

Table S3 Histopathological changes in tissue samples obtained on scheduled necropsy days. To evaluate the degree of change for each described feature the following scale was used: 0- no lesion/change; 1-minimal change; 2- mild change; 3- moderate change; 4- marked change; and 5-severe change.

Model development experiment	Kp1-Day 9 10 ⁸ CFU	Kp2-Day 5 10 ⁸ CFU	Kp3-Day 13 10 ⁸ CFU	Kp4-Day 13 10 ¹⁰ CFU	Kp5-Day 9 10 ¹⁰ CFU	Kp6-Day 5 10 ¹⁰ CFU	Vaccination experiment	Kp13-Day 3 Sham	Kp14-Day 3 Sham	Kp7-Day 3 CPS2	Kp11-Day 3 CPS2	Kp12-Day 5 Sham	Kp10-Day 5 CPS2	Kp15-Day 7 Sham	Kp16-Day 7 Sham	Kp8-Day 7 CPS2	Kp9-Day 7 CPS2
Cervical LN						not examined	Cervical LN				not examined						
active germinal centers	2	2	1	3	0		hyperplasia	0	1	0		0	1	1	1	0	2
draining neutrophils	0	0	0	1	2		draining neutrophils	0	0	0		1	1	2	2	0	1
							edema	0	0	0		1	0	0	0	0	0
Mediastinal LN							Mediastinal LN										
edema	0	0	0	0	0	0	edema	2	0	2	0	1	2	0	0	1	0
draining neutrophils	1	0	0	1	0	3	draining neutrophils	2	1	0	1	0	0	0	0	0	0
draining eosinophils	2	1	0	1	0	0	draining eosinophils	0	0	0	0	0	0	1	0	0	0
draining macrophages	0	0	0	0	0	2	draining macrophages	0	2	0	0	0	0	0	0	0	0
medullary cord hyperplasia	2	2	2	2	2	2	hyperplasia	0	0	2	0	2	1	1	0	2	0
Trachea							Trachea										
tracheitis	1	1	1	1	1	1	tracheitis	0	2	0	1	0	0	1	0	0	1
Heart							Heart										
inflammation	0	0	0	1	0	0	inflammation	0	0	0	0	0	0	0	0	1	0
Lungs-Right Upper Lobe							Lungs-Right Upper Lobe										
neutrophil infiltrates	1	2	1	0	1	4	neutrophil infiltrates	4	2	2	4	1	0	0	0	1	0
lymphocytic infiltrates	2	1	1	1	1	1	lymphocytic infiltrates	2	2	1	2	2	2	2	2	2	2
macrophage infiltrates	2	2	1	1	2	2	macrophage infiltrates	3	3	2	4	3	4	2	3	4	2
airway edema	0	0	0	0	0	0	airway edema	3	1	0	2	2	3	0	0	3	0
bronchiolitis/peribronchiolitis	2	2	1	1	2	4	bronchiolitis/peribronchiolitis	2	2	2	2	2	2	1	0	3	1
thickened alveolar septae	0	2	1	2	1	2	thickened alveolar septae	2	0	2	3	2	3	2	2	3	2
organized fibrin	0	2	1	0	1	2	organized fibrin	2	2	0	2	2	4	1	0	3	0
bronchiolitis obliterans	0	0	0	0	0	0	bronchiolitis obliterans	0	0	0	0	0	0	0	0	3	0
type II pneumocyte hyperplasia	0	2	0	1	1	3	type II pneumocyte hyperplasia	3	0	0	3	2	2	2	2	3	1
lymphocytic infiltrates/perivasculitis	1	2	1	1	1	1	lymphocytic infiltrates/perivasculitis	2	1	2	3	2	2	2	1	3	2
aspiration pneumonia	2	0	0	0	0	0	aspiration pneumonia	0	0	0	0	0	0	0	0	0	0
pleuritis	1	0	1	2	2	1	pleuritis	1	0	0	1	0	1	1	1	4	1
Lungs-Right Middle Lobe							Lungs-Right Middle Lobe										
neutrophil infiltrates	1	1	0	0	1	3	neutrophil infiltrates	3	3	3	3	2	0	0	0	1	0
lymphocytic infiltrates	2	1	1	1	1	1	lymphocytic infiltrates	2	2	2	2	2	2	2	2	2	2
