Exhibit 1

Accession #___18-020_
Submission Date_25 Jan 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z17324__
Species_____Mn____ Requester's Phone_____

Date of Death__3 Jan 18_ Date of Necropsy_3 Jan 18_Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __16 Feb 18____ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Twenty seven day old, 400 gm female infant found dead with no significant gross findings.

Histological Findings:

Sections of adipose throughout the body exhibit extensive depletion/atrophy including peri-renal adipose. Lymph nodes and spleen have little to no follicular activity and scant to no lymphoid development/maturation. Pancreas has moderate zymogen depletion.

Degree of autolysis impedes evaluation of the GI tract. Large intestine has moderate numbers of multifocal dilated crypts with cellular debris, some of which are degenerate neutrophils. GI tract is otherwise unremarkable besides autolysis.

Sections of liver, kidneys, lungs, heart, esophagus, skin with mammary gland and muscle are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Extensive, multicentric adipose depletion and lymphoid hypoplasia and with moderate pancreatic zymogen depletion
2. Moderate, multifocal, colonic crypt dilation/abscessation

Histology Comments:

With a history of a infant animal that has adipose depletion, lack of lymphoid development, and with an otherwise unremarkable gross exam, inanition and hypoglycemia as cause of death are suspect. The

disseminated lymphoid hypoplasia, which likely occurred due to lack of sufficient caloric intake, suggests the possibility of immunosuppression, and the colonic crypt changes are suspect as being secondary to such.

The crypt abscesses were probably bacterial in origin, with common agents including *Shigella, Campylobacter, Salmonella, Yersinia* sp and others.

Please contact me with any questions, comments or concerns.

Pathologist ___RM___

Exhibit 2

Accession # 18-140
Submission Date 20 Jun 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z18123
Species MN Requester's Phone 206.685.1842

Date of Death 6/15/18 Date of Necropsy 6/15/18 Time 1425-1505 hrs Pathologist TH

Nutritional Condition: ☐ Adequate ☒ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final 23 Jul 18 ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

M11051 (dam) gave birth to Z18123 on June 10th without any apparent difficulty in a breeding group compound. This particular group has been on fluconazole treated feed since March 2016. During afternoon observations on June 15th, the dam was discovered holding the deceased infant. Prior to this time, no abnormal behaviors of either the dam or infant were noted and they appeared well bonded. The infant had previously been observed nursing and appeared alert. On June 14th, the dam came up to the front of the housing complex for treats and the infant was nursing and grasping very well at this time.

Gross Description:

Examined is a 0.44kg, 5 day old male pig-tail macaque in lean body condition (1.5/5). No fractures, bruising, or other signs of injury were identified. There were two very small abrasions on the right eyebrow and right forehead, measuring 2 x 1 mm and 4 x 2 mm, respectively with no swelling or bruising noted around the abrasions. It could not be definitively determined if these abrasions were ante or postmortem. The abrasions were not present on the June 14th visual inspection while the dam was taking treats. A single piece of moistened bedding was found in the oral cavity and measured about 11mm x 4 mm. There was no fluid present from either nasal passage. The distal tip (about 8 mm) of the tongue appeared dried out.

The thoracic cavity did not contain any free fluid, and the heart and pericardium appeared normal with the diaphragm intact. The lungs were slightly mottled in color, ranging from light to dark pink in color and no exudate was present on cross section. All portions of lung submitted for histopathology floated in formalin. A swab from the trachea was collected and submitted for analysis.

There were minimal deposits of fat within the subcutaneous layer and minimal adipose tissue internally within the omentum and mesentery. The stomach contained a moderate amount of fluid digesta and the GI tract contained mild to moderate amounts of digesta, predominantly in the small intestines. Several portions of the distal small intestine and proximal large intestine appeared lighter in color, almost translucent, relative to surrounding tissue with a moderate amount of gas present. No lymphadenopathy

was appreciated but multiple sections of gastrointestinal tract and lymph nodes were submitted for histopathology. A rectal swab was also collected and submitted. The adrenal glands appeared slightly enlarged and were submitted for histopathology along with sections from both kidneys, which appeared normal. The remaining internal organs appeared unremarkable.

Gross Diagnosis(es):

1. Spontaneous infant death

Gross Comments:

The cause of death in this case is unclear at this time. The lean body condition and low body weight in combination with the visual changes noted in the gastrointestinal tract suggest either malnutrition and/or malabsorption. While the appearance of the distal tongue may have been due to portmortem changes, mild dehydration cannot be ruled out and may have contributed to a hypovolemic state.

Histological Findings:

Lungs have severe, near diffuse, effacing suppurative to pyogranulomatous infiltrate of all airways.

Sections of brain, spleen, thymus, liver, heart, kidney, pancreas, salivary gland, muscle, skin, tongue, and GI tract (degree of autolysis of GI tract precludes accurate assessment but there are no overt lesions) are histologically unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Severe, diffuse, suppurative to pyogranulomatous pneumonia

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Histology Comments:

Death was due to the pneumonia that almost certainly was of bacterial origin. Marginal nutritional condition (noted grossly)/inadequate nursing can predispose infants to pneumonia, and gross findings suggests this occurred in this case. The most common agent causing pneumonia in this age group is *Klebsiella* sp.

Please contact either of us with any questions, comments or concerns.

Pathologist ___TH (gross)/RM (histo)__

Exhibit 3

Accession #___18-223_
Submission Date_2 Oct 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18160___
Species_____Mn____ Requester's Phone_____

Date of Death_24 Aug 18_ Date of Necropsy_24 Aug 18____Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _26 Nov 18___ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Six day old, male, 450 gm, from dam Z11173 from SPF colony at NIRC. Animal presented 23 Aug lethargic, and was found dead the next day. No significant gross findings besides autolysis.

Histological Findings:

Sections of lymph nodes, spleen, thymus, liver, heart, kidneys, lungs, adipose (essential adipose is adequate), skin with mammary gland, and muscle are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Open – suspect hypoglycemia

Histology Comments:

A definitive cause of demise is not identified, however lack of overt lesions and lethargic presentation suggest hypoglycemia from inadequate nursing as the cause of death.

Please contact me with any questions, comments or concerns.

Pathologist _____RM___

Exhibit 4

Accession #___18-201_
Submission Date_28 Aug 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18146___
Species_____Mn____ Requester's Phone_____

Date of Death_27 Jul 18_ Date of Necropsy_27 Jul 18____Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _1 Oct 18___ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Two day old, male, 470 gm, from dam Z14193 from SPF colony at NIRC. Animal presented 26 Jul dehydrated, animal was treated, and died overnight. No significant gross findings.

Histological Findings:

Sections of lymph nodes, spleen, thymus, liver, heart, kidneys, lungs, adipose (adequate), skin with muscle, pancreas and GI tract are unremarkable besides autolysis, and degree of autolysis precludes meaningful evaluation of the GI tract.

Final Principal Diagnosis(es):

1. Open – suspect hypoglycemia

Histology Comments:

Lack of overt lesions (noting that degree of autolysis precludes accurate evaluation of the GI tract) and presentation suggest hypoglycemia from inadequate nursing as the cause of death.

Please contact me with any questions, comments or concerns.

Pathologist _____RM___

Exhibit 5

Accession #___18-260_
Submission Date_14 Nov 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18205__
Species_____Mn____ Requester's Phone_____

Date of Death__7 Nov 18_ Date of Necropsy_7 Nov 18_Time_____Pathologist ____NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __11 Dec 18___ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History and Gross Findings:

Four day old, 310 gm, female abandoned by dam (Z11356), sent to nursery, failed attempt at reuniting with dam, returned to nursery and found dead 7 Nov. Weight at delivery was 590 gm. No significant gross findings except small size.

Histological Findings:

Adipose has multicentric, extensive depletion including pericardial and perirenal adipose..

Sections of lymph nodes, thymus, spleen, liver, heart, kidneys, lungs (mild multifocal deep aspiration of amniotic cells and debris), muscle, GI tract (extensive autolysis) and skin with mammary gland are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Extensive, multicentric adipose depletion

Histology Comments:

With the history provided and histologic changes, demise due to inanition and hypoglycemia (from lack of adequate nursing) is indicated.

Please contact me with any questions, comments or concerns.

Pathologist ___RM___

Exhibit 6

Accession #___18-264_
Submission Date_4 Dec 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18197___
Species_____MN____ Requester's Phone___(206) 616-0501_____

Date of Death__11/29/18_ Date of Necropsy_11/30/18_Time____0730__Pathologist ____CMM____
_____

Nutritional Condition: X Adequate Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __9 Jan 19_____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

~1 month old male Pigtail Macaque in adequate condition (BCS 2/5, 0.71kg at necropsy) was found dead at ~1845 on 11/29/18 in the ABC nursery.

At 2 days of age, the infant was pulled from the dam on 10/30/18 for for bilateral corneal ulcerations, bleeding gingival ulcers, and soft feces with frank blood. The animal was treated with fluids (LRS), dextrose, B vitamins, Azithromycin, Tylenol, and topical eye ointment (Neomycin). Biofire fecal results were positive for EPEC. Treatment was successful and the infant was returned to the Dam on 11/14/18. On 11/17/18, infant was noted to be lethargic and not grasping onto the dam well. The infant was pulled from the dam, returned to the nursery for further care, and received LRS, Tylenol, and B vitamins. On 11/19/18, while in the nursery, the infant was noted to be slightly dehydrated (5%) but otherwise doing well and received LRS, Tylenol, and B vitamins. On 11/26/18 the infant was returned to the dam and was noted to be grasping well and nursing. On 11/29/18, dehydration was noted in the infant. On further examination, the infant has lost 200g and was dehydrated (10%). The infant was pulled from the dam, treated with LRS, B vitamins, and bottle fed. A self-feeding bottle was provided in the infant enclosure along with a warming pad. The infant was BAR and active at the time. The infant was last checked at 1630 by an AHT and was slated for checks q4 hours overnight for formula changes and feeding.

The on call vet (CMM) received a call from the AHT at 1845 reporting that the infant was dead. Upon arrival, the on call vet discovered the infant has consumed 62ml of formula from the bottle. There was evidence of vomit and diarrhea in the enclosure and rigor mortis had set in. No obvious external causes of death were discernable.

Gross Description:

Examined is a 0.71kg, male pig-tail macaque in adequate body condition. On external examination there were pinpoint bilateral opacities in the central ventral portion of the cornea (previous corneal ulceration), perianal staining was present, formula was present in the mouth, the abdomen was bloated, and there was a purple discoloration to the ventral skin surface most likely from post-mortem blood pooling.

Internal examination revealed yellowish-white severely dialted and distended intestines affecting all segments (including cecum and colon). The liver was slightly pale and diffusely mottled. The lungs (all lobes) did not deflate and were a tan color with diffuse dark red/purple mottling. The dorsal surfaces of all lung lobes had rib imprints on them. On cut surface, creamy colored bubbles foamed from the bronchioles and the surface appeared meaty in texture. No other abnormalitied were detected.

Gross Diagnosis(es):

1. Suspect pneumonia

Gross Comments: Histopathology is pending.

Histological Findings:

Lungs have multifocal, severe, deep aspiration of foreign material (consistent with formula) and with moderate to severe alveolar suppuration and histiocytosis with phagocytosis of the foreign material, and there also are moderate numbers of mixed bacteria in the foreign material.

Pancreas has diffuse, severe, effacing granulomatous (lymphocytes, macrophages and plasma cells) and fibrosing (reactive and mature fibrosis though mostly mature) inflammation. Islets appear to be spared.

Sections of brain, lymph node, adipose (adequate), spleen, liver, gall bladder, heart, kidneys, skin with mammary gland, skeletal muscle and diaphragm, and GI tract are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Severe, multifocal, acute-suppurative and histiocytic pneumonia associated with foreign material (formula) and mixed bacteria: Acute aspiration pneumonia
2. Severe, diffuse, granulomatous and fibrosing pancreatitis

Histology Comments:

Proximal cause of death was acute, severe aspiration pneumonia.

An unexpected finding is the pancreatitis, which would have been of at least moderate clinical significance. The lesion was chronic and active with the underlying cause no longer evident. However considering age, species, presentation and overall findings, a past adenoviral infection is suspect.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 7

Accession #___19-008_
Submission Date_8 Jan 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18230___
Species_____Mn____ Requester's Phone_____

Date of Death__2 Jan 19_ Date of Necropsy_2 Jan 19_Time_____Pathologist ____NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __1 Feb 19__ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Six day old, 600 gm, intact male pig-tailed macaque part of SPF colony at NIRC. Animal was found dead in the enclosure (dam M03284). Postmortem was unremarkable.

Histological Findings:

Adipose has multicentric, extensive depletion including of pericardial and perirenal adipose.

Sections of lymph nodes, spleen, and thymus have moderate hypoplasia.

GI tract is autolyzed, especially small intestine, impedeing evaluation. However, large intestine has moderate, lamina propria pyogranulmatous infiltrate with moderate numbers of abscessed crypts. The GI tract is otherwise unremarkable besides autolysis.

Sections of heart, lungs (agonal congestion and edema and mild multifocal deep aspiration of amniotic cells and debris), kidneys, liver, muscle, pancreas, and skin with mammary gland are unremarkable besides stated changes and autolysis.

Final Principal Diagnosis(es):

1. Extensive, multicentric adipose depletion
2. Moderate, multicentric lymphoid hypoplasia: lymph nodes, spleen and thymus
3. Moderate, diffuse, pyogranulomatous colitis with multifocal crypt abscessation

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Histology Comments:

The scenario leading to demise is speculated as being primary inanition (inadequate suckling and represented as diagnosis #1) leading to secondary immunosuppression (evidenced by diagnosis #2) and finally with a bacterial colitis that may have been opportunistic. Other scenarios are feasible.

Common etiologic agents of the colitis include *Campylobacter* and *Salmonella* and *Shigella* sp and other species.

Please contact me with any questions, comments, concerns.

Pathologist ____RM_____

Exhibit 8

Accession #___19-015_
Submission Date_1 Feb 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18226___
Species_____Mn____ Requester's Phone_____

Date of Death__5 Jan 19_ Date of Necropsy_5 Jan 19_Time_____Pathologist ____NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __14 Feb 19__ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Three week old, 500 gm, intact male pig-tailed macaque part of SPF colony at NIRC. Animal was found dead in the enclosure (dam Z13110). Postmortem was unremarkable besides poor body condition.

Histological Findings:

Adipose has multicentric, moderate to extensive depletion including perirenal adipose, whereas pericardial adipose is adequate.

Sections of lymph nodes, spleen, and thymus have moderate hypoplasia.

Pancreas has moderate diffuse zymogen depletion.

Sections of heart, lungs, kidneys, liver, muscle, GI tract (autolysis impedes accurate evaluation although there are no overt lesions) and skin are unremarkable besides stated changes and autolysis.

Final Principal Diagnosis(es):

1. Moderate to extensive, multicentric adipose depletion and with diffuse, moderate, pancreatic zymogen depletion
2. Moderate, multicentric lymphoid hypoplasia: lymph nodes, spleen and thymus

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Histology Comments:

The scenario leading to demise is speculated as being a combination of developing inanition (represented by diagnosis #1) and hypoglycemia, both from inadequate suckling. This is supported by

the relatively small size (500 gm) of a 3+ week old infant. There also was likely developing secondary immunosuppression evidenced by diagnosis #2.

As per histologic description, autolysis impedes accurate evaluation of the GI tract.

Please contact me with any questions, comments, concerns.

Pathologist ____RM_____

Exhibit 9

Accession #___19-017__
Submission Date_1 Feb 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z19030___
Species_____Mn____ Requester's Phone_____

Date of Death__14 Jan 19__ Date of Necropsy_14 Jan 19_Time_____Pathologist ____NIRC____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __21 Feb 19__ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Newborn, 600 gm, male pig-tailed macaque part of SPF colony at NIRC. Animal was found dead in the enclosure the day of birth (first birth for dam Z14029). Postmortem was unremarkable besides large fetal size and bruised face, and the lungs floated in formalin (expanded).

Histological Findings:

Sections of spleen, thymus, adipose (adequate/abundant), heart, lungs (inflated), kidneys (scattered/rare protein filled tubules in cortex), liver, skin with umbilicus, and umbilical cord are unremarkable.

Final Principal Diagnosis(es):

1. Unremarkable tissues/organs

Histology Comments:

The most likely cause of death in a newborn with no gross or histologic lesions is hypoglycemia from inadequate suckling. The large size of the infant and bruised face in combination with a first-infant dam also suggests a difficult delivery that can result in a weak infant unable to suckle properly.

Please contact me with any questions, comments, concerns.

Pathologist ____RM_____

Exhibit 10

Accession #___19-043_
Submission Date_21 Mar 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator___Colony_ Animal ID #___Z18231_____
Species_____Mn____ Requester's Phone_____

Date of Death__24 Feb 19_____ Date of Necropsy___24 Feb 19__Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __26 Apr 19_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Description:

This animal was part of the SFP3 colony at NIRC and was found dead with no gross abnormalities. Dam was K07168. Animal weighed 900 gm.

Histological Findings:

Thymus, lymph nodes and spleen have mild to moderate hypoplasia. Sections of adipose (adequate), liver, heart, kidneys, lungs, skin, muscle and GI tract (autolysis impedes evaluation but there are no overt abnormalities) are histologically unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Neonatal death – undetermined

Histology Comments:

A cause of demise is not identified in submitted tissues/organs. Autolysis does impede evaluation of the GI tract. Hypoglycemia from inadequate nursing is a possible cause of demise and is common in this age group, while noting there were adequate adipose stores.

Please contact me with any questions, comments or concerns.

Pathologist_____RM_____

Exhibit 11

Accession #___19-031_
Submission Date_28 Feb 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____CMM_____ Investigator___Colony_ Animal ID #___Z19049_
Species_____Mn____ Requester's Phone___60501_____

Date of Death__02/26/19_____ Date of Necropsy 02/26/19 Time 0730 Pathologist ____CMM____
_____

Nutritional Condition: ☐ Adequate ☒ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __13 Mar 19_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

Infant was found dead in the enclosure (112). No blood was present in either the outside or inside enclosures.

Gross Description:

A 0.48 kg (BCS 2/5) 2.5-week old female Macaca nemestrina is presented for necropsy.

Externally there are signs of trauma to the right side of the face/neck/skull. A small ~0.2 cm round wound in skin on the left caudal side of the skull was present. There was bruising bilateraly around the eyes/lids. There was dried blood around the nares. Bruising was present rostral to the right ear. The right temporal region of the skull has multiple punctures (2) and the skull underneath the punctures was moveable. There were multiple (5) punctures along the right side of the face/cheek/neck. There was complete fracture of the symphysis in the mandible and disarticulation of the right temporomandibular joint. There was complete fracture of the right hard palate resulting in a moveable fragment ~0.5cm in diameter. There was a puncture near the medial canthus of the right eye. Bony structures ventral to the right eye were crushed.

Upon internal examination, there was mild subcutaneous bruising around the ventral neck. The left kidney was pale and friable. The pancreas was not able to be located. No digesta was present throughout the gastrointestinal teact. There was some gaseous distension of the intestines sporadically through the GIT. There was a black gelatinous mass (~1cm in diameter) adhered to the gastric mucosa at the greater curve of the stomach. The liver has a yellow/tan and dark red mottled appearance and was friable. The lungs were a tan/yellow and dark red mottled color and most of the lobes did not collapse. There was some foam present on cut section. Significant subcutaneous hemorrhage was present over the right and caudal skull. Hemorrhage was present along the lambdoidal and coronal skull suture lines. An ~1cm triangular fracture was present in the right frontal skull above the right eye.

Gross Diagnosis(es):

1. Suspect pneumonia and anorexia as cause of death, followed by post-mortem trauma.

Histological Findings:

Lungs have multifocal, moderate, deep aspiration of foreign material/debris (some consistent with milk) and with modeate to severe, alveolar and sometimes large airway suppuration, fibrin deposition, and necrosis, and there also are moderate numbers of mixed bacteria and areas of moderate alveolar histiocytosis with phagocytosis of material.

Brain has moderate, multifocal, neuropil hemorrhage.

