



Molecular cloning and expression analysis of the *GNAS* gene in pig and porcine fibroblast cells

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ABSTRACT. The Alpha subunit of the stimulatory guanine nucleotide-binding protein (GNAS) is a complex imprinted gene. The major product of the *GNAS* gene is the α -subunit of the guanine nucleotide-binding protein (Gas), which plays a key role in multiple signal transduction pathways. Gas is required for the production of the receptor-stimulated intracellular cyclic adenosine monophosphate (cAMP). It has been demonstrated that an increase in the concentration of the intracellular second messenger cAMP promotes apoptosis in different tumor entities. Mutations of GNAS have also been identified in many tumors. This study aimed to investigate the expression pattern and the apoptosis effect in fibroblast cells for porcine GNAS. The results show that *GNAS* mRNA was detected in a wide range of tissues, especially in the longissimus dorsi muscle and thyroid gland. The developmental pattern of GNAS mRNA in the thyroid gland of Jinhua pigs was then examined; however, there was no significant difference ($P > 0.05$) among any of the stages. GNAS gene expression was relatively stable in the thyroid gland during the entire growth and development process. The developmental pattern of GNAS mRNA in the longissimus dorsi muscle was significantly different among the various developmental stages ($P < 0.01$). GNAS mRNA was strongly expressed at 60 days, 90 days, and 150 days after birth, whereas the expression level was very

low during the embryo stages. Target RNA interference of GNAS in porcine fibroblast cells leads to lower mRNA expression of Bcl-2, Fas, and Caspase-3, which are recognized as apoptosis related markers.

Key words: Apoptosis; Guanine nucleotide-binding protein; Pig; Thyroid gland