

# 第12回 梨大胚培養士アカデミーセミナー 開催のご案内

日時: 2023年10月17日(火) 15:00~16:30  
場所: S1-22

## In vitro growth and development of buffalo oocytes

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Buffalo (*Bubalus bubalis*) is an important livestock species in many countries of the world, particularly in Asia and the Mediterranean region. They have poor reproductive performances including poor expression of estrous sign, seasonal breeding, long post-partum ovarian inactivity, late pubertal maturity, poor conception rate and long calving interval. Assisted reproductive technologies are required for improvement of their reproductive efficiencies. Their ovaries contain a limited numbers of antral follicles comparing cattle. Therefore, in vitro growth (IVG) of immature buffalo oocytes is important to increase the availability of functional oocytes for in vitro embryo production. Several factors, including stem cell factor (SCF), play important roles in growth and survival of mammalian oocyte. It has been reported that SCF supports the growth, viability and nuclear maturation of buffalo oocytes in vitro (Theriogenology 2020; 142: 114-119). Oocyte-granulosa cell complexes (OGCs) were dissected from early antral follicles of slaughtered buffalo ovaries and cultured for 6 days in media supplemented with 0, 50 or 100 ng/mL SCF. In vitro grown oocytes were further cultured for in vitro maturation for 24 h. The results showed that SCF significantly ( $P<0.05$ ) increased buffalo oocyte diameter in vitro. The percentages of surviving oocytes were 60, 81 and 92 in 0, 50 and 100 ng/mL SCF supplemented group, respectively. On the other hand, L-carnitine is a vitamin like amino acid that acts as a transporter in metabolic pathway. It transports long chain fatty acids into the mitochondria via  $\beta$ -oxidation and finally adenosine triphosphate (ATP) is generated. The effects of L-carnitine on growth and development of buffalo oocytes were examined in vitro. L-carnitine enhanced growth of buffalo oocytes in vitro (Animals 2022; 12: 1957). Significantly ( $p<0.05$ ) lower numbers of oocytes degenerated in 0.5 mg/ml L-carnitine group than others. L-carnitine also enhanced the formation of antrum-like structures and nuclear maturation rate of in vitro grown buffalo oocytes. L-carnitine increased the cumulus cell expansion rate in buffalo oocytes. Similarly, L-carnitine induced the in vitro meiotic progression of buffalo oocytes (Asian Pacific Journal of Reproduction 2022; 11: 236-242). On the other hand L-carnitine reduced the rate of oocyte degeneration in vitro. It has also been reported that estradiol has promoting effects on normal progress of in vitro oocyte meiosis in buffalos and goats (Reprod Med Biol. 2021;20:62-70). However, the rate of in vitro maturation was lower in buffaloes than goats. Thus, the rate of development is lower in buffaloes than other species of domestic animals. Attention should be paid to identify the causes involved in poor growth and development of buffalo oocytes and their remedies in future studies.

問合わせ : 高度生殖補助技術センター 岸上哲士(8705)