SUPPLEMENTARY TABLES

Table S1 RT-qPCR plasma cycle threshold values.

ANIMAL ID	DAY	CT VALUE	POS/NEG
1	0	Undet	-
1	3	32.8 / 32.8	+
1	6	15.9 / 15.9	+
1	DE / 8	18.4 / 18.1	+
2	0	Undet	-
2	3	37.8 / 37.4	+
2	6	16.4 / 16.3	+
2	DE/ 8	16.7 / 16.7	+
3	0	Undet	-
3	3	35.9 / 36.2	+
3	6	15.0 / 15.2	+
3	DE/ 7	14.3 / 14.5	+
4	0	Undet	-
4	3	35.1 / 35.6	+
4	6	17.4 / 17.3	+
4	DE/ 8	17.1 / 17.0	+
5	0	Undet	-
5	3	Undet / 40.1	±
5	6	28.7 / 28.7	+
5	DE/ 9	19.4 / 19.4	+
6	0	Undet	-
6	3	Undet	-
6	6	21.9 / 21.2	+
6	DE / 9	15.1 / 14.7	+

Undet: Undetermined. Pos/ Neg: positive/negative, DE: day of euthanasia.

21 **Table S2 Summary of gross and histopathology findings in spleen and liver.**

Animal Number, DE	Liver	Spleen
1, Day 8	Gross pathology: deep mahogany and markedly enlarged with a diffusely enhanced reticular pattern and moderately rounded edges. On section the hepatic tissue bulges, is markedly friable, and yellow diffusely. Severe, subacute, diffuse hepatic necrosis and lipidosis with severe hepatomegaly. Histopathology: diffuse moderate pan-acinar mixed macrovesicular lipid-type and glycogen-type vacuolation of the hepatocyte cytoplasm. Hepatocytes often contain variably sized hyaline eosinophilic inclusions, occasionally with pyknotic nuclear dust. Approximately 20% of hepatocytes are necrotic or apoptotic. There are frequent apoptotic and necrotic cells within the sinusoids (rule out Kupffer cells). There are scattered bacterial emboli, occasionally enmeshed in fibrin. There are low numbers of viable and degenerate macrophages and lymphocytes in the portal triads. There is mild to moderate autolysis of the gallbladder.	Gross pathology: moderately, diffusely enlarged and firm. Friable in section. Moderate, subacute, diffuse splenomegaly with fibrinous necrosis. Histopathology: red pulp is diffusely expanded and effaced by abundant necrosis with admixed fibrin. There are numerous bacterial cocci, individually and within colonies, within the red pulp. White pulp elements are widely separated with moderate to severe lymphoid depletion and necrosis. They are frequently circumscribed by acute (ring) hemorrhage, and occasionally effaced by hemorrhage. Viable and degenerate vacuolated macrophages infiltrate both compartments.
2, Day 8	Gross pathology: pale tan and markedly enlarged diffusely with moderately rounded edges. Markedly friable, and yellow diffusely. Severe, subacute, diffuse hepatic necrosis and lipidosis with severe hepatomegaly. Histopathology: diffuse mild pan-acinar mixed lipid-type and glycogen-type vacuolation of the hepatocyte cytoplasm. Hepatocytes often contain variably sized hyaline eosinophilic inclusions, occasionally with pyknotic nuclear dust. Approximately 30% of hepatocytes are necrotic or apoptotic. There is mild Kupffer cell hyperplasia with frequent apoptotic and necrotic cells. Within the sinusoids there are low numbers of degenerate neutrophils. There are low numbers of viable and degenerate macrophages and lymphocytes in the portal triads.	