

Application of recombinant SAT2 foot-and-mouth disease virus non-structural 3ABC polyprotein, in a diagnostic ELISA

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Foot-and-mouth disease (FMD) virus (FMDV) is the causal agent of a highly infectious vesicular disease affecting primarily cattle, pigs, sheep, goats and artiodactyl wild-life species. Although mortality rates are generally low (less than 5%), recent FMD outbreaks clearly highlighted the serious economic consequences associated with the disease globally. This non-enveloped virus of icosahedral symmetry is a member of the genus Aphthovirus in the family Picornaviridae, and comprised of seven serologically distinct serotypes. The single-stranded positive-sense RNA genome encodes four structural proteins, which assemble into the ca. 30 nm virion, and non-structural proteins (NSP), such as polyprotein 3ABC, which is indispensable for virus replication.

The development of a rapid and easy serological assay, which will enable the detection of all seven FMDV serotypes and allow differentiation between vaccinated and convalescent infected animals, will be a major advance in FMDV diagnosis. The detection of antibodies to 3ABC has been reported to be a sensitive and specific method to differentiate between infected and vaccinated cattle. Although a number of commercially available ELISA-based assays have been developed using recombinant 3ABC, these tests rely on the use of European FMDV strains. Assessment of commercial kits in the African context, indicated that antibodies to the NSPs of FMDV could be detected in the sera of infected cattle, but failed to reach the purported specificity and sensitivity for given reference cattle. In this study the 3ABC polyprotein encoding region of an SAT strain (ZIM 7/83) were cloned and expressed in *Escherichia coli* and *Spodoptera frugiperda* cells by means of a recombinant baculovirus. The expressed proteins will be used to develop an SAT type-specific 3ABC ELISA.