Introduction: A new coronavirus (CoV), Middle East respiratory syndrome CoV (MERS-CoV), is causing an ongoing outbreak in people, sometimes resulting in severe or even fatal pneumonia. MERS-CoV uses dipeptidyl peptidase 4 (DPP4) as a functional receptor and is able to infect cells of a limited number of animal species including bats, camels, goats and non-human primates in vitro, but so far there is no good animal model for human disease. Because the virus binding region in rabbit DPP4 closely resembles that in human DPP4, we tested whether rabbits can be infected with MERS-CoV as an animal model for MERS-CoV infection in man.

Materials and Methods: Sixteen rabbits, serologically negative for MERS-CoV, were inoculated with MERS-CoV or sham inoculum via nose and trachea and swabs were taken frequently. The rabbits were killed 3, 4 or 21 days (n = 4 per day) after inoculation and during necropsy examination samples were taken for pathology, immunohistochemistry, in-situ hybridization and virology.

Results: The rabbits had no clinical signs and 3 or 4 days after inoculation. They had high viral loads as determined by PCR and scattered virus antigen expression in the lungs and nose, associated with mild alveolitis and moderate rhinitis.

Conclusions: The results of this study demonstrate that rabbits can be infected with MERS-CoV with virus replication in the lungs and nose. Therefore, rabbits infected with MERS-CoV may be used as a model to study the pathogenesis of MERS, transmission of MERS-CoV and to test intervention strategies aimed at inhibition of MERS-CoV replication in vivo.