Gross pathology: moderately, diffusely enlarged and firm. Friable on section. Moderate, subacute, diffuse splenomegaly with fibrinous necrosis. Histopathology: red pulp is diffusely expanded and effaced by abundant necrosis with admixed fibrin. White pulp elements are widely separated with moderate to severe lymphoid depletion and necrosis. They are rarely circumscribed or partially effaced by acute hemorrhage. Viable and degenerate vacuolated macrophages infiltrate both compartments. There are frequent necrotic spindled cells within the trabeculae.
3, Day 7	Gross pathology: mildly enlarged, diffusely pale-yellow, and severely friable. Degeneration and necrosis, diffuse, severe. Histopathology: diffuse mild pan-acinar glycogen-type vacuolation of the hepatocyte cytoplasm. Hepatocytes occasionally contain variably sized hyaline eosinophilic inclusions, occasionally with pyknotic nuclear dust. Approximately 5% of hepatocytes are necrotic or apoptotic. There is minimal Kupffer cell hyperplasia. There are rare apoptotic and necrotic cells within the sinusoids (rule out Kupffer cells). There are low numbers of viable and degenerate macrophages and lymphocytes in the portal triads. There is mild autolysis of the gallbladder.	Gross pathology: mildly enlarged, turgid, and friable with multifocal pale-white spots. Congestion, diffuse, mild, with possible lymphoid degeneration and necrosis. Histopathology: contracted with a slightly wrinkled capsule and few red pulp erythrocytes. The red pulp is infiltrated and expanded by moderate numbers of frequently apoptotic or necrotic vacuolated macrophages, with mild accumulation of fibrin. There is moderate to severe lymphoid depletion of the white pulp with few small lymphocytes. White pulp consists predominantly of vacuolated macrophages and medium lymphocytes with lymphocytolysis and mild lymphoid necrosis. Within the follicles, germinal centers are frequently necrotic.
4, Day 8	Gross pathology: pale tan and markedly enlarged diffusely with moderately rounded edges. The distal one-third of each liver lobe is mottled red. hepatic tissue bulges, is markedly friable, and yellow diffusely. Severe, subacute, diffuse hepatic necrosis and lipidosis with severe hepatomegaly Histopathology: diffuse mild to moderate pan-acinar microvesicular lipid-type vacuolation of the hepatocyte cytoplasm. Hepatocytes often contain variably sized hyaline eosinophilic inclusions, occasionally with pyknotic nuclear dust. Approximately 20% of hepatocytes are necrotic or apoptotic, with minimal oval cell hyperplasia. There is mild Kupffer cell hyperplasia with frequent apoptotic and necrotic cells. Within the sinusoids there are low	Gross pathology: moderately, diffusely enlarged and firm. Friable on section. Moderate, subacute, diffuse splenomegaly with fibrinous necrosis. Histopathology: mildly enlarged with rounded edges. The red pulp is diffusely moderately expanded by abundant necrotic cellular debris admixed with fibrin and moderate numbers of vacuolated macrophages with few erythrocytes. There is diffuse moderate lymphoid depletion of the white pulp, with multifocal lymphoid necrosis that effaces PALS and follicles.

