Abstract

Porcine Respiratory Cell and Tissue Coinfections and Superinfections with Porcine Reproductive and Respiratory Syndrome and Swine Influenza Viruses [†]

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Abstract: Porcine reproductive and respiratory syndrome virus (PRRSV) and swine influenza type A virus (swIAV) are major contributors to the porcine respiratory disease complex that is still threatening porcine farming around the world. Understanding the interactions between these two viruses and the effect of their coinfection on the porcine immune response will lead to better preventive and therapeutic measures. In vivo studies of these coinfections showed contradictory results while in vitro studies showing slight interferences between the viruses were limited due to the fact that the two viruses did not share the same host cells. SwIAV mainly infects epithelial cells, while PRRSV only infects cells expressing CD163, such as alveolar macrophages. In an attempt to evaluate the effect of PRRSV infection on the replication of swIAV, the possible induction of trained immunity, and on the host antiviral response, we carried out several coinfections and superinfections using local viral strains. Our infection protocols were performed using a tracheal epithelial cell line and precision-cut lung slices (PCLS) combining different cell types mimicking infections in real conditions. The expression of viral and cellular transcripts involved in the recognition of the virus and in the antiviral response was assessed by quantitative PCR. Immunostaining was also carried out to monitor the virus distribution in the pulmonary tissue. Interestingly, without infecting epithelial cells, PRRSV was able to interfere with swIAV infection and inhibit the antiviral response of the hosting cell. The mechanisms of this interference are still unclear and need to be investigated to ultimately apply improved preventive and therapeutic approaches.

Keywords: coinfection

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