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SUMMARY

Chronic infections lead to the functional exhaustion of T cells which is mediated by the expression and interaction of PD-1 on T cells and PD-L1 on infected cells. However, the expression dynamics of PD-L1 and the immunological functions of the PD-1/PD-L1 pathway in chronic diseases of pigs are still poorly understood. In this chapter, anti-bovine PD-L1 mAbs were tested for their cross-reactivity with swine PD-L1. Subsequently, immunohistochemical analysis was conducted using the anti-PD-L1 mAb. Finally, the immune activation of swine PBMCs by the blockade with anti-PD-L1 mAb was assessed.

Several anti-PD-L1 mAbs tested recognized swine PD-L1-expressing cells. Among them, 6C11-3A11 exhibited high binding affinity to swine PD-L1 and was found to be the optimal detection antibody for PD-L1 in pigs. In addition, the binding of swine PD-L1 protein with PD-1 was inhibited by some of these cross-reactive mAbs. Immunohistochemical analysis using 6C11-3A11 revealed that PD-L1 was expressed at the site of infection in pigs affected with PRRS, mycoplasmosis, PCV-2 infection, and proliferative enteropathy. Importantly, the PD-L1 blockade using the cross-reactive mAb 4G12-C1 significantly increased the production of IL-2 from swine PBMCs.

These findings suggest that the PD-1/PD-L1 pathway could be involved in immunosuppression in chronic infections in pigs. This study provides a new perspective on therapeutic strategies for chronic diseases in pigs by targeting immunosuppressive pathways.