	numbers of degenerate neutrophils. There are multiple small foci of acute hemorrhage. There is minimal oval cell hyperplasia. There are low to moderate numbers of viable and degenerate macrophages and lymphocytes in the portal triads. There is moderate autolysis of the gallbladder mucosa.	
5, Day 9	Gross pathology: mildly to moderately enlarged, diffusely mottled pale-yellow to dark-red, and severely friable. Degeneration and necrosis, diffuse, severe. Histopathology: diffuse mild pan-acinar macrovesicular lipid-type vacuolation of the hepatocyte cytoplasm. Hepatocytes often contain variably sized hyaline eosinophilic inclusions, occasionally with pyknotic nuclear dust. Approximately 30% of hepatocytes are necrotic or apoptotic, with minimal oval cell hyperplasia. There is mild Kupffer cell hyperplasia with frequent apoptotic and necrotic cells. Within the sinusoids there are low numbers of degenerate neutrophils. There are scattered microhemorrhages. There are low numbers of viable and degenerate macrophages and lymphocytes in the portal triads. There is moderate autolysis of the gallbladder mucosa.	Gross pathology: mildly enlarged, turgid, and friable. Congestion, diffuse, mild. Histopathology: The red pulp is expanded by abundant necrotic cellular debris and fibrin admixed with moderate numbers of vacuolated macrophages. There is variable moderate to severe lymphoid depletion of the white pulp with few small lymphocytes. White pulp consists predominantly of vacuolated macrophages and medium lymphocytes with lymphocytolysis and moderate lymphoid necrosis. Some PALS and follicles are virtually effaced by hemorrhage and necrosis.
6, Day 9	Gross pathology: slightly enlarged, diffusely pale-yellow, and severely friable. Degeneration and necrosis, diffuse, severe. Histopathology: diffuse mild pan-acinar macrovesicular lipid-type vacuolation of the hepatocyte cytoplasm. Hepatocytes occasionally contain variably sized hyaline eosinophilic inclusions, occasionally with pyknotic nuclear dust. Approximately 40% of hepatocytes are necrotic or apoptotic, often in nodules with degenerate macrophages and neutrophils admixed. There is mild Kupffer cell hyperplasia, with rare mitotic figures. There are frequent apoptotic and necrotic cells within the sinusoids (rule out Kupffer cells), with viable and degenerate neutrophils. ICIB are rarely present in hepatocytes and Kupffer cells. Bile pigment is frequently visible within and between hepatocytes. There are scattered foci of dissociated hepatic cords with hemorrhage. There is mild multifocal oval cell hyperplasia, with rare ICIB. There are low numbers of viable and degenerate macrophages and lymphocytes in the portal triads. There is mild autolysis of the gallbladder.	Gross pathology: mildly enlarged, turgid, and friable. Congestion, diffuse, mild. Histopathology: red pulp is expanded by abundant necrotic cellular debris and fibrin admixed with moderate numbers of vacuolated macrophages. There is variable moderate to severe lymphoid depletion of the white pulp with few small lymphocytes. White pulp consists predominantly of vacuolated macrophages and medium lymphocytes with lymphocytolysis and mild lymphoid necrosis. Within the follicles, germinal centers are frequently necrotic. Some PALS and follicles are virtually effaced by hemorrhage and necrosis.