Sections of lymph node, adipose (adequate), spleen, liver, gall bladder, heart, kidneys, urinary bladder, skin, skeletal muscle, pancreas, salivary gland, and GI tract (extensive autolysis but no overt lesions) are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Moderate to severe, multifocal, acute to subacute – fibrinosuppurative and necrotizing - pneumonia associated with foreign material and mixed bacteria: Acute aspiration pneumonia

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Histology Comments:

Cause of death was acute to subacute, moderate to severe aspiration pneumonia. As grossly suspect, the vast majority of the gross trauma was postmortem. The areas of relatively minor brain hemorrhage suggest some possible antemortem trauma as well although terminal sepsis/toxemia could also have caused the brain hemorrhage.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 12

Accession #___19-098_
Submission Date_8 May 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z19106__
Species_____MN____ Requester's Phone___(206) 685-1842_____

Date of Death__5/5/19_ Date of Necropsy_5/5/19_Time_1230__Pathologist ____TH_____
_____

Nutritional Condition: ☐ Adequate ☒ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __12 Jun 19___ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

A one week old (born 4/28/19) male pigtail macaque was found dead in the group enclosure on the morning on 5/5/19. An exam had been performed on the infant on 5/2/19 and at that time the infant's weight was 0.50 kg, heart and lungs auscultated normally, the infant was nursing and grasping well, and a mild (3%) dehydration was noted. Subcutaneous fluids were administered that day to correct for the dehydration. The dam's exam on that date revealed no evidence of dehydration and excellent milk production. The dam and infant appeared normal during treatments for that social group on 5/3/19 and 5/4/19. The infant was observed nursing on 5/4/19.

On the day the infant was discovered deceased, the dam (T01112) was noted to be lethargic and her eyes appeared sunken. She was sedated for an exam and found to be 10% dehydrated. Milk could be easily expressed from each mammary gland and appeared normal. Fecal output was not observed on her and intestinal loops palpated within normal limits. The uterus was normal on palpation for a postpartum uterus and no vaginal discharge was noted on exam. She was given both IV and subcutaneous fluids as well as NSAIDs, iron, and vitamin B supplementation. She was removed from the social group and started on gastrointestinal support. The following morning (5/6/19), tan fluid feces were observed in her pan and a sample submitted for a Biofire test.

The dam has a history of viable births in 2014 and 2017 and a nonviable birth in 2016.

Gross Description:

Examined is a 0.44 kg, male pig-tail macaque in lean body condition. There is small abrasion on the ventral chin which is likely postmortem but no other signs of trauma. There is significant delay on skin turgor test. The umbilicus appears normal with no signs of erythema or swelling present. The liver, gallbladder, spleen, pancreas, kidneys, adrenal glands, and bladder appear normal. The bladder was filled with a moderate amount of very concentrated urine. The stomach and small intestines contained scant colostrum; no palpable thickenening or lymphadenopathy of the mesenteric lymph nodes was appreciated and the stomach and intestines appeared on gross evaluation normal. The colon contained a small amount of formed fecal matter and the perineum contained a small amount of dried fecal matter.

The lung lobes were uniformly light pink in color and no exudate was noted on cut cross section. No free fluid was present in the thoracic cavity and all lung lobes floated in formalin. The diaphragm was intact. The heart, thymus, and brain appeared normal.

Gross Diagnosis(es):

1. Failure to thrive

Gross Comments:

The significant weight loss (0.05 kg from exam three days prior), delayed skin turgor test, and minimal colostrum in the stomach and small intestines suggest hypovolemic shock secondary to dehydration as likely cause of death. Histopathology is pending.

Histological Findings:

Spleen, lymph nodes and GALT have moderate to extensive hypoplasia. Adipose throughout the body has moderate (pericardial) to extensive (elsewhere including perirenal) depletion.

Sections of brain, liver, gall bladder, heart, kidneys, urinary bladder, lungs, GI tract and pancreas, and skin with umbilicus are histologically unremarkable.

Final Principal Diagnosis(es):

1. Moderate to extensive, multicentric, adipose depletion and lymphoid hypoplasia

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Histology Comments:

Findings are consistent with developing inanition. This with the history and lack of other histologic lesions indicates hypoglycemia and dehydration, due to inadequate suckling, as the cause of death.

Please contact either of us with any questions, comments or concerns.

Pathologist TH (gross)/RM (histo)

Exhibit 13

Accession # 19-154
Submission Date 24 Jul 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z19187
Species Mn Requester's Phone

Date of Death 17 Jul 19 Date of Necropsy 17 Jul 19 Time Pathologist NIRC

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 12 Aug 19 ☐ Preliminary ☐ Amended

Clinical History and Gross Findings:

One week old, 540 gm, male from Dam Z09128 presented 16 Jul for lethargy and brought to nursery for feeding and placed in incubator. Found dead the next day with no significant gross findings.

Histological Findings:

Lungs have severe, near diffuse, effacing suppurative to occasionally pyogranulomatous infiltrate of all airways with some sparing of larger airways, and there are multifocal aggregates of cocci to possibly coccobacilli bacteria.

Adipose has multicentric, extensive depletion/atrophy.

Sections of lymph nodes, spleen, thymus, liver, heart, kidneys, pancreas, muscle, skin with mammary glands (mild focal ulceration with fibrinosuppurative crust), and GI tract (degree of autolysis of GI tract precludes accurate assessment but there are no overt lesions) are histologically unremarkable besides autolysis and stated minor lesion.

Final Principal Diagnosis(es):

1. Severe, diffuse, suppurative to pyogranulomatous pneumonia associated with bacteria
2. Extensive, multicentric adipose depletion

Histology Comments:

Death was due to the pneumonia that was of bacterial origin. Poor nutritional condition (evidenced by diagnosis #2) associated with inadequate nursing can predispose infants to pneumonia, and it is suspect

this occurred in this case. The most common agents causing pneumonia in this age group are *Klebsiella pneumoniae* and *Streptococcus pneumoniae*.

Please contact me with any questions, comments or concerns.

Pathologist ___RM____

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Exhibit 14

Accession #___19-167_
Submission Date 20 Aug 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID # Z19202
Species_____Mn____ Requester's Phone_____

Date of Death__4 Aug 19_ Date of Necropsy__4 Aug 19_____Time_____Pathologist _NIRC_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _10 Sep 19____ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Three day old, 500 gm, male from Dam M07175 found dead 4 Aug with no significant gross findings.

Histological Findings:

Lungs have severe, multifocal and coalescing, effacing suppurative infiltrate of all airways, though the infiltrate is mostly alveolar with some sparing of larger airways, and there are multifocal aggregates of cocci to possibly coccobacilli bacteria.

Sections of spleen, thymus, liver, heart, kidneys, adipose (adequate) and skin at umbilicus (mild to moderate multifocal pyogranulomatous cellulitis) are histologically unremarkable besides autolysis and stated minor lesion.

Final Principal Diagnosis(es):

1. Severe, multifocal and coalescing, suppurative pneumonia associated with bacteria

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Histology Comments:

Death was due to the pneumonia that was of bacterial origin. The most common agents causing pneumonia in this age group are *Klebsiella pneumoniae* and *Streptococcus pneumoniae*.

Please contact me with any questions, comments or concerns.

Pathologist ___RM

Exhibit 15

Accession #___19-200_
Submission Date_1 Oct 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z19214___
Species_____Mn____ Requester's Phone_____

Date of Death_27 Aug 19_ Date of Necropsy_27 Aug 19_Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __15 Nov 19____ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

Two day old, 280 gm male was abandoned by dam Z13031, brought to nursery and treated. Died during the night. No significant gross findings.

Histological Findings:

Skin with the umbilicus has a moderate sized, well-demarcated umbilical abscess with rod to mixed bacteria and with phagocytosis often of the bacteria.

Lungs are inflated and have mild to moderate, multifocal, deep aspiration of amniotic cells and debris.

Sections of lymph nodes, spleen, adipose (adequate), liver, gall bladder, kidneys, heart, muscle and GI tract are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Moderate, focal, well-demarcated umbilical abscess with rod to mixed bacteria

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Histology Comments:

A definitive cause of demise is not identified, however with the history and lack of other significant findings, hypoglycemia secondary to abandonment is suspect. The umbilical abscess may have contributed to demise (via sepsis/toxemia) however there was no strong evidence of such and the abscess was relatively small and well-demarcated.

Please contact me with any questions, comments or concerns.

Pathologist ___RM____

Exhibit 16

University of Washington
National Primate Research Center

Accession # 19-225
Submission Date 1 Nov 19

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester CMM Investigator Hotchkiss Animal ID # Z19260
Species Mn Requester's Phone 60501

Date of Death 10/31/19 Date of Necropsy 10/31/19 Time 0700 Pathologist CMM

Nutritional Condition: Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _7 Nov 19_____ Preliminary _____ ☐ Amended _____

Clinical History:

Male *Macaca nemestrina* born 10/18/19 to Dam Z14340.

At new infant exam on 10/22/19, the infant was noted to be thin/small weighting 390g. The Dam and Infant were moved into a single cage to allow monitoring of the infant and weight checks. A weight check was scheduled for 10/30/19. Prior to this weight check, the infant was noted to be grasping the dam and was observed nursing.

At the weight check on 10/30, the infant was in poor BCS (1/5) and had lost 20g. Fecal staining was noted in the perianal area, back legs, and tail. Small superficial wounds were present on the ventral tail. The infant was ~10% dehydrated by skin tent. Due to poor condition, the infant was pulled to the nursery for intensive care and bottle feeding.

Q2 hr bottle feeding commenced mid-morning on 10/30, the infant was consuming 2-5ml per feeding overnight. The infant was noted to have fluid feces and was started on pepto. The infant was struggling to maintain body temperature overnight with temps reading ~96.5-97.1F despite the isolette temperature being set at 86F.

At the 6am feeding, the infant had lost an additional 10g and was limp with no muscle tone present. The infant was given Tylenol and pepto. Feeding was attempted, occasional sucking was present. ~20 minutes into the feeding the infant began gasping. Oxygen therapy was initiated and thoracic auscultation revealed a very slow and uneven heart rate. Breathing progressed to agonal breaths. Chest compressions commenced to no avail and the heart stopped shortly after.

Gross Description:

A 0.36g male Macaca nemestrina in poor BCS (1/5) was presented for gross necropsy.

The stomach was severely inflated with air, likely due to agonal breaths. There was milk present in the stomach. There was scant digesta present throughout the rest of the GIT. The kidneys appeared pale

and mottled with tiny dark spots. The lungs were mottled lite pink and dark purple. No other gross abnormalities were detected.

Gross Diagnosis(es): suspect acute aspiration pneumonia.

Histological Findings:

The distal ileum, cecum and colon have severe, multifocal ulcerations with fibrinosuppurative crusts/diptheritic membranes, and underlying submucosa has pyogranulomatous to granulomatous to deeper fibrosing and granulomatous inflammation that is moderate to extensive. Non-ulcerated large intestinal mucosa has moderate, multifocal, pyogranulomatous inflammation with scattered to moderate numbers of crypt abscesses. Other areas of small intestine and stomach are unremarkable.

Pancreas has moderate zymogen depletion, and adipose has multicentric areas of moderate atrophy (essential adipose is present).

Sections of spleen, lymph nodes, liver, gall bladder, heart, kidneys, lungs, seminal vesicle and skin are unremarkable.

Final Principal Diagnosis(es):

1. Severe, multifocal, ulcerative and fibrinosuppurative to granulomatous and fibrosing (chronic-active) typhylocolitis

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Histology Comments:

Demise was due to the typhylocolitis primarily. Small size and poor body condition (from small birth weight and inadequate nursing) also could have easily predisposed the animal to the bacterial infection, and at least made the infection more clinically severe.

Common etiologic agents of the typhylocolitis include *Shigella, Salmonella, Campylobacter* and *Yersinia* sp.

There was no evidence of aspiration in the numerous samples of lung examined.

Please contact either of us with any questions or comments.

Pathologist CMM (gross)/RM (histo)

Exhibit 17

Accession #___20-054_
Submission Date_20 Mar 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z20022___
Species_____Mn____ Requester's Phone_____

Date of Death_9 Feb 20_ Date of Necropsy_9 Feb 20_Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __5 May 20__ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

600 gram, neonatal, pig-tailed macaque part of SPF colony at NIRC, from dam J03187, found dead with no gross lesions.

Histological Findings:

Histologic appearance of many tissues/organs is consistent with a neonate.

Adipose has multicentric, extensive depletion including pericardial and perirenal adipose, and pancreas has moderate, diffuse zymogen depletion. Thymus is inactive/depleted with moderate necrosis/apoptosis and with minimal suppuration in areas of necrosis. Lymph nodes, GALT and spleen have inactive follicles/extensive depletion.

Sections of liver, heart, kidneys, lungs (expanded), GI tract (extensive autolysis and some ingesta evident), thyroid gland, muscle, and skin are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Extensive, multicentric adipose and lymphoid (lymph nodes, spleen, GALT and thymus) depletion, and with diffuse, moderate, pancreatic zymogen depletion

---

Histology Comments:

The most significant findings indicate inanition with evidence of immunosuppression that likely was secondary to inanition. It is suspect the animal was abandoned by the dam and had resultant inadequate suckling/hypoalimentation.

Please contact me with any questions, comments, or concerns.

Pathologist ____RM_____

Exhibit 18

University of Washington
National Primate Research Center

Accession # 21-005
Submission Date 5 Jan 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z20186
Species MN Requester's Phone (206) 616-1233

Date of Death 12/312020 Date of Necropsy 12/31/2020 Time 0900 Pathologist SY

Nutritional Condition: ☐ Adequate Marginal X Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 8 Jan 21 ☐ Preliminary Gross ☐ Amended

Clinical History:

Z20186 (born 11/18/20, ear tattoo "S-I") was first examined on 11/24/20 and noted to be in marginal body condition (2/5 BCS), weighing 450g during her new infant exam. The dam (M01119) was noted to have one functional mammary gland. Dam/infant were moved to the hospital for monitoring. Subsequent weight checks showed weight gain on 11/30, 10g loss on 12/08, and a 10g loss on 12/15 with ~5% dehydration (treated with SQ LRS). One the following day (12/16), the infant was reported for dehydration. During the physical exam, it was noted that an additional 10g had been lost, dehydration was present (~5-7%), and the infant was weak. The decision was made to remove the infant from the dam for intensive care in the nursery. In the following 2 weeks (12/17-12/31) the infant was pale, had mild/moderate abnormal mentation, a weak suckle response, was unable to maintain hydration, and continued to lose/not gain weight despite treatments with steroids, antibiotics, antidiarrheal medications, subcutaneous fluids, and bottle feedings q2hrs (~10ml per feeding). On 12/27 the decision was made to switch from regular formula to soy formula to treat potential malabsorption/maldigestion issues. On 12/30, the animal was transitioned onto a high caloric soymilk diet. Radiographs taken on the same day revealed no significant abnormalities.

On the morning of 12/31, rectal temperature was 95.4F and active warming commenced until a temperature of 98.0F was achieved. Feeding proceeded as per normal. Cardiac arrest occurred shortly after feeding was discontinued.

Gross Description:

Examined is a 0.46 kg, intact, 43-day-old (1 month 13 day old), female pig-tail macaque in marginal body condition (BCS 1.5/5). Externally, the skin appears pale in coloration. The abdomen appears mildly bloated. The tongue has white material adhered to the dorsal surface, likely milk residue. The hard palate and skull fontanelle are closed and appear normal. There is mild yellow fecal staining around the perineum.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. The lungs appear pale in coloration with focal regions of red discoloration likely due to post-mortem congestion. All

sections of collected lung float in formalin. The heart appears subjectively small in size. The heart and pericardial sac were submitted en bloc in formalin for further anatomic review of vasculature, valves, and chambers.

Abdominal cavity: No free fluid is present in the abdominal cavity. The liver appears normal in size and is normal in coloration; the texture appears normal. The liver and associated vasculature was submitted en bloc for anatomic evaluation. The gallbladder is minimally distended and intact. The spleen is normal in color and size. Both kidneys are normal in size and color. The adrenal glands appear normal. The urinary bladder is completely empty of urine. The GI tract is gas distended diffusely. The stomach appears large and distended with moderate amount of gas and liquid ingesta. The stomach wall appears thin and translucent. There is moderate digesta present throughout the length of the GI tract. The intestinal mucosa coloration ranges from yellow to tan intermittently along the entire length. The reproductive tract appears grossly normal.

Skull: The brain and pituitary appears WNL.

Gross Diagnosis(es):

1. Low adiposity
2. Microcardia
3. Gastric aerophagia and distension

Histological Findings:

Multiple sections of large intestine have moderate to extensive and often widespread mucosal ulceration with fibrinosuppurative lining (diphtheritic membranes), and there is massive luminal bacterial proliferation, and suppurative to pyogranulomatous lamina propria to submucosal inflammation with reactive granulation tissue formation and submucosal vasculitis. Where mucosa is present there is similar lamina propria infiltrate and moderate to large numbers of crypt abscesses. Stomach and small intestine are unremarkable besides early villar blunting and fusion of small intestine.

Lymph nodes and spleen have extensive lymphoid hypoplasia. Adipose has disseminated and multicentric, moderate to extensive adipose depletion.

Sections of brain, liver, gall bladder, heart, kidneys, lungs, pancreas, muscle, and skin with mammary gland are histologically unremarkable.

Final Principal Diagnosis(es):

1. Severe, multifocal to widespread, ulcerative, fibrinosuppurative to pyogranulomatous and fibrosing colitis with diphtheritic membranes
2. Severe, diffuse and multicentric lymphoid hypoplasia: spleen and lymph nodes
3. Moderate to severe, multicentric and disseminated adipose depletion

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Histology Comments:

Proximal cause of death was likely fluid and electrolyte loss and toxemia/septicemia due to the severe colitis. The causative agent was likely bacterial with common agents including *Shigella* (favored), *Salmonella, Yersinia* and possibly others. Notably, the multicentric lymphoid depletion and adipose depletion suggest predisposing factors of immunosuppression and marginal nutritional status respectively.
Please contact either of us with any questions, comments or concerns.

Pathologist SY (gross)/RM (histo)

Exhibit 19

Accession # 21-013
Submission Date 22 Jan 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z21003
Species Mn Requester's Phone (206) 685-1842

Date of Death 01/21/2021 Date of Necropsy 08/20/2020 Time 0930 Pathologist AF

Nutritional Condition: ☐ Adequate ☐ Marginal ☒ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 22 Jan 21 ☐ Preliminary ☐ Amended

Clinical History:

Z21003 presented as found deceased in enclosure in the AM with dam (L06185) still holding infant. Animal's birth date was 18Jan2021 and was reported for looking small but grasping and in the correct position for nursing.

Gross Description:

Examined is a 303 gram, intact, female pig-tail macaque in poor body condition (BCS 1.5/5). Externally, there is a small section of dried umbilicus attached, and there are no external wounds evident. There is mild to moderate autolysis present.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. All sections of collected lung float in formalin. The remainder of the respiratory system is otherwise grossly unremarkable. The heart appears normal in size. No abnormalities are noted of the valves within the heart.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. The stomach and entire length of the GI tract are devoid of material. There is mild amounts of gas present within the intestines. Liver, kidney, spleen, and remainder of abdominal organs all appear grossly WNL.

Skull: The brain and pituitary appear grossly normal. The corneas are dry and wrinkled and both eyes were incidentally ruptured during attempted collection. Remainder of the skull organs appear grossly WNL.

Gross Diagnosis(es):

1. Malnutrition – probable hypoglycemia

Gross Comments:

Suspect cause of death was due to failure to nurse and resultant hypoglycemia. Dam is doing well. Tissues/organs will not be evaluated histologically unless the dam develops clinical signs.

Pathologist AF (gross)

Exhibit 20

University of Washington
National Primate Research Center

Accession # 21-067
Submission Date 13 May 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z20158
Species MN Requester's Phone (206) 685-1842

Date of Death 05/11/2021 Date of Necropsy 05/11/2021 Time 1730 Pathologist AF

Nutritional Condition: ☐ Adequate ☒ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 18 May 21 ☐ Preliminary Gross ☐ Amended

Clinical History:

Z20158 presented late afternoon 05May2021 for being reported with audible breathing and increased respiratory effort. On initial physical exam, the animal had audible respirations with slight increased effort, mucous membranes were pink, adequately hydrated, and was otherwise unremarkable. Radiographs performed showed mild pneumonia in the right caudal lung field, suspect due to aspiration. The animal was pulled to hospital and started on dexamethasone, aminophylline, and Naxcel. Respiratory condition was monitored overnight by staff and no further audible breathing or abnormal effort was reported. While in hospital, the animal was treated on the dam daily (dam under sedation). When there was a stressor in the room (cleaning, etc.) the infant was reported with mild audible breathing without abnormal effort, and respiratory sounds would return to normal soon after the stimulus ceased. 11May2021 late afternoon the animal was reported for labored breathing with severe audible respirations and effort. The animal was T: 101.1F (armpit temp), open-mouth breathing, there was significant audible sounds in the upper and lower respiratory tracts on inspiration and expiration, slight blue-coloration to lips, and significant abdominal effort observed. Emergency treatment was provided including flow-by oxygen. SPO2 readings were between 89% to 94% while on 100% oxygen. The animal briefly improved slightly in that it had closed-mouth breathing and a return to normal coloration, but otherwise the increased respiratory effort remained unchanged. The animal was placed in an isolate with flow-by O2 to serve as an oxygen chamber and the animal returned to open-mouth breathing with slight blue coloration to lips, with no change in the increased respiratory effort. The animal was then observed to have a seizure. Due to the lack of response to therapy, humane euthanasia was elected. Necropsy was performed immediately following.

