Study of traceability of porcine induced pluripotent stem cells after transplantation [1]

Yu-Jing Liao [2] Yu-Zhan Liu [2] Yi-Shiou Chen [2] Ja-Xin Lee [2]
Lih-Ren Chen [2][3][4] and Jenn-Rong Yang [2][5]

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Abstract

The purpose of this study was to establish the green fluorescent protein expressing porcine induced pluripotent stem cells (piPS/GFP$^+$ cells) and to investigate the traceability after cell transplantation. By using electroporation with 2 DC pluses of 150 V/cm and 10 mini sec, we successfully transfected GFP reporter gene into piPS cells, thereafter, which continuously and steadily expressed GFP signal. The embryoid formation derived from piPS/GFP$^+$ cells by hanging drop culture also maintained GFP expression, induced and spontaneous differentiated into cells and tissues of the three germ layers. Furthermore, the teratomas were found in the NOD-SCID mice after piPS/GFP$^+$ cells transplantation. The GFP expression of the transplanted piPS/GFP$^+$ could be detected by using in vivo imaging system on day 30 after transplantation. The size of teratomas was significantly enlarged on day 90 after transplantation, along with the increment of the GFP signal intensity. Therefore, the GFP expression of piPS/GFP$^+$ cells can be continuously and steadily maintained regardless of the differentiation or transplantation. The piPS/GFP$^+$ cells could serve as a traceable target after transplantation and could be beneficial for the development of cell transplantation therapeutics.

Key words: Porcine induced pluripotent stem cells, Green fluorescent protein, Spontaneous differentiation, Teratoma.

(1) Contribution No. 2233 from Livestock Research Institute, Council of Agriculture, Executive Yuan.
(2) Physiology Division, COA-LRI, Hsinhua, Tainan 71246, Taiwan, R.O.C.
(3) Institute of Biotechnology, National Cheng Kung University, Tainan 70101, Taiwan. R.O.C.
(4) Institute of Biotechnology, Southern Taiwan University, Tainan 71005, Taiwan. R.O.C.
(5) Corresponding author, E-mail: jryang@mail.tlri.gov.tw.