DE: day of euthanasia.

SUPPLEMENTARY FIGURE LEGENDS

FIG. S1 Correlations of biomarkers and liver radiodensity (expressed as Hounsfield units (HU)]. Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; CA, calcium; GGT, gamma glutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

FIG. S2 Correlations of biomarkers and liver volumes. Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; CA, calcium; GGT, gamma glutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

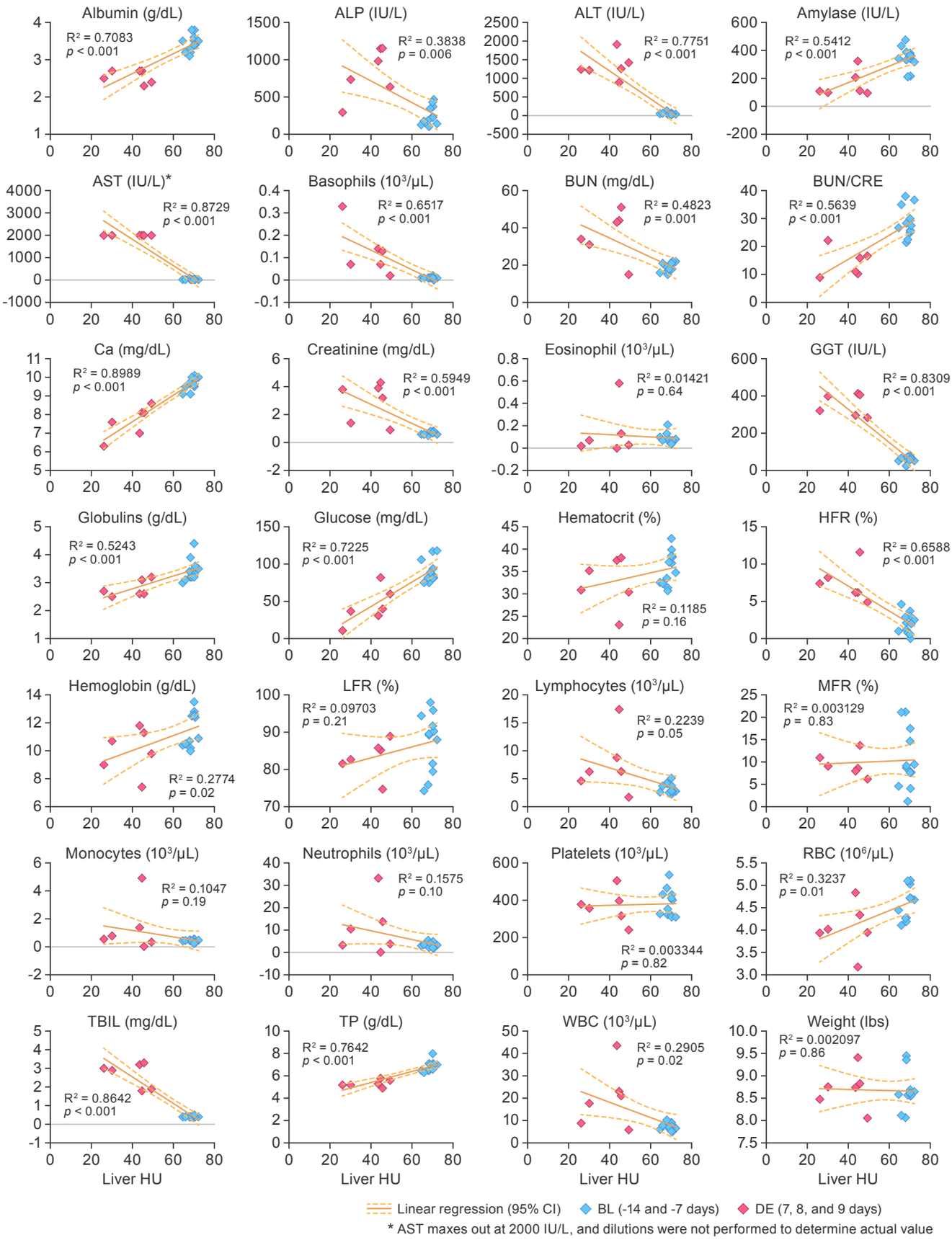
FIG. S3 Correlations of biomarkers and spleen radiodensity (expressed as Hounsfield units [HU]). Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; CA, calcium; GGT, gamma glutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell

