophils, epithelioid macrophages **(1pt)**, eosinophils **(1pt)**, fewer multinucleated giant cells, lymphocytes and plasma cells admixed with fibrin and edema. Multifocally, macrophages contain intracytoplasmic golden-brown to black globular pigment with refractile spicules (mite excrement) **(2pt)**. This infiltrate often extends into and compresses the peribronchiolar adventitia and surrounding alveoli, which are often atelectatic. Within the expanded bronchiolar lumina are multiple cross and tangential sections of an arthropod **(1pt)** parasite, which are 300-500 um in width and are characterized by a brown chitinized cuticle, jointed appendages, striated musculature, a body cavity, digestive tract, primitive nervous system and reproductive organs **(2pt)**. The parasites are surrounded by an exudate of low to moderate numbers of viable and degenerate neutrophils, proteinaceous fluid, and cellular debris **(1pt)**, and the bronchiolar epithelium of affected bronchioles (“mite houses”) is markedly attenuated or missing **(1pt)**. At peripheral areas of expanded bronchioles, bronchiolar airway is hyperplastic **(1pt)**. The pleura is multifocally lined by either dense plaque-like proliferations of mesothelial cells admixed with multifocal hemorrhage and cellular debris **(1pt)**, a combination of epithelial macrophages and multinucleated giant cells **(1pt)**, or both. Throughout the section, and primarily in subpleural areas, there is moderate to marked smooth muscle hyperplasia of arteriolar walls.

MORPHOLOGIC DIAGNOSIS: Lung: Bronchiolitis, pyogranulomatous and eosinophilic, chronic, multifocal, moderate, with smooth muscle hypertrophy, bronchiectasis, and intrabronchiolar arthropods and mite pigments. **(3pt)**

CAUSE: *Pneumonyssus simicola* **(2pt)**

O/C: **(1pt)**

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Case 2. Tissue from a dog

MICROSCOPIC DESCRIPTION: Colon: Infiltrating the lamina propria, multifocal effacing the muscularis mucosa, and elevating the overlying multifocally ulcerated mucosa, there is an unencapsulated, moderately cellular, infiltrative, poorly demarcated neoplasm **(2 pt.)** composed of two populations of cells **(1 pt.)**. The first population are polygonal with abundant granular basophilic cytoplasm and a centrally placed round nucleus, which resemble ganglion cells **(1 pt.)**. Mitotic figures are rare. Clusters of these cells are dispersed through broad streams and bundles **(1 pt.)** of densely packed spindle cells separated by a fine fibrovascular stroma **(1 pt.)**. Spindle cells have a moderate amount of a finely vacuolated eosinophilic cytoplasm and centrally placed nuclei with finely stippled chromatin and 1-2 nucleoli **(1 pt.)**. Mitotic figures are also rare in this population. The adjacent colonic lamina propria is expanded by large numbers of lymphocytes **(1 pt.)**, plasma cells, with fewer histiocytes, neutrophils, multifocal hemorrhage, edema, and cellular debris., as well as low to moderate numbers of hemosiderin-laden macrophages **(1 pt.)**. There is multifocal marked edema and hemorrhage of the superficial mucosa, and the mucosal epithelium is multifocally ulcerated **(1 pt.)** with attenuation of adjacent mucosal epithelium and infiltration of moderate numbers of neutrophils within these areas. **(1 pt.)** There is marked loss of colonic glands **(1 pt.)**; remaining colonic glands are widely separated and tortuous, and often filled with abundant mucin. There are few small hyperplastic glands which are lined by darkly basophilic epithelial cells with vesicular nuclei, scattered mitotic figures and no apparent cytoplasmic mucin. **(1 pt.)**

MORPHOLOGIC DIAGNOSIS: 1. Colon: Ganglioneuromatosis. **(3 pt.)**

2. Colon: Colitis, atrophic and lymphoplasmacytic, chronic, diffuse, severe, with ulceration, edema, and marked glandular loss. **(2 pt.)**

O/C: **(1 pt.)**

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Tissue from a rhesus macaque.

MICROSCOPIC DESCRIPTION: Pancreas (2pt.): There is diffuse severe loss of pancreatic architecture **(1pt.)**, with marked atrophy **(1pt.)** of acinar cells, which lack zymogen granules and often have a dilated acinar lumen contain small amounts of cellular debris **(1pt.)**. Approximately 60% **(1pt.)** of the section is replaced by multifocal to coalescing areas of lytic necrosis **(2pt.)** infiltrated by large numbers of largely degenerate neutrophils **(1pt.)** admixed with abundant cellular debris, edema, and hemorrhage. Throughout the section, moderate numbers of acinar cells contain nuclei which are expanded by a single deeply basophilic homogenous intranuclear viral inclusion **(2pt.)**. The fibrous connective tissue between remaining acini contains moderate numbers of neutrophils, histiocytes, lymphocytes and plasma cells dispersed evenly throughout **(1pt.)**, as well as hemorrhage and cellular debris. The adjacent mesentery is heavily vascularized with perivascular aggregates of lymphocytes, plasma cells, and fewer neutrophils. **(1pt.)**.

MORPHOLOGIC DIAGNOSIS:

Pancreas: Pancreatitis, necrotizing, chronic, diffuse, severe, with marked acinar atrophy and loss, moderate lymphohistocytic interstitial pancreatitis, and numerous intranuclear viral inclusions. **(4 pts)**

CAUSE: Simian adenovirus (3 pts)

O/C - (1pt.)

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Case 4. Tissue from a bushy-tailed jird.

MICROSCOPIC DESCRIPTION: Liver: Scattered randomly **(1pt.)** throughout the section are multifocal to coalescing areas of lytic necrosis **(2pt.)** in which hepatocyte architecture is lost, and the area is infiltrated by numerous degenerate neutrophils **(1pt.)** admixed with cellular debris and brightly eosinophilic fibrin **(1pt.)**. Numerous 2x4 bacilli are visible throughout necrotic foci, most prominently at the border with adjacent normal tissue **(2pt.)**. Hepatocytes adjacent to these foci are mildly swollen and contain one to multiple discrete lipid vacuoles **(1pt.)** within their cytoplasm and nuclei are shrunken, with clumped chromatin adjacent to the nuclear membrane (degeneration) **(1pt.)**. There are few lymphocytes and plasma cells within portal areas, and scattered islands of extramedullary hematopoiesis **(1pt.)** within the parenchyma. Throughout the section, Kupffer cells are mildly hypertrophic and sinusoids contain increased numbers of circulating neutrophils and histiocytes. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Liver: Hepatitis, necrotizing, random multifocal, moderate, with numerous extracellular bacilli. **(3pt.)**

CAUSE: *Listeria monocytogenes* **(5pt.)**

O/C - (1pt.)