macrophage infiltrates	2	2	1	2	2	3	macrophage infiltrates	3	3	3	4	3	3	3	3	4	2
airway edema	0	0	0	0	0	0	airway edema	1	2	0	0	0	0	0	0	3	0
bronchiolitis/peribronchiolitis	2	2	1	0	2	2	bronchiolitis/peribronchiolitis	2	2	2	2	2	1	1	1	2	1
thickened alveolar septae	2.5	2	1	1	2	2	thickened alveolar septae	2	2	2	3	2	3	3	2	2	2
organized fibrin	0	1	0	0	2	1	organized fibrin	1	2	1	2	2	2	2	1	3	1
bronchiolitis obliterans	2	0	0	0	3	1	bronchiolitis obliterans	0	0	0	0	0	0	1	0	3	1
type II pneumocyte hyperplasia	2	2	1	1	2	2	type II pneumocyte hyperplasia	3	3	2	3	3	3	3	2	3	2
lymphocytic infiltrates/perivasculitis	2.5	1	1	2	2	2	lymphocytic infiltrates/perivasculitis	2	2	3	2	2	2	2	1	3	3
aspiration pneumonia	0	0	0	0	0	0	aspiration pneumonia	0	0	0	0	3	0	0	0	0	0
pleuritis	2	1	2	3	4	4	pleuritis	1	1	2	1	1	1	1	2	3	2
Lungs-Right Lower Lobe							Lungs-Right Lower Lobe										
neutrophil infiltrates	2	1	0	0	2	4	neutrophil infiltrates	4	3	3	4	2	0	0	0	1	0
lymphocytic infiltrates	0	1	1	1	1	1	lymphocytic infiltrates	2	1	2	2	2	2	2	2	3	2
macrophage infiltrates	3	2	1	2	4	4	macrophage infiltrates	3	3	3	4	3	4	4	3	4	3
airway edema	0	0	0	0	4	2	airway edema	3	2	1	3	0	0	2	0	3	0
bronchiolitis/peribronchiolitis	2	2	1	1	4	4	bronchiolitis/peribronchiolitis	3	2	0	2	1	1	2	1	2	0
thickened alveolar septae	2	2	1	2	4	3	thickened alveolar septae	2	2	2	3	2	2	3	2	3	3
organized fibrin	0	0	0	0	4	2	organized fibrin	2	2	0	3	2	2	3	2	4	0
bronchiolitis obliterans	4	0	0	5	4	2	bronchiolitis obliterans	0	0	0	0	0	0	4	1	4	2
type II pneumocyte hyperplasia	0	2	1	2	4	3	type II pneumocyte hyperplasia	2	3	2	3	2	3	4	3	3	3
lymphocytic infiltrates/perivasculitis	2	1	1.5	2.5	2	2	lymphocytic infiltrates/perivasculitis	2	2	3	2	2	2	2	1	3	2
aspiration pneumonia	1	0	0	0	0	0	aspiration pneumonia	0	0	0	0	0	0	0	0	0	0
pleuritis	4	1	2	2	4	5	pleuritis	2	1	2	3	1	1	2	2	4	3
Lungs-Left Upper Lobe							Lungs-Left Upper Lobe										
neutrophil infiltrates	1	2	0	0	1	3	neutrophil infiltrates	4	3	3	4	1	0	0	0	0	0
lymphocytic infiltrates	2	2	1	1	1	1	lymphocytic infiltrates	1	1	2	2	2	2	1	2	1	2
macrophage infiltrates	2	4	1	2	2	3	macrophage infiltrates	4	3	3	4	3	2	1	2	1	2
airway edema	0	3	0	0	0	0	airway edema	3	2	1	3	1	0	0	0	0	0
bronchiolitis/peribronchiolitis	2	4	0	1	2	3	bronchiolitis/peribronchiolitis	2	2	2	3	2	0	1	0	1	1
thickened alveolar septae	0	3	0	1	1	2	thickened alveolar septae	3	2	2	0	3	0	0	2	0	2
organized fibrin	0	3	0	0	1	1	organized fibrin	3	2	0	3	2	0	0	0	0	0
bronchiolitis obliterans	0	0	0	0	0	2	bronchiolitis obliterans	0	0	0	0	0	0	0	0	0	0
type II pneumocyte hyperplasia	0	4	0	1	1	2	type II pneumocyte hyperplasia	2	0	0	0	4	0	0	2	0	2