count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

FIG. S4 Correlations of biomarkers and spleen volumes. Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; CA, calcium; GGT, gamma glutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

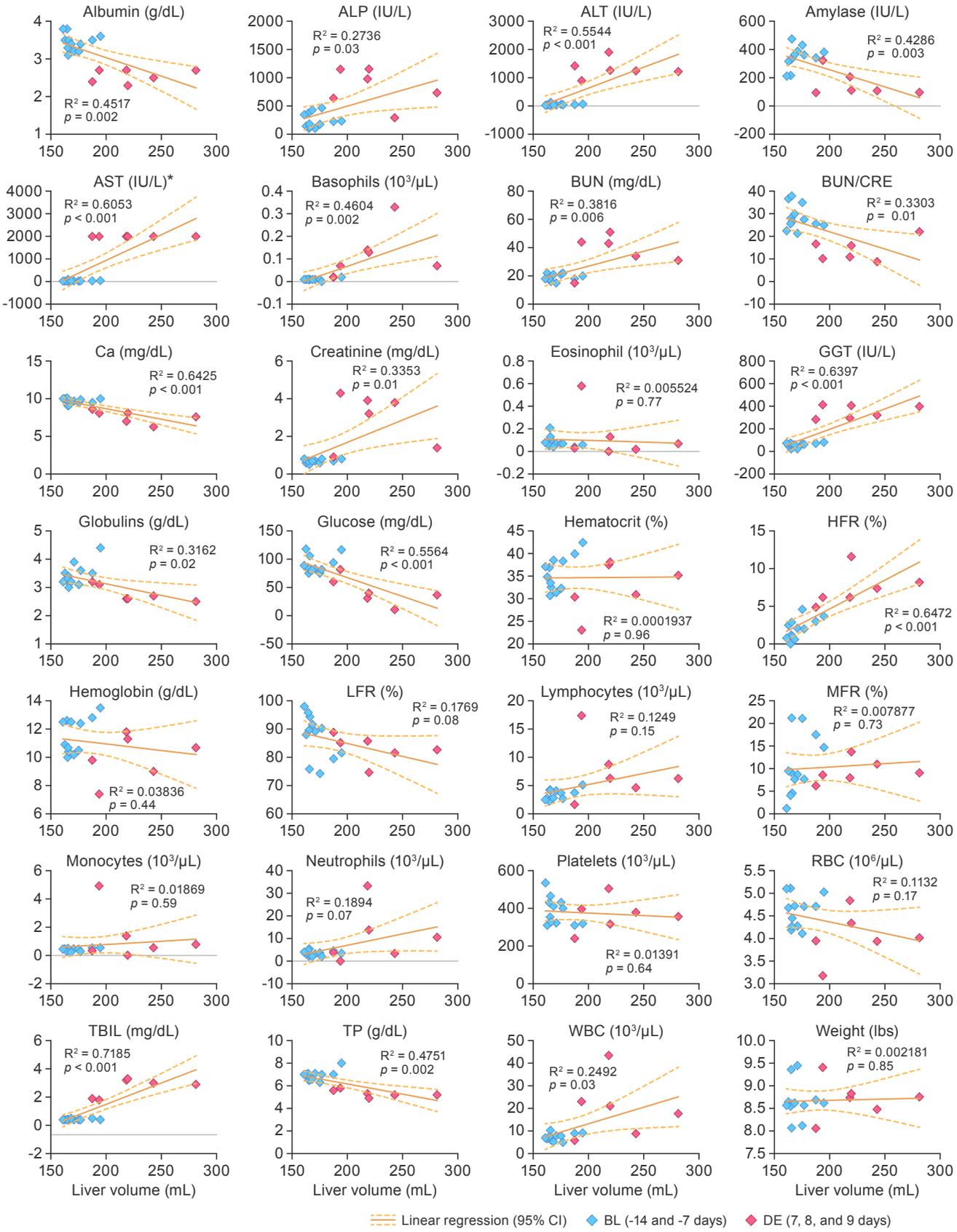
FIG. S5 Spleen, lymphoid, and pancreas disease markers after Marburg virus (MARV) exposure (rhesus monkey). (A) In the spleen, the white pulp is severely depleted and the red pulp is markedly expanded by necrotic cellular debris admixed with abundant fibrin. (B) A further magnified view of the area within the white box in panel A shows lymphoid depletion, necrosis, and circumferential (ring) hemorrhage in the splenic white pulp. (C) Higher magnification shows abundant necrotic cellular debris and fibrin in the red pulp. (D) Severe lymphoid depletion, with abundant acute hemorrhage and necrosis in the axillary lymph node. (E) Higher magnification shows these features as well as necrotizing arteritis with abundant fibrin. (F) Diffuse and marked atrophy of the acinar cells of the exocrine pancreas, with edema of the intervening stroma. (G) Acinar drop out results in condensation of small ducts in the exocrine pancreas. Remaining acinar cells are small with loss of apical zymogen granules and vacuolation of the apical cytoplasm.

