

Supplementary Table S1. Primer sequences for qPCR.

Target gene	Forward Primer (5'-3')	Reverse Primer (5'-3')
<i>Vdr</i>	5'-CTG CAC CTC CTC ATC TGT GA-3'	5'-CCC CTT CAA TGG AGA TTG C-3'
<i>Cyp24A1</i>	5'-ACC CCC AAG GTC CGT GAC ATC-3	5'-CCA GTT GGG TCC AGG TAA GG-3'
<i>Cyp27B1</i>	5'-CCG CGG GCT ATG CTG GAA C-3'	5'-CTC TGG GCA AAG GCA AAC ATC TGA-3'
<i>Ifnα</i>	5'-GGA CTT TGG ATT CCC GCA GGA GAA G-3'	5'- GCT GCA TCA GAC AGC CTT GCA GGT C-3'
<i>Ifnβ</i>	5'-AGG GCG GAC TTC AAG ATC-3'	5'-CTC ATT CCA CCC AGT GCT-3'
<i>Ifnγ</i>	5'-TGC ATC TTG GCT TGG CAG CTC TTC-3'	5'-GGG TTG ACC TCA AAC TTG GCA-3'
H1N1 M gene	5'-AGA TGA GTC TTC TAA CCG AGG TCG-3'	5'-TCG AGA TCG GTG TTC TTT CC-3'

Supplementary Table S2. Histological evaluation of SARS-CoV-2 infected mouse.

Parameter	Score = 0	Score = 1	Score = 2	Score = 3
Perivascular Infiltrates (0-3)	None	Up to 10% vessels affected	Up to 25% vessels affected	≥ 25% vessels affected
Lymphocyte dominant (0-1)	No	Yes		
Endothelial reactivity (0-2)	None	Any/multi- focal	Generalized	
Other vascular parameters (0-1)	Absent	Present		
Type II pneumocyte hypertrophy (0-1)	Absent	Present		
Pneumonia extent (0-3)	None	Minimal, focal	Minimal, multi-focal	Mild, multi-focal
Alveolar remodeling (0-1)	None	Any		
Interstitial pneumonia (0-3)	None	Up to 10% affected	10- 25% affected	≥ 25% affected
Intra-alveolar inflammation (0-3)	None	Up to 10% affected	Up to 25% affected	≥ 25% affected

¹Histopathology criteria for scoring lung sections of SARS-CoV-2 infected mice.

Supplementary Table S3. Histological evaluation of SARS-CoV-2 infected.

Parameter	Score = 0	Score = 1	Score = 2	Score = 3	Score = 4
Lesions (0-4)	None	Up to 25% affected	25-50% affected	50-75% affected	> 75% affected
Alveoli (0-3)	None	Mild edema and/or infiltrate	Moderate to severe edema or infiltrate	Diffuse alveolar damage	N/A
Bronchioles (0-3)	None	Mild peribronchiolar cuffing and/or infiltrate, or epithelial degeneration	Moderate peribronchiolar cuffing and/or infiltrate with epithelial degeneration	Severe peribronchiolar cuffing and/or infiltrate with epithelial necrosis	N/A
Blood vessels (0-3)	None	Perivascular edema, mild perivascular cuffing	Perivascular cuffing in >30% of vessels, minimal vasculitis	Vasculitis with thrombosis	N/A
Hemorrhage (0-2)	None	Mild	Severe	N/A	N/A
Type II pneumocyte hyperplasia (0-2)	None	Early change, mild	Marked change, widespread	N/A	N/A

¹Histopathology criteria for scoring lung sections of SARS-CoV-2 infected hamsters.

Supplementary Table S4. Histological evaluation of H1N1 infected.

Parameter	Score = 0	Score = 1	Score = 2	Score = 3
Total lymphocyte infiltration (0-3)	None	Some inflammation	< 3 foci of inflammation	> 3 foci of inflammation
Perivascular infiltration (0-3)	None	Some lymphocytes around bronchiole or blood vessel	Lymphoid aggregates around bronchioles or blood vessel	Multiple lymphoid aggregates
Alveolar Hemorrhage (0-3)	None	Few hemorrhagic lesions	Multiple lesions	Hemorrhage with alveolar damage

¹Histopathology criteria for scoring lung sections of H1N1 influenza infected mice.