

Macrophage-B cell interactions in the inverted porcine lymph node and their response to Porcine Reproductive and Respiratory Syndrome Virus.

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Abstract

Swine lymph nodes (LN) present an inverted structure compared to mouse and human, with the afferent lymph diffusing from the centre to the periphery. This structure, also observed in close and distant species such as dolphins, hippopotamus, rhinoceros and elephants, is poorly described, nor are the LN macrophage populations and their relationship with B cell follicles. B cell maturation occurs mainly in LN B cell follicles with the help of LN macrophage populations endowed with different antigen delivery capacities. We identified three macrophage populations that we localized in the inverted LN spatial organization. This allowed us to ascribe porcine LN MF to their murine counterparts: subcapsular sinus MF, medullary cord MF and medullary sinus MF. We identified the different intra and extrafollicular stages of LN B cells maturation and explored the interaction of MF, drained antigen and follicular B cells. The porcine reproductive and respiratory syndrome virus (PRRSV) is a major porcine pathogen that infects tissue macrophages (MF). PRRSV is persistent in the secondary lymphoid tissues and induces a delay in neutralizing antibodies appearance. We observed PRRSV interaction with two LN MF populations, of which one interacts closely with centroblasts. We observed BCL6 up-regulation in centroblast upon PRRSV infection, leading to new hypothesis on PRRSV inhibition of B cell maturation. This seminal study of porcine LN will permit fruitful comparison with murine and human LN for a better understanding of normal and inverted LN development and functioning.

Keywords : Swine, lymph node, PRRSV, macrophage, B cell, centrocyte, BCL6

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