

# The 129th RIKEN BRC SEMINAR



日時:2015年 7月 2日(木) 16:30~17:30

場所:バイオリソースセンター1階 森脇和郎ホール

Byeong Chun Lee, DVM, Ph.D.

Professor, Dept. of Theriogenology and Biotechnology College of  
Veterinary Medicine, Seoul National University

Lee 教授は、最初のイヌクローンを報告された研究者です (Lee et al. Nature 2005)。  
現在まで、イヌとブタのクローンでトップクラスの研究が続けられており、麻薬探知犬などへの応用  
も開始されています。セミナーでは、初のクローン犬 "スナッピー"誕生から10年間の研究の成果に  
ついてご講演して頂きます。

## Ten years progress after first clone dog "Snuppy"

Dog has unique reproductive features characterized by a monoestrous, polyovulatory and non-seasonal reproductive cycle, ovulation of oocytes at the germinal vesicle stage, and delayed meiotic resumption of ovulated oocytes. These features require numerous adaptations of in vivo/vitro methods commonly and efficiently used in other species. Although a mature oocyte with MII cytoplasm is essential for SCNT, in vitro maturation rates of canine oocytes still remain low compared to results in farm animals. Therefore, protocols to collect in vivo matured oocytes surgically by flushing oviducts have been developed, and between six and 12 oocytes can be collected during one oestrus cycle of each bitch, with an average recovery rate up to 93.8% recovery rate. Because ovulation induction is also not well established in dogs, natural ovulation of the oocyte donor dog and recipient has to be predicted by serum progesterone concentration. Since the first cloned dog, named Snuppy (Seoul National University puppy), was reported by our group, a total of 40 non-transgenic puppies and 12 transgenic cloned puppies have been reported. A variety of donor cells have been used including male and female, adult and foetal fibroblasts, young and aged donor dogs, small and large breeds, fibroblasts and adipose-derived mesenchymal stem cells and even genetically modified cells. Electrofusion of a cytoplasm with a donor cell transferred into the perivitelline space of an enucleated oocyte in dogs is carried out by needle fusion, with a success rate up to 83.5%. After electrofusion and chemical activation, the reconstructed embryos are immediately transferred to a spontaneously synchronous recipient because in vitro culture protocol has not yet been established in dogs. Cloning efficiency (number of puppies/transferred embryos) was higher in nulliparous than in multiparous recipients, but synchronization between the oocyte donor dog and recipient within 1 day did not influence efficiency. Recently, elite cloned drug sniffing dog, rescuer dog and quarantine sniffing dog generated using SCNT technique.



連絡先: 遺伝工学基盤技術室

小倉 淳郎(029-836-9165)