

The Effects of Transcription / Translation Inhibitors on Meiotic Maturation of Porcine Oocyte *In Vitro*

Tae Ho Byun¹, Sung Ho Lee², Chang Sik Park³ and Sang Ho Lee¹

¹Graduate School of Biotechnology, Korea University, ²College of Visual Image & Health, Kongju National University & ³Division of Animal Science and Resources, Chung Nam National University

The oocytes from most of animal species accumulate genetic information and other necessary materials during oogenesis for the later use in the early development. Over the years oocyte maturation has been studied extensively both *in vitro* and *in vivo*. Particularly, maturation of follicular oocyte *in vitro* becomes one of the important tools for the studies of basic cell biology, the *in vitro* technology of animal production, and in particular, the somatic cell cloning by nuclear transfer. We examined meiotic maturation and cumulus expansion in the presence of translation or transcription inhibitors for varying periods of *in vitro* maturation (IVM) of pig oocyte. In Experiment I, the results revealed that translation and transcription inhibitors inhibited cumulus expansion and meiotic maturation during 35h of IVM. However, 50 to 60% of the oocytes underwent nuclear maturation without cumulus expansion during 75h of IVM. The rest of the oocytes were arrested at metaphase I (40-50%) in the presence of the inhibitors. In Experiment II, the OCCs were exposed to the drugs only for 15h to examine translation and transcription inhibitors on cumulus expansion and meiotic maturation. Transcription inhibitors for 15h did not arrest meiotic maturation when the oocytes were cultured for subsequent, necessary period of IVM, whereas cumulus expansion was completely inhibited, suggesting that initial 15h is critical transcription activity for cumulus expansion. Translation inhibitors for 15h exposure did not alter cumulus expansion and meiotic maturation during subsequent culture in the absence of the drugs. In Experiment III, the OCCs were exposed to the drugs only for later 30h to examine the influence of transcription and translation inhibitors on oocyte maturation. Interestingly, all meiotic maturation underwent normally with full expansion of cumulus. Similar results were obtained from Experiment IV where 5h of exposure from 15 to 20h of IVM culture to the drugs was performed and subsequently cultured for same period in fresh medium. Taken there results together, both transcription and translation are necessary for nuclear maturation and cumulus expansion, and first 15h IVM for cumulus expansion is critical. The arrested oocytes by the drugs were still capable of undergoing nuclear maturation, although cumulus expansion was affected.