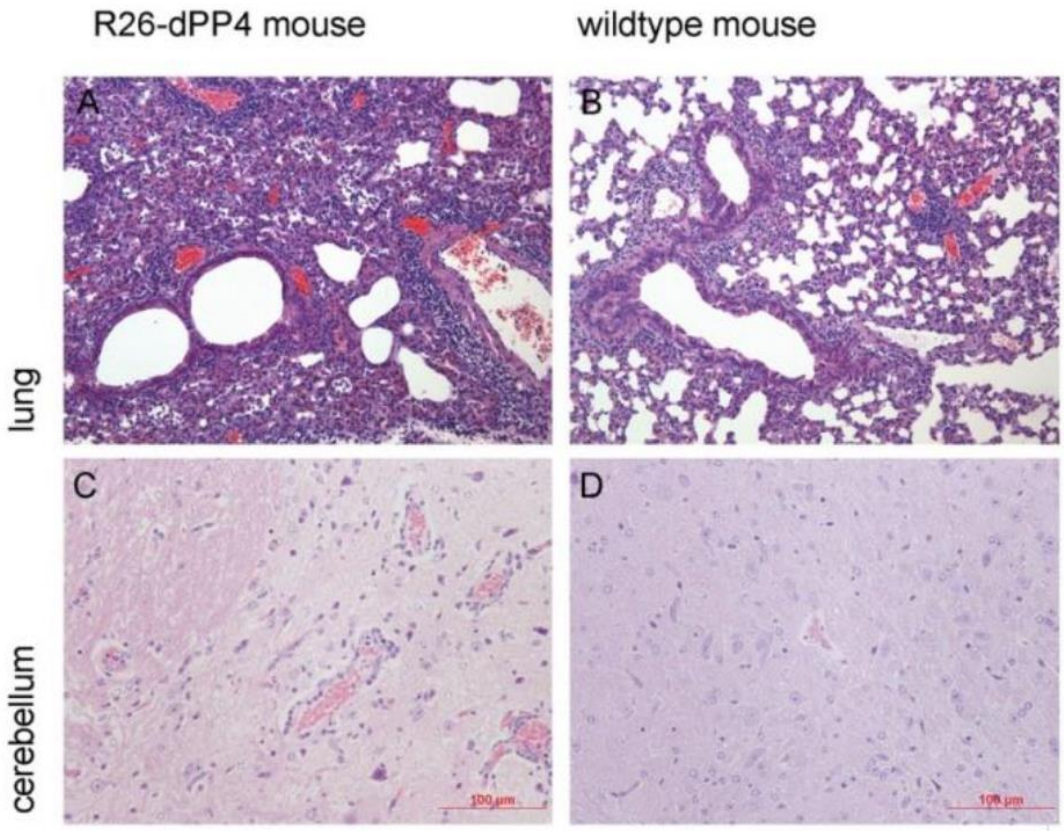
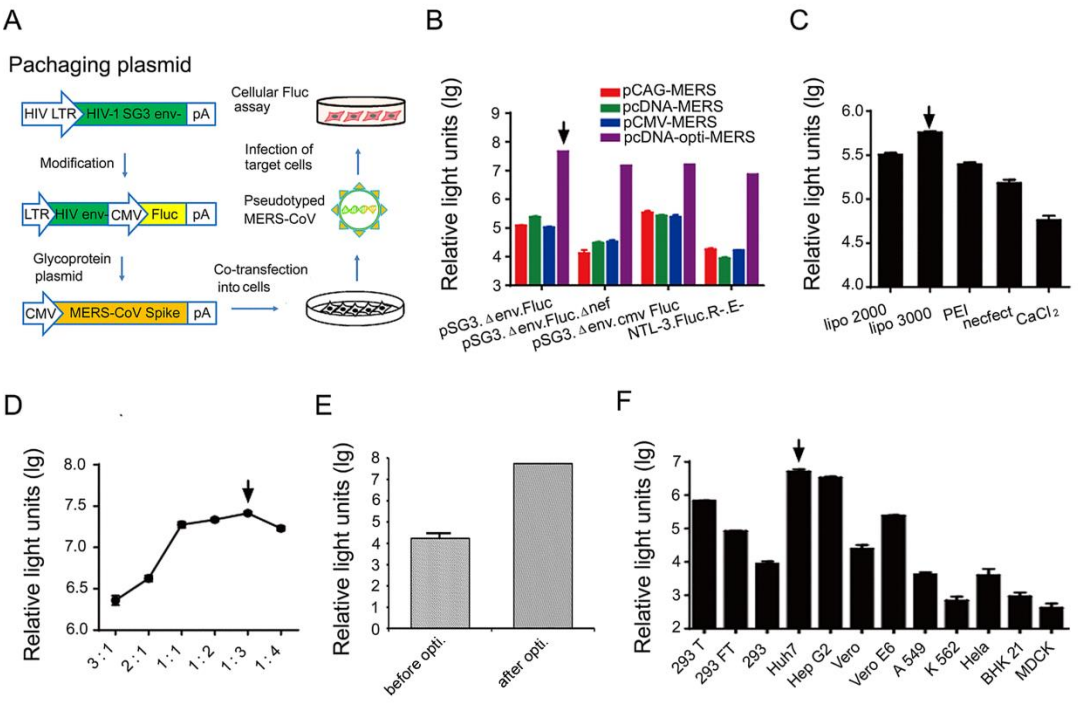


