

Molecular Characterization of Porcine MMP19 and MMP23B Genes and Its Association with Immune Traits

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Abstract :

MMP19 and *MMP23B* belong to the Matrix metalloproteases (*MMPs*) family, which are zinc-binding endopeptidases that are capable of degrading various components of the extracellular matrix. They are thought to play important roles in embryonic development, reproduction and tissue remodeling, as well as in cell proliferation, differentiation, migration, angiogenesis, apoptosis and host defense. However, they are poorly understood in pigs. Here, we obtained the full length coding region sequence and genomic sequence of the porcine *MMP19* and *MMP23B* genes and analyzed their genomic structures. The deduced amino acid sequence shares similar precursor protein domains with human and mouse *MMP19* and *MMP23B* protein, respectively. Using IMpRH panel, *MMP19* was mapped to SSC5p12-q11 (closely linked to microsatellite DK) and *MMP23B* was mapped to SSC8q11-q12 (linked to microsatellite Sw2521). Quantitative real-time PCR showed that *MMP19* was abundantly expressed in the liver, while *MMP23B* was strongly expressed in the ovarian and heart. Furthermore, both genes were all expressed increasingly in prenatal skeletal muscle during development. Three SNPs were detected by sequencing and PCR-RFLP methods, and association analysis indicated that C203T at exon 5 of *MMP19* has a significant association with the blood parameters WBC (G/L) and IgG2 (mg/mL) ($P < 0.05$), SNP C131T at exon 3 of *MMP23B* is significantly associated with the blood parameters HGB (g/L) and MCH ($P < 0.05$), and A150G in exon 4 has no significant association with the economic traits in pigs.

Key Word :

pig, *MMP19*, *MMP23B*, chromosome mapping, expression, association analysis.