lymphocytic infiltrates/perivasculitis	1	2.5	1	1	2	2	lymphocytic infiltrates/perivasculitis	2	2	3	2	2	1	1	1	1	2
aspiration pneumonia	1	0	0	0	0	0	aspiration pneumonia	0	0	0	0	0	0	0	0	0	0
pleuritis	1	2	1	1	1	2	pleuritis	3	1	1	2	1	0	1	1	1	1
Lungs-Left Middle Lobe							Lungs-Left Middle Lobe										
neutrophil infiltrates	1	2	0	0	2	4	neutrophil infiltrates	4	3	3	4	1	0	0	0	0	0
lymphocytic infiltrates	2	2	1	1	1	1	lymphocytic infiltrates	1	2	2	2	2	2	1	2	2	1
macrophage infiltrates	2	3	1	2	2	2	macrophage infiltrates	4	3	3	4	4	2	2	3	2	2
airway edema	0	0	0	0	0	1	airway edema	3	1	0	3	1	0	0	0	0	0
bronchiolitis/peribronchiolitis	2	3	1	2	1	2	bronchiolitis/peribronchiolitis	2	1	2	2	1	0	1	0	2	1
thickened alveolar septae	0	2	0	1	2	2	thickened alveolar septae	3	2	2	3	3	2	2	2	0	0
organized fibrin	0	1	0	0	1	1	organized fibrin	3	2	1	3	2	0	0	1	0	1
bronchiolitis obliterans	0	0	0	0	0	0	bronchiolitis obliterans	0	0	0	0	0	0	0	0	0	0
type II pneumocyte hyperplasia	0	3	0	1	2	3	type II pneumocyte hyperplasia	2	2	1	2	4	1	2	2	1	1
lymphocytic infiltrates/perivasculitis	0	2	1	1	1	2	lymphocytic infiltrates/perivasculitis	2	2	3	2	2	2	1	2	2	1
aspiration pneumonia	2	0	0	0	0	0	aspiration pneumonia	2	2	3	2	2	2	1	2	2	1
pleuritis	0	1	0	1	1	3	pleuritis	2	1	1	0	2	1	0	1	1	1
Lungs-Left Lower Lobe							Lungs-Left Lower Lobe										
neutrophil infiltrates	2	2	0	0	2	4	neutrophil infiltrates	4	4	3	4	1	1	0	0	0	0
lymphocytic infiltrates	2	2	1	1	1	1	lymphocytic infiltrates	1	2	2	2	2	2	1	2	2	2
macrophage infiltrates	2	4	1	2	2	3	macrophage infiltrates	4	4	3	4	4	3	2	3	2	3
airway edema	0	3	0	0	0	2	airway edema	4	3	1	2	1	1	0	0	1	0
bronchiolitis/peribronchiolitis	2	4	0	2	3	4	bronchiolitis/peribronchiolitis	3	2	2	3	1	2	1	1	2	1
thickened alveolar septae	0	2	1	1	2	3	thickened alveolar septae	3	3	2	2	3	3	2	3	1	2
organized fibrin	0	3	0	0	2	2	organized fibrin	3	1	1	3	2	3	0	2	1	0
bronchiolitis obliterans	0	0	0	0	4	2	bronchiolitis obliterans	2	0	0	0	0	1	1	2	1	0
type II pneumocyte hyperplasia	0	3	1	1	3	3	type II pneumocyte hyperplasia	3	3	1	2	5	4	2	3	1	2
lymphocytic infiltrates/perivasculitis	1	2.5	1	1	2	2	lymphocytic infiltrates/perivasculitis	2	2	3	2	2	2	1	1	2	2
aspiration pneumonia	1	0	0	0	0	0	aspiration pneumonia	0	0	0	0	0	0	0	0	0	0
pleuritis	2	1	2	2	1	4	pleuritis	4	2	1	1	2	1	1	1	1	2
Liver							Liver										
hepatocyte degeneration	0	0	0	0	0	0	hepatocyte degeneration	0	0	0	0	0	0	0	0	0	0
glycogen accumulation	1	4	3	3	2	0	glycogen accumulation	0	0	3	0	2	3	4	4	2	2
lipidosis	0	2	0	0	0	2	lipidosis	2	3	0	1	0	0	2	0	0	0
inflammation	0	0	0	0	1	1	inflammation	0	1	0	0	0	0	0	0	0	0
Spleen							Spleen										
inflammation	0	0	0	0	0	0	inflammation	0	1	1	0	0	0	0	0	0	0
Kidney							Kidney										
degeneration/necrosis	0	0	0	0	0	0	degeneration/necrosis	0	0	0	0	0	0	0	0	0	0
Bladder							Bladder										
	0	1	1	0	0	0		0	0	0	1	0	1	0	0	1	0
Nasal							Nasal										
not collected	3	not collected	2	1	3	not collected	not collected	not collected	not collected	not collected	not collected	not collected	not collected	not collected	not collected	not collected	not collected
Brain							Brain										
	0	0	0	0	1	0	Vaccine injection site										
							skin										
								2	0	3	0	0	0	0	0	0	4

Index:
0 = no lesion
1 = minimal change
2 = mild change
3 = moderate change
4 = marked change
5 = severe change

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