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Case 1 – Tissue from a squirrel.

MICROSCOPIC DESCRIPTION: Haired skin: Markedly expanding the dermis and extending to the epidermis and cut borders are two dome-shaped, densely cellular proliferations of spindle cells **(1pt)** arranged in short streams and bundles **(1pt)** and separated by a small amount of pre-existent collagen **(1pt)**. Spindle cells have indistinct cell borders, a moderate amount of eosinophilic fibrillar cytoplasm **(1pt)**, and occasionally contain a 5-10um, round, intracytoplasmic, brightly eosinophilic viral inclusion body **(2pt)**. Nuclei are irregularly round to oval, have moderately stippled chromatin, and indistinct nucleoli. **(1pt)** The mitotic rate averages 1/10 HPF. **(1pt)** More prominently at the periphery of the mases, there is an infiltrate of moderate numbers of lymphocytes with fewer plasma cells and histiocytes. **(1pt)** The epidermis overlying the dermal neoplasms is markedly thickened (hyperplastic), with marked expansion of the stratum spongiosum (acanthosis). **(1pt)** In the overlying epidermis, there is clusters of cells within the stratum spinosum which exhibit marked epithelial ballooning degeneration **(2pt)** and frequently 10um diameter eosinophilic intracytoplasmic viral inclusion bodies **(1pt)**. There is diffuse mild parakeratotic and orthokeratotic hyperkeratosis.

MORPHOLOGIC DIAGNOSIS: Haired skin: Viral fibropapillomas, multiple, with epidermal hyperplasia **(1pt)**, ballooning degeneration **(1pt)**, and epithelial and fibroblastic eosinophilic intracytoplasmic viral inclusion bodies. **(1pt)**

CAUSE: Leporipoxvirus **(2pt)**

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

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Case 2 – Tissue from an axolotl.

MICROSCOPIC DESCRIPTION: Oral mucosa (skin - OK) **(1pt)**. Within the deep dermis **(1pt)**, subjacent to the lateral line **,** there is a well-demarcated, unencapsulated, moderately cellular, multilobular neoplasm **(2pt)** which elevates the overlying epidermis. **(1pt)**. Neoplastic cells are arranged in nests and packets **(1pt)** on a finely fibrillar eosinophilic stroma **(1pt)**. Neoplastic cells often form rosettes **(2pt)** around aggregates of a pale bluish homogenous secretory material **(1pt)**. Neoplastic cell range from irregularly round to pyramidal **(1pt)** with indistinct cell borders and a moderate amount of finely granular eosinophilic cytoplasm. **(1pt)** Nuclei are irregularly round to oval with coarsely clumped chromatin and one to three small basophilic nucleoli. **(1pt)** Mitotic figure average 1-2 per high powered field and are occasionally bizarre. **(1pt)** There is abundant cellular apoptosis and clusters of degenerating swollen neoplastic cells with vacuolated cytoplasm. **(1pt)** Cystic areas of necrosis and dropout range up to 1mm in diameter. **(1pt)**

MORPHOLOGIC DIAGNOSIS: Oral mucosa: Neuroepithelioma **(4pt)**.

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

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Case 3 – Tissue from a dolphin.

MICROSCOPIC DESCRIPTION: Spinal cord **(1pt)**: The leptomeninges, subdural space, and the inner half of the dura **(1pt)** is filled and/or infiltrated by large numbers of macrophages **(1pt)**, lymphocytes **(1pt)**, and fewer plasma cells **(1pt)**, which separate and surround spinal nerves. The walls of small vessels, primarily veins, are expanded by bright pink extravasated protein and contain pyknotic nuclei admixed eith cellular debris (fibrinoid necrosis). **(1pt)** The inflammatory infiltrate extends downward and expands Virchow-Robins spaces. **(1pt)** Dilated axon sheaths **(1pt)** are scattered throughout all funiculi, especially the dorsal funiculi as well as lateral funculi in the areas of the dorsal horns. Within these areas, Schwann cells are often hyperplastic. Within the spinal grey matter, along the midline dorsal to the ventral medial fissue, there is a focal area of cavitating necrosis, **(2pt)** which contains few gliofibrillary strands. This area of necrosis is bordered by spongiotic neuropil containing moderate numbers of Gitter cells **(1pt)** as well as hypertrophic astrocytes **(1pt)**. Occasional neurons within this area are swollen with a loss of Nissl substance. **(1pt)**.

MORPHOLOGIC DIAGNOSIS: Spinal cord: Meningomyelitis **(1pt)**, lymphohistiocytic **(1pt)**, diffuse, severe, with fibrinoid vasculitis and focal grey matter necrosis.

2. Spinal canal, arterial plexus: Atherosclerosis, proliferative, multifocal, marked, with subintimal fibrosis and occlusion. **(2pt.)**

CAUSE: Brucella ceti **(2pt)**

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

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Case 4 – Tissue from a rhinoceros.

MICROSCOPIC DESCRIPTION: Adrenal gland. Diffusely, the adrenal medulla is markedly expanded **(1pt.)** (though to estimate here, as the scanned slide only has only a portion of it showing); medullary tissue is is primarily arranged in long trabecular, but several expansile nodules are present within this tissue. At one edge of the section, within the medulla, there is an expansile, unencapsulated, poorly demarcate, moderately cellular neoplastic neoplasm **(1pt.)**. Neoplastic cells are arranged in nest and packets **(1pt.)** on a fine fibrovascular stroma. Neoplastic cells are oval to spindled with finely granular, basophilic cytoplasm and indistinct cell borders. **(1pt.)** Nuclei are irregularly round with 1-2 basophilic nuclei, finely clumped chromatin, and a prominent nuclear membrane. **(1pt.)** Mitoses are rare. **(1pt.)** There are large areas of apoptosis and dropout scattered throughout the neoplasm, and a focally extensive area of central coagulative necrosis with peritheliomatous survival of neoplastic cells within. **(1pt.)**

At the opposite edge of the section, there is a well-demarcated, encapsulated, well-demarcated, moderately cellular neoplasm. **(1pt.)** The neoplasm is composed of two populations of cells. **(1pt.)** The first population is well-differentiated adipocytes **(1pt.)** which are separated by moderate amounts of hemorrhage. The second population is a large area of trilinear extramedullary hematopoiesis **(1pt.)** containing megakaryocytes **(1pt.)** and islands of erythrocyte precursors **(1pt.)** on a more diffuse background of immature leukocytes and peripheral blood. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: 1. Adrenal gland, medulla: Pheochromocytoma **(2pt.)**
2. Adrenal gland, medulla: Myelolipoma. **(2pt.)**
2. Adrenal gland, medulla: Hyperplasia, diffuse, moderate. **(1pt.)**

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