



# Single nucleotide polymorphism screening, molecular characterization, and evolutionary aspects of chicken *Piwi* genes

H.Z. Wang<sup>1</sup>, T. Ma<sup>1</sup>, G.B. Chang<sup>1</sup>, F. Wan<sup>1</sup>, X.P. Liu<sup>2</sup>, L. Lu<sup>1</sup>, L. Xu<sup>1</sup>, J. Chen<sup>1</sup> and G.H. Chen<sup>1</sup>

<sup>1</sup>College of Animal Science and Technology, Yangzhou University, Yangzhou, Jiangsu, China

<sup>2</sup>Poultry Institute, Chinese Academy of Agricultural Sciences, Yangzhou, Jiangsu, China

Corresponding authors: G.B. Chang / G.H. Chen  
E-mail: passioncgb@163.com and / ghchen@yzu.edu.cn

Genet. Mol. Res. 14 (4): 14802-14810 (2015)

Received April 4, 2015

Accepted August 1, 2015

Published November 18, 2015

DOI <http://dx.doi.org/10.4238/2015.November.18.45>

**ABSTRACT.** The P-element-induced wimpy testis (*Piwi*) gene is involved in germline stem cell self-renewal, meiosis, RNA silencing, and transcriptional regulation. *Piwi* genes are relatively well conserved in many species, but their function in poultry species is unclear. In this study, *Piwi* genes were sequenced using a target-sequence capture assay in quail and 28 breeds of chicken. Single nucleotide polymorphisms (SNPs) and evolutionary aspects of these chicken breeds were then analyzed. We found that SNP sites existed mainly in the introns of a few chicken breeds, and we selected an SNP on intron 4 for further verification by Sanger sequencing, the results of which were similar to those obtained by the target-capture sequencing assay. The evolutionary analysis revealed that there were more mutations in the Chahua and Leghorn breeds than in the other breeds, and that the phylogenetic tree was divided into four main categories that suggested that *Piwi* is evolutionarily conserved, and mutations in the introns might be associated with gametogenesis. The screened SNPs can be used as

candidate markers for *Piwi*, and our results provide basic information for the further study of *Piwi* function in poultry.

**Key words:** Chicken; Target-capture sequencing; *Piwi* genes; SNP