Detoxified *Pseudomonas* Exotoxin A Enhanced the Immune Response of a Porcine Circovirus type 2 (PCV2) ORF2 Recombinant Protein

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ABSTRACT In this study, five different fragments of porcine circovirus type 2 (PCV2) ORF2 antigenic regions were cloned, over-expressed in *E. coli*. Rats were immunized with the fragments to evaluate the immunogenicity of the PCV2 ORF2 recombinant proteins. Results showed that the ORF2 F2 fragment (residues 78-156) was the most immunogenic in terms of the antibody response. Detoxified *Pseudomonas* exotoxin A (PE) and KDEL signal peptide were fused with F2 fragment at the N and C terminuses, respectively. This study evaluated the application of using the binding and translocation domains of PE as a vehicle for PCV2 F2 fragment, resulting in the construction of a PE-F2-KDEL recombinant protein. F2 and PE-F2-KDEL recombinant proteins were intraperitoneally injected to mice. Results showed that PE-F2-KDEL induced significantly higher levels of anti-PCV2 serum IgG antibodies than F2. Additionally, PE-F2-KDEL recombinant protein also stimulated significantly higher levels of PCV2-specific IgG compared to inactivated PCV2 whole virus antigen. These results showed that detoxified *Pseudomonas* exotoxin A could enhance the immune response of a PCV2 ORF2 recombinant protein. [Chen HC, Yang SH, Chen YS, *Lai SS, *Kuo TY. Detoxified *Pseudomonas* exotoxin A enhanced the immune response of a porcine circovirus type 2 (PCV2) ORF2 recombinant protein. Taiwan Vet J 37 (4): 233-245, 2011. *Corresponding author TEL: 886-3-9357400 ext 7714, FAX: 886-3-9327850, E-mail: tykuo@niu.edu.tw; TEL: 886-2-29388535, FAX: 886-2-22343367, E-mail: lai@ntu.edu.tw]

Key words: PCV2 ORF2 recombinant protein, porcine circovirus type 2, *Pseudomonas aeruginosa* exotoxin A

INTRODUCTION

Porcine circovirus type 2 (PCV2) has been associated with porcine circovirus associated diseases (PCVD) in young weaned pigs [2] and porcine dermatitis and nephropathy syndrome (PDNS) in pigs from 12 to 16 weeks old [11]. PCVD was first recognized in Canada in 1991 [6] and later also described worldwide. PCVD is mainly caused by PCV2, along with co-infections and/or secondary infections with other pathogens [1]. The disease causes major economic impact on swine production worldwide.

PCV2 belongs to the *Circoviridae* family of the *Circovirus* genus. It is 17 nm in diameter, non-enveloped, icosahedral, and with single stranded closed circular ambisense DNA of 1.76 kb. PCV2 has two major