Gross Description:

Examined is a 0.65 kg, intact, 1 month old, female pig-tail macaque in marginal body condition (BCS 2/5). Externally, the haircoat has a greasy appearance and there is a scant amount of dark-red, liquid stools from rectum. There is a small superficial abrasion on the tip of the tongue.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. The left and right lung fields have focal areas of dark-red, consolidated areas near the main stem bronchi that make up about 5-7% of the entire lung fields. Cranial and caudal lung fields affected. The remainder of the lungs are pale-pink and remain mildly inflated when sectioned and texture WNL. There hilar lymph nodes are mild to moderately enlarged. All section of lung float in formalin. The heart appears normal in size. No abnormalities are noted of the valves within the heart. Sections of lung and hilar lymph nodes are collected in formalin and frozen.

Abdominal cavity: No free fluid is present in the abdominal cavity. The liver, kidneys, reproductive tract, and spleen were grossly WNL. The GI tract is gas distended diffusely and mostly devoid of digesta. The stomach is adequately sized and contains minimal amounts digesta. The cecum is dark red and is moderately distended with thick, liquid, dark-red material. The remainder of the large intestine is gas distended and unremarkable. Mesenteric lymph nodes were adequate in size.

Skull: There is a mild amount of CSF present when sectioning the skull. The cerebral hemispheres and cerebellum appear WNL. The pituitary appears WNL. There is a focal, superficial abrasion on the tip of the tongue (collected). Nasal cavities appear grossly normal. Remainder of the tissues in the skull appear WNL.

Gross Diagnosis(es):

1. Multifocal, locally extensive, acute pneumonia
2. Moderate, hemorrhagic enterocolitis

Gross Comments:

The pulmonary discoloration and congestion suggests pulmonary pathology; histology is required to further elucidate. The discoloration of the cecum suggests GI pathology and histology is required to further classify the findings. The abrasion on the tongue is likely secondary to the distressed respirations of the animal.

Histological Findings:

Sections of lungs have multifocal, moderate to severe and multifocally effacing, primarily alveolar, suppurative to less often pyogranulomatous infiltrates, and with moderate, multifocal extension of inflammation into bronchioles and bronchi.

Sections of large intestine have mild to moderate, multifocal lamina propria suppuration, and also with increase in lymphocytes, plasma cells, macrophages and eosinophils. Submucosa has mild to moderate, perivascular inflammation that most often is granulomatous with rare neutrophils. There also are areas of moderate to extensive spirochetosis. Small intestine has early/mild to moderate, multifocal villar blunting and fusion, and small and large intestine have moderate increase in mucosal cell turnover/apoptosis. Sections of stomach are unremarkable.

Sections of brain, lymph node, spleen (added 28 May 2021), liver, gall bladder, heart, kidneys, tongue, skin and skeletal muscle are unremarkable.

Final Principal Diagnosis(es):

1. Severe, multifocal, suppurative to pyogranulomatous pneumonia
2. Moderate, multifocal, suppurative colitis

Histology Comments:

Demise was due to the acute to subacute pneumonia of probable bacterial etiology. The most common causative agent in macaques is *Streptococcus pneumoniae* although other agents such as *Klebsiella pneumoniae* are possible as well.

The colitis also was likely bacterial, with common agents including *Shigella, Yersinia, Salmonella* and *Campylobacter* or others, and the colitis was contributing moderately to demise as well. The organisms described should be considered commensals.

Please contact either of us with any questions, comments or concerns.

Pathologist AF (gross)/RM (histo)

Exhibit 21

Accession #___21-077_
Submission Date_3 Jun 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z21094___
Species_____MN____ Requester's Phone___(206) 606.0501_____

Date of Death__05/27/2021_ Date of Necropsy_05/27/2021_Time_1100__Pathologist ___CMM____
_____

Nutritional Condition: Adequate X Marginal XPoor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _10 Jun 21____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

Z21094 was delivered by emergency c-section on 5/25/21 after it was discovered that the fetal heart rate was 60 bpm during a semiannual exam. Estimated delivery date for the infant was ~June 8th based on previous biparietal diameter measurements. He was ~380g on delivery. The dam did not accept the infant and surrogate attempts were not successful. No rooting behavior was observed on the surrogate. The infant was found deceased in the isolette at the 10pm bottle feeding on 5/27/21.

Gross Description:

Examined is a 340g, 2-day old, intact, male pigtail macaque in marginal to poor condition (BCS 2/5). Externally, there is thick black feces present in the perianal area.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. There are several purple areas on several lung lobes on the dorsal surfaces. All lobes appear inflated. There are visible rib imprints on the ventral surface of the right caudal lung lobe. All sections of collected lung float in formalin. The heart appears normal in size.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. The stomach and intestinal tract have adequate amounts of normal digesta present. Liver, kidney, spleen, and remainder of abdominal organs all appear grossly WNL.

The brain appears normal with no gross abnormalities.

Gross Diagnosis(es):

1. Pulmonary edema

Histological Findings:

Lungs have severe, multifocal, sometimes effacing suppurative to pyogranulomatous and fibrinous inflammation primarily in alveoli and sometimes extending into bronchioles, and also with vasculitis, and there are rare possible bacteria.

Sections of brain, spleen and lymph nodes (inactive), adipose (moderate multicentric depletion), liver, gall bladder, heart, kidneys (mild multifocal tubular protein deposition), pancreas and GI tract are histologically unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Severe, multifocal, fibrinosuppurative to pyogranulomatous pneumonia and vasculitis
2. Moderate, multicentric adipose depletion

Histology Comments:

Demise was due to pneumonia that likely was bacterial. The distribution of lesions and vasculitis suggest bacterial sepsis rather than inhalation. Grossly noted body condition and moderate adipose depletion multicentrically suggests hypoalimentation (reduced nursing)/hypoglycemia may have predisposed the animal to infection.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (gross)

Exhibit 22

University of Washington
National Primate Research Center

Accession # 21-078
Submission Date 4 Jun 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z21088
Species MN Requester's Phone (206) 606.0501

Date of Death 06/02/2021 Date of Necropsy 06/02/2021 Time 1830 Pathologist CMM

Nutritional Condition: X Adequate Marginal Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final ☐ Preliminary Gross ☐ Amended

Clinical History:

Z21088 was observed having a seizure (status elipticus) in group enclosure while on the dam at ~1100 on 6/2/21. The animal was pulled immediately for emergency medical treatment. The seizure ceased with the administration of midazolam. On physical exam the following was noted: ~10 dehydration by skin tent, severe abdominal boat, pale mucous membranes. The following treatments were administered: Ceftiofur, Dexamethasone, LRS/B comp, Iron, Ondansetron, and Dextrose. Flow by Oxygen and warming therapy commenced. Blood glucose was WNL and PLRs were intact. Initial xrays indicated severe gas distension of the stomach, transverse and descending colon. Follow up xrays revealed movement of gas distension towards the lower colon and metoclopramide was administered to help with gas passage, resulting in the passage of large amounts of yellow, foul-smelling, liquid feces. The animal never regained appropriate mentation and eyes remained unfocused and do not track objects/light. The respiratory pattern deteriorated throughout monitoring with alternating slow and fast/panting breathing patterns, with occasional bouts of apnea. Small milk feedings were slowly provided. At ~6pm, focal seizures began in the left arm, followed shortly by facial twitching, at which point midazolam was administered. Seizures progressed to include the left leg and additional midazolam was administered. The decision for human euthanasia was made based on poor clinical response and poor prognosis. Euthanasia solution was injected both IP and IC.

Gross Description:

Examined is a 630g, 20-day old, intact, female pigtail macaque in adequate condition (BCS 2.5/5). Externally, there is yellow liquid feces in the perianal area.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. All lung lobes remain inflated with a foamy external appearance. All lobes are lite tan in color with diffuse brown patches.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract and bladder appear grossly normal. The stomach has undigested liquid milk present. The large intestine is severely

distended with orange/red discoloration, distended vasculature, and is full of yellow fluid feces. The ileocecal junction and cecum are white in color. Liver, kidney, spleen, and remainder of abdominal organs all appear grossly WNL.

The brain appears normal with no gross abnormalities.

Gross Diagnosis(es):

1. Pneumonia
2. Severe distension of the large intestine
3. Severe diarrhea

Histological Findings:

Large intestine has moderate, multifocal crypt abscesses. Stomach and small intestine are unremarkable.

Sections of brain, lymph nodes, spleen (reactive endothelium), liver, gall bladder, adipose (adequate), heart, kidneys, lungs and pancreas are unremarkable.

Final Principal Diagnosis(es):

1. Moderate, multifocal, colonic crypt abscessation

Histology Comments:

A cause of the seizures is not identified histologically. This indirectly supports a congenital or genetic cause.

The large intestinal lesions were only moderate and of limited clinical significance.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 23

Accession #___21-105_
Submission Date_29 Jun 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z21109___
Species_____MN____ Requester's Phone___(206) 606.0501_____

Date of Death__06/28/2021_ Date of Necropsy_06/2182021_Time_0930_Pathologist ___CMM____
_____
Nutritional Condition: Adequate XMarginal Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __1 Jul 21_____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

Z21109 was born overnight/early morning on 6/27-6/28. The infant was noted as deceased during morning checks (~630AM). This was the Dam's (Z16193) first pregnancy/birth.

Gross Description:

Examined is a 390g, intact male pigtail macaque in marginal condition (BCS 2.5/5). Externally, the tip of the left ear was chewed, the penis/scrotal area is dark purple/black color and the penis is missing, there is a moderate bruise on the left side of the ventral thorax, the umbilicus is gone with dark purple bruising in the surrounding area, there is a dark bruise on the chin and the upper left lip, and the tail tip is black and appears necrotic (~1cm distally) followed by an area of dark purple coloration in the immediate proximal ~1cm area.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. The lungs were normal pink in color and floated in formalin. The heart appears normal in size.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. The stomach is empty with no evidence of nursing and the intestinal tract is full of a dark firm material (assume meconium). The cecum is firm and full of dark firm material (assume meconium). Liver, kidney, spleen, and remainder of abdominal organs all appear grossly WNL.

Gross Diagnosis(es):

1. Open

Gross Comments:

The external lesions noted likely occurred after death.

Histological Findings:

Sections of spleen, lymph nodes, adipose (adequate), liver, gall bladder, heart, kidneys, lungs (expanded), pancreas, GI tract, skin, muscle and testicle with epididymis are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Unremarkable tissues/organs

Histology Comments:

Significant lesions are not identified histologically. Lack of lesions in concert with history and gross findings suggest hypoglycemia (secondary to inadequate suckling) as cause of demise.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 24

University of Washington
National Primate Research Center

Accession # 21-116
Submission Date 8 Jul 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z21108
Species MN Requester's Phone (206) 606.0501

Date of Death 07/01/2021 Date of Necropsy 07/01/2021 Time 0830 Pathologist CMM

Nutritional Condition: Adequate Marginal XPoor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final 23 Aug 21 ☐ Preliminary Gross ☐ Amended _____

Clinical History:

Z21108 was born overnight/early morning on 6/25-6/26. On 6/27 the dam (Z16205) was noted for holding the infant awkwardly throughout the day. The dam/infant were pulled to the hospital for maternal/infant bonding that day per on call vet/BMS recommendations. On 6/28 the dam/infant were joined in the hospital by another dam/infant social partner from the same group enclosure to promote maternal bonding. BMS commenced camera monitoring of the situation with no nursing observed throughout the day despite dam holding infant normally. The infant was moved to the nursery for overnight feeding/care and a reintroduction to the dam was done on 6/29 with camera monitoring by BMS. Nursing was sporadically noted throughout the day and the infant subsequently became dehydrated with diarrhea. A clinical decision was made to move the infant to the nursery with treatment for diarrhea/dehydration/overnight and feeding. On 6/30 the infant was evaluated by veterinary and BMS, with the decision to discontinue reintroduction efforts due to the clinical condition of the infant. BMS noted that the infant was not gaze tracking, opisthotonus was present, the infant did not orient towards sounds, and the MRO reflex was absent. Clinical treatments were added for diarrhea and analgesic management. The infant died overnight between 10pm-12am.

Gross Description:

Examined is a 430g, 5 day old, intact female pigtail macaque in poor/marginal nutritional condition (BCS 2/5). Externally there is fecal staining and dried blood in the perianal area. Formula is present in the mouth and around the mouth. There is postmortem subcutaneous blood pooling on the ventral surface.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. The lungs were normal pink in color and has a slightly foamy external appearance with some foam present on cut section. The heart appears elongated in size and pale in coloration. The thymus is undersized for animal age.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. There is formula present in the stomach and dark/mucoid (likely due to treatment with bismuth

for diarrhea) feces in the lower GI tract. Liver, kidney, spleen, and remainder of abdominal organs all appear grossly WNL.

Histological Findings:

Sections of large intestine have moderate to massive, multifocal ulceration of mucosa with fibrinosuppurative crusts, and submucosa has moderate to extensive mixed (pyogranulomatous) inflammation with vasculitis. Sections of stomach and small intestine are unremarkable.

Sections of lungs have multifocal, moderate to severe and multifocally effacing, alveolar, suppurative to pyogranulomatous infiltrates, and associated with areas of debris and mixed bacteria.

Adipose has moderate to extensive depletion, except for essential adipose which is adequate. Pancreas has diffuse, extensive zymogen depletion.

Sections of brain, lymph nodes and spleen (inactive with moderate to low cellularity/hypoplastic), liver, gall bladder, heart, kidneys, urinary bladder, salivary gland, skin with umbilicus (umbilicus has superficial mixed inflammation with ulceration, and limited to no deeper inflammation) and skeletal muscle are unremarkable besides stated changes.

Final Principal Diagnosis(es):

1. Severe to massive, multifocal, ulcerative, fibrinosuppurative to pyogranulomatous colitis with submucosal vasculitis
2. Severe, multifocal, suppurative to pyogranulomatous pneumonia associated with debris and mixed bacteria
3. Moderate lymphoid hypoplasia: spleen and lymph nodes: with moderate to extensive, non-essential adipose depletion

---

Histology Comments:

Demise was likely due to a combination of factors, and with the history and overall findings the favored scenario is an infant with chronic hypoalimentation leading to a weak animal with a poorly developing immune system, secondary colitis, and aspiration pneumonia.

The colitis was likely bacterial, with common agents including *Shigella, Yersinia*, *Salmonella* and *Campylobacter* or others, and the colitis contributed significantly to demise.

The acute to subacute pneumonia also is of probable bacterial etiology, and the presence of debris and mixed bacteria suggests aspiration pneumonia. The pneumonia also contributed significantly to demise.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 25

Accession #___21-122_
Submission Date 18 Aug 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z21145___
Species_____MN____ Requester's Phone___(206) 606.0501_____

Date of Death__08/17/2021_ Date of Necropsy_08/17/2021_Time_0900__Pathologist ___CMM____
_____

Nutritional Condition: XAdequate Marginal Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _31 Aug 21_____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

Z21145 was born overnight/early morning on 8/16-8/17. The infant was noted as deceased during morning checks (~630AM). This was the Dam's (Z14335) second pregnancy/birth.

Gross Description:

Examined is a 530g, intact male pigtail macaque in good condition (BCS 3/5). Externally, there were no abnormalities detected.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. The lungs were a lite pink color with diffuse mottling and all sections floated in formalin. The heart appears subjectively large in size.

Abdominal cavity: A moderate amount of clear straw-colored free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. The stomach is empty with no evidence of nursing. Meconium is present throughout the intestinal tract. The remainder of abdominal organs appear grossly WNL.

Gross Comments: Histology is pending.

Histological Findings:

Lungs are expanded and have multifocal, moderate alveolar deposition of amniotic cells and debris.

Sections of brain, spleen, lymph nodes, adipose (adequate), liver (congested), gall bladder, heart, kidneys, pancreas, GI tract, skin with umbilicus and muscle, and umbilical cord are unremarkable besides stated minor change.

Final Principal Diagnosis(es):

1. Moderate, multifocal, alveolar deposition of amniotic cells and debris
2. Otherwise unremarkable tissues/organs

Histology Comments:

Diagnosis #1 suggests dystocia with a live infant that may have been weakened with reduced ability to nurse. This in concert with history and gross findings, particularly lack of evidence of nursing, suggest hypoglycemia as cause of demise.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 26

WaNPRC Records Review

October 30, 2017 at 1pm
Location: HSB I-421
Members present: WaNPRC: CH, JD, JW TB, **IACUC:** JFI, JPVH, LJE, JS, **Support:** STI, KSH

1. **Protocol Reassignments:**
    a. 153 assignments, 44 re-assignments
    b. Made comment to ask for more detail when they are re-assigned. What protocol are they coming from?
        - **Update on 10/30:** No change was made. WaNPRC will include this information for the next meeting in April 2018.

2. **Adverse Events and Spontaneous Deaths:**
- ABC:
    a. In the last 6 months: 3 infants died of trauma, 16 total cases since 2013, 7 of 16 occurred when no male was present, deaths attributed to males=6. The only consistency seems to be seasonal, during storms in Arizona. Rate of trauma is .75%.
    b. 3 spontaneous infant deaths from pneumonia, sepsis and intestinal disease.
    c. 36 infants were born and 6 infants died between April 1 and September 30.
    d. Valley Fever continues to be an issue. Discontinued medicated food due to newer FDA regulations, so it was difficult to obtain medicated food until recently. They have started the medicated food again.
    e. ABC is using the nursery more often over the last few months.
- New Iberia had 2 trauma deaths around June/July 2017.

3. **Clinical Cases (I-Wing):**
    a. Kiem project: Z15204 found dead with bloat.
    b. Ho project: Z15033 died suddenly from thrombus in pulmonary trunk.
    c. Kean project A13226: Animal was sedated and while infusing red cells back into monkey it went into cardiac arrest. Researchers tried to do CPR. Assumed to be an idiopathic anesthetic death. Necropsy was unremarkable.
    d. Walton project A14221: Animal was ataxic after behavior testing, treated with dexamethasone and she was better. Her behavioral performance went down but her social partner had recently died. They continued to test her but she wasn't doing well. They stopped testing her and treated her for a possible infection. She was euthanized 05-05-17. At necropsy, they found infection. Her social partner also had an infection. This group is on vet monitoring now but no animals are currently assigned to the project. Both animals were MRSA positive.

4. **Behavior Management:**
   - Behavioral Monitoring
     a. 17 open behavioral cases = 1.8%
        - 7 non-injurious self-biting
        - 8 over-groom/hair-pluck
        - 2 locomotor stereotypy
     b. We have conducted 19,818 behavioral observations recorded in ARMS in the last year
        - 13,170 in Seattle
        - 6,648 in Arizona
   - Socialization
     a. We have conducted introductions for 756 animals in Seattle in the last year
     b. Percent of non-exempt animals socialized
     c. Both Facilities 85%
     d. Seattle 74%
   - Socialization for Animals on Projects
     a. 365 animals on projects (628 total in Seattle)
        - 138 Socialized in full contact
          - 70 protected contact
          - 26 infants in periodic contact
     b. 112 Project Exemptions
     c. 85 Veterinary Exemptions
     d. 31 In the Process of Being Socialized

5. **Animal Observations noted during site visits:**
   a. Z14095: Arizona – one animal observed to be self-grasping. Socialized and is doing well.
   b. Z12048: Pregnant female with jacket, didn't adjust well. Jacket was removed. Re-evaluating jacket training SOP.
   c. 2 pregnant animals with alopecia, probably transport stress, as they came up from ABC.
   d. Squirrel monkeys: They are older and have medical problems that are being monitored.
   e. A17212: Lesions on dorsal wrists. They've healed now. Animal is fine.
   f. Alopecia cases: A15112 was socialized, A15104 and A15108 are being socialized now. A social pair in ARCF have had alopecia for a long time and even social housing isn't helping it. Alopecia is very difficult to treat.

