Improved Immunogenicity of DNA Constructs Co-expressing the GP5 and M Proteins of Porcine Reproductive and Respiratory Syndrome Virus by Glycine-proline-glycine-proline (GPGP) Linker in Mice

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(Received: December 9, 2010. Accepted: January 10, 2011)

ABSTRACT The objective of the study was to evaluate whether co-expressing porcine reproductive and respiratory syndrome virus (PRRSV) envelope glycoprotein 5 (GP5) and matrix (M) protein linked by glycine-proline-glycine-proline (GPGP) could enhance its immunogenicity in mice. Three DNA constructs expressing GP5/M without GPGP linker (pcDNA-5L6), GP5/M conjugated by GPGP linker (pcDNA-5L6G), and M/GP5 conjugated by GPGP linker (pcDNA-6L5) were included. These constructs were then inserted into an eukaryotic expression vector, pcDNA3.1/V5-His TOPO, as DNA vaccines to inject mice intramuscularly for four times at a 2-week interval. Serum samples were collected at various designated time points for the measurement of PRRSV-specific antibodies and splenocytes were isolated at time of sacrifice for lymphocyte blastogenesis assay. The results showed that pcDNA-5L6- and pcDNA-6L5-inoculated mice displayed higher PRRSV-specific neutralizing antibody (NA) titers, serum IgG responses, and lymphocyte proliferative responses than did the pcDNA-5L6-inoculated mice. The data indicated that co-expressing GP5/M with GPGP can indeed improve the immunogenicity of the heterodimeric complex. [Chia MY, Hsiao SH, Chan HT, Do YY, Huang PL, Chang HW, Tsai YC, Lin CM, Cheng CH, * Pang VF, * Jeng CR. Improved Immunogenicity of DNA Constructs Co-expressing the GP5 and M Proteins of Porcine Reproductive and Respiratory Syndrome Virus by Glycine-proline-glycine-proline (GPGP) Linker in Mice. Taiwan Vet J 37 (1): 12-23. 2011. * Corresponding author TEL: 886-2-3366-3869, Fax: 886-2-2362-1965, E-mail: crjeng@ntu.edu.tw (Jeng CR), pang@ntu.edu.tw (Pang VF)]

Key words: GP5 and M proteins, GPGP linker, mice, PRRSV

INTRODUCTION

Porcine reproductive and respiratory syndrome (PRRS) is an important viral disease of pigs which was first described in North American in 1987 [12] and in Europe in 1990 [26]. It causes significant economic losses due to reproductive failure and pneumonia [26]. The PRRSV belongs to the order Nidovirales and