Supplementary Figure 1



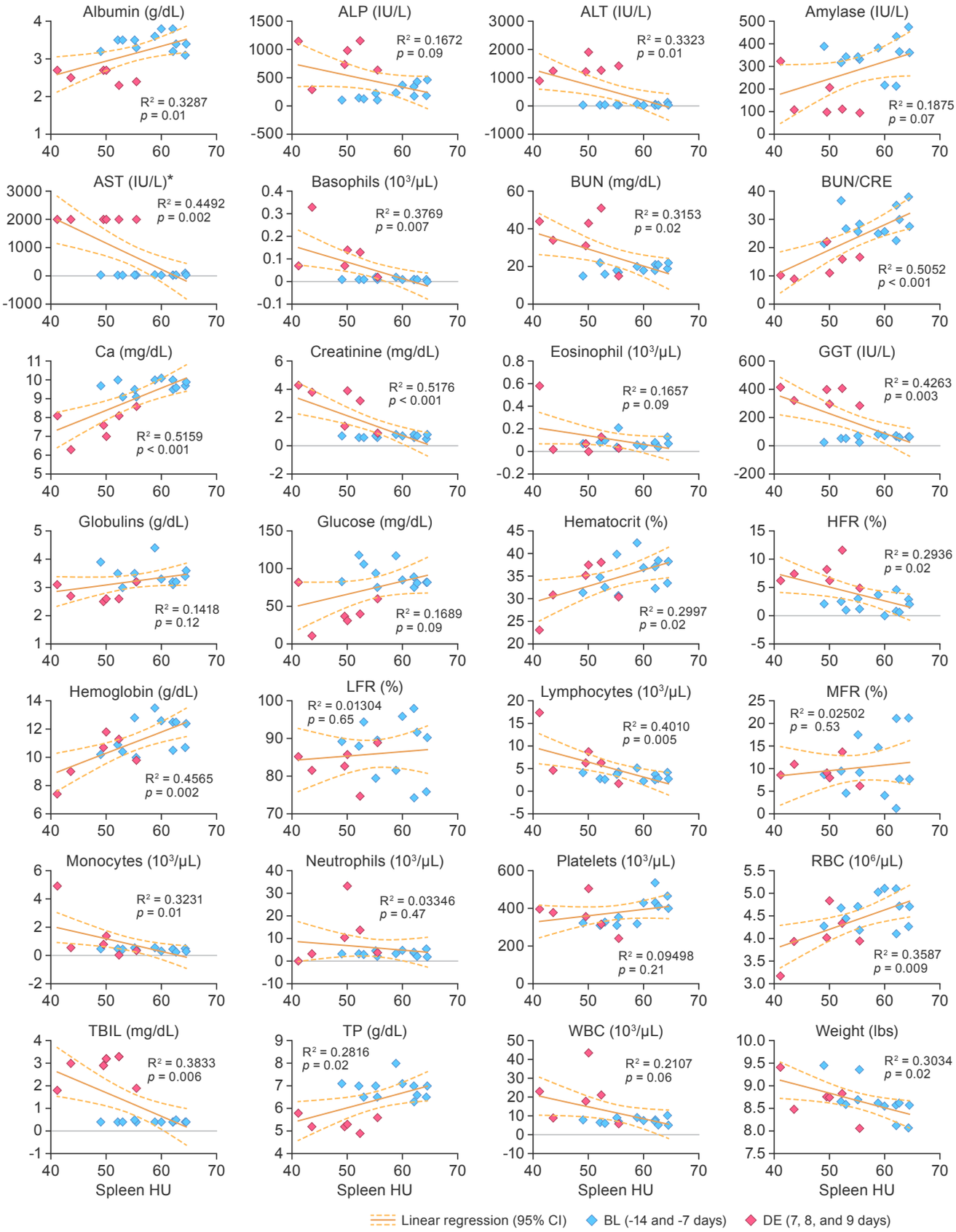
Correlations of biomarkers and liver radiodensity (expressed as Hounsfield units (HU)]. Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; Ca, calcium; GGT, gammaglutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

