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Detection of a novel single nucleotide polymorphism and imprinted status analysis of the Ras protein-specific guanine nucleotide-releasing factor 1 gene in domestic pigs

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ABSTRACT. The aim of this study was to determine the imprinting status of the Ras protein-specific guanine nucleotide-releasing factor 1 (*Rasgrf1*) gene in domestic pigs. In this study, a 228-bp partial sequence located in exon 14 and a 193-bp partial sequence located in exon 1 of the *Rasgrf1* gene in domestic pigs were obtained. A novel single nucleotide polymorphism, a G/A transition, was identified in *Rasgrf1* exon 14, and then the reciprocal Berkshire x Wannan black F1 hybrid model and the reverse transcription-polymerase chain reaction-restriction fragment length polymorphism method were used to detect the imprinting status of the porcine *Rasgrf1* gene at the 1-day-old developmental stage.

Imprinting analysis showed that, compared to the imprinted expression of the *Rasgrf1* gene in mouse and rat, a variable imprinting status was observed in domestic pigs. In principle, the porcine *Rasgrf1* gene was maternally expressed in the liver and small intestine, paternally expressed in the lung, and biallelically expressed in brain, heart, spleen, kidney, stomach, pancreas, fat, testis, ovary, longissimus dorsi, and pituitary tissues. In conclusion, our results indicated that the *Rasgrf1* gene shows both species- and tissue-specific variation in imprinted expression.

Key words: Domestic pigs; Single nucleotide polymorphism; *Rasgrf1*; Imprinting analysis