- SR buprenorphine – injection site had severe reaction. Currently looking to switch to 10 mg/mL solution.
    - **Update on 10/30:** Since the last records review 568 administrations of SR buprenorphine have occurred. There were a handful of reactions, but most involved only transient swelling that resolved.

- Biscuit counting – separation for eating and assessing food consumption. Implemented for monitoring of the nutritional status of the animals. Looking for a decrease in the number of obese animals and clinical disease related to overeating. Asked for update at the next records review meeting.
    - **Update on 10/30:** Discontinued unless animals are fat or skinny.

Exhibit 27

OFFICE OF RESEARCH
UNIVERSITY of WASHINGTON

November 19, 2021

Jacquelyn Tubbs olawdco@od.nih.gov
Office of Animal Welfare, NIH
6700B Rockledge Drive, Suite 2500, MSC 6910
Bethesda, MD 20892

Re: Animal Welfare Assurance A3464-01 [OLAW Case 11N]

Dear Dr. Tubbs,

Detailed below is our response to the request for further details as outlined in your letter dated October 28, 2021.

Please describe the biosecurity measures in place to identify and prevent the spread of the infectious pathogens identified on page 1 of 7 in the report provided by PETA.

WaNPRC performs routine screening for infectious pathogens and additional screening as warranted based on clinical signs. During semi-annual health assessments, NHPs undergo routine screening for MTBC (tuberculosis) by skin test with Mammalian Old Tuberculin; as well as serologic testing for multiple enzootic primate viruses (including SRV, STLV, SIV, and B virus); *Trypanosoma cruzi;* and *Coccidioides* if in Arizona or shipped from Arizona. All *Coccidioides* seropositive animals are treated with fluconazole. If requested by an investigator or if animals show clinical signs of a possible infectious disease, they may be tested for *Campylobacter, Shigella, Salmonella, Cryptosporidium and Vibrio* by multiplex PCR or culture and treated as appropriate. Animals are screened for West Nile virus antibodies or MRSA by culture if warranted by the study assignment.

Please describe current practices for assessing the health status of primates prior to their transfer/transport to other animal facilities.

Animals to be transferred/transported to other animal facilities undergo complete physical examination prior to shipment, and animals with clinical evidence of infectious disease are not shipped. All animals are screened for tuberculosis within 30 days of shipment. *T. cruzi* status is disclosed to any potential purchaser. Upon request, animals are screened for *Campylobacter, Salmonella, Shigella, Cryptosporidium, Vibrio*, and any other requested specific pathogens prior to shipment.

Please describe corrective measures implemented to ensure WaNPRC remains current and compliant with state and local regulations regarding the transfer/transportation of animals in these colonies.

In 2021, we received a Notice of Correction regarding errors we made in interstate transport of non-human primates. We took this situation very seriously and investigated thoroughly. We discussed our plans with the State Veterinarian and others and instituted the following corrective actions:
1) We now have a Standard Operating Procedure (SOP) for animal shipments, including those from Arizona to Seattle. Records and Logistics personnel and Veterinarians receive this SOP as part of their training requirement to be reviewed annually.

Exhibit 28

Accession #___21-098_
Submission Date_22 Jun 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___J06251_
Species_____MN____ Requester's Phone___(206) 685-1842_____

Date of Death__06/20/2021_ Date of Necropsy_06/20/2021_Time_____1100__Pathologist ___AF_____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☐ Poor ☒ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☐ Final __1 Jul 21__ ☐ Preliminary ____Gross_____ ☒ Amended __9 Jul 21___

Clinical History:

J06251 presented as found down in her enclosure and minimally responsive. Animal was QAR and vocalizing at time of sedation. PE findings: T:99.1F P:150, ~5-7% dehydrated, BCS 4-4.5/5, mildly harsh lung sounds on the left side with an abnormal thump sound intermittently at the completion of the inspiratory breath, mucous membranes pale to pale pink, pupils dilated, animal vocalized on abdominal palpation with no specific isolation in location, mild amount of yellow-liquid fluid expelled from the mouth and nose, remainder of PE was unremarkable. Animal was started on flow-by O2, emergency doses of IV steroids, fluids, buprenorphine and anti-emetics. Survey radiographs were obtained- lobar sign present in the caudal left lung field along with generalized interstitial pattern in all lung fields. Abdominal ultrasound showed the lining of stomach thickened and contrast of cortex to medulla in kidneys was subjectively decreased. CBC/Chem/electrolytes preformed and cocci collected with results showing increased ALT and bilirubin, mild hypoalbuminemia, and mildly low chloride. BP was initially 40/20 and SP02 ranged from 92% to 97%. The animal's vitals remained stable and BP increased to 60/25. Her mucous membranes would fluctuate from grey-pale to pale-pink. Following ~2 hours of emergency treatments, the animal had not recovered from sedation and a moderate amount of yellow-liquid again regurgitated from the mouth and nose. The animal abruptly went into cardiac arrest following the regurgitation event. IV epinephrine and chest compressions started and an irregular heart beat was recovered. Euthanasia was elected shortly following this event due to lack of response to treatment and poor prognosis. Necropsy was performed about one hour post-euthanasia.

Gross Description:

Examined is a 12.12 kg, 14 year old, intact, female pig-tail macaque in obese body condition (BCS 4-4.5/5). Externally, there is an IV catheter in the left saphenous vein. There is mild yellow staining around the nares and mouth. There is mild autolysis present.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. There are locally extensive areas of dark-purple, consolidated lung in both the left and right lung fields, more severely on the left side with approximately 30% of the lung field affected. The remaining lung lobes had a bubble-

wrap texture and did not deflate entirely. All sections of collected lung float in formalin. The remainder of the respiratory system is otherwise grossly unremarkable. The heart appears normal in size. No abnormalities are noted of the valves within the heart.

Abdominal cavity: No free fluid is present in the abdominal cavity. The liver appears normal in size and color. The gallbladder is slightly distended and intact. The spleen is normal in color and size. Both kidneys subjectively have decreased contrast between the cortex and medulla, and are normal in size. Both adrenal glands were friable and difficult to collect. The urinary bladder is empty.

The stomach is adequately sized and is moderately full of yellow-liquid material. The walls are subjectively thickened and there are multifocal regions of the fundus with small, pinpoint, partial-thickness erosions and dark-red coloration. Multiple sections of stomach are collected. The duodenum, jejunum, and ileum are filled with dark red, thick, liquid material. There are multifocal sections of jejunum ranging from 1 to 5 cm in length where the mucosa is dark-red. Two sections of jejunum are collected and labeled in cassettes Jej and Jej 2. The cecum, colon, and rectum are normal in coloration and contain a small amount of formed stools. No mesenteric lymph node was able to be identified and collected due to the amount of fat present. The reproductive tract appears grossly normal.

Skull: The brain and pituitary appear grossly normal; remainder of the tissues in the head and skull appear grossly normal.

Gross Diagnosis(es):

1. Multifocal and locally extensive pneumonia
2. Gastritis with suspect ulceration
3. Hemorrhagic enteritis

Gross Comments:

Pulmonary discoloration and abnormal texture will need histopathology to further elucidate. The suspect gastric ulcerations will need histopathology to determine the extent of the damage to the mucosal lining (if any), The abnormal coloration of the contents of the small intestine will require histoapth to further identify the source of the suspect GI bleed.

Histological Findings:

Sections of stomach and small intestine have severe, multifocal, mucosal to mural to transmural acute necrosis with suppuration and fibrin deposition to pyogranulomatous inflammation, there are regions of mucosal ulceration in the stomach, and numerous septic thrombi with copious rod bacteria in thrombi and vessels and some regions of vascular necrosis as well. There also are mild to moderate changes in stomach, small and large intestine consistent with IBD/food allergy/hypersensitivity/dietary intolerance.

Heart has mild to moderate, multicentric lymphohistiocytic infiltrate in myocardium and epicardium.

Sections of brain, lymph nodes, spleen, liver (mild to moderate fatty change, lobular collapse and lymphohistiocytic aggregates), gall bladder, kidneys (mild membranoproliferative glomerular change diffusely and multifocal lymphohistiocytic aggregates), lungs (small discrete nodular papillary proliferation of well-differentiated bronchiolar epithelium, and also mild pneumoconiosis and congestion), skin with mammary gland, and muscle are unremarkable besides stated lesions.

Final Principal Diagnosis(es):

1. Severe, multifocal, transmural, fibrinonecrotic to pyogranulomatous gastroenteritis with copious rod-bacterial proliferation and septic thrombi
2. Mild to moderate, multifocal, granulomatous myocarditis
3. Papillary bronchiolar adenoma

Histology Comments:

Demise was due to the bacterial gastroenteritis and resultant sepsis/toxemia. An agent such as *Clostridium* sp is suspect due to the massive bacterial proliferation. A gram stain is pending and an addendum will follow. Discussed case with clinicians, and a second opinion from AB concurred.

The myocarditis suggests the possibility of asymptomatic Chagas disease although other causes are possible for this clinically silent process. Likewise, the papillary adenoma was an incidental finding.

Please contact either of us with any questions, comments or concerns.

Pathologist AF (gross)/RM (histo)

ADDENDUM 9 JUL 21 RM

Gram stain reveals the organisms are gram positive cocci in clusters and chains. Notably, another animal in the same enclosure (21-110 Z20164) succumbed to a similar process though with a severe meningitis with similar cocci bacteria and with growth from heart blood of 4+ *Staphylococcus aureus* and 2+ growth of viridans group *Streptococcus* sp. *S. aureus* is the suspect pathogen in both of these cases with less likely the pathogen being *Streptococcus* sp.

AMENDED DIAGNOSIS #1:

Severe, multifocal, transmural, fibrinonecrotic to pyogranulomatous gastroenteritis with copious gram positive cocci bacterial proliferation and septic thrombi

Exhibit 29

University of Washington
National Primate Research Center

Accession #___21-110_
Submission Date_2 Jul 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z20164__
Species_____MN____ Requester's Phone___(206) 606-0501_____

Date of Death__06/30/2021_ Date of Necropsy_06/30/2021_Time_1300__Pathologist ___CMM____
_____
Nutritional Condition: Adequate Marginal X Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _Swab of ventricle for bacterial culture_____

Type of report: ☐ Final _13 Jul 21____ ☐ Preliminary ____Gross_____ ☒ Amended __27 Jul 21__

Clinical History:

Z20164 was reported on the evening of 6/29 for being slow and uncoordinated in the group enclosure. The animal was immediately moved to the hospital and TX commenced (fluids, steroids, antibiotics, nutritional support). The following morning, the animal was hunched with moderate dehydrated and labored respirations in the hospital cage; clinical treatment commenced with SQ fluids and additional antibiotics. No abnormalities were detected in thoracic auscultation. An hour later, the animal was noted for lateral recumbency in the hospital cage with pale mucous membranes. Emergency treatment commenced with IV fluids/steroids/potassium, IM iron, PO glucose, gavaged nutrition, and active warming. The animal remained in lateral recumbency with an elevated respiratory rate (~60bpm) and mild harsh lung sounds that were attributed to the respiratory pattern. Heart rate and rhythm were WNL. Monitoring/warming commenced for ~2 hours during which mucous membrane color improved and the animal was responsive to stimuli. At ~1145 the animal stopped breathing and the heart stopped beating.

Gross Description:

Examined is a 1.63 kg, 0.8 year old, intact female pigtail macaque in poor body condition (BCS 2/5). Externally there is an IV catheter present in the right saphenous vein.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. The lungs appear grossly normal. There is a small amount of free slightly hemorrhagic fluid present in the pericardial sac. There is an ~1-1.5 cm dark lesion at the apex of the heart.

Abdominal cavity: There is no free fluid in the abdominal cavity. The surface of the spleen has sporadic pitting with a small pale <2mm nodular lesion at the free edge. There is a moderately hemorrhagic area present at the junction of the pylorus and the duodenum. There are pale rib imprints present on the surface of multiple liver lobes. There is moderate gas distension of the cecum and jejunum. The digestive tract is full of liquid digesta (yellow in cranial part, greenish in caudal tract). The reproductive tract appears grossly normal.

Skull: The brain and pituitary appear grossly normal; remainder of the tissues in the head and skull appear grossly normal.

Gross Diagnosis(es):

1. Hepatic edema

Histological Findings:

Brain has severe, multifocal fibrinosuppurative to pyogranulomatous infiltrate of leptomeninges with multifocal, copious, cocci bacterial proliferation; bacteria are in clusters and chains.

One section of stomach has moderate numbers of occlusive to near-occlusive, submucosal fibrinosuppurative thrombi with early organization. Another section of stomach has areas of florid cocci bacterial proliferation in crypts. Other sections of stomach, and sections of small and large intestine are unremarkable besides autolysis and mild to moderate, typical, lamina propria infiltrate of/increase in lymphocytes, plasma cells, macrophages and eosinophils.

Liver has moderate numbers of partially occlusive fibrinous thrombi with early organization in medium sized veins. Liver also has mild, multifocal, periportal lymphohistiocytic aggregates, and gall bladder is unremarkable besides autolysis. Sections of lung have few thrombi as per liver.

The heart interventricular septum has a focal, small region of myocellular necrosis with infiltrate of neutrophils, macrophages and lymphocytes. Other sections of heart are unremarkable.

Sections of lymph nodes and spleen (low follicular activity and spleen has reactive endothelium), pancreas, thyroid gland, skin with mammary gland, and muscle are unremarkable.

Final Principal Diagnosis(es):

1. Severe, multifocal, fibrinosuppurative to pyogranulomatous leptomeningitis associate with copious cocci bacteria
2. Severe, multifocal, submucosal, fibrinosuppurative (septic), venous thrombosis with early organization, and associated with regional, copious, crypt, cocci bacterial proliferation: stomach
3. Moderate, multifocal, partially occlusive, hepatic and pulmonary, venous thrombosis with early organization
4. Focal, moderate, necrotizing and pyogranulomatous myocarditis
5. Low follicular activity: lymph nodes and spleen

Histology Comments:

Microbiology of heart blood swab sampled postmortem revealed heavy growth (4+) of *Staphylococcus aureus* and moderate growth (2+) of viridans group *Streptococcus* sp.

This case is similar to 21-098 (J06251). Preliminary report distributed to veterinarians 9 Jul 21.

Demise was due to the cocci bacterial meningitis, which likely originated from the stomach, with *S. aureus* being the suspect primary pathogen as per culture. Typically, the viridans group of *Streptococcus* sp are commensals, supporting this interpretation. The hepatic and pulmonary thrombosis and myocarditis were also due to the same process. The low lymphoid follicular activity suggests the possibility of immunosuppression as a predisposing factor.

A gram stain of brain is pending and an addendum will follow; confirmation of gram positive cocci is expected.

Please contact either of us with any questions, comments or concerns.

Pathologist: CMM(gross)/RM (histo)

ADDENDUM 27 JUL 21 RM

Gram stain of brain confirms the organisms are gram positive cocci in chains and clusters.

Exhibit 30

2) We registered with Global Vet Link to prepare Certificates of Veterinary Inspection (CVIs) for future shipments. We signed up with the office of the State Veterinarian to receive regulatory updates and will use group e-mails to ensure that we continue to receive the information particularly critical for staff turnover. We implemented a procedure for annual check-ins with the State Veterinarian to confirm compliance with regulations.
3) We reported all the animals that had positive titers for Valley Fever that were shipped from Arizona to Seattle in the Washington State portal. We will report any future cases as described in the SOP mentioned in Section 1.
4) We communicate regularly with the Washington State Veterinarian to ensure that ALL reportable pathogens that our animals are exposed to are properly reported and documented according to regulations and recommendations.

Please describe the water quality assurance and control processes that are performed to analyze the water that serves as a drinking source for the breeding colony. Please confirm the presence of a filtration system or describe the processes in place that ensure potable drinking water for animals.

The water consumed by our animals in Arizona is pre-treated with low levels of chlorine and is confirmed to be clean and potable. Professional quarterly testing of our well water that supplies our facility began in 2014. There were two instances of elevated perchlorate level detection, one in 2014 and one in 2016. In 2014 this sample was taken from a storage tank and a subsequent sample from the well that provides water to the Arizona Breeding Colony was tested and confirmed to be below the trigger level for our contingency plan. In 2016, there was an elevated level of perchlorate detected and there was prompt retesting of the well. A second test determined that carryover contamination in the lab of perchlorate occurred during the initial analysis and levels were in fact below the limit that would trigger our contingency plan of installing an ion exchange (reverse osmosis) filtration system to remove contaminants. The Environmental Protection Agency (EPA) confirmed that since 2016, quarterly groundwater monitoring has not detected concentrations that exceed the trigger level.

While no data is provided, the letter states "infant mortality rates at this breeding site have exceeded 25 percent." Regarding the Arizona breeding colony, please comment on infant mortality rates from 2018 to present and note if any trends have been identified among infant mortality rates.

At the Arizona breeding colony, infant mortality was 16% in 2018, 10% in 2019, 4% in 2020, and 11% in 2021. All deceased animals undergo necropsy, and no trends related to cause of death have been identified.

Please let us know if you need additional information.

Sincerely,

(b) (6)

Joe Giffels
Institutional Official
Senior Associate Vice Provost for Research Administration and Integrity

(b) (6)

Exhibit 31

Accession #___18-121
Submission Date 14 Mar 2018

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DP_____ Investigator___DP____ Animal ID #___T04352_
Species_____Mn____ Requester's Phone_____

Date __14 Mar 2018_____Time_____Pathologist ___AB_____
_____
Other Tests: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final 14 Mar 2018__ ☐ Preliminary _____ ☐ Amended _____

Clinical History: this animal was assigned to the "Mn model development: GC infection and URT imaging by PET" protocol.

Gross Description: oviduct and fimbria from a 9 kg, 13 year old female pig tail macaque are diffusely erythematous and edematous. The right fimbria display three small peritubal adhesions. There is focal left peritubal adhesion, an adhesion between the tube and fimbria and focal hydrosalpinx with mild thickening and opacity of the ligament.

Diagnosis(es):
Multifocal peritubal adhesions with focal hydrosalpinx and ligament thickening.

Comments: adhesions and thickening of the mesosalpinx may be related to chronic inflammation. Histopathology is not requested due to lack of funding.

Pathologist_____AB_____

Exhibit 32

Accession #___18-134_
Submission Date_14 Jun 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF_____Animal ID #___A16236_____
Species_____Mm____ Requester's Phone_____

Date of Death___14 Jun 18_____ Date of Necropsy___14 Jun 18_Time___1100_Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _18 Jun 18___ ☐ Preliminary __14 Jun 18_____ ☐ Amended _____

Clinical History:

Seven year old male rhesus macaque assigned to the project "Optimization of a therapeutic HIV/SIV multi-antigen DNA vaccine". The animal was inoculated with SIV Delta B670 in Nov '16. The animal has remained clinically normal, has had 2 jejunal resections, and has unremarkable bloodwork except for slight reduction in CD4+ lymphocytes. Euthanized at end of project.

Gross Description:

A 7 year old, approximately 10 kg, intact male with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and moderately excessive adipose stores) condition. There is slight tooth wear and tartar deposition, and the integumentary and musculoskeletal systems are otherwise grossly unremarkable besides scars from previous experimental surgeries.

There are mild to moderate, multifocal adhesions of bowel to mestenery and mesentery to body wall, and the jejuncectomy sites are well-healed though there are moderately extensive fibrous adhesions of jejunum to jejunum incorporating the resection sites. Lymph nodes are generally large to extremely large, and spleen is mottled white (follicular hyperplasia). The nervous, cardiovascular, respiratory, digestive, urogenital, hemic-lymphatic and endocrine systems are otherwise grossly unremarkable.