Suppl. Figure 1 Pathogenesis caused by hCoV-EMC infection to R26-hDPP4-knockin mice in lung and brain. (A) Severe pathological changes observed in lung of R26-hDPP4- knockin mice, including widened alveolar septa, edema, vascular dilatation and hyperemia, perivascular infiltration of inflammatory cells, and necrosis of bronchial epithelial cells. (B) No, or mild, symptoms observed in lungs from wild-type mice. (C) Perivascular gliosis around vessel was visualized in R26-hDPP4-infected knockin mice, but not observed in wild-type mice. All mice (n=12) observed showed uniform symptoms.



Suppl. Figure 2. Optimized methods to produce MERS-CoV pseudovirus pHIV/MERSS/Fluc. (A) Schematic diagram of pHIV/MERSS/Fluc generation. 293T or other cells were cotransfected with MERS-CoV-Spike expression vector and HIV backbone vector. Pseudotyped MERS-CoV was collected from the supernatant, used to infect the target cells, and incubated for 48 h before luciferase activity assay. (B) Optimization of the envelope-deleted HIV framework plasmid and expression plasmid. Different MERS-CoV Spike plasmids and framework plasmids were cotransfected to generate pHIV/MERSS/Fluc. (C) Optimization of the transfection reagents. The pcDNA-opti-MERS-Spike plasmid and pSG3.Δenv.Fluc were cotransfected using different transfection reagents. (D) Optimization of the proportion of plasmids. Different proportions of pcDNA-opti-MERS-Spike plasmid and pSG3.Δenv.cmv.Fluc were tested. (E) Values of RLUs of cells infected with pseudotyped MERS-CoV with and without optimization were compared. (F) Cell tropism of pHIV/MERSS/Fluc. Different cell lines were infected with the same lot of pHIV/MERSS/Fluc. RLUs of the infected cells were measured.

Table 1S. Biodistribution of pseudotyped and authentic MERS-CoV in infected R26-hDPP4 mice

Organs	Liver	Spleen	Lung	Bronchi	Kidney	Intestine	Thymus	Muscle	Brain
Pseudotyped virus①	✓	✓	✓	✓	✓	✓	✓	✓	✓×③
Authentic virus②	nd④	nd	✓	✓	×	nd	nd	nd	✓

① Distributions of pseudotyped virus were determined by BLI and Q-PCR, ✓ means positive; × means negative;

② Distributions of authentic virus were determined by titration of virus or IHC;

③ Pseudotyped virus was observed by BLI and Q-PCR in about 50% of infected mice, but authentic virus was revealed in the brain of all infected mice.

④ nd: not determined.