

SWINE HEALTH

Title: A Cell-free Synthesis Approach for the Rapid and Cost-Effective Production of Foot and Mouth Disease Vaccines **NPB# 13-104** **revised**

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Scientific Abstract: Multiple different gene constructs were designed and custom synthesized for the production of the Food and Mouth Disease Virus (FMDV) structural proteins necessary to synthesize a virus-like particle. These genes were based upon the A24 Cruzeiro FMD strain as this strain remains an outbreak threat, particularly in South America and thus the US. The utility of an *E. coli*-based cell-free system for the production of structural FMDV proteins was demonstrated for the first time. In addition, the cell-free protein synthesis reactions were directly controlled and optimized for improved soluble production of the desired FMDV proteins. The formation of virus-like particles was assessed using sucrose velocity sedimentation assays.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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