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IN VITRO MATURATION

DAMRI DARAWIROJ : INSULIN-LIKE GROWTH FACTOR -I PROMOTES MATURATION RATE OF THE DOMESTIC CAT OOCYTES IN VITRO. THESIS ADVISOR: KANOK PAVASUTHIPAISIT Ph.D., YINDEE KITIYANANT M.Sc., VIJITTRA LEARDKAMOLKARN Ph.D. 61 p. ISBN 974-663-923-4

The objectives of the present study were to determine the influence of insulin-like growth factor-I (IGF-I) on domestic cat oocyte maturation *in vitro* and to identify the optimal time for the *in vitro* maturation (IVM). In experiment I, a total of 879 oocytes were obtained from cats subjected to ovariectomy and were classified into 4 grades using the criteria of the complement of cumulus cells and the morphology of oocyte cytoplasm: grade 1 with tightly compacted cumulus cells; grade 2 with less than 5 layers cumulus surrounding; grade 3 with partial cumulus surrounding; and grade 4 with denuded oocytes. Both grades 1 and 2 oocytes have uniformly dark ooplasm, whereas grades 3 and 4 have either dark or pale ooplasm. The oocytes in each grade were randomly divided and cultured in Dulbecco's minimum essential medium (DMEM) containing 0.4% BSA; 1 µg/ml FSH, LH and estradiol with or without 100 ng/ml IGF-I at 38°C, 5% CO<sub>2</sub>. After 32h, the assessment of oocyte maturation was performed. The immature oocytes were stained to identify the meiotic stages. The percentage of grades 1 and 2 mature oocytes (43.54%, 46.41%) was markedly increased in DMEM + IGF-I compared to the control (22.40%, 29.50%). In addition, the percentage of mature oocytes in grades 1 and 2 were significantly higher than those in grades 3 and 4 ( $p < 0.05$ ) both in the control and experimental groups. The majority of immature oocytes both in DMEM and DMEM+IGF-I were arrested at germinal vesicle breakdown (GVBD) and metaphase I (MI). On the other hand, no effects of IGF-I on the maturation rate of grades 3 and 4 were observed. In experiment II, to determine the time required for IVM, grades 1 and 2 oocytes were cultured using the same protocol for 32, 36 and 48h. There were no significant differences ( $p > 0.05$ ) in maturation rate among the three incubation times. These results suggested that IGF-I was able to exert the stimulatory effect on only good quality domestic cat oocytes during maturation *in vitro*. This effect may be mediated via cumulus cells. In IVM of domestic cat oocytes, the 32-h culturing time is sufficient for resumption of meiotic maturation.