

Commentary on Sensitivity of Immune Response vs. Stress Resistance

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ABSTRACT

Stress resistance refers to adaptability to harsh environments and is therefore negatively correlated with immune response sensitivity. The article "Three functional mutation sites affect the immune response of pigs through altering the expression pattern and IgV domain of the CD4 protein" identified three key SNPs that affect the CD4 protein antigen presentation function and analyzed the reasons for the differences in stress resistance of different breeds of pigs. We provided a short commentary on the research in this article, which will help the reader's understanding of disease resistance breeding and the treatment of immune-related diseases

Key Words: Immune response; Sensitivity; Stress resistance; Environmental suitability

DESCRIPTION

Disease resistance and stress resistance have always been the focus of pig breeding. Generalized stress resistance generally refers to resistance to disease or stress, namely the adaptation and regulation ability of organisms to the bad environment. The immune response is regulated by a complex molecular regulatory network, which is activated when the body is attacked by antigens or subjected to stress, ultimately enabling the organism to destroy antigens or adapt to the environment [1].

As a kind of important immune cells, CD4+T cells play an important role in immune response. In the article "Three functional mutation sites affect the immune response of pigs through altering the expression pattern and IgV domain of the CD4 protein" [2], the authors screened out three key SNP sites in the CD4 gene, which can lead to the change of two amino acids, and thus leading to functional inactivation of IgV domain in the CD4 protein, thus affecting the immune response process. This is an important finding for pig disease resistance breeding. These three SNPs led to the formation of two haplotypes of the CD4 gene (A and B). The localization of CD4 protein on the cell membrane was blocked in genotype AA individuals, so the immune response was weakened compared with genotype BB individuals. Interestingly, the genotype frequency varies greatly among different pig breeds. After a long period of evolution and artificial selection, the stress resistance and disease resistance of Chinese indigenous breeds are higher than that of Western commercial pig breeds [3]. However, this article confirms that the frequency of allele A in Chinese breeds was higher than that in western commercial breeds. These indicated that CD4 protein encoded by Haplotype A was weaker in immune response (antigen presentation) than that of Haplotype B, so the immune sensitivity of type AA pigs was lower than that of type BB pigs. Generally, the immune response is usually accompanied by an inflammatory response, when the immune system is attacked by an antigen [4]. Excessive immunity can lead to a strong inflammatory response in the body, such as stress response and autoimmune diseases [5,6].

CONCLUSION

Therefore, we believe that if the body is less sensitive to the environment, the intensity of the inflammatory response will be weaker, resulting in less discomfort, and the body is better able to adapt to the harsh environment. The results of this article help us to understand the relationship between immune response sensitivity and stress resistance, and provide potential targets for animal breeding and the treatment of immune-related diseases.

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