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ORAL

Direct reprogramming of mouse somatic cells into pluripotent stem sells by pig germinal vesicle oocytes extract

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Abstract

Genomic reprogramming factors in the cytoplasm of mature oocytes could be reprogrammed somatic cell cells to totipotency cells and full-term development (cloned animals). Since then, this technique has been considered an important toot not only for animal reproduction but also for regenerative medicine, concervation of endangered species, and for study of genes function and cell biology. Moreover, in order to produce nuclear transfer embryonic stem (ntES) cells using somatic cell nuclear transfer (SCNT), the SCNT technique requires donated fresh oocytes, which raises ethical problems for production in human cloned embryo. For this reason, the use of induced pluripotent stem (iPS) cells for genomic reprogramming and for regenerative medicine is currently a hot topic in this field. However, the use of iPS cells for human therapy by the technique of retroviruses used to insert the pluripotent genes into somatic cells could cause tumors in tissues grown from the host iPS cells. Recently, we found that genomic reprogramming factors in the cytoplasm of pig germinal vesicle (GV)-stage oocytes has been shown to improve the efficiency of producing cloned mouse offspring and could reprogram pig fibroblasts to stem-like cells. In this talk, we will discuss whether pig GV cytoplasmic extract could induce pluripotent stem cells from mouse fibroblast cells (interspecies reprogramming). We first established stem-like cells from mouse fibroblast cells treated with GV oocytes extracted (gviPS cells). We demonstrated that reactivation of Oct4 promoter in mouse Oct4-GFP fibroblast cells at day 10 after treated with pig GV oocyte cytoplasmic extract and the formation of colonies is observed at 3 weeks after treatment. In addition, mouse gviPS cells reprogrammed with pig GV cytoplasmic extract can in vitro re-differentiate into neuron-like cells. Interestingly, mouse gviPS cells injected into embryos of different mouse strain could be produced chimeric mice.

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