

## CNN3 Is Regulated by microRNA-1 during Muscle Development in Pigs

Zhonglin Tang<sup>1\*</sup>, Ruyi Liang<sup>1,2\*</sup>, Shuanping Zhao<sup>1</sup>, Ruiqi Wang<sup>1</sup>, Ruihua Huang<sup>2?</sup>, Kui Li<sup>1?</sup>

1. Key Laboratory of Farm Animal Genetic Resources and Germplasm Innovation of Ministry of Agriculture, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing 100193, P.R.China 2. Department of Animal Genetics, Breeding and Reproduction, College of Animal Science and Technology, Nanjing Agricultural University, Nanjing, P.R.China \* Both authors contributed equally to this work. ? Corresponding author: Kui Li, E-mail: kuili@iascaas.net.cn.

Ruihua Huang, E-mail: hrh2002@126.com

### Abstract :

The calponin 3 (CNN3) gene has important functions involved in skeletal muscle development. MicroRNAs (miRNAs) play critical role in myogenesis by influencing the mRNA stability or protein translation of target gene. Based on paired microRNA and mRNA profiling in the prenatal skeletal muscle of pigs, our previous study suggested that CNN3 was differentially expressed and a potential target for miR-1. To further understand the biological function and regulation mechanism of CNN3, we performed co-expression analysis of CNN3 and miR-1 in developmental skeletal muscle tissues (16 stages) from Tongcheng (a Chinese domestic breed, obese-type) and Landrace (a Western, lean-type) pigs, respectively. Subsequently, dual luciferase and western blot assays were carried out. During skeletal muscle development, we observe a significantly negative expression correlation between the miR-1 and CNN3 at mRNA level. Our dual luciferase and western blot results suggested that the CNN3 gene was regulated by miR-1. We identified four single nucleotide polymorphisms (SNPs) contained within the CNN3 gene. Association analysis indicated that these CNN3 SNPs are significantly associated with birth weight (BW) and the 21-day weaning weight of the piglets examined. These facts indicate that CNN3 is a candidate gene associated with growth traits and regulated by miR-1 during skeletal muscle development in pigs

### Key Word :

CNN3, miR-1, skeletal muscle, development, pig.

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