Gross Diagnosis(es):

1. Mild to moderately extensive, multifocal, fibrous abdominal adhesions
2. Extensive, generalized lymphadenomegaly

Gross Comments:

The adhesions from past jejunectomies and other surgeries were currently clinically insignificant, and there were no significant gross findings except for generalized lymphadenopathy indicating extensive antigenic stimulation. Samples acquired as per research protocol (copy of protocol in case folder). Histology is pending on representative tissues/organs preserved in formalin. ***18 Jun 18: Histology has been cancelled, and this report is final.***

Pathologist_____RM_____

Exhibit 33

Accession #___18-192_
Submission Date_23 Aug 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____JM_____ Investigator___SH____ Animal ID #___A17122_____
Species_____Mm____ Requester's Phone_____

Date of Death_23 Aug 18___ Date of Necropsy_23 Aug 18_Time_____0930___Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __24 Aug 18_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This 5 year old rhesus macaque was assigned to the project "Probiotic use as an adjuvant in HIV vaccine" and was challenged repeatedly IR with SHIV.C.CH505.375H.dCT beginning Mar '18. The animal has remained clinically normal with unremarkable bloodwork. Euthanized at end of project.

Gross Description:

A 5 year old, 9.4 kg, intact male with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There are no external lesions besides mild tartar deposition on the teeth, and the integumentary system is unremarkable.

The nervous, cardiovascular, respiratory, digestive, urogenital, endocrine, hemic-lymphatic (lymph nodes generally small to moderate size) and musculoskeletal systems are otherwise grossly unremarkable.

Final Principal Diagnosis(es):
1. Unremarkable tissues/organs

Comments:

There was no gross evidence of significant disease. Tissues/organs acquired as per research protocol (necropsy protocol in case folder). Histology not requested.

Pathologist_____RM_____

Exhibit 34

Accession #___19-047_
Submission Date_28 Mar 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____MO_____ Investigator___DF____Animal ID #___A11230_____
Species_____Mn____ Requester's Phone_____

Date of Death__28 Mar 19___ Date of Necropsy_28 Mar 19__Time_____0945___Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __28 Mar 19_____ ☐ Preliminary _28 Mar 19___ ☐ Amended _____

Clinical History:

This pig-tailed macaque was assigned to the project "Evaluation of SIV co-infection on ZIKV pathogenesis in pig-tailed macaques". The animal was inoculated SQ with Zika virus 4 Mar '19. The animal has remained clinically normal with unremarkable bloodwork. Euthanized at end of project.

Gross Description:

A approximately 7 kg, 10 year old, intact female with active reproductive tract, pig-tailed macaque is presented euthanized in good postmortem and nutritional (adequate adipose stores and well-muscled) condition. There is mild to moderate, multifocal alopecia and moderate tartar deposition on the teeth. Otherwise there are no significant external lesions and the integumentary and musculoskeletal systems are otherwise grossly unremarkable.

The nervous, cardiovascular, respiratory (minimal multifocal fibrous pulmonary pleural adhesions, probably due to past pulmonary mite infection as the animal is of Indonesian origin), digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes small to moderate sized) systems are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

There are no gross lesions of clinical significance. Samples acquired as per research protocol (copy of protocol in case folder), and representative tissues and organs preserved in formalin. Histology is pending (later cancelled).

Histological Findings:

Final Principal Diagnosis(es):

Histology Comments:

Pathologist_____RM_____

Exhibit 35

University of Washington
National Primate Research Center

Accession #___19-073_
Submission Date_24 Apr 19

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester_____MO_____ Investigator___DF_____Animal ID #___Z15384_____
Species_____Mn_____ Requester's Phone_____

Date of Death___24 Apr 19_____ Date of Necropsy____24 Apr 19_Time__1000_Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __24 Apr 19_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This animal was assigned to the protocol "Prophylactic SHIV vaccine in NHP" and was inoculated IR with SHIV in Mar '19. The animal has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 3 year old, approximately 4.5 kg, intact male with inactive reproductive tract, pig-tailed macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth. Otherwise there are no significant external lesions and the integumentary and musculoskeletal systems are grossly unremarkable.

The nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes are moderate to large size) systems are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not present. Tissues/organs acquired as per research protocol. Histology is declined.

Pathologist_____RM_____

Exhibit 36

Accession #___19-078_
Submission Date_30 Apr 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester_____MO_____ Investigator___DF_____Animal ID #___Z13327_____
Species_____Mn_____ Requester's Phone_____

Date of Death___30 Apr 19_____ Date of Necropsy____230 Apr 19_Time _1000_Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __30 Apr 19_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This animal was assigned to the protocol "Prophylactic SHIV vaccine in NHP" and was inoculated IR with SHIV in Mar '19. The animal has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 5 year old, approximately 7.1 kg, intact female with active reproductive tract, pig-tailed macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth and there are no significant external lesions and the integumentary and musculoskeletal systems are grossly unremarkable.

The nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes are moderate to large size) systems are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not present. Tissues/organs acquired as per research protocol. Histology is declined.

Pathologist_____RM_____

Exhibit 37

University of Washington
National Primate Research Center

Accession # 19-264
Submission Date 30 Sept 2019

DIAGNOSTIC LABORATORY BIOPSY REPORT

Requester TB Investigator TB Animal ID # Z17071
Species Mfl Requester's Phone

Date of Death 30 Sept 2019 Date of Necropsy 30 Sept 2019 Time Pathologist AB

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 30 Sept 2019 ☒ Preliminary 30 Sept 2019 ☐ Amended

Clinical History: this animal was assigned to the "developmental neurotoxicity of domoic acid" protocol. There is no history of clinical abnormalities and CBC and chemistry panels are unremarkable.

Gross Description: a 2.6 year old, 2.5 kg female cynomolgous macaque in good nutritional and post mortem condition is submitted. The lungs are mildly erythematous and congested. Other organ systems are unremarkable.

Gross Diagnosis(es):
Mild pulmonary congestion

Gross Comments: tissue samples were collected per extensive research protocol. Histopathology was not requested.

Histological Findings:

Final Principal Diagnosis(es):

Histology Comments:

Pathologist_____AB_____

Exhibit 38

Accession #___20-088_
Submission Date_7 May 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19122
Species_____Mm____ Requester's Phone_____

Date of Death__7 May 20_____ Date of Necropsy_7 May 20_Time_0930_____Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __7 May 20_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR 4X with SIV starting in Jan '20. The animal has developed moderate reduction in CD4+ lymphocytes and has remained clinically normal with otherwise unremarkable bloodwork.

Gross Description:

A 5 year old, 8.2 kg, intact female with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and abundant adipose stores) condition. There is minimal tartar deposition on the teeth, and multiple digits are missing and healed over. There are are no other significant external lesions and the integumentary system is otherwise grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes moderate to large sized) are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Pathologist_____RM_____

Exhibit 39

Accession #___20-114_
Submission Date_15 Jun 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____VN_____ Investigator___HK____ Animal ID #___Z12209_____
Species_____Mm____ Requester's Phone_____

Date of Death_15 Jun 20_ Date of Necropsy___15 Jun 20_____Time__0930_Pathologist _____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __15 Jun 2020_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This animal was assigned to the project "Donor Pool". The animal has remained clinically normal with unremarkable bloodwork except for recent mild to moderate neutrophilia and monocytosis.

Gross Description:

A 7 year old, 5.9 kg, intact female with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There are no significant external lesions and the integumentary and musculoskeletal systems are grossly unremarkable besides mild tartar deposition on the teeth.

The caudal portions of both lateral ventricles of the brain are moderately dilated with moderate thinning of overlying caudal portions of the parietal and temporal lobes of cerebral cortex and similar thinning of the overlying cortex of the occipital lobe diffusely. The nervous system is otherwise grossly unremarkable.

The cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic systems are grossly unremarkable.

Gross Diagnosis(es):

1. Moderate, bilateral, caudal hydrocephalus: caudal portions of lateral ventricles

Gross Comments:

The hydrocephalus was likely congenital/developmental, and may have resulted in behavioral/cognitive disorders. This possibly would have been difficult to detect however.

There are no other significant gross lesions. Samples acquired as per research protocol. Histology is not requested.

Pathologist____RM_____

Exhibit 40

University of Washington
National Primate Research Center

Accession #___20-115_
Submission Date_16 Jun 20

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19120
Species_____Mm____ Requester's Phone_____

Date of Death__16 Jun 20_____ Date of Necropsy_16 Jun 20_Time_0930____Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __16 Jun 20_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR 6X with SIV starting in Feb '20. The animal has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 5 year old, ~7.4 kg, intact female with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth, and multiple missing digits that are healed over. There are are no other significant external lesions and the integumentary system is otherwise grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes moderate sized) are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Pathologist_____RM_____

Exhibit 41

Accession #___19-248
Submission Date_12 Dec 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____VN_____ Investigator___HK____ Animal ID #___A19109_____
Species_____Mm____ Requester's Phone_____

Date of Death__12 Dec 19_____ Date of Necropsy_12 Dec 19_Time___0930___Pathologist ____RM
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __8 Apr 20__ ☐ Preliminary __11 Dec 19_____ ☐ Amended _____

Clinical History:

This animal was assigned to the project "amfAR" and was euthanized at the end of the study. The animal has remained clinically normal with minor bloodwork abnormalities. There is a tuberculin syringe needle in the subcutis of the left lateral hip that broke off during an injection.

Gross Description:

A 3 year old, 5.1 kg, intact female with slightly active reproductive tract, rhesus macaque is presented in good postmortem and nutritional (adequate muscling and adequate adipose stores) condition. There is mild tartar deposition on the teeth, multifocal mild to moderate alopecia, and the left lateral thigh has a well-healed, approximately 10cm long scar. The subcutis of the left lateral hip has a tuberculin syringe needle embedded in fibrous tissue in the subcutis. There are no other significant external lesions and the integumentary system and musculoskeletal systems are otherwise grossly unremarkable.

The respiratory, digestive, cardiovascular, nervous, urogenital, endocrine and hemic-lymphatic (lymph nodes small to moderate sized) systems are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable gross exam (besides subcutaneous foreign body)

Gross Comments:

The subcutaneous needle was clinically insignificant. Appropriate tissues/organs preserved in formalin. Samples acquired as per research protocol. Histology is pending.

Histological Findings:

Sections/blocks of lymph nodes are as follows: 5 is axillary, 6 is pulmonary hilar, 7 is iliac, 8 is inguinal, 9 is mesenteric, and 10 is submandibular.

One adrenal gland has a large, chronic thrombus at the corticomedullary junction with early organization/granulation tissue formation peripherally and with early peripheral fibrosis and mild histiocytic infiltrate. Both adrenal glands also have moderate, multifocal corticomedullary calcification, and moderate, multifocal nodular cortical hyperplasia.

Stomach, small intestine and large intestine have moderate lamina propria infiltrate of/increase in eosinophils, lymphocytes, plasma cells with scattered to large numbers (large numbers in the stomach sections) of Mott cells, and macrophages. The small intestine has moderate villar blunting and fusion, and scattered tortuous crypts. Large and small intestine have mild to moderate increase in mucosal cell turnover (apoptosis). Large intestine has multifocal, superficial mucosal, adherent prolifertation of curved to coiled bacterial organisms (spirochetosis) and areas of mild crypt loss. Esophagus is unremarkable. GALT is unremarkable and moderately active.

Sections of brain, pituitary gland, eye, lymph nodes (inactive to low follicular activity), spleen (low to moderate follicular activity), thymus (moderate involution), liver (minimal fatty change of hepatocytes and multifocal lymphohistiocytic aggregates), gall bladder (minimal submucosal lymphohistiocytic infiltrates), kidneys (mild diffuse membranoproliferative change of glomeruli, and multifocal interstitial lymphohistiocytic aggregates), urinary bladder, heart, aorta, lungs (mild perivascular, peribronchial and peribronchiolar lymphohistiocytic aggregates, and minimal pneumoconiosis), trachea, pancreas, salivary gland, thyroid glands, tongue, skeletal muscle, ovaries (active and with moderate numbers of calcified ova), oviducts, uterus, cervix, bone with marrow, and skin with mammary gland are unremarkable besides stated minor changes.

Final Principal Diagnosis(es):

1. Focal, extensive, chronic infarct: adrenal gland corticomedullary junction
2. Moderate, diffuse, eosinophilic, lymphoplasmacytic and histiocytic gastro-entero-colitis with enteric villar blunting and fusion, and with extensive, multifocal, large intestinal spirochetosis
3. Moderate, multifocal, corticomedullary calcification: adrenal glands

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Histology Comments:

A cause of the chronic adrenal infarct is not evident. The lesion likely was clinically insignificant particularly with lack of similar lesions elsewhere. Adrenal corticomedullary calcification (diagnosis #3) is a common, idiopathic, incidental lesion in aging rhesus. It is possible that these foci of calcification initially are infarcts, but this is considered somewhat unlikely as adrenal calcification of varying degrees is commonly seen whereas infarcts are not.

The inflammatory component of diagnosis #2, which can cause diarrhea and potentially other sequelae thereof, represents typical changes in this species in this colony, and they have been previously discussed. Inflammatory changes present are consistent with food allergy/hypersensitivity/dietary intolerance/IBD. The large intestinal organisms should be considered commensals although they are potential pathogens. Please contact me if you wish to discuss these changes further.

Please contact me with any questions, comments, concerns or desired changes/additions.

Pathologist____RM_____

Exhibit 42

Accession #___20-020_
Submission Date 29 Jan 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____CP_____ Investigator___HK____ Animal ID #___Z16047_____
Species_____Mn____ Requester's Phone_____

Date of Death___29 Jan 20_____ Date of Necropsy_29 Jan 20__Time__0930__Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _2 Jun 20___ ☐ Preliminary __29 Jan 20_____ ☐ Amended _____

Clinical History:

This animal was assigned to the project "UCLA CIRM". The animal received chemical marrow ablation with marrow transplantation and has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 3 year old, 4.6 kg, intact male with inactive reproductive tract pig-tailed macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There are no significant external lesions and the integumentary and musculoskeletal systems are unremarkable.

The nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes moderate sized, and the spleen has multifocal moderate capsular irregular indentations and mild fibrosis with mild adhesions to omentum secondary to laparoscopic biopsies) systems are unremarkable besides stated changes.

Gross Diagnosis(es):

1. Unremarkable gross exam

Gross Comments:

Samples acquired as per research protocol (copy of protocol in case folder) and representative samples of all remaining available organs acquired for histology.

Histological Findings:

Sections/blocks of lymph nodes are as follows: 5 is axillary, 6 is pulmonary hilar, 7 is iliac, 8 is inguinal, 9 is mesenteric, and 10 is submandibular.

Stomach, small intestine and large intestine have moderate lamina propria infiltrate of/increase in eosinophils, lymphocytes, plasma cells, and macrophages. The small intestine has moderate villar blunting and fusion and scattered tortuous crypts, and areas of moderate to extensive goblet cell hyperplasia. Large and small intestine have moderate increase in mucosal cell turnover (apoptosis). Large intestine has near-diffuse, superficial mucosal, adherent prolifertation of curved to coiled bacterial organisms (spirochetosis). Fundic stomach has extensive spiral bacteria infection. GALT is unremarkable and moderately active.

One section of lung has two small arterioles partially (one) to completely (other) occluded by macrophages and giant cells with fewer eosinophils, and the one occluded arteriole has a luminal, semi-circular, translucent, slightly refractile and granular foreign object that is approximately 50 x 25 micrometers. Lungs also have mild perivascular, peribronchiolar and peribronchial lymphohistiocytic aggregates.

Sections of brain, pituitary gland, eye, lymph nodes (moderate follicular activity, and the iliac node has moderate hemosiderosis from past blood draws), spleen (moderate follicular activity and reactive endothelium), thymus (active), liver (mild lymphohistiocytic aggregates, centrilobular to midzonal hydropic hepatocellular degeneration, and lobular collapse), gall bladder, kidneys (mild diffuse membranoproliferative change of glomeruli and scattered lymphohistiocytic aggregates), urinary bladder, heart, trachea (mild submucosal lymphohistiocytic aggregates), air sac (mild submucosal lymphohistiocytic aggregates), pancreas, salivary gland (minimal multifocal lymphohistiocytic aggregates), thyroid glands, parathyroid glands, adrenal gland, tongue (mild submucosal lymphohistiocytic aggregates), skeletal muscle, testicle (inactive), epididymis, seminal vesicle, bone with marrow, and skin with mammary teat and duct are unremarkable besides stated minor changes.

Final Principal Diagnosis(es):

1. Moderate, diffuse, eosinophilic, lymphoplasmacytic and histiocytic gastro-entero-colitis with enteric villar blunting and fusion, and with extensive, near-diffuse large intestinal spirochetosis and extensive, diffuse-fundic spiral bacteria infection
2. Focal, pulmonary arteriolar vascular occlusion by foreign material with mild histiocytic and eosinophilic, regional arteriolitis

---

Histology Comments:

The inflammatory component of diagnosis #1, which can cause diarrhea and potentially other sequelae thereof, represents typical changes in this species in this colony, and they have been previously discussed. Inflammatory changes present are consistent with food allergy/hypersensitivity/dietary intolerance/IBD. The organisms diagnosed should be considered commensals although they are potential pathogens. Please contact me if you wish to discuss these changes further.

The pulmonary arteriolar foreign material with vascular occlusion and resultant inflammation consistent with foreign-body type inflammation and regional minor hypersensitivity was a clinically insignificant lesion. It is included as a diagnosis because if large amounts of foreign material enter the pulmonary vasculature then there can be significant clinical consequences. The foreign material, as stated above, was in the vascular system and lodged in the small vessel described. Likely the material was either inadvertently injected or is a catheter fragment that embolized.

Please contact me with any questions, comments, concerns or desired changes/additions.

Pathologist_____RM_____

Exhibit 43

University of Washington
National Primate Research Center

Accession # 20-207
Submission Date 21 Dec 20

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester CP Investigator HK Animal ID # A18128
Species Mm Requester's Phone

Date of Death 21 Dec 20 Date of Necropsy 21 Dec 20 Time 1100 Pathologist RM

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☐ Final 8 Mar 21 ☐ Preliminary 21 Dec 20 ☒ Amended 12 Mar 21

Clinical History:

This animal was assigned to the project "Cell and gene therapy for HIV cure" and was inoculated with SHIV in Feb 19. The animal has been clinically normal with recent unremarkable bloodwork besides slightly decreased CD4+ cell count.

Gross Description:

A 5 year old, ~6.7 kg, intact female with active reproductive tract rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth, and otherwise there are no significant external lesions and the integumentary and musculoskeletal systems are unremarkable.

The nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes small sized, and the spleen has multifocal capsular irregular indentations and fibrosis secondary to laparoscopic biopsies) systems are unremarkable besides stated changes.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Samples acquired as per research protocol (copy of protocol in case folder) and representative samples of all remaining available organs acquired for histology.

Histological Findings:

Sections/blocks of lymph nodes are as follows: 5 is axillary, 6 is pulmonary hilar, 7 is iliac (and sacral), 8 is inguinal (not present – deeper levels are pending), 9 is mesenteric, and 10 is submandibular.

Kidneys have mild to occasionally moderate, multifocal, interstitial lymphohistiocytic aggregates, and one kidney has a mid-cortical, radially oriented, approximately 1mm long x 0.5 mm wide lymphohistiocytic aggregate and interstitial fibrosis with effacement of a small portion of parenchyma (subclinical infarct). There also is mild diffuse membranoproliferative change of glomeruli.

Stomach, small intestine and large intestine have mild to moderate lamina propria infiltrate of/increase in eosinophils, lymphocytes, plasma cells, and macrophages. The small intestine has moderate villar blunting and fusion, scattered tortuous crypts, and one section has extensive goblet cell hyperplasia. Large and small intestine have mild to moderate increase in mucosal cell turnover (apoptosis). Large intestine has diffuse, moderate to extensive, superficial mucosal, adherent prolifertation of curved to coiled bacterial organisms (spirochetosis). Fundic stomach has extensive diffuse spiral bacteria infection. Esophagus is unremarkable. GALT is unremarkable and mildly to moderately active.

Sections of brain, pituitary gland, eye, lymph nodes (low follicular activity), spleen (low to moderate follicular activity and areas of mild capsular reactive fibrosis secondary to previous biopsies, reactive endothelium, and a minute focus on the capsule with granulomatous and fibrosing inflammation surrounding macrophages and giant cells with a central microscopic focus of plant material – likely a surgical gauze sponge fragment), thymus (moderately active/partly involuted), liver (minimal lobular collapse and lymphhistiocytic aggregates, and Ito cell vacuolation), gall bladder, urinary bladder, heart, aorta, lungs (mild perivascular, peribronchial and peribronchiolar lymphohistiocytic aggregates), trachea (minimal submucosal lymphohistiocytic aggregates), pancreas (mild chronic serositis), salivary gland (solitary small lymphohistiocytic aggregate), thyroid glands, parathyroid gland, adrenal gland (mild multifocal regions of calcification of corticomedullary junction and mild nodular cortical hyperplasia), tongue, skeletal muscle, oviducts, uterus, bone with marrow, and skin with mammary gland are unremarkable besides stated minor changes.

