

Immunoinformatics analysis of SLA-DRB1 diversity in Mong Cai Pigs for antigenic peptide presentation of foot-and-mouth disease.

Nguyen Thu Uyen¹, Jae-Young Heo^{1,2}, Ki-Duk Song^{1,2}

¹Department of Agriculture and Convergence Technology, Jeonbuk National University, Jeonju, Korea

²International Agricultural Development and Cooperation Center, Jeonbuk National University, Jeonju, Korea

The genetic diversity found in native breeds, such as Mong Cai pig (MCP), a Vietnamese indigenous breed can be utilized to enhance disease resistance, thereby contributing to improve overall animal health. The MCP's SLA class II is highly diverse and polymorphic, with polymorphisms in the peptide-binding region (PBR) play a key role in presenting antigenic peptides. Among SLA class II molecules, DR molecules are extensively studied for their associations with infectious diseases. In SLA-DR, polymorphic variations are mainly located in the β -chain PBR, which is encoded by exon 2 of the DRB1 gene. Besides that, in Vietnam, foot-and-mouth disease (FMD) remains a persistent threat to present due to its high genetic variability and strong transmissibility, despite ongoing control efforts. This study used immunoinformatics to analyze DRB1 amino acid sequences of the MCP breed, aiming to evaluate their potential to present pathogen-derived peptides from circulating FMD serotypes in Vietnam. Based on this analysis, two peptides from VP1 protein of serotype A, and one peptide from VP1 protein of serotype O were identified as having binding potential to MCP DR molecules. These findings suggest that these peptides may serve as candidates for a multi-epitope vaccine targeting FMDV infections in the MCP breed. Furthermore, this study provides valuable insights into the application of SLA class II genetic diversity in the development of effective vaccination strategies against infectious diseases in pigs.

Key words : Mong Cai pig, DRB1, antigen presentation, foot and mouth disease