WSC 2019-2020 Conference 15
Case 1. Tissue from NOD SCID mouse.

MICROSCOPIC DESCRIPTION: Multiple sections of brain with telencephalon, diencephalon (at level of hippocampus, cerebellum and brainstem. **(1pt.)** There is diffuse expansion of the lateral ventricles bilaterally **(1pt.)** and third ventricle. **(1pt.)** These dilated spaces contain large numbers of predominantly degenerate neutrophils **(1pt.)** admixed with abundant cellular debris, and innumerable rod-shaped bacilli, **(1pt.)** best visualized within clear spaces, which are often discrete and well-spaced from each other. Neutrophils multifocally infiltrate the ependyma (including that of the fourth ventricle **(1pt.)** beneath the cerebellar folia) and choroid plexus, and multifocally, the adjacent grey and white matter. There are randomly scattered foci of malacia **(1pt.)** within the periventricular gray and white matter containing large numbers of degenerate neutrophils, cellular debris, bacilli and remnant gliovascular strands, and occasionally hemorrhage and polymerized fibrin. **(1pt.)** Within and adjacent to these areas, neutrophils and glial cells surround shrunken, swollen, and lightly eosinophilic neurons occasionally contain a fragmented nucleus (necrosis). **(1pt.)** Capillaries contain fibrin thrombi, and walls are smudgy and contain cellular debris and often perivascular hemorrhage. **(1pt.)** Capillaries that are still patent contain low to moderate numbers of circulating neutrophils which often pavement along their walls. **(1pt.)** There is a marked gliosis within these areas as well. **(1pt.)** There are multifocal aggregates of neutrophils within the meninges and extending down along Virchow-Robins space. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Brain: Ventriculitis, periventriculitis, and meningitis **(1pt.)**, necrotizing and suppurative, **(1pt.)** multifocal to coalescing, severe, with vasculitis, thrombosis **(1pt.)** gliosis, and numerous bacilli. **(1pt.)**

CAUSE: Klebsiella sp. (*oxytoca* or *pneumoniae* OK) **(2pt.)**

O/C: (1pt.)

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Case 2. Tissue from an CYBB[ko} mouse.

MICROSCOPIC DESCRIPTION: Spleen. The normal follicular and sinusoidal architecture of the spleen is diffusely effaced **(1pt.)** by two proliferative processes. The first process is a nodular proliferation of macrophages **(1pt.)** admixed with innumerable viable neutrophils **(1pt.)** which occupies up to 60 percen t**(1pt.)** of the splenic parenchyma, primarily white pulp. Macrophages exhibit moderate anisocytosis and anisokaryosis with moderate amounts of cytoplasm **(1pt.)** which often contain one or more 3-4 um **(1pt.)** intracytoplasmic **(1pt.)** yeasts **(2pt.)** with a 1um hyaline amphophilic wall and basophilic vacuolated cytoplasm. **(1pt.)** The second process is a diffuse effacement of red pulp by innumerable granulocyte precursors **(1pt.)** with a predominance of band neutrophils **(1pt.)** throughout which are scattered fewer erythrocytic precursors and megakaryocytes. **(1pt.)** There is diffuse hypoplasia of white pulp (consistent with this inbred and manipulated strain.) The adjacent mesentery **(1pt.)**is expanded by a similar population of neutrophils and fewer macrophages with moderate amounts of edema and atrophy of adipocytes; there is moderate multifocal mesothelial hyperplasia.

MORPHOLOGIC DIAGNOSIS: 1. Spleen: Splenitis, pyogranulomatous **(1pt.)**, diffuse, severe, with intrahistiocytic yeasts. **(1pt.)**
2. Spleen, red pulp: Granulocytic and myeloid hyperplasia, diffuse, severe. **(1pt.)**
3. Spleen, white pulp: Lymphoid hypoplasia, diffuse severe (consistent with genotype). **(1pt.)**

CAUSE: *Candida* sp. (This case is *C. parasilopsis but C. albicans* is fine.)

