



## Cell proliferation and apoptosis in the fetal and neonatal ovary of guinea pigs

S.Y. Sun<sup>1,2</sup>, W. Zhang<sup>1,3</sup>, X. Han<sup>1</sup>, R.H. Huang<sup>1</sup> and F.X. Shi<sup>1</sup>

<sup>1</sup>Laboratory of Animal Reproduction, College of Animal Science and Technology, Nanjing Agricultural University, Nanjing, China

<sup>2</sup>Wenzhou Vocational College of Science and Technology, Wenzhou, China

<sup>3</sup>College of Animal Science, Henan Science and Technology Institute, Xinxiang, China

Corresponding authors: F.X. Shi / R.H. Huang  
E-mail: fxshi@njau.edu.cn / hrh2002@126.com

Genet. Mol. Res. 13 (1): 1570-1578 (2014)

Received January 18, 2013

Accepted June 29, 2013

Published March 12, 2014

DOI <http://dx.doi.org/10.4238/2014.March.12.9>

**ABSTRACT.** The guinea pig is an excellent animal model for studying reproductive biology of adult humans and most domestic animals. Yet, whether this animal might serve as a good model for embryonic stage investigations and determinations of signals affecting or directing ovary development remains unknown. These questions were addressed by examining morphological evolution and the expression of biomarkers of cell proliferation and apoptosis in the ovaries of fetal and neonatal guinea pigs in the present study. Embryonic and neonatal guinea pigs at 30, 40, 50, 60, and 68 days postcoitum (dpc) and at 1 day postpartum (dpp) were evaluated, and the dynamic changes in follicles between 30 dpc and 1 dpp were observed. Results also showed that a critical period of follicular development in guinea pig embryos occurred at 40 to 50 dpc. Moreover, the proliferating-cell nuclear antigen, a cell proliferation marker, immunohistochemically stained healthy follicles, while caspase-3, an apoptosis marker, was mainly observed in atretic follicles. Together, these results demonstrate that cell proliferation and apoptosis contribute to follicular formation, development, and atresia in fetal and neonatal guinea pig ovaries. Furthermore, this study

confirmed that the guinea pig is also an excellent animal model for studying reproductive biology in human and domestic animal embryos.

**Key words:** Cell proliferation; Apoptosis; Ovary; Embryo; Guinea pig