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INDUCED PLURIPOTENT STEM CELLS DERIVED FROM PORCINE SERTOLI CELLS

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Induced pluripotent stem cells (iPSCs) are generated by reprogramming of fully differentiated adult cells using four transcription factors, including OCT4, SOX2, KLF-4 and c-MYC (OSKM). Porcine is a meaningful model for regenerative medicine because its anatomy and physiology are similar to human. However, reprogramming efficiency of porcine fibroblasts into iPSCs is currently poor. This study used Sertoli cells as a novel cell origin for somatic cells reprogramming. Neonatal testes were collected from 1-week old piglets. The testes were digested by two-step enzymatic method in order to isolate the Sertoli cells. The Sertoli cells were transfected with retroviral vectors expressing OSKM. We observed the primary colonies and counted on day 7 after transfection. The characteristics of Sertoli iPSCs-like colonies were analyzed by morphology, alkaline phosphatase staining, RT-PCR, G-banding, in vitro and in vivo differentiation. Sertoli cells obtained from neonatal porcine showed typically polygonal shaped. A total of 240 colonies (0.33%) originated from seeding 72,500 cells were observed on day 7. The Sertoli iPSCs-like colonies exhibited a high nuclear per cytoplasm ratio with prominent nucleoli. We picked up 30 Sertoli iPSCs-like colonies and 8 cell lines (26.6%) demonstrated undifferentiated stage of iPSCs. The Sertoli iPSCs-like colonies were positive to alkaline phosphatase staining and expressed endogenous pluripotent. G-banding analysis demonstrated normal karyotype. Under differentiation conditions, iPSC-like cell lines could form three-dimension aggregated masses, which represented three germ layers of embryonic cells. For in vivo differentiation, tumour mass were collected and presented all of ectoderm, mesoderm, and endoderm. In conclusion, the Sertoli cells can be used as a novel somatic cell origin for iPSCs reprogramming.

Biography

P Setthawong has completed her Bachelor's Degree in Faculty of Veterinary Science (First-Class Honors) from Chulalongkorn University, Thailand. She got a Scholarship in Thailand Research Fund through the Royal Golden Jubilee PhD Program (Grant No. PHD/0143/2556). She is currently pursuing a Doctor of Philosophy Degree in the field of Obstetrics, Gynaecology and Reproduction at Chulalongkorn University, Thailand. She is interested in veterinary stem cells especially in pig as an animal model for human. She aims to study about generation of embryonic stem cells and induced pluripotent stem cells. She has succeeded in establishing and characterizing induced pluripotent stem cells derived from Sertoli and fibroblast cells.

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