Supplementary Figure 2



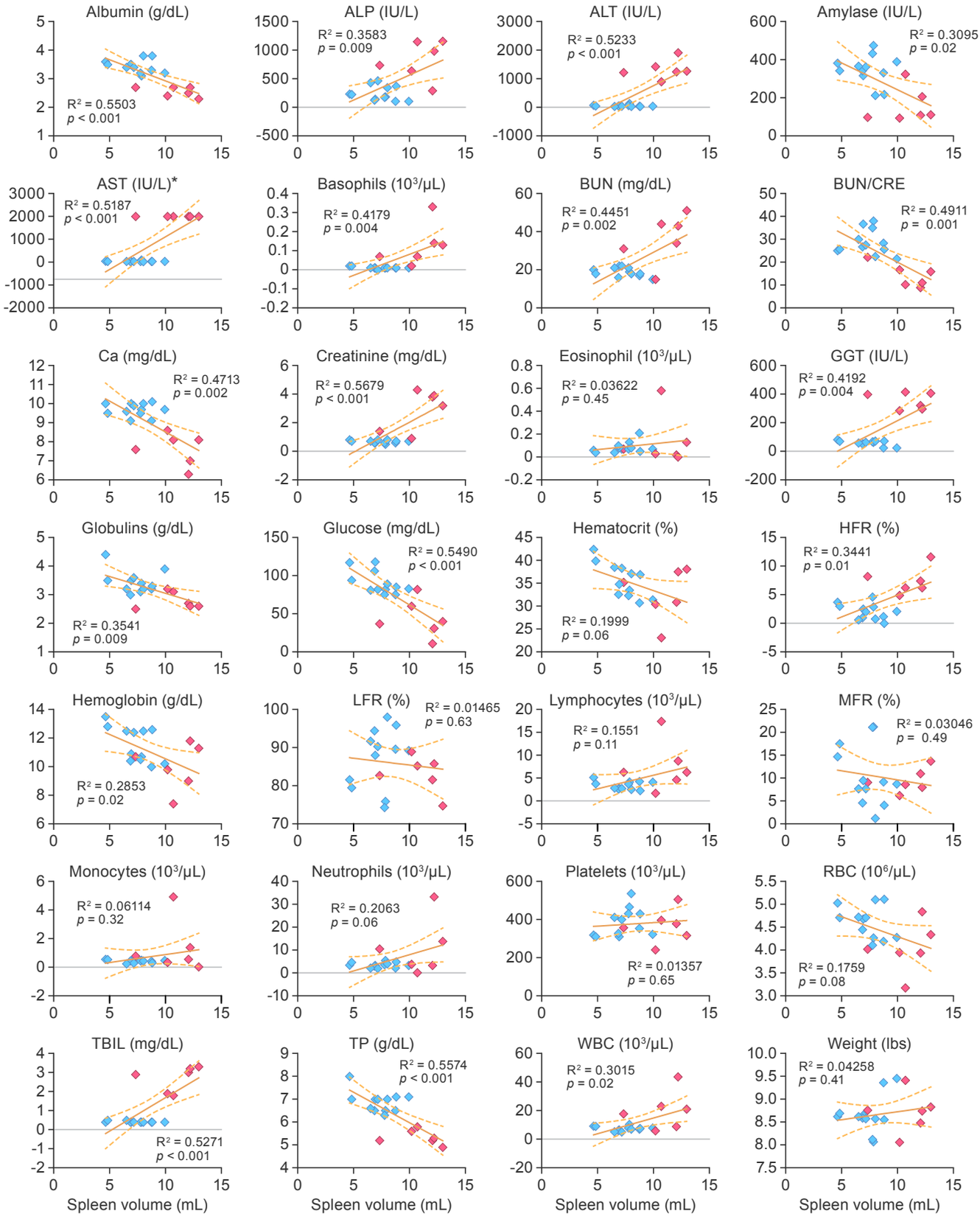
Correlations of biomarkers and liver volumes. Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; Ca, calcium; GGT, gammaglutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

