



Genetic association of sequence variation in exon 3 of the swine leukocyte antigen-*DQA* gene with piglet diarrhea in Large White, Landrace, and Duroc piglets

Q.L. Yang¹, X.Y. Huang¹, J.J. Kong², S.G. Zhao¹, L.X. Liu³ and S.B. Gun^{1,4}

¹College of Animal Science and Technology, Gansu Agricultural University, Lanzhou, China

²Yongjing Country Agriculture and Animal Husbandry Bureau, Linxia, China

³College of Life Science and Engineering, Northwest University for Nationalities, Lanzhou, China

⁴Gansu Research Center for Swine Production Engineering and Technology, Lanzhou, China

Corresponding author: S.B. Gun

E-mail: gunsbao056@126.com

Genet. Mol. Res. 15 (3): gmr.15038673

Received March 30, 2016

Accepted May 5, 2016

Published August 18, 2016

DOI <http://dx.doi.org/10.4238/gmr.15038673>

Copyright © 2016 The Authors. This is an open-access article distributed under the terms of the Creative Commons Attribution ShareAlike (CC BY-SA) 4.0 License.

ABSTRACT. Piglet diarrhea is one of the primary factors that affects the benefits of the swine industry. Recent studies have shown that exon 2 of the swine leukocyte antigen-*DQA* gene is associated with piglet resistance to diarrhea; however, the contributions of additional exon coding regions of this gene remain unclear. Here, we detected and sequenced variants in the exon 3 region and examined their associations with diarrhea infection in 425 suckling piglets using the polymerase chain reaction-single-strand conformational polymorphism

and sequencing analysis. The results revealed that exon 3 of the swine leukocyte antigen-*DQA* gene is highly polymorphic and pivotal to both diarrhea susceptibility and resistance in piglets. We identified 14 genotypes (AA, AB, BB, BC, CC, EE, EF, BE, BF, CF, DD, DH, GG, and GF) and eight alleles (A-H) that were generated by 14 nucleotide variants, eight of which were novel, and three nucleotide deletions. Statistical analyses revealed that the genotypes AB and EF were associated with resistance to diarrheal disease ($P < 0.05$), and the genotype DD may contribute to diarrhea susceptibility but was unique to Large White pigs ($P > 0.05$). These results elucidate the genetic and immunological background to piglet diarrhea, and provide useful information for resistance breeding programs.

Key words: *SLA-DQA*; Variation; Genetic diversity; Resistance; Piglet diarrhea