Extended Abstract

Three functional mutation sites affect the immune response of pigs through altering the expression pattern and IgV domain of the CD4 protein

Xinyun Li

Abstract

The CD4 protein is an important surface marker of T lymphocytes, which can mediate the antigen presentation process by interacting with MHC II and TCR molecules in human and mouse.
In this study, two haplotypes (A and B) of the *CD4* gene were found within Chinese indigenous and Western commercial pig breeds. These two haplotypes were defined by 22 fully linked SNPs in the CDS region of the *CD4* gene. The expression level and localization of the CD4 protein were significantly different between haplotypes A and B. Transcriptome analysis revealed that the immune response-related genes and signaling pathways were down-regulated in genotype AA. Finally, three linked functional SNPs were identified, which affected the expression level and membrane localization of the CD4 protein in pigs. These three SNPs led to the replacements of two amino acids in the IgV1 domain of the CD4 protein, and related to the function of the CD4 protein in the immune response.

Conclusion

These three linked SNPs were the key functional mutation sites in the CD4 gene, which played important roles in the immune response, and could be utilized as new molecular markers in breeding for disease resistance in pigs..