Duration of Immunity in pigs upon infection with African swine fever virus

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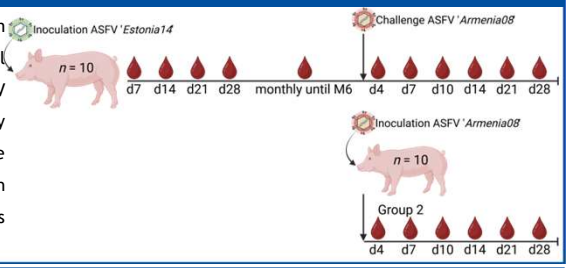
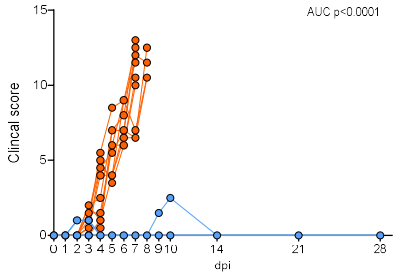
INTRODUCTION

In this study, long-term fate and immunity of animals recovering from moderately virulent ASFV infection were assessed. Six months after initial inoculation, all animals were challenged with highly virulent ASFV '*Armenia08*'. This study indicates that protective immunity upon recovery can last at least six months. No persistent or chronic disease course were observed in convalescent pigs. These findings have implications for both vaccine development and assessment, and disease control strategies including surveillance actions.



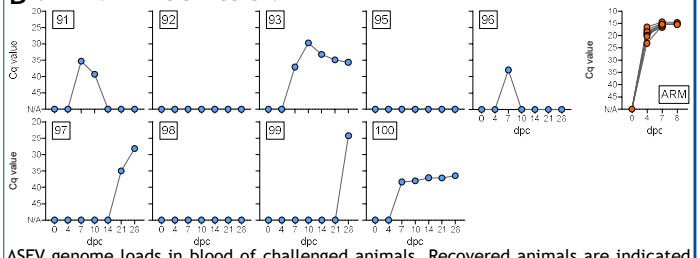
RESULTS

A CLINICAL MANIFESTATION



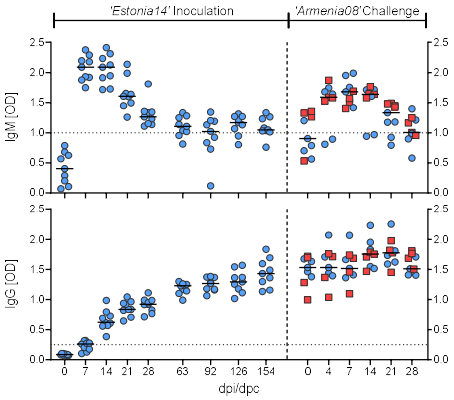
Clinical score of recovered (*n* = 9, blue) and naïve pigs (*n* = 10, orange) after challenge with ASFV '*Armenia08*'.

B VIRAEMIA PROGRESSION



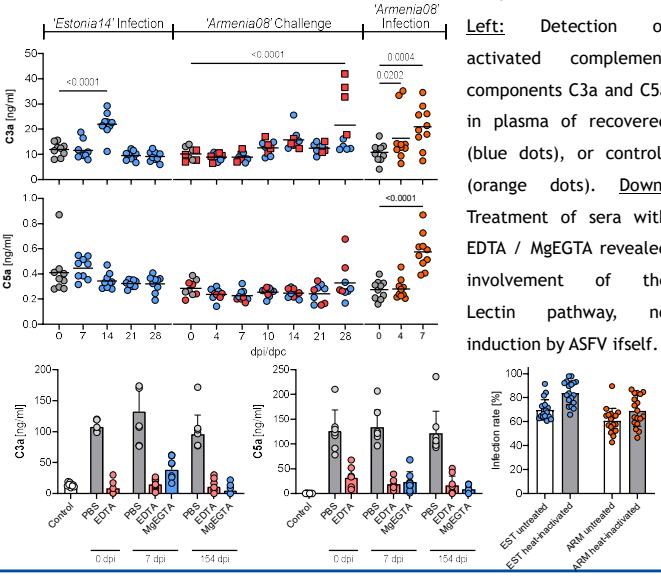
ASFV genome loads in blood of challenged animals. Recovered animals are indicated in blue, naïve in orange. Among the recovered animals, only three remained ASFV genome-negative in blood throughout the observation period after challenge with ASFV '*Armenia08*', while the remaining six animals were ASFV-positive at least once.

C ANTIGEN-SPECIFIC Ig KINETICS



Kinetics of IgM and IgG in sera of pigs after inoculation with ASFV '*Estonia14*' and challenge with ASFV '*Armenia08*'. Animals that were still positive in qPCR at the end of the trial (28 days after challenge) are shown as red squares .

D INVOLVEMENT OF THE COMPLEMENT SYSTEM (LECTIN PATHWAY)



Left: Detection of activated complement components C3a and C5a in plasma of recovered (blue dots), or controls (orange dots). Down: Treatment of sera with EDTA / MgEGTA revealed involvement of the Lectin pathway, no induction by ASFV ifself.

CONCLUSIONS

Our study investigated the robustness of immunity induced by a moderately virulent ASFV strain, '*Estonia14*', against a highly virulent strain, '*Armenia08*'. Recovered pigs exhibited no clinical signs upon challenge, while control pigs developed acute disease. However, three pigs showed limited viral presence post-challenge. Stable IgG levels and a moderate increase post-challenge support the role of humoral immunity. Elevated complement factor C3a levels correlated with challenge virus presence in recovered pigs. Conversely, increased C3a and C5a levels in control animals indicate contribution of the complement system to ASF pathogenicity. These findings demonstrate that prior infection with a moderately virulent ASFV strain elicits robust protection against infection with a highly virulent strain for at least six months.

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