RESEARCH ABSTRACT

SWINE HEALTH

Title: Development of ASFV-specific monoclonal antibodies and mAb-based blocking ELISA – **NPB #19-117:**

Investigator: Ying Fang

Institution: University of Illinois at Urbana-Champaign

Date Submitted: January 1, 2021

Scientific Abstract:
Recent outbreaks of African Swine Fever virus (ASFV) in China and some European countries pose the potential pandemic threat to global swine industry. Highly sensitive and specific diagnostic reagents and assays are urgently needed for rapid detection and implementation in quarantine and elimination of infected animals. In this study, we generated a panel of specific mAbs against selected immunogenic ASFV proteins, including p10, p14.5, p22, p30, p49, p54, p72, and CD2v. These mAbs were initially screened by immunofluorescent assay using *in vitro* expression system. The antibody reactivity was confirmed in virus-infected cells. Their application in the detection of ASFV infection was further tested using the methods of IFA, IHC, Western blotting, immunoprecipitation and ELISA. One of the anti-p30 mAbs showed specific blocking activity against ASFV specific serum antibodies in a blocking ELISA (bELISA) format. Subsequently, an anti-p30 mAb-based bELISA was developed. Serum standards were established, which includes high positive, low positive and negative standard. Analytical sensitivity analysis showed that the 1:64 dilution of high positive standard serum is the limit of detection. Receiver Operating Characteristic (ROC) analysis calculated a diagnostic sensitivity of 98.11% and a diagnostic specificity of 99.42%. A cut off value of the assay was determined as percentage of inhibition (PI) at 45.92%. The coefficient of variation of an internal quality control serum was 6.81% for between-runs, 6.71% for within-run, and 6.14% for within-plate. These results indicate that the bELISA can be used as a serological test for ASFV with high levels of sensitivity, specificity and repeatability. The availability of the panel of mAbs and bELISA provides important tools in aid of ASFV diagnostics and research.