Final Principal Diagnosis(es):

1. Mild to moderate, multifocal, granulomatous interstitial nephritis
2. Mild to moderate, diffuse, eosinophilic, lymphoplasmacytic and histiocytic gastro-entero-colitis with enteric villar blunting and fusion, and with extensive, diffuse, large intestinal spirochetosis and gastric-fundic spiral bacterial infection

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Histology Comments:

The renal lesions were subclinical and have numerous potential possible causes, including consequences of experimental manipulations.

The inflammatory component of diagnosis #2, which can cause diarrhea and potentially other sequelae thereof, represents typical changes in this species in this colony, and they have been previously discussed. Inflammatory changes present are consistent with food allergy/hypersensitivity/dietary intolerance/IBD. The bacterial organisms diagnosed should be considered commensals in my opinion. Please contact me if you wish to discuss these changes further.

Adrenal calcification (not diagnosed in this case as the lesions were mild) is a common, idiopathic, incidental, progressive process in rhesus.

Please contact me with any questions, comments, concerns or desired changes/additions.

Pathologist_____RM_____

ADDENDUM 12 MAR 21 RM

Deeper levels of the inguinal lymph node block do not identify lymph node. Additional levels will not be done to preserve the tissue in the event special procedures are desired on this node.

Exhibit 44

Accession #___21-017_
Submission Date 1 Feb 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____GW_____ Investigator___GW___ Animal ID #___Z13108_____
Species_____Mn____ Requester's Phone_____

Date of Death___1 Feb 21_____ Date of Necropsy_____1 Feb 21_Time_1030___Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __12 Mar 21___ ☐ Preliminary __1 Feb 21_____ ☐ Amended _____

Clinical History:

This animal was assigned to the project "Optimizing a model of *Mycoplasma genitalium* reproductive tract infection in female Mn". The animal was inoculated multiple times with the agent intravaginally. The animal has remained clinically normal with recently unremarkable bloodwork.

Gross Description:

A 7 year old, 9.1 kg, intact female with active reproductive tract, pig-tailed macaque is presented euthanized in good nutritional and postmortem condition. There is moderate tartar deposition on the teeth. Otherwise, there are no significant external lesions and the integumentary and musculoskeletal systems (including hip, stifle, shoulder and elbow joints) are grossly unremarkable.

The dorsal cranial bladder wall has a large, approximately 2 cm diameter, round, mural mass that is on section tan white with central necrosis. Otherwise, the urogenital, nervous, respiratory, cardiovascular, digestive, endocrine and hemic-lymphatic systems are grossly unremarkable.

Gross Diagnosis(es):

1. Mural mass – urinary bladder – suspect leiomyoma

Gross Comments:

The urinary bladder mass was clinically silent currently, and is a suspect leiomyoma, although other lesions are possible. Samples acquired as per research protocol (copy of protocol in case folder). Limited histology of reproductive tissue, iliac lymph nodes, and the urinary bladder are pending.

Histological Findings:

Sections/blocks are as follows:

1 is left oviduct ampulla
2 is right oviduct ampulla
3 is left oviduct fimbria
4 is right oviduct fimbria
5 is left oviduct isthmus
6 is right oviduct isthmus
7 is left ovary
8 is right ovary
9 is iliosacral lymph node
10 is uterus
11 is cervix and distal vagina
12 is proximal to mid vagina and labia
13 is the urinary bladder and associated mass

The urinary bladder wall mass centrally consists of necrotic debris, degenerate neutrophils and abundant monomorphic plant material (surgical gauze sponge). This is in turn surrounded by granulomatous and fibrosing inflammation with abundant similar plant material with numerous giant cells, and there is an outer wall of thick, dense, mature collagen (gossypiboma). The mass is adhered by fibrous tissue to the bladder wall, and the bladder is otherwise unremarkable besides a solitary, small lymphohistiocytic aggregate in the mid wall.

The endocervix (uterine cervix) is unremarkable, whereas the ectocervix (vaginal cervix) and distal vagina have mild to moderate, submucosal and also sometimes perivascular aggregates of lymphocytes and macrophages with fewer plasma cells, and with epithelial infiltration (exocytosis) multifocally.

Sections of the left and right ampulla (very rare round cell – lymphocyte and/or macrophage - in the submucosa), left and right fimbria (the submucosa and the wall have a minute, perivascular lymphohistiocytic aggregate, and very rare round cells elsewhere), left and right isthmus, left and right ovary (active), uterus (the mid wall has a plant fragment consistent with a fragment of gauze associated with macrophages and the serosa has mild to moderate granulomatous and fibrosing serositis – both likely from previous C-section), vagina and labia (very rare round cells including some gold-brown pigment-laden macrophages, the latter likely from past menses, and the serosa adjacent to the gossypiboma has moderate sclerosing and histiocytic to granulomatous serositis with some gold-brown pigment-laden macrophages, and these serosal changes are secondary to the presence of the gossypiboma), and iliosacral lymph node (moderate follicular activity) are unremarkable besides stated changes.

Final Principal Diagnosis(es):

1. Urinary bladder-associated gossypiboma
2. Mild to moderate, multifocal, granulomatous (lymphocytic, histiocytic and plasmacytic) ectocervicitis and vaginitis

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Histology Comments:

The gossypiboma was due to a surgical gauze sponge left likely during the C-section. The lesion notably was incidental.

There are no clinically significant changes in other tissues/organs examined. There however was a subclinical cervicitis and vaginitis; although some lymphohistiocytic aggregates are typically present in adult female macaques at these sites, they were in my opinion slightly increased beyond baseline. The cause is suspect as being the experimental infection.

Please contact me with any questions, comments or concerns.

Pathologist_____RM_____

Exhibit 45

Accession #___18-124_
Submission Date_7 Jun 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A16144_____
Species_____Mm____ Requester's Phone_____

Date of Death___7 Jun 18_____ Date of Necropsy___7 Jun 18_Time____0930_Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _21 Aug 18___ ☐ Preliminary __7 Jun 18_____ ☐ Amended _____

Clinical History:

Eight year old male rhesus macaque assigned to the project "Immunogenicity and protective efficacy of therapeutic SIV vaccines in NHP's". The animal was inoculated with SIV Delta B670 in Sep '16. The animal has remained clinically normal however there is marked, chronic elevation of BUN and creatinine, thrombocytopenia, anemia and hypophosphatemia. Euthanized at end of project.

Gross Description:

A 8 year old, approximately 8.5 kg, intact male with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is multifocal, moderate alopecia of the legs, some missing fingertips healed over, slight tooth wear and tartar deposition, and the integumentary and musculoskeletal systems are otherwise grossly unremarkable besides scars from previous experimental surgeries.

Kidneys are diffusely pale with scattered cysts. Otherwise the urogenital system is grossly unremarkable.

The spleen is greatly enlarged with military white nodules throughout. Lymph nodes throughout the body are moderate to large size. The hemic-lymphatic system is otherwise grossly unremarkable (besides adhesions noted below).

There are moderate, multifocal adhesions of bowel to mestenery and body wall, and the jejuncectomy site is well-healed though firmly adhered to adjacent jejunum and adhered to jejunal mesenteric nodes. The nervous, cardiovascular, respiratory, digestive, and endocrine systems are otherwise grossly unremarkable.

Gross Diagnosis(es):

1. Marked splenomegaly – suspect lymphoid hyperplasia
2. Marked, diffuse nephropathy with moderate cystic change
3. Moderate, multifocal, fibrous abdominal adhesions

Gross Comments:

Renal changes suggest chronic interstitial nephritis (likely secondary to Tenofovir administration). The splenomegaly is interpreted as being due to lymphoid hyperplasia from antigenic stimulation. The adhesions from past jejunectomies and other surgeries were currently clinically insignificant. Samples acquired as per research protocol (copy of protocol in case folder). Histology is pending on representative tissues/organs preserved in formalin.

Histological Findings:

Slides/blocks are as follows:

1 is pulmonary hilar lymph node
7 is axillary lymph node
8 is iliac node
9 is inguinal node
10 is mesenteric node
11 is retropharyngeal node
12 is duodenum
13 is ileum
14 is ileocecal lymph node
15 is rectum
16 is bone marrow

Kidneys have moderate to extensive, diffuse, interstitial reactive and mature fibrosis with granulomatous infiltrate including lymphofollicular formation multifocally, and there is moderate to moderately extensive effacement of parenchyma. Glomeruli have moderate to extensive enlargement with membranoproliferative change and scattered sclerotic/effaced glomeruli. There is mulfocal Bowman's capsule sclerosis, hyperplasia of parietal Bowman's epithelium, and occasional glomerular synechiae. Tubules have moderate to large numbers of small to moderately large cysts with flattened epithelium, and other tubules have multifocal extensive cytoplasmic protein deposition, there is multifocal tubular degeneration and regeneration, and scattered proteinaceous casts. Urinary bladder is unremarkable.

A lymph node adjacent to the pancreas has focal, malignant transformation of lymphocytes: There is loss/effacement of lymphoid architecture by a monotonous population of medium to large lymphocytes with moderate to high mitotic index and with moderate infiltration of adjacent pancreas and adipose. Pancreas is otherwise unremarkable.

Lymph nodes have moderate to more often marked lymphofollicular reactivity, mesenteric node has peripheral sclerosing and granulomatous serositis (secondary to jejunectomies), and spleen also has marked lymphofollicular reactivity and mild, multifocal pigment deposition.

Stomach, small intestine and large intestine have mild to moderate lamina propria infiltrate of/increase in eosinophils, lymphocytes, plasma cells, and macrophages. Fundic stomach has multifocal, extensive spiral bacteria infection. The small intestine has moderate villar blunting and fusion, scattered tortuous crypts, and increase in mucosal cell turnover (apoptosis). Large intestine has multifocal, extensive, superficial, adherent proliferations of curved to coiled bacteria (spirochetosis), mild increase in mucosal cell turnover, and scattered crypt loss. There also is scattered moderate sclerosing and granulomatous serositis of the GI tract (secondary to past jejunectomies). Esophagus is unremarkable. GALT is unremarkable.

Sections of brain, pituitary gland, eye, liver (mild lobular collapse and lymphohistiocytic aggregates), gall bladder, heart (septum has a focal, moderate aggregate of lymphocytes, plasma cells and macrophages, and there are minimal similar aggregates elsewhere), aorta, lungs (mild perivascular, peribronchial and peribronchiolar lymphohistiocytic aggregates and pneumoconiosis), trachea, salivary gland (mild multifocal lymphohistiocytic aggregates), adrenal glands (mild multifocal nodular cortical hyperplasia), thyroid glands, tongue, skeletal muscle, skin with mammary gland, testis, epididymis, serminal vesicle, prostate gland and bone marrow are unremarkable.

Final Principal Diagnosis(es):

1. Severe, diffuse, fibrosing and granulomatous interstitial nephritis with membranoproliferative glomerulonephritis and tubular cyst formation
2. Lymphosarcoma "in-situ": pancreatic lymph node
3. Marked lymphoid hyperplasia: lymph nodes and spleen
4. Mild to moderate, diffuse, eosinophilic, lymphoplasmacytic and histiocytic gastro-entero-colitis with enteric villar blunting and fusion, and with extensive fundic spiral bacteria infection and multifocal large intestinal spirochetosis

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Histology Comments:

The chronic interstitial nephritis was likely due to Tenofovir administration. Moderately extensive renal compromise would have been predicted which is consistent with antemortem bloodwork.

The lymphosarcoma "in-situ" (very early and localized lymphoma) was likely due to malignant transformation of lymphocytes from reactivation of a latent herpesvirus infection (macaque homologs of EBV and KSHV) secondary to the SIV infection. This has occurred in a number of animals on this study (see 18-146 and 148; A16234 and A16149). The marked lymphoid hyperplasia present systemically (diagnosis #3) often precedes this transformation, and the lymphoid reactivity itself indicates profound antigenic stimulation likely from a variety of sources including the SIV infection and reactivation of a latent herpesvirus infection(s).

Diagnosis #4, which can cause diarrhea and potentially other sequelae thereof, represents typical changes in this species in this colony, and they have been previously discussed. Changes present are consistent with food allergy/hypersensitivity/dietary intolerance/IBD. The organisms diagnosed should be considered commensals that are potentially opportunistic pathogens. Please contact me if you wish to discuss these changes further.

Please contact me with any questions, comments, concerns or desired changes/additions.

Pathologist_____RM_____

Exhibit 46

Accession #___20-083_
Submission Date_1 May 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19139
Species_____Mm____ Requester's Phone_____

Date of Death__1 May 20_____ Date of Necropsy_1 May 20_Time_0930_____Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __1 May 20_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR twice with SIV in Jan '20. The animal has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 5 year old, 7.7 kg, intact male with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. Both pinnae are missing and healed over, and multiple digits are missing as well and healed over. There is mild tartar deposition on the teeth. Otherwise, there are are no significant external lesions and the integumentary system is grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes moderate to moderately large sized) are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Pathologist_____RM_____

Exhibit 47

Accession #___20-095_
Submission Date_13 May 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19118
Species_____Mm____ Requester's Phone_____

Date of Death__13 May 20_____ Date of Necropsy_13 May 20_Time_0930___Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __13 May 20_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR 2X with SIV in Feb '20. The animal has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 5 year old, 7.7 kg, intact female with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth, numerous digits are missing and healed over, and both pinnae are mostly missing and healed over. There are are no other significant external lesions and the integumentary system is otherwise grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, respiratory, digestive, urogenital, endocrine (adrenal glands have multifocal moderate calcification) and hemic-lymphatic (lymph nodes moderate to large sized) are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Pathologist_____RM_____

Exhibit 48

Accession #___20-097_
Submission Date_14 May 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19138
Species_____Mm____ Requester's Phone_____

Date of Death__14 May 20_____ Date of Necropsy_14 May 20_Time_0930___Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __14 May 20_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR 4X with SIV beginning in Jan '20. The animal has remained clinically normal with unremarkable bloodwork besides intermittent mild thrombocytopenia.

Gross Description:

A 5 year old, 9.1 kg, intact male with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is mild tartar deposition on the teeth, multiple missing digits that are healed over, and the left pinnae is partially missing and healed over. There are are no other significant external lesions and the integumentary system is otherwise grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes moderate to very large sized – submandibular nodes are very large) are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Pathologist_____RM_____

Exhibit 49

Accession #___20-108_
Submission Date_4 Jun 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19135
Species_____Mm____ Requester's Phone_____

Date of Death__4 Jun 20_____ Date of Necropsy_4 Jun 20_Time_1030Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __11 Sep 20__ ☐ Preliminary __4 Jun 20_____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR 6X with SIV starting in Feb '20. The animal has remained clinically normal with unremarkable bloodwork besides thrombocytopenia and monocytosis.

Gross Description:

A 6 year old, 11.0 kg, intact male with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth, and the left pinnae is mostly missing and healed over. Otherwise, there are are no significant external lesions and the integumentary system is otherwise grossly unremarkable.

The caudal-distal-mid regions of both caudal lung lobes each have an approximately 2x1x1 cm deep purple, firm focus (infarcts). A large artery in the middle of the right caudal lung lobe has a suspect partially occlusive thrombus. The respiratory system is otherwise grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes generally moderate sized) are grossly unremarkable.

Gross Diagnosis(es):

1. Moderate, chronic, bilateral pulmonary infarcts: bilateral caudal lung lobes: with suspect pulmonary thrombus

Gross Comments:

The pulmonary changes suggest the syndrome of "proliferative-occlusive pulmonary arteriopathy with thrombosis and infarction". Histology is required to confirm/further elucidate; please inform me if histology is desired.

Otherwise, changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Histological Findings:

Multiple sections of lungs and large airways reveal moderate numbers of medium sized to large arteries and arterioles with partial to complete luminal occlusion by irregular nodules of mixed smooth muscle and fibrous to occasionally mucinous connective tissue; the connective tissue is mostly mature but also reactive. These lesions contain mild granulomatous infiltrate with some macrophages containing gold-brown pigment (hemosiderin from past hemorrhage), and occluded vessels have small areas of luminal recanalization. A moderate sized peripheral alveolar infarct has interstitial to effacing fibrosis that is mixed reactive and mature/long-standing, there is moderate granulomatous infiltrate with moderate numbers of pigment laden macrophages in remaining alveoli, moderate multifocal regions of type II pneumocyte hyperplasia, and the pleura has moderate fibrosis and proliferation of reactive granulation tissue with mesothelial hyperplasia.

There also is minimal peribronchial, peribronchiolar, and perivascular lymphohistiocytic aggregates and pneumoconiosis.

Final Principal Diagnosis(es):

1. Moderate to occlusive, multifocal, arteriolar and arterial, nodular, smooth muscle and connective tissue proliferations with chronic infarction and vascular recanalization: **"Proliferative-occlusive pulmonary arteriopathy with infarction"**

Histology Comments:

As suspected at gross exam, the pulmonary lesions are consistent with the syndrome "Proliferative-occlusive pulmonary arteriopathy with thrombosis and infarction". This syndrome is secondary to the SIV infection, the syndrome is virus strain-related with some strains having very high incidence though others have moderate to low incidence, and the pathogenesis is poorly understood. The most common clinicopathologic abnormality associated with the syndrome is chronic thrombocytopenia, which this animal had. Sudden death can occur with large, acute infarcts. Overall, lesions in this animal were moderate and clinically silent.

Please contact me with any questions, comments or concerns.

Pathologist_____RM_____

Exhibit 50

Accession #___20-107_
Submission Date_4 Jun 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____DF_____ Investigator___DF____Animal ID #___A19130
Species_____Mm____ Requester's Phone_____

Date of Death__4 Jun 20_____ Date of Necropsy_4 Jun 20_Time_0930Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __4 Jun 20_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

This rhesus macaque was assigned to the project "Prophylactic SIV Vaccines and Optimization of different Adjuvant combinations in NHP". The animal was vaccinated multiple times and then challenged IR 8X with SIV starting in Jan '20. The animal has remained clinically normal with unremarkable bloodwork.

Gross Description:

A 4 year old, 6.3 kg, intact female with active reproductive tract, rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There is minimal tartar deposition on the teeth, most of the left pinnae is missing and healed over, and there are multiple missing digits that are healed over. Otherwise, there are are no significant external lesions and the integumentary system is otherwise grossly unremarkable.

The musculoskeletal, nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes generally moderate sized) are grossly unremarkable.

Gross Diagnosis(es):

1. Unremarkable tissues/organs

Gross Comments:

Changes of significance are not identified at gross exam. Tissues/organs harvested as per research protocol (copy of protocol in case folder). Histology is not requested.

Pathologist_____RM_____

Exhibit 51

Accession # 20-125
Submission Date 25 Jun 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester CP Investigator HK Animal ID # A15108
Species Mm Requester's Phone

Date of Death 22 Jun 20 Date of Necropsy 22 Jun 20 Time 0930 Pathologist RM

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 4 Dec 20 ☐ Preliminary 25 Jun 20 ☐ Amended

Clinical History:

This animal was assigned to the project "Kean SHIV Reservoir". The animal was challenged with SHIV 1157ipd3N4 in Nov '17 and has recently been clinically normal with mostly unremarkable bloodwork (slight decrease in CD4+ lymphocytes).

Gross Description:

A 10 year old, ~9 kg, intact female with active reproductive tract rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and overly abundant adipose stores) condition. There are no significant external lesions besides mild tartar deposition on teeth, 3 distal portions of digits on the right hand that are healed over, and partially missing pinnae that are healed over, and the integumentary and musculoskeletal systems are otherwise unremarkable.

There are mild to moderate, multifocal, firm, white (fibrous) adhesions of visceral pleura of lungs to parietal pleura of the chest wall. The respiratory system is otherwise grossly unremarkable.

The nervous, cardiovascular, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes small to very small sized, and the spleen is also small and has multifocal capsular irregular indentations and fibrosis with mild adhesions to omentum secondary to laparoscopic biopsies) systems are unremarkable besides stated changes.

Gross Diagnosis(es):

1. Mild, multifocal, fibrous pleural adhesions

Gross Comments:

The fibrous pleural adhesions were clinically insignificant, and likely from past lung mite infection while in the country of origin. Samples acquired as per research protocol (copy of protocol in case folder) and representative samples of all remaining available organs acquired for histology.

