生物理工学研究所セミナー

1．生物理工学研究所では、本研究所設立の趣旨に基づき、ハイテクリサーチ研究に関する情報交流事業の一つとして、先端技術研究者を招聘し、セミナーを開催する。

2．このセミナーは、本年は、主として研究所研究員および生物理工学部大学院学生を対象に行われた。

3．今後、本セミナーは、本学全体ならびに一般企業等の研究者に対しても公開し、先端技術の情報交流をはじめ、企業と大学、公共研究機関など相互に共同研究の機会を発展させることを目的にしている。

4．本セミナーの要旨は、生物理工学研究所紀要に掲載される。

生物理工学研究所セミナー（1999）

	日　程	講演者	所　属
第四回	10／15／1999	Dr. Teruhiko Wakayama	Univ. Hawaii (Honolulu, USA)
第五回	1／31／2000	Dr. Will H. Eyestone	Virginia Tech Univ. (VA, USA)

第四回　生物理工学研究所セミナー

日付：　10／15／1999

演題：　FULL-TERM DEVELOPMENT OF MICE FROM ENUCLEATED OOCYTES INJECTED WITH CUMULUS CELL NUCLEI

演者：　Dr. Teruhiko Wakayama

所属：　Department of Anatomy and Reproductive Biology, University of Hawaii, Honolulu, Hawaii 96822, USA

Until recently, fertilization was the only way to produce viable mammalian offspring, a process implicitly involving male and female gametes. However, techniques involving fusion of embryonic or fetal somatic cells with enucleated oocytes have become steadily more successful in generating cloned young. Dolly the sheep4 was produced by electrofusion of sheep mammary-derived cells with enucleated sheep oocytes. Here we investigate the factors governing embryonic development by introducing nuclei from somatic cells (Sertoli, neuronal and cumulus cells) taken from adult mice into enucleated mouse oocytes. We found that some enucleated oocytes receiving Sertoli or neuronal nuclei developed in vitro and implanted following transfer, but none developed beyond 8.5 days post coitum; however, a high percentage of enucleated oocytes receiving cumulus nuclei developed in vitro. Once transferred, many of these embryos implanted and, although most were subsequently resorbed, a significant proportion (2 to 2.8%) developed to term. These experiments show that for mammals, nuclei from terminally differentiated, adult somatic cells of known phenotype introduced into cnucleated oocytes are capable of supporting full development.

Nature (394, 369 ; 1998) より抜粋。

第五回　生物理工学研究所セミナー

日付：　1／31／2000

演題：　PRODUCTION AND BREEDING OF TRANSGENIC CATTLE EXPRESSING HIGH LEVELS OF HUMAN ALPHA-LACTALBUMIN IN THEIR MILK

演者：　Dr. Will H. Eyestone

所属：　Department of Veterinary Medicine Virginia Tech University, Blacksburg, Virginia 24060 USA

Transgenic technology permits major modifications of phenotype by introducing subtle changes in genotype. For domestic farm species, genetic modification may be used to enhance agricultural production or to generate novel genotypes capable of producing heterologous proteins for biomedical applications. The advent of in vitro embryo production techniques has facilitated the large-scale, commercial use of transgenic technology in cattle. Accordingly, we employed in vitro-produced zygotes and embryos in an effort to generate transgenic cattle. Overall, pronuclei in 36,530 in vitro matured and fertilized zygotes were microinjected with a construct designed to express human alpha-lactalbumin in the mammary gland. Of these, 1,472 developed and were transferred to recipients, including 148 twin transfers. Initial pregnancy rate on Day 30 of gestation was 28% (374／1,324). Subsequent calving rate was 17% (226／1,324). Eighteen calves (8%) were transgenic. In vitro produced embryos were used to facilitate breeding of transgenic bulls. Frequency of transgene transmission varied from 3 to 54% between bulls, indicating varying degrees mosaicism. Embryos produced in vitro by these bulls were biopsied and screened for transgenesis prior to transfer to recipients; nearly all calves born from screened, transgenic embryos were themselves transgenic. Heifers obtained by these methods have been induced to lactate and are expressing human alpha-lactalbumin in their milk at a level of 4 g／l.