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Foot-and-Mouth Disease epitope-based vaccines

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Introduction:

An epitope vaccine is a new method for prevention and control of FMDV. We have focused on the design and construction of the recombinant epitope vaccine against FMDV type O, type A and type Asia1.

Materials and methods:

All viruses were gifted from the National FMD Reference Laboratory of China. A tandem repeated multiple-epitope gene (RE) containing two copies of the residues 141–160 and 200–213 of VP1 of FMDV (type O/A/ Asia1) was synthesized by overlapping RT-PCR. Genes of IgG and 3D of FMDV were amplified by RT-PCR, respectively. The proteins were expressed in *E.coli* cells and purified using Ni-NTA resin. The vaccine candidates were developed and their potency evaluated in guinea pigs and pigs.

Results:

The data showed that the broad-spectrum FMD multiple-epitope recombinant vaccine against FMDV type O provided a cross protection against antigenic variants of FMDV type O in pigs. RE-IgG combination with 3D vaccine against FMDV type Asia1 not only elicited high titers of neutralizing antibodies in the vaccinated guinea pigs, but conferred complete protection in guinea pigs against Asia1 virus challenge. Epitope-based vaccine against FMDV type A for bovine elicited specific antibodies in guinea pigs.

Discussion:

This novel design strategy breaks through the limitation of the quasispecies nature and antigenic variants of FMDV within the same serotype, which will pave the way for designing a novel broad-spectrum vaccine of other RNA viruses. We speculate that this vaccine formulation is a promising recombinant subunit vaccine, which may replace traditionally inactivated vaccines and be used for the control and prevention of FMD in the future.

** Abstract for 2nd FMD Scientific Meeting for East Asia should not exceed 1 page, including Introduction/Materials and Methods/Result/Discussion. Please kindly submit abstract of each talk to Dr Batsukh Basan OIE Regional Representation for Asia and the Pacific (b.basan@oie.int, asia.pacific@oie.int) by 30 May2015