



# CMHD Pathology Report



## CMHD Pathology Core

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## Mouse Genetics Project

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CMHD LabID: N13-239

## Relevant History:

increased circulating alkaline phosphatase level  
increased energy expenditure  
increased oxygen consumption  
increased carbon dioxide production

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**AnimalID: M00198182**

## Histopathology Findings:

### liver (MA:0000358)

#### Histopath Description:

moderate lipidosis

#### Morphological Diagnosis:

**Distribution:** multifocal; **Severity:** moderate; **MPATH Diagnosis:** steatosis MPATH:622

#### Definitive Diagnosis:

Moderate lipidosis

### spleen (MA:0000141)

#### Histopath Description:

mild erythroid hyperplasia

#### Morphological Diagnosis:

**Distribution:** multifocal; **Severity:** mild; **MPATH Diagnosis:** extramedullary hemopoiesis  
MPATH:595

#### Definitive Diagnosis:

Splenic erythroid hyperplasia

### salivary gland (MA:0000346)

#### Histopath Description:

There are multifocal perivascular mononuclear inflammatory cell aggregates.

#### Morphological Diagnosis:

**Distribution:** multifocal; **Severity:** mild;

#### Definitive Diagnosis:

Interstitial inflammatory aggregates

### knee (MA:0000046)

#### Histopath Description:

The overall subgross anatomical organization of the femur, tibia, and the knee joint are within normal limits. Histologically, there is focal fraying (fibrillation) and mild erosion of the superficial (gliding) zone of the anterior margin of the femoral articular cartilage

#### Morphological Diagnosis:

**Duration:** chronic; **Distribution:** focally extensive; **Severity:** mild; **MPATH Diagnosis:**  
degenerative change MPATH:14

**Definitive Diagnosis:**

Mild fibrillation of the superficial zone of femoral articular cartilage - consistent with low grade degenerative joint disease (DJD)

**Histopathology Comments:**

The histological changes within the superficial articular cartilage are indicative of early and very mild DJD. The lesions are likely age-associated. DJD occurs in all inbred strains of mice as part of the aging process.

**urinary bladder (MA:0000380)****Histopath Description:**

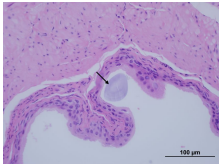
There is a 100 um oval homogenous lightly basophilic material within the lumen in contact with surface epithelium

**Morphological Diagnosis:**

**Distribution:** focal; **Severity:** mild;

**Definitive Diagnosis:**

Cystolithiasis



Urinary bladder,  
urolith

**AnimalID: M00202503****Histopathology Findings:****liver (MA:0000358)****Histopath Description:**

Diffuse lipidosis

**Morphological Diagnosis:**

**Distribution:** diffuse; **Severity:** severe; **MPATH Diagnosis:** steatosis MPATH:622

**Definitive Diagnosis:**

Diffuse hepatic steatosis

**adrenal gland (MA:0000116)****Histopath Description:**

There is a small, well-circumscribed mass in the cortex. It is encapsulated by a thin layer of pale eosinophilic material and fusiform cells (connective tissue with fibroblasts) and is made of nests of polygonal cells interspersed by a very thin fibrovascular membrane. The architecture is reminiscent of the zona glomerulosa and zona fasciculata of the mature adrenal gland.

**Morphological Diagnosis:**

**Distribution:** focal;

**Definitive Diagnosis:**

accessory adrenal cortical tissue

**testis (MA:0000411)****Histopath Description:**

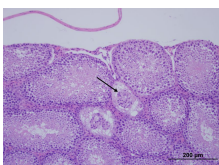
There rare foci of vacuolar degeneration and atrophy of the seminiferous tubule

**Morphological Diagnosis:**

**Distribution:** multifocal; **Severity:** mild;

**Definitive Diagnosis:**

Testicular degeneration and atrophy



Testis,  
degeneration and  
atrophy, 20x

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**AnimalID: M00422815**

**Histopathology Findings:**

**liver (MA:0000358)**

**Histopath Description:**

minimal lipidosis

**Morphological Diagnosis:**

**Distribution:** multifocal; **Severity:** mild; **MPATH Diagnosis:** steatosis MPATH:622

**Definitive Diagnosis:**

minimal lipidosis

**salivary gland (MA:0000346)**

**Histopath Description:**

There are multifocal perivascular mononuclear inflammatory cell aggregates.

**Morphological Diagnosis:**

**Distribution:** multifocal; **Severity:** mild;

**Definitive Diagnosis:**

Interstitial inflammatory aggregates

**lymph node (MA:0000139)**

**Histopath Description:**

The mesenteric lymph node is enlarged (greater than three-fold). There are multiple follicles with large germinal centers. The sinuses contain large numbers of mature lymphocytes.

**Morphological Diagnosis:**

**Duration:** Sub-acute; **Distribution:** Diffuse; **Severity:** moderate; **MPATH Diagnosis:** hyperplasia MPATH:134

**Definitive Diagnosis:**

Lymphoid hyperplasia.

**Histopathology Comments:**

The changes in the mesenteric lymph node are suggestive of draining of a regional inflammatory process. However, such a process was not observed in the tissues examined.

