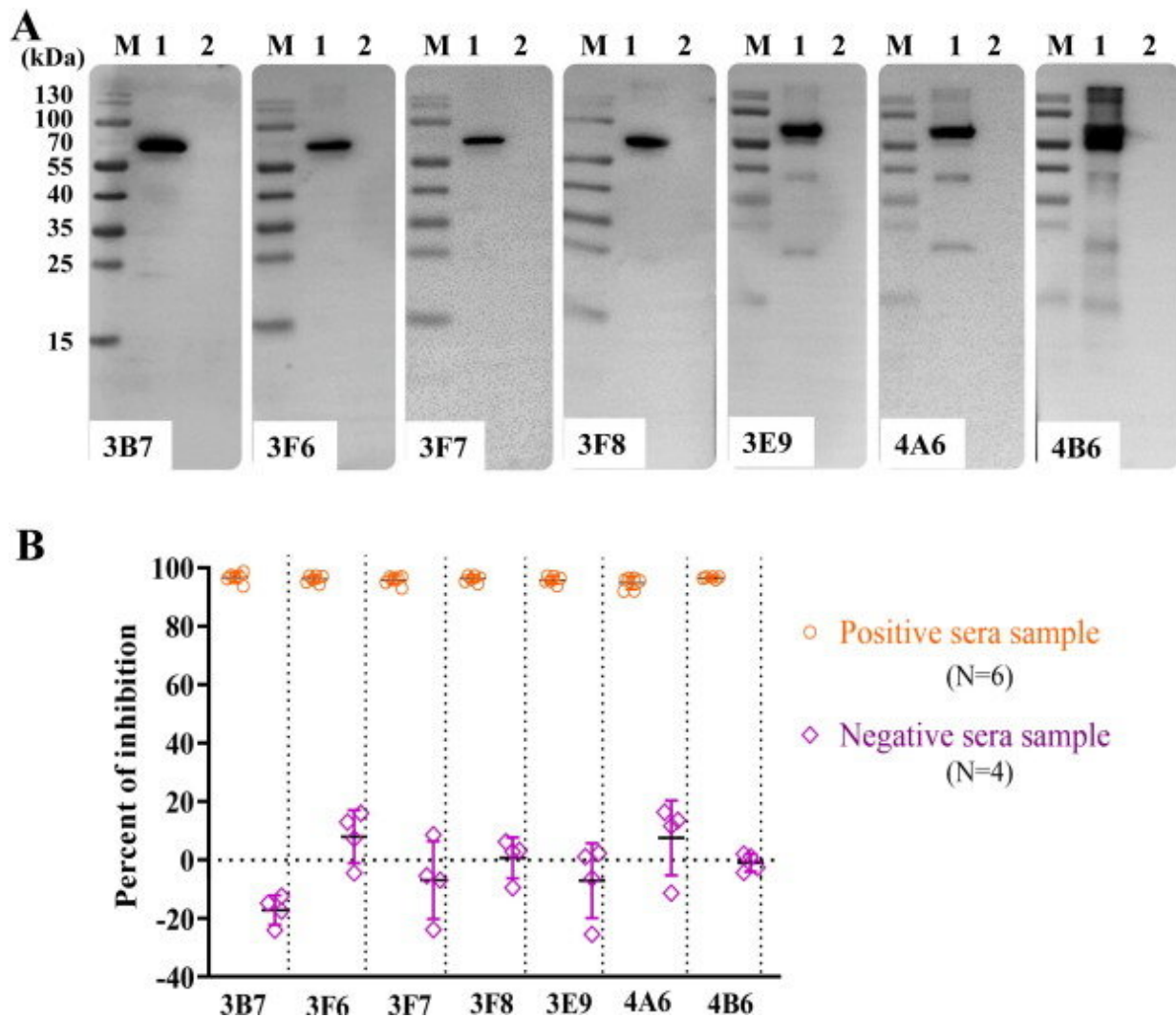# Improving the detection of African swine fever virus antibodies in serum

September 2 2022

Evaluation of P22 mAbs by Western blot analysis and blocking enzyme-linked immunosorbent assay (ELISA). A) Western blot analysis of the P22-monoclonal antibodies' (mAbs) specificity to the targeted P22 protein. The block letter

between two numbers at the lower corner of each picture, represents name of mAb, KDa = kilo Dalton, M = marker, Lane-1 = recombinant P22 protein loaded with 15 μl at a concentration of 1 mg/ml and Lane-2 = maltose binding protein (MBP) as a negative control. These results showed that, all of the mAbs were highly specific and recognized the MBP-tagged P22 protein at the expected weight of around 66 KDa. B) Evaluation of seven P22-mAbs (3B7, 3F6, 3F7, 3F8, 3E9, 4A6 and 4B6) for their application in blocking ELISA using six positive and four Negative pig serum samples to African swine fever virus (ASFV) and all of them were inhibited to bind their target coated antigen by the positive serum samples with mean PI > 92%. Data represents the mean of the results from three independent experiments. Credit: *Biosafety and Health* (2022). DOI: 10.1016/j.bsheal.2022.04.002

African swine fever (ASF) is a highly infectious and fatal disease of pigs. Due to the complexity of the ASF virus (ASFV) and various clinical forms of the disease, a wide range of highly effective and robust sero-diagnostic assays are required.

The use of the most antigenic ASFV proteins is highly crucial to improving sero-diagnostic assays. Currently, only a few highly antigenic recombinant proteins have been tested and validated for use as reagents in ASF sero-diagnostic assays. So far, three ELISA kits based on the recombinant proteins P72, P30, and PP62 have been approved.

In a new study published in *Biosafety and Health* based on the recombinant P22 protein, a highly sensitive, specific, and rapid P22 monoclonal antibody-based blocking ELISA (mAb-bELISA) assay was developed to detect serum antibodies induced by genotype I and II ASFVs to detect ASFV antibodies. A total of 806 pig serum samples were tested to evaluate the performance of the diagnostic assay. The assay was able to detect ASFV antibodies as early as 9 days post-infection.

Based on this study, the noval P22-mAb based bELISA assay can be used for rapid and accurate detection of antibodies against ASFV, which will play a valuable role in the containment and prevention of ASF as an alternative to other serological diagnostic methods. Also, this study will assist researchers to further investigate the immunogenic importance of the P22 protein in ASFV infection.

More information: Ghebremedhin Tsegay et al, Novel P22-monoclonal antibody based blocking ELISA for the detection of African swine fever virus antibodies in serum, *Biosafety and Health* (2022). DOI: 10.1016/j.bsheal.2022.04.002

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