Histological Findings:

Sections/blocks of lymph nodes are as follows: 5 is axillary, 6 is pulmonary hilar, 7 is iliac, 8 is inguinal, 9 is mesenteric, and 10 is submandibular. Lymph nodes have slight activity, hilar nodes have moderate pigment deposition, and mesenteric and submandibular nodes are very small fragments.

Stomach, small intestine and large intestine have mild to moderate lamina propria infiltrate of/increase in eosinophils, lymphocytes, plasma cells, and macrophages. The small intestine has moderate villar blunting and fusion and scattered tortuous crypts, and areas of extensive goblet cell hyperplasia. Large and small intestine have mild increase in mucosal cell turnover (apoptosis). Large intestine has multifocal, extensive, superficial mucosal, adherent prolifertation of curved to coiled bacterial organisms (spirochetosis). Fundic stomach has extensive spiral bacteria infection. GALT is unremarkable.

Sections of brain, pituitary gland (focal small lymphohistiocytic aggregate), eye, spleen (slight to moderate follicular activity and mild multifocal capsular chronic inflammation secondary to previous biopsies), liver (diffuse Ito cell vacuolation, minimal lobular collapse and lymphohistiocytic aggregates), kidneys (mild to moderate diffuse membranoproliferative change of glomeruli), urinary bladder, heart (mild steatosis and minimal megalo- and dyskaryosis), aorta, lungs (mild perivascular, peribronchial and peribronchiolar lymphohistiocytic aggregates and pneumoconiosis), trachea (focal submucosal lymphohistiocytic aggregate), pancreas, salivary gland (focal mild lymphohistiocytic aggregate), thyroid glands, adrenal gland (moderate, multifocal calcification of corticomedullary region), tongue, skeletal muscle, oviducts, uterus, bone with marrow, and skin with mammary gland are unremarkable besides stated minor changes.

Final Principal Diagnosis(es):

1. Mild to moderate, diffuse, eosinophilic, lymphoplasmacytic and histiocytic gastro-entero-colitis with enteric villar blunting and fusion, and with extensive, multifocal large intestinal spirochetosis and diffuse-fundic gastric spiral bacteria infection
2. Moderate, multifocal calcification of corticomedullary junction: adrenal gland

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Histology Comments:

The inflammatory component of diagnosis #1, which can cause diarrhea and potentially other sequelae thereof, represents typical changes in this species in this colony, and they have been previously discussed. Inflammatory changes present are consistent with food allergy/hypersensitivity/dietary intolerance/IBD. The organisms diagnosed should be considered commensals although they are potential pathogens. Please contact me if you wish to discuss these changes further.

Adrenal corticomedullary calcification is a common, idiopathic, incidental lesion in rhesus macaques.

Please contact me with any questions, comments, concerns or desired changes/additions.

Pathologist_____RM_____

Exhibit 52

Accession #___20-121__
Submission Date 22 Jun 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____CP_____ Investigator___HK____ Animal ID #___A15106_____
Species_____Mm____ Requester's Phone_____

Date of Death___22 Jun 20_____ Date of Necropsy_22 Jun 20__Time__0930__Pathologist ___RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☐ Final _3 Dec 20___ ☐ Preliminary __22 Jun 20___ ☒ Amended __11 Dec 20__

Clinical History:

This animal was assigned to the project "Kean SHIV Reservoir". The animal was challenged with SHIV 1157ipd3N4 in Nov '17 and has recently been clinically normal with unremarkable bloodwork.

Gross Description:

A 11 year old, ~7.4 kg, intact female with active reproductive tract rhesus macaque is presented euthanized in good postmortem and nutritional (adequate muscling and adipose stores) condition. There are no significant external lesions (mild tartar deposition on teeth, and portions of both pinnae are missing and healed over) and the integumentary and musculoskeletal systems are unremarkable.

There are mild to moderate, multifocal, firm, white (fibrous) adhesions of visceral pleura of lungs to parietal pleura of the chest wall. The respiratory system is otherwise grossly unremarkable.

The nervous, cardiovascular, digestive, urogenital, endocrine and hemic-lymphatic (lymph nodes small sized, and the spleen has multifocal capsular irregular indentations and fibrosis with mild adhesions to omentum secondary to laparoscopic biopsies) systems are unremarkable besides stated changes.

Gross Diagnosis(es):

1. Mild to moderate, multifocal, fibrous pleural adhesions

Gross Comments:

The fibrous pleural adhesions were clinically insignificant, and likely from past lung mite infection while in the country of origin. Samples acquired as per research protocol (copy of protocol in case folder) and representative samples of all remaining available organs acquired for histology.

Histological Findings:

Sections/blocks of lymph nodes are as follows: 5 is axillary, 6 is pulmonary hilar, 7 is iliac, 8 is inguinal, 9 is mesenteric, and 10 is submandibular.

Stomach, small intestine and large intestine have mild to moderate lamina propria infiltrate of/increase in eosinophils, lymphocytes, plasma cells, and macrophages. The small intestine has moderate villar blunting and fusion and scattered tortuous crypts, and areas of extensive goblet cell hyperplasia. Large and small intestine have mild to moderate increase in mucosal cell turnover (apoptosis). Large intestine has multifocal, extensive, superficial mucosal, adherent prolifertation of curved to coiled bacterial organisms (spirochetosis). GALT is unremarkable.

An axillary lymph node has 3 microgranulomas. Lymph nodes have slight to moderate activity, the hilar nodes have moderate pigment deposition, and a iliac node has moderate hemosiderosis (secondary to femoral blood draws).

Liver has mild to moderate, diffuse deposition of gold-brown pigment in Kuppfer cells (hemosiderosis). There also are minimal, multifocal lymphohistiocytic aggregates. Gall bladder is unremarkable.

Uterus has mild, multifocal aggregates of endometrial glands in the superficial to mid muscularis (adenomyosis). Oviducts are unremarkable.

Sections of brain, pituitary gland, eye, spleen (slight follicular activity and mild follicular amyloidosis), thymus (residual), kidneys (mild diffuse membranoproliferative change of glomeruli and rare interstitital lymphohistiocytic aggregates), urinary bladder, heart (mild steatosis, megalo- and dyskaryosis, and rare small lymphohistiocytic aggregates), aorta, lungs (mild perivascular, peribronchial and peribronchiolar lymphohistiocytic aggregates and pneumoconiosis, and regions of agoal congestion), trachea, pancreas, salivary gland (multifocal minimal lymphohistiocytic aggregates), thyroid glands, adrenal gland (mild, multifocal calcification of corticomedullary region), tongue, skeletal muscle, bone with marrow, and skin with mammary gland are unremarkable besides stated minor changes.

Final Principal Diagnosis(es):

1. Mild to moderate, diffuse, eosinophilic, lymphoplasmacytic and histiocytic gastro-entero-colitis with enteric villar blunting and fusion, and with extensive, multifocal large intestinal spirochetosis
2. Mild, multiple, microgranulomas: axillary lymph node
3. Mild to moderate, diffuse, hepatic hemosiderosis
4. Mild, multifocal adenomyosis

Histology Comments:

The inflammatory component of diagnosis #1, which can cause diarrhea and potentially other sequelae thereof, represents typical changes in this species in this colony, and they have been previously discussed. Inflammatory changes present are consistent with food allergy/hypersensitivity/dietary intolerance/IBD. The large intestinal organism diagnosed should be considered commensals although they are potential pathogens. Please contact me if you wish to discuss these changes further.

The axillary microgranulomas are idiopathic and have many possible causes including consequences of past node biopsies. The lesions were clinically insignificant. A special stain for mycobacteria is pending and an addendum will follow.

The hepatic hemosiderosis also was clinically insignificant, and as in past similar cases likely secondary to iron supplementation.

Adenomyosis (and endometriosis) is very common in rhesus, the lesion can impede fertitility, and is a precursor lesion to endometriosis. Lesions in this animal were early.

Please contact me with any questions, comments, concerns or desired changes/additions.

Pathologist_____RM_____

ADDENDUM 11 DEC 20 RM

Fite's acid fast stain of the axillary microgranulomas is negative.

Exhibit 53

Accession #___18-056_
Submission Date_6 Mar 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18047___
Species_____Mn____ Requester's Phone_____

Date of Death_21 Feb 18_ Date of Necropsy_21 Feb 18____Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _21 May 18___ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History and Gross Findings:

Four week old, 600 gm, female, from dam Z13123 from SPF colony at NIRC. Found dead in cage, and necropsy findings were good body condition, and severe, multicentric (head, chest, abdomen) trauma.

Histological Findings:

Lungs have massive, multicentric, acute hemorrhage.

Sections of spleen, lymph nodes, thymus, liver with gall bladder, heart, kidneys, GI tract and pancreas, muscle, and skin are unremarkable besides autolysis.

Final Principal Diagnosis(es):

1. Massive, multicentric, acute trauma/hemorrhage

Histology Comments:

Demise was due to conspecific trauma as per gross and histological findings.

Please contact me with any questions, comments or concerns.

Pathologist _____RM___

Exhibit 54

Accession #___18-247_
Submission Date_31 Oct 18

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18198___
Species_____MN____ Requester's Phone___(206) 616-0501_____

Date of Death__10/30/18_ Date of Necropsy_10/30/18_Time____0900__Pathologist ____CMM____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __10 Dec 18____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

1 day old male infant was discovered in group enclosure when Animal Husbandry and Veterinary Services staff arrived at the colony that morning. This was the fourth infant from this dam (K06192). All previous births (2014, 2015, 2016) were unremarkable and had viable births.

Gross Description:

Examined is a 0.41kg, male pig-tail macaque in adequate body condition. On external examination there was an ~1 mm puncture wound in the medial canthus area of the left eye with bruising visibible in the right eyelid, over the nasal bridge and under both eyes. The left eye appeared dark in color and neither the iris nor pupil were visible. The right eye appeared cloudy. There were superficial scratches present on the right cheek. An ~0.5 mm puncture was present in the hard palate immediately caudal to the front middle incisor area. The left maxilla was freely moveable between middle left incisor area and the left canine tooth area. No other external abnormalities were detected.

The organs of the abdominal cavity were autolyzed. No digesta was present in the stomach. The lungs were a pale tan color with red mottling. All lung fields floated when placed in formalin.

There was extensive subcutaneous hemorrhage over the entire skull and all skull plates were freely moveable. There was an ~2 mm fracture in the right frontal plate running diagonally from the fontanele area towards the temple area. There was extensive hemorrhage over all areas of the brain and the brain was friable.

Gross Diagnosis(es):

1. Trauma

Gross Comments:

Histopathology is pending.

Histological Findings:

Besides moderate to extensive autolysis (as noted grossly) sections of brain, thymus, spleen, lymph node, liver, gall bladder, heart, adipose (adequate), kidneys, lungs (inflated and with moderate, multifocal, deep aspiration of amniotic cells and debris), skin, muscle, and GI tract are unremarkable.

Final Principal Diagnosis(es):

1. Acute, severe, cranial trauma

Histology Comments:

As per gross findings, death was due to cagemate trauma. The pulmonary aspiration suggests dystocia which could have resulted in a relatively weak infant. There was no other evidence of disease in sections examined although autolysis impedes microscopic evaluation.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 55

Accession #___19-006_
Submission Date_8 Jan 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z18229___
Species_____Mn____ Requester's Phone_____

Date of Death_25 Dec 18_ Date of Necropsy_25 Dec 18____Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☐ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _31 Jan 19___ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History and Gross Findings:

One day old, 350 gm, male, from dam Z13036 from SPF colony at NIRC. Found abandoned by dam 24 Dec, brought to nursery, and found dead the next day. Necropsy findings were puncture wound of right caudolateral thorax/cranial abdomen with moderate subcutaneous, peri-renal and abdominal hemorrhage.

Histological Findings:

One kidney (described above) has moderate peri-renal hemorrhage and fibrin deposition with large numbers of mixed bacteria, and also some plant material and a few white blood cells.

Sections of spleen, lymph nodes, thymus, liver, heart, lungs (mild deep aspiration of amniotic cells and debris), adipose (adequate), GI tract and pancreas, muscle, and skin with umbilicus are unremarkable.

Final Principal Diagnosis(es):

1. Traumatic puncture wound of right caudolateral thorax (gross diagnosis) with peri-renal hemorrhage and fibrin containing mixed bacteria and plant material

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Histology Comments:

Based upon history and gross and histological findings, proximal cause of demise is suspect as being due to inadequate nursing with resultant hypoglycemia. However, the (probable) bite wound with intra-abdominal introduction of mixed bacteria would have resulted in serious clinical signs if the animal had not died.

Please contact me with any questions, comments or concerns.

Pathologist _____RM___

Exhibit 56

Accession #___19-012_
Submission Date_18 Jan 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester_____CMM_____ Investigator___Colony_ Animal ID #___Z19005_____
Species_____Mn____ Requester's Phone___60501_____

Date of Death__1/12/19_____ Date of Necropsy 1/12/19 Time_1600___Pathologist ____CMM____
_____

Nutritional Condition: ☐ Adequate X Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __7 Feb 19____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

Infant was found dead in the enclosure. A moderate amount of blood was present, smeared on the perch and with numerous droplets beneath the perch.

Infant born 1/10/19 to Dam Z14320 in AA112. This is a new breeding group of young animals (5-6yo), and this was the first birth in the enclosure.

Gross Description:

A 0.50 kg (BCS 2/5) 3-day old male Pigtail macaque is presented for necropsy. Externally there are signs of trauma to the right skull. There are 2 side-by-side round (~2.5 cm diameter) areas of full-thickness skin missing from the right side of the head with a thin isthmus of skin between them. Bone underlying the most rostral lesion is missing in an abstract jagged shape (~1.5 cm in diameter at largest area). The brain is visible through the hole and parts of it seem to be missing.

Upon internal examination, the lungs float and appear subjectively to be a yellowish color. The sagittal suture line and the right coronal suture line are fractured. The underlying meninges are mildly hemorrhagic. The right mid-cerebrum in severely indented (possibly missing). The brain stem appeared hemorrhagic. When the brain was removed from the skull, the right cerebral hemisphere fell apart and broke into pieces.

Gross Diagnosis(es):

1. Trauma to the right skull/brain

Histological Findings:

Brain has moderate, multifocal, acute meningeal hemorrhage.

Sections of liver, gall bladder, thymus, spleen, lymph nodes, adipose (adequate), pancreas, heart, kidneys, lungs (focal small discrete alveolar pyogranulomatous infiltrate), and skin and deeper tissue at umbilicus (moderate, focal, regional, discrete chronic-active and ulcerative dermatitis, cellulitis and omphalitis with peripheral tissue having no lesions) are unremarkable besides stated minor changes.

Final Principal Diagnosis(es):

1. Severe, acute, cranial trauma (gross diagnosis) with histologic multifocal, moderate, acute meningeal hemorrhage

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Histology Comments:

As per history, gross findings and histology, demise was due to severe, acute, cranial trauma from a cagemate. For clarity, the umbilical inflammation was typical/within normal limits for a neonate.

Please contact either of us with any questions, comments or concerns.

Pathologist__CMM (gross)/RM (histo)____

Exhibit 57

Accession #___19-132_
Submission Date_21 Jun 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator___Colony_ Animal ID #___Z19169_____
Species_____Mn____ Requester's Phone_____

Date of Death___21 Jun 19_____ Date of Necropsy____21 Jun 19_Time_1130_Pathologist ____KG/CE___
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __25 Jun 19___ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

Z19169 (currently assigned to "Breeding") was born via natural birth on the evening of 6/16/2019 to a dam (A12255) that was previously assigned to the Adams project but was removed from study due to femoral catheter complications. The dam accepted the infant immediately and the infant was observed to be nursing and appeared healthy on cage side observation. On 6/17 and 6/18, the dam was noted to be intermittently laying down in the cage and on the afternoon of the 6/17, she pulled the infant off of her and refused to let the infant nurse. The dam was sedated for an exam and the infant was placed in the nursery. At that time it was suspected that the dam was uncomfortable due to a blocked mammary duct and possible non-infectious mastitis. Culture of the mammary milk was later confirmed to be negative for microorganisms. The blockage was resolved by stripping the teat and the dam was started on analgesia and antibiotics. The dam was still observed to be occasionally laying down on 6/19 and 6/20, but overall had improved. She was sedated on 6/20 for repeat exam and determined to have weakness and a small hernia of her body wall, which was subsequently repaired. On 6/21, the dam was recovering very well, so a reintroduction between the dam and infant was attempted. Upon placing the infant in the cage, the dam bit the infant's head several times before the infant could be removed from the dam.

The infant on initial veterinary exam was very pale with prolong CRT (~2-3 seconds). Heart rate was ~140 bpm and respiratory rate was >80 brpm. SPO2 varies from 75-95%. A large soft swelling was immediately identified on the cranium (right side > left side) and multiple skull bones appeared to be fractured on palpation of the skin on the cranium, which was intact. The swelling increased in size over the next 5 minutes and red bruising was noted to be forming on both upper eyelids. Intravenous catheter placement was attempted several times, but unsuccessful. Severe hypotension and hypovolemic shock was suspected. Due to grave prognosis, humane euthanasia was elected. The animal was deeply anesthetized with high dose ketamine and dexmeditomidine. Intracardiac administration of euthasol was attempted but unsuccessful, so intrathoracic euthasol was administered.

Gross Description:

A 5 day old, male, 620g pig-tailed macaque is presented euthanized for necropsy in adequate nutritional and good postmortem condition. There is severe, subcutaneous hemorrhage of the cranium (right side > left side), numerous complete skull fractures with several fractured bone pieces penetrating into the cerebral cortical tissue (right side > left) and cerebral cortical tissue protruding through various holes in the skull. There is approximately 5mm thick of the most superficial layers of the cerebral cortex partially transected away from the remaining deeper cerebral cortex, resulting in a macerated appearing flap. There also is severe diffuse subdural hemorrhage. There is a 1 cm deep laceration just distal to the right ischial callosity with muscle exposure and partial laceration of the muscle. There is a 2mm puncture wound on the left caudolateral chest that was full thickness through the skin but did not penetrate the muscle. Otherwise, the nervous, cardiovascular, respiratory, digestive, urogenital, endocrine, hemic-lymphatic, integumentary and musculoskeletal systems are grossly unremarkable.

Gross Diagnosis(es):

1. Massive, multicentric, acute, dam-induced trauma/bite wounds with skull fractures and eviscerated and lacerated cerebrum

Gross Comments:

Demise was due to dam-induced bite wounds. The entire body is preserved in formalin, although histology will not be performed. Please contact either of us with any questions, comments or concerns.

Pathologist_____KG/CE_____

Exhibit 58

Accession #___19-230_
Submission Date_4 Nov 19

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z19256___
Species_____Mn____ Requester's Phone_____

Date of Death__6 Oct 19_ Date of Necropsy_6 Oct 19_Time_____Pathologist ___NIRC____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __3 Feb 20____ ☐ Preliminary _____ ☐ Amended _____

Clinical History and Gross Findings:

300 gm male from unknown dam (dam not listed in ARMS) found dead with a crushed skull.

Histological Findings:

Sections of lymph node, spleen, thymus, adipose (adequate), liver, gall bladder, kidneys, heart and lungs (inflated) are unremarkable.

Final Principal Diagnosis(es):

1. Acute cranial trauma – crushed skull (gross diagnosis)

Histology Comments:

Inflated lungs indicate a live birth, and the gross findings are consistent with cagemate trauma resulting in demise.

Please contact me with any questions, comments or concerns.

Pathologist ___RM___

Exhibit 59

Accession # 20-023
Submission Date 27 Jan 2020

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester DJ Investigator Colony Animal ID # Z19278
Species Mn Requester's Phone

Date of Death 27 Jan2020 Date of Necropsy 27 Jan 2020 Time 2:30pm Pathologist AB

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 28 Jan 2020 ☐ Preliminary ☐ Amended

Clinical History: this animal was assigned to the "breeding colony". She was euthanized due to trauma.

Gross Description: a .75 kg, 1.5 month old female pig tail macaque in good nutritional and post mortem condition is submitted. There is an open approximately 3 cm linear dorsal head wound, with penetration of skull bone fragments into the brain at the rostral aspect of the wound. Upon opening the skull, there is hemorrhage along the entire right frontal and prefrontal lobes, with mild extension across mid line into the left surface of the frontal lobe. Hemorrhage extends into the brain parenchyma approximately 1 cm along the right frontal lobe. There is mild retrobulbar hemorrhage and mild edema of the right periorbital tissues. Other organs systems are unremarkable.

