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IN VITRO CHARACTERIZATION OF PRRSV ISOLATES WITH DIFFERENT IN VIVO PATHOGENICITY BY USING MONOCYTE-DERIVED MACROPHAGES

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Introduction

Porcine reproductive and respiratory syndrome virus (PRRSV) is classified in two genotypes: type 1 and type 2. Within these two genotypes, several isolates exist with different virulence and pathogenicity features. Recently, highly pathogenic (HP) isolates emerged causing severe economic losses. In this study the in vitro behavior of an Italian HP-PRRSV (PR40) was compared with other European PRRSV-1 strains, with different in vivo pathogenicity.

Materials and Methods

As previously described, in order to assess the PRRSV-1 strains infection ability and the induction of cytokine production we used monocyte-derived macrophages (MDMs) polarized with IFN- γ , IL-4 or IFN- β . Nine PRRSV-1 isolates were analyzed: two Italian strains, five Eastern European strains, and Lena and Lelystad as reference-strains for HP and low pathogenic (LP) PRRSV, respectively. MDMs were infected with 0.1MOI of each virus and 16h post-infection, cells were harvested for PRRSV-N protein detection by flow cytometry, while supernatants were collected for PRRSV titration and cytokine measurements by ELISA (IFN- α , TNF- α , IL1- β and IL-10).

Results

The different strains were able to infect MDMs, with the best efficiency in unpolarized M \emptyset and IL-4 treated MDMs, and the least in IFNs-treated. Lena showed the highest infectivity independently to the different MDMs treatments, compared to the other HP strains. Regarding the cytokines measurement, IFN- α and IL-10 were not detected in the supernatant of infected MDMs; moreover, the Italian PR40 strain was the only one that induced a significant release of TNF- α and IL1- β .

Discussion and Conclusion

The genome analysis of PR40 showed amino acid deletions in the nsp2 coding gene. The deletions in this gene may affect the strain virulence and the TNF pathway. Therefore, it could be speculated that the in vivo pathogenicity of the PR40 strain may be associated also to the enhanced production of TNF- α and IL1- β .

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