Supplementary Figure 3



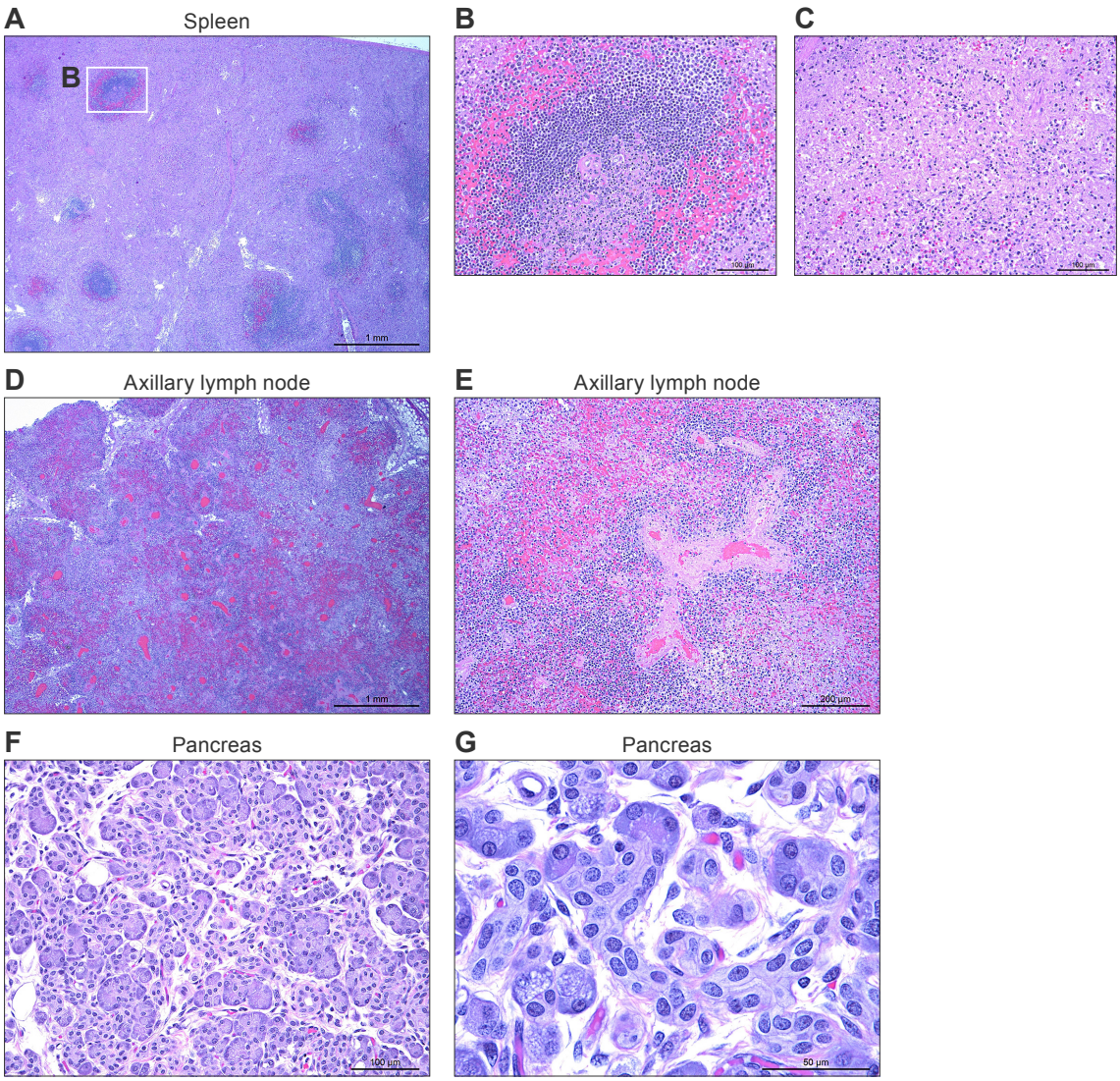
Correlations of biomarkers and spleen radiodensity (expressed as Hounsfield units [HU]). Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of Euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; Ca, calcium; GGT, gammaglutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

Supplementary Figure 4



Correlations of biomarkers and spleen volumes. Baseline time points are shown in blue, whereas day-of-euthanasia time points are shown in red. BL, baseline; DE, day of euthanasia; ALP, alkaline phosphatase; AST, aspartate aminotransferase; ALT, alanine aminotransferase; BUN, blood urea nitrogen; CRE, creatinine; Ca, calcium; GGT, gammaglutamyl transferase; HFR, high-fluorescent reticulocytes; LFR, low-fluorescent reticulocytes; MFR, medium-fluorescent reticulocytes; RBC, red blood cell count; TBIL, total bilirubin; TP, total protein; WBC, white blood cell counts.

Supplementary Figure 5



Spleen, lymphoid, and pancreas disease markers after Marburg virus (MARV) exposure (rhesus monkey). (A) In the spleen, the white pulp is severely depleted and the red pulp is markedly expanded by necrotic cellular debris admixed with abundant fibrin. (B) A further magnified view of the area within the white box in panel A shows lymphoid depletion, necrosis, and circumferential (ring) hemorrhage in the splenic white pulp. (C) Higher magnification shows abundant necrotic cellular debris and fibrin in the red pulp. (D) Severe lymphoid depletion, with abundant acute hemorrhage and necrosis in the axillary lymph node. (E) Higher magnification shows these features as well as necrotizing arteritis with abundant fibrin. (F) Diffuse and marked atrophy of the acinar cells of the exocrine pancreas, with edema of the intervening stroma. (G) Acini drop results in condensation of small ducts in the exocrine pancreas. Remaining acinar cells are small with loss of apical zymogen granules and vacuolation of the apical cytoplasm.