**retina (MA:0000276)**

**Histopath Description:**

There is a focally extensive folding of the retina at the optic nerve.

**Morphological Diagnosis:**

**Distribution:** Focal; **Severity:** mild;

**Definitive Diagnosis:**

Retinal folding (dysplasia)

**bone marrow (MA:0000134)**

**Histopath Description:**

The marrow cellularity is reduced (70-80%). Numerous poorly differentiated blastic cells are present within the marrow. Cells are round to oblong and have eosinophilic cytoplasm and large nucleus. Mitosis is numerous (average 6/high power field (400x)). Apoptotic cells are also frequently seen. Granulopoietic myeloid precursors with band nucleus and hypereosinophilic cytoplasm are frequently observed. Maturing granulocytic and erythroid cells are markedly decreased. Megakaryocytes are also rare and many of them are nearly half the normal size with hypolobulated nucleus (micromegakaryocytes). The stroma is increased and marrow stromal or hemoreticular cells are prominently seen.

**Morphological Diagnosis:**

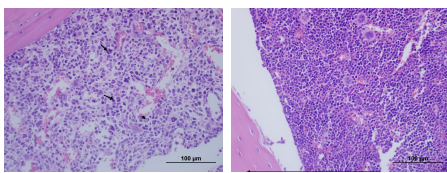
**Distribution:** diffuse; **Severity:** severe; **MPATH Diagnosis:** myelodysplastic disorder MPATH:341

**Definitive Diagnosis:**

Myelodysplasia with trilineage hypoplasia

**Histopathology Comments:**

The presence of blastic cell population, apoptosis, increased stroma, trilineage hematopoietic hypoplasia, dysplastic granulopoietic cells, micromegakaryocytes and compensatory splenic hematopoiesis are suggestive of myelodysplastic disorder. The blast population is low to consider leukemia.



Bone marrow,  
myelodysplasia,  
40x

Bone marrow,  
normal, 40x

**spleen (MA:0000141)****Histopath Description:**

Marked erythropoiesis and moderate granulopoiesis and megakaryopoiesis

**Morphological Diagnosis:**

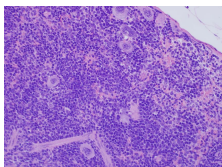
**Distribution:** multifocal to coalescing; **Severity:** moderate; **MPATH Diagnosis:** extramedullary hemopoiesis MPATH:595

**Definitive Diagnosis:**

Marked erythropoiesis and moderate granulopoiesis and megakaryopoiesis

**Histopathology Comments:**

Compensatory extramedullary hematopoiesis is a common feature of myelodysplastic disorders



Spleen,  
extramedullary  
hematopoiesis, note  
marked  
erythropoiesis and  
clusters of  
megakaryocytes,  
40x

**AnimalID: M00202507****Histopathology Findings:****thyroid gland (MA:0000129)****Histopath Description:**

Unilaterally, nearly 1/6th of the thyroid gland gland is replaced by predominantly lymphocytic inflammatory infiltrate.

**Morphological Diagnosis:**

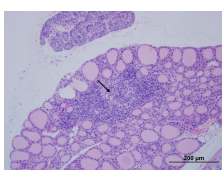
**Distribution:** Unilateral; **Severity:** mild; **MPATH Diagnosis:** inflammation MPATH:212

**Definitive Diagnosis:**

Thyroiditis, lymphocytic, mild.

**Histopathology Comments:**

Thyroiditis is commonly seen in some strains of aging mice (such as B6;129); females are markedly overrepresented.



Thyroid,  
inflammation, 20x

**liver (MA:0000358)****Histopath Description:**

minimal lipidosis

**Morphological Diagnosis:****Distribution:** multifocal; **Severity:** mild; **MPATH Diagnosis:** steatosis MPATH:622**Definitive Diagnosis:**

lipidosis

**spleen (MA:0000141)****Histopath Description:**

mild erythroid hyperplasia

**Morphological Diagnosis:****Distribution:** multifocal; **Severity:** mild; **MPATH Diagnosis:** extramedullary hemopoiesis MPATH:595**Definitive Diagnosis:**

Splenic erythroid hyperplasia

**salivary gland (MA:0000346)****Histopath Description:**

There are multifocal perivascular mononuclear inflammatory cell aggregates.

**Morphological Diagnosis:****Distribution:** multifocal; **Severity:** mild;**Definitive Diagnosis:**

Interstitial inflammatory aggregates

**Report Summary and Recommendation:**

Myelodysplastic disorder is a rare condition in young mouse. Immunohistochemistry is required to establish cell lineage with certainty. Urinary calculi are rarely seen in B6 mice. Its presence/absence in the other mice could not be confirmed since calculi could be washed out during tissue processing. Increased alkaline phosphatase activity has been associated with calcium nephrolithiasis in human patients (Arrabal-Polo et al., 2012). The thyroid inflammation is focally extensive and its significance in presence of abundant and normal glandular structures is uncertain. We did not find histological correlates to the metabolic phenotypes in this line. Other lesions are considered incidental and attributable to diet or strain background.

**References:**

Arrabal-Polo MA, et al. (2012). Biochemical determinants of severe lithogenic activity in patients with idiopathic calcium nephrolithiasis. *Urology*. 79(1):48-54.