


Applied Genetics and Molecular Biotechnology |

[Published: 10 December 2021](#)

# Infection and protection responses of deletion mutants of non-structural proteins of foot-and-mouth disease virus serotype Asia1 in guinea pigs

[H. Lalzampaia](#), [Subhadra Elango](#), [Jitendra K. Biswal](#), [Narayanan Krishnaswamy](#), [R. P. Tamil Selvan](#), [P. Saravanan](#), [Priyanka Mahadappa](#), [V. Umamathi](#), [G. R. Reddy](#), [V. Bhanuprakash](#), [Aniket Sanyal](#) & [H. J. Dechamma](#) 

*Applied Microbiology and Biotechnology* **106**, 273–286 (2022)

**249** Accesses | **1** Altmetric | [Metrics](#)

## Abstract

The development of a negative marker vaccine against the foot-and-mouth disease virus (FMDV) will enhance the capabilities to differentiate vaccinated from infected animals and move forward in the progressive control pathway for the control of FMD. Here, we report the development of mutant FMDV of Asia1 with partial deletion of non-structural proteins 3A and 3B and characterization of their infectivity and protection response in the guinea pig model. The deleted FMDV Asia1/IND/63/1972 mutants, pAsia<sup>Δ3A</sup> and pAsia<sup>Δ3A3B1</sup> were constructed from the full-length infectious clone pAsia<sup>WT</sup>, the viable virus was rescued, and the genetic stability of the mutants was confirmed by 20 monolayer passages in BHK21 cells. The mutant Asia1 viruses showed comparable growth pattern and infectivity with that of Asia<sup>WT</sup> in the cell culture. However, the Asia<sup>Δ3A3B1</sup>