Gross Diagnosis(es):
Dorsal skull laceration and fractures with moderate meningeal, frontal lobe and mild retrobulbar hemorrhage and brain injury.

Gross Comments: injuries were severe and involved the brain parenchyma.

Final Principal Diagnosis(es):
1. Dorsal skull laceration and fractures with moderate meningeal, frontal lobe and mild retrobulbar hemorrhage and mild periorbital edema.

Comments: post mortem examination is consistent with clinical interpretation of severe head trauma with brain injury.

Pathologist_____AB_____

Exhibit 60

Accession # 20-184
Submission Date 19 Oct 20

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester Colony Investigator Colony Animal ID # Z20176
Species MN Requester's Phone (206) 685-1842

Date of Death 10/14/2020 Date of Necropsy 10/14/2020 Time 1328 Pathologist AF

Nutritional Condition: ☐ Adequate ☒ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other

Other Diagnostic Samples

Type of report: ☒ Final 11 Dec 20 ☐ Preliminary Gross ☐ Amended

Clinical History:

Z20176 (ear tattoos "R-Y") was found deceased on dam (Z13067) in enclosure at ~0930 of 14Oct2020. Infant was immediately removed from dam and placed into refrigerator prior to necropsy. Infant is 2 weeks old and was clinically WNL at time of new infant exam 09Oct2020. This is the dam's second infant- the previous was euthanized due to poor condition at almost 10 months of age. PE of the dam at time of infant removal was unremarkable aside from mildly swollen mammary glands.

Gross Description:

Examined is a 0.41 kg, intact, 12-day-old, male pig-tail macaque in marginal body condition (BCS 2/5). Externally, there is moderate green-purple-grey discoloration of the integument over the thorax and abdomen. The right occipital bone has ~4x1.5 cm defect palpable under the skin. There is severe bruising of the brow above the eyes and severe peri-ocular bruising OD. There is ~1.5 cm, linear, full-thickness wound on the left side of the face ventral to the eye with black margins- suspect post-mortem trauma. There is ~3x1.5 cm full-thickness wound on the ventral neck with severe soft tissue damage (including portions of the trachea missing) and with black, dry margins- suspect post-mortem trauma. The tip of the tongue is clamped between the jaws and the tip is contused. The right and left hands and forearms are moderately covered in dried blood. The left testicle is herniated through the left inguinal region with no bruising of surrounding tissue- suspect post-mortem trauma. There is mild fecal staining around the perineum. There is moderate to severe autolysis present.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. The lungs appear WNL and all sections of collected lung float in formalin. The heart appears normal in size and no clotted blood present within the chambers. No abnormalities are noted of the valves within the heart.

Abdominal cavity: No free fluid is present in the abdominal cavity. The liver appears normal in size and is normal in coloration; the texture is mildly friable. The gallbladder is minimally distended and intact. The spleen is mildly friable in texture but normal in color and size. Both kidneys are normal in size and color and are moderately friable. The adrenal glands are difficult to visualize due to the severity of autolysis present- cassette is labeled with suspect portions of each adrenal. The urinary bladder is completely

empty of urine. The GI tract is moderately to severely friable and gas distended diffusely. The stomach is adequately sized and contains minimal amounts digesta. There is minimal digesta present throughout the length of the GI tract. The intestinal mucosa coloration ranges from pink to dark grey intermittently along the entire length- suspect coloration abnormalities are due to post-mortem changes. The left testicle is black and dry due to being herniated post-mortem, the remainder of the reproductive tract appears grossly normal.

Skull: A section of skull from the right cranium defect is found in the SQ space over the left hemisphere of the cranium. The parietal bone is completely separated at the sagittal suture line. The brain has a diffuse, severe hematoma present within the cranial space and through the meninges bilaterally. The right hemisphere of the cerebrum is severely damaged and separated from the left side prior to removal. There is a hematoma present over the left hemisphere of the cerebrum but the tissues otherwise appear undamaged. The cerebellum is collected separately due to the severity of brain damage and appears grossly normal. The pituitary appears WNL.

Gross Diagnosis(es):

1. Skull fracture with cerebral damage and subdural hematoma

Gross Comments:

The severity of autolysis may affect the histologic assessment of tissues.
Suspect pre-mortem, blunt trauma as cause for the skull fracture and demise.

Histological Findings:

Tissues/organs have moderate to extensive autolysis impeding evaluation and identification. Brain notably is relatively well preserved and has moderate, multifocal, acute meningeal and parenchymal hemorrhage.

Sections of lymph node, spleen, adipose (adequate), GI tract, liver, gall bladder, lungs, kidneys, heart and skin with muscle are unremarkable besides moderate to extensive autolysis.

Final Principal Diagnosis(es):

1. Skull fracture with cerebral damage and subdural hemorrhage (gross diagnosis) and with histologic moderate, multifocal, cerebral, meningeal to parenchymal hemorrhage

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Histology Comments:

Although autolysis precludes accurate evaluation and sometimes even identification of many tissues/organs, histology provides further support of cranial trauma as cause of death.

Please contact either of us with any questions, comments or concerns.

Pathologist AF (gross)/RM (histo)_____

Exhibit 61

University of Washington
National Primate Research Center

Accession #___21-110_
Submission Date_2 Jul 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z20164__
Species_____MN____ Requester's Phone___(206) 606-0501_____

Date of Death__06/30/2021_ Date of Necropsy_06/30/2021_Time_1300__Pathologist ___CMM____
_____
Nutritional Condition: Adequate Marginal X Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _Swab of ventricle for bacterial culture_____

Type of report: ☐ Final _13 Jul 21____ ☐ Preliminary ____Gross_____ ☒ Amended __27 Jul 21__

Clinical History:

Z20164 was reported on the evening of 6/29 for being slow and uncoordinated in the group enclosure. The animal was immediately moved to the hospital and TX commenced (fluids, steroids, antibiotics, nutritional support). The following morning, the animal was hunched with moderate dehydrated and labored respirations in the hospital cage; clinical treatment commenced with SQ fluids and additional antibiotics. No abnormalities were detected in thoracic auscultation. An hour later, the animal was noted for lateral recumbency in the hospital cage with pale mucous membranes. Emergency treatment commenced with IV fluids/steroids/potassium, IM iron, PO glucose, gavaged nutrition, and active warming. The animal remained in lateral recumbency with an elevated respiratory rate (~60bpm) and mild harsh lung sounds that were attributed to the respiratory pattern. Heart rate and rhythm were WNL. Monitoring/warming commenced for ~2 hours during which mucous membrane color improved and the animal was responsive to stimuli. At ~1145 the animal stopped breathing and the heart stopped beating.

Gross Description:

Examined is a 1.63 kg, 0.8 year old, intact female pigtail macaque in poor body condition (BCS 2/5). Externally there is an IV catheter present in the right saphenous vein.

Thoracic cavity: No free fluid is found in the thoracic cavity and the diaphragm is intact. The lungs appear grossly normal. There is a small amount of free slightly hemorrhagic fluid present in the pericardial sac. There is an ~1-1.5 cm dark lesion at the apex of the heart.

Abdominal cavity: There is no free fluid in the abdominal cavity. The surface of the spleen has sporadic pitting with a small pale <2mm nodular lesion at the free edge. There is a moderately hemorrhagic area present at the junction of the pylorus and the duodenum. There are pale rib imprints present on the surface of multiple liver lobes. There is moderate gas distension of the cecum and jejunum. The digestive tract is full of liquid digesta (yellow in cranial part, greenish in caudal tract). The reproductive tract appears grossly normal.

Skull: The brain and pituitary appear grossly normal; remainder of the tissues in the head and skull appear grossly normal.

Gross Diagnosis(es):

1. Hepatic edema

Histological Findings:

Brain has severe, multifocal fibrinosuppurative to pyogranulomatous infiltrate of leptomeninges with multifocal, copious, cocci bacterial proliferation; bacteria are in clusters and chains.

One section of stomach has moderate numbers of occlusive to near-occlusive, submucosal fibrinosuppurative thrombi with early organization. Another section of stomach has areas of florid cocci bacterial proliferation in crypts. Other sections of stomach, and sections of small and large intestine are unremarkable besides autolysis and mild to moderate, typical, lamina propria infiltrate of/increase in lymphocytes, plasma cells, macrophages and eosinophils.

Liver has moderate numbers of partially occlusive fibrinous thrombi with early organization in medium sized veins. Liver also has mild, multifocal, periportal lymphohistiocytic aggregates, and gall bladder is unremarkable besides autolysis. Sections of lung have few thrombi as per liver.

The heart interventricular septum has a focal, small region of myocellular necrosis with infiltrate of neutrophils, macrophages and lymphocytes. Other sections of heart are unremarkable.

Sections of lymph nodes and spleen (low follicular activity and spleen has reactive endothelium), pancreas, thyroid gland, skin with mammary gland, and muscle are unremarkable.

Final Principal Diagnosis(es):

1. Severe, multifocal, fibrinosuppurative to pyogranulomatous leptomeningitis associate with copious cocci bacteria
2. Severe, multifocal, submucosal, fibrinosuppurative (septic), venous thrombosis with early organization, and associated with regional, copious, crypt, cocci bacterial proliferation: stomach
3. Moderate, multifocal, partially occlusive, hepatic and pulmonary, venous thrombosis with early organization
4. Focal, moderate, necrotizing and pyogranulomatous myocarditis
5. Low follicular activity: lymph nodes and spleen

Histology Comments:

Microbiology of heart blood swab sampled postmortem revealed heavy growth (4+) of *Staphylococcus aureus* and moderate growth (2+) of viridans group *Streptococcus* sp.

This case is similar to 21-098 (J06251). Preliminary report distributed to veterinarians 9 Jul 21.

Demise was due to the cocci bacterial meningitis, which likely originated from the stomach, with *S. aureus* being the suspect primary pathogen as per culture. Typically, the viridans group of *Streptococcus* sp are commensals, supporting this interpretation. The hepatic and pulmonary thrombosis and myocarditis were also due to the same process. The low lymphoid follicular activity suggests the possibility of immunosuppression as a predisposing factor.

A gram stain of brain is pending and an addendum will follow; confirmation of gram positive cocci is expected.

Please contact either of us with any questions, comments or concerns.

Pathologist: CMM(gross)/RM (histo)

ADDENDUM 27 JUL 21 RM

Gram stain of brain confirms the organisms are gram positive cocci in chains and clusters.

Exhibit 62

University of Washington
National Primate Research Center

Accession #___21-066_
Submission Date_11 May 21

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z21065___
Species_____MN____ Requester's Phone___(206) 685.1842_____

Date of Death__05/07/2021_ Date of Necropsy_05/07/2021_Time_0830__Pathologist ___AF_____
_____

Nutritional Condition: X Adequate ☐ Marginal Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final __18 May 21____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

Z21065 was found in the enclosure with the male grabbing the infant from the dam and biting the infant. Upon immediate removal from group, the infant was noted with skull fracture and euthanasia was elected via heavy sedation and intracardiac injection. Necropsy was performed immediately following euthanasia.

Gross Description:

Examined is a 315g, 20 day old, intact, female pigtail macaque in good body condition (BCS 3/5). Externally, the skull plates are highly mobile and deformed on the dorsal aspect of the skull, slightly more pronounced on the left side of midline. There is moderate bruising on the brow and over the eyelids OU. There is a single abrasion present of the right side of the nose. Mild autolysis present.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. The cranial aspects of the left and right lung fields have focal hematomas present from the intracardiac injection. All sections of collected lung float in formalin. The remainder of the respiratory system is otherwise grossly unremarkable. The heart appears normal in size.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. The stomach and intestinal tract have adequate amounts of normal digesta present. Liver, kidney, spleen, and remainder of abdominal organs all appear grossly WNL.

Skull: The skull plates are deformed into a concave shape and are highly mobile. There is a hematoma and brain tissue present subcutaneously. There are fractures present bilaterally at the temporal lobe areas that extend through the frontal and parietal skull plates. There is an intracranial hematoma present within the fracture site. There is complete destruction of the left cerebral hemisphere and partial destruction of the right cerebral hemisphere. There is minimal identifiable cerebellum tissue present. The intact portion of right cerebral hemisphere and pituitary gland are collected. The entire skull bones are collected (2 sections).

Gross Diagnosis(es):

1. Acute, severe, skull fractures with hemorrhage and brain avulsion

Gross Comments:

Demise was due to cranial trauma. Histology pending.

Histological Findings:

Sections of brain have moderate to extensive, multifocal, acute hemorrhage with regions of disruption/fragmentation of parenchyma.

Sections of lymph nodes, thymus, spleen, adipose (adequate), liver, gall bladder, heart, kidneys, lungs, skin, skeletal muscle, GI tract and pancreas are unremarkable.

Final Principal Diagnosis(es):

1. Acute, severe, skull fractures with hemorrhage and brain avulsion (gross diagnosis) and with histologic, moderate to extensive, multifocal, acute brain hemorrhage with parenchymal disruption

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Histology Comments:

Histology supports gross interpretations.

Please contact either of us with any questions, comments or concerns.

Pathologist AF (gross)/RM (histo)

Exhibit 63

Accession #___21-109_
Submission Date 29 Jun 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator_Colony___Animal ID #___Z21111___
Species_____MN____ Requester's Phone___(206) 606.0501_____

Date of Death__06/29/2021_ Date of Necropsy_06/29/2021_Time_1100__Pathologist ___CMM____
_____

Nutritional Condition: Adequate X Marginal Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples _____

Type of report: ☒ Final _7 Jul 21_____ ☐ Preliminary ____Gross_____ ☐ Amended _____

Clinical History:

Z21111 was born overnight/early morning on 6/28-29. The infant was noted as deceased during morning checks (~630AM). This was the Dam's (Z16008) first pregnancy/birth.

Gross Description:

Examined is a 380g, intact male pigtail macaque in marginal condition (BCS 2-2.5/5). Externally, there is moderate bruising to the genitals (penis/scrotum) with superficial scratches scattered sporadically in the area. There is a full thickness puncture to the right inguinal area. The majority of the tail is missing and there is a strip of desiccated hard tissue ~5cm in length remaining. There are several full thickness lacerations/punctures to the perianal area. D1 of the left foot is missing with severe bruising of D2-5 present over the metatarsals. The right foot is missing D2-5 with bite marks on the plants surface of the foot, the ankle and the caudal lower leg. There is moderate edema of the remaining right foot. There are small superficial abrasions to the right cheek and nose.

Thoracic cavity: The diaphragm is intact and there is no free fluid in the thoracic cavity. The lungs were a lite pink color with diffuse mottling and all sections floated in formalin. The heart appears normal in size.

Abdominal cavity: No free fluid is present in the abdominal cavity. The reproductive tract appears grossly normal. The stomach is empty with no evidence of nursing and the upper small intestine has moderate gas distension and is pale in coloration. The remainder of abdominal organs all appear grossly WNL.

Gross Diagnosis(es):

1. Perimortem trauma

Histological Findings:

Sections of spleen (congested), lymph nodes, liver (congested), gall bladder, heart, kidneys, lungs (inflated), GI tract and pancreas, skin with umbilicus, muscle, testicle, and epididymis (extensive acute hemorrhage) are histologically unremarkable besides autolysis and stated changes.

Final Principal Diagnosis(es):

1. Neonatal death: hemorrhage, edema, abrasions and bite wounds (gross and histology) indicating trauma, empty stomach (gross) indicating hypoalimentation with hypoglycemia

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Histology Comments:

Gross and histologic findings indicate cage mate induced trauma as cause of death. Lack of nursing (empty stomach) with resultant hypoglycemia could have predisposed via infant being weak or alternatively could have been the primary problem.

Please contact either of us with any questions, comments or concerns.

Pathologist CMM (gross)/RM (histo)

Exhibit 64

Accession #___21-168_
Submission Date 30 Nov 21

University of Washington
National Primate Research Center

DIAGNOSTIC LABORATORY NECROPSY REPORT

Requester____Colony_____ Investigator___Colony_ Animal ID #___Z21209_____
Species_____Mn____ Requester's Phone_____

Date of Death__29 Nov 21_ Date of Necropsy__30 Nov 21_Time1000__Pathologist ____RM_____
_____

Nutritional Condition: ☒ Adequate ☐ Marginal ☐ Poor ☐ Obese

Other Tests Required: ☐ Sero ☐ Micro ☐ Parasit ☐ Other_____

Other Diagnostic Samples __Microbiology swabs of heart blood and stomach fluid being held for possible culture_____

Type of report: ☒ Final __30 Nov 21_____ ☐ Preliminary _____ ☐ Amended _____

Clinical History:

Neonate born 29 Nov from dam Z16020 found DIC 30 Nov.

Gross Description:

A neonatal, female, 483 gm pig-tailed macaque is presented dead in good postmortem and adequate nutritional condition. There are numerous puncture wounds to the dorsum of the head and face with fracture of the frontal bone and mild hemorrhage in/around the frontal cortex, and a puncture wound through a fractured mandible. Eyes are missing. There are no other significant external lesions and the integumentary and muculoskeletal systems are otherwise grossly unremarkable.

Lungs float in formalin and the stomach contains blood tinged fluid. Otherwise, the nervous, cardiovascular, respiratory, digestive, urogenital, endocrine and hemic-lymphatic systems are grossly unremarkable.

Gross Diagnosis(es):

1. Extensive, multicentric-cranial, acute maternal-induced trauma

Gross Comments:

This neonate was a live birth as per lung aeration, and demise was due to maternal trauma. Appropriate tissues/organs preserved in formalin. Histology will not be performed as the dam is clinically normal and unless the dam has health issues. Likewise swabs for possible microbiology are being held refrigerated.

Please contact me with any questions, comments or concerns.

Pathologist____RM_____

Exhibit 65

Inspection Report

University Of Washington
Box 357160
Seattle, WA 98195

Customer ID: **1016**
Certificate: **91-R-0001**
Site: 002
UNIVERSITY OF WASHINGTON

Type: ROUTINE INSPECTION
Date: Aug-01-2014

2.33 (b) (2)

ATTENDING VETERINARIAN AND ADEQUATE VETERINARY CARE.

***On May 2, 2013, a 1-month old male pig-tailed macaque (ID #Z13068) along with its mother, were introduced to their assigned breeding group following a 2 day protected contact period when the infant was attacked. Approximately 15-20 minutes after open contact was established, the single adult male of the group attacked the infant. The infant sustained extensive trauma and was euthanized by the veterinarian.

In a separate breeding group, on May 30, 2013, a 6-month old male pig-tailed macaque (ID #Z13080), was attacked by the adult male in its group. That animal (ID #Z13080), subsequently died from its injuries. In another separate incident on June 12, 2013, a 9-month old female pig-tailed macaque (ID #Z12341) was attacked by an adult male, through mesh contact and was euthanized by the veterinarian.

Following the May 2nd attack, the veterinarian notified the facility behavioral management group of the incident. The veterinarian and the behavioral group also discussed the temperament and behavioral history of the male that was involved in the May 2nd attack. There were no subsequent dam/infant pairs placed with the male involved in the May 2nd attack. Following the May 30th attack, all males were removed from breeding groups until new group assignments and behavioral assessments were complete. Mesh contact remained following the May 30th attack, as to not completely disrupt the groups.

It is common for males, including male primates, to attack and kill young offspring of their species (known as infanticide). Knowing this behavior (as stated by the facility) and that it was occurring at the facility, it is the veterinarian's and the facility's responsibility to prevent this behavior and any subsequent injuries. Preventative action should have been taken following the May 2nd attack, before the attacks on May 30th and June 12th. The facility has implemented changes in their group housing policy. After June 12, 2013, young primates are no longer housed with adult males, in order to prevent future attacks.

An inspection was started on 7/14/14 and finished on 8/1/14 to review animal enclosures and animal medical records.

Prepared By: AARON RHYNER, V M O
AARON RHYNER, V M O USDA, APHIS, Animal Care
Title: VETERINARY MEDICAL OFFICER Inspector 6077
Date: Feb-11-2015

Received By: (b)(6),(b)(7)(c)
Title:
Date: Feb-11-2015

Inspection Report

Exit interview was conducted on-site with the veterinarian on 8/7/14.

Prepared By:	AARON RHYNER, V M O	
	AARON RHYNER, V M O USDA, APHIS, Animal Care	**Date:**
Title:	VETERINARY MEDICAL OFFICER Inspector 6077	Feb-11-2015
Received By:	(b)(6),(b)(7)(c)	
		Date:
Title:		Feb-11-2015