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

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Case 3. Tissue from a mouse.

MICROSCOPIC DESCRIPTION: Lung: Multiple sections of lung are present on the section. Diffusely, there are profound inflammatory changes affecting between 80% and 100% **(1pt.)** of each section which are centered on airways. **(1pt.)** Bronchioles of all sizes are outlined by large aggregates of lymphocytes and plasma cells (which likely represents hyperplasia of bronchiolar-associated lymphoid tissue **(1pt.)** of larger airways, and *de novo* inflammation around smaller airways.) Airway epithelium is markedly hyperplastic **(1pt.)** and layered up to 3-4 cells thick in numerous airways, with numerous mitotic figures, apoptotic cells and infiltration with low numbers of lymphocytes and neutrophils. **(1pt.)** Lumina are filled and occasionally expanded (bronchiectasis) **(1pt.)** with large numbers of viable and degenerate neutrophils, **(1pt.)** debris laden macrophages and cellular debris. Peribronchiolar inflammation as well as hyperplastic epithelium extends into and effaces adjacent alveoli. **(1pt.)** Alveoli are filled with various combinations and combinations of foamy macrophages **(1pt.)**, viable and degenerate neutrophils **(1pt.)**, cellular debris, hemorrhage, fibrin, and edema. In severely affected areas, there is sepal necrosis **(1pt.)** and discontinuity, and diffusely, alveolar septa are expanded by edema, increased numbers of circulating neutrophils, hyperplasia of intraseptal macrophages, and scattered type II pneumocyte hyperplasia. **(1pt.)** Medium- and large-caliber arterioles are surrounded by large numbers of lymphocytes and plasma cells. **(1pt.)** There are numerous areas of alveolar emphysema.

MORPHOLOGIC DIAGNOSIS: Lungs: Bronchopneumonia, **(1pt.)** suppurative, **(1pt.)** chronic, **(1pt.)** diffuse, severe, with marked bronchiolectasis, florid bronchiolar epithelial hyperplasia, and perivascular and peribronchiolar hyperplasia.

CAUSE: *Mycoplasma pulmonis* **(3pt.)**

O/C: (1pt.)

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Case 4. Tissue from a NSG IL-2 Rg null mouse.

MICROSCOPIC DESCRIPTION: Haired skin. There are three sections of skin which all have the essentially the same lesions. There is a minimal cell-poor interface **(1pt.)** dermatitis at the dermoepidermal junction which is composed of low numbers of lymphocytes **(1pt.)**, histiocytes **(1pt.)** and plasma cells which multifocally infiltrate the basal layers **(1pt.)** of the epidermis of both the epidermis **(1pt.)** and the hair follicles. **(1pt.)** There is diffuse epidermal hyperplasia with a pronounced granular cell layer. There is intracellular **(1pt.)** and intracellular edema **(1pt.)** of the basal layer and multifocal shrunken, brightly eosinophilic **(1pt.)** apoptotic cells **(1pt.)** within this layer. Multifocally there is mild spongiosis **(1pt.)**and multifocal clefting **(1pt.)** between the dermis and epidermis, but no evidence of acantholytic cells or pustule formation. Varying combinations and concentrations of macrophages, lymphocytes, neutrophils, and plasma cells **(1pt.)** also expands the deep and intrafollicular dermis. **(1pt.)** There is regional moderate orthokeratotic hyperkeratosis. **(1pt.)**

MORPHOLOGIC DIAGNOSIS: Haired skin: Dermatitis, lymphohistiocytic **(1pt.)**, diffuse, mild to moderate, with epidermal and follicular basal cell apoptosis **(1pt.)**, intra- and extracellular edema, epidermal hyperplasia, hypergranulosis, **(1pt.)** and orthokeratotic hyperkeratosis. **(1pt.)**

NAME THE CONDITION: Graft versus host disease **(2pt.)**

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