Abstract

Induced pluripotent stem (iPS) cells are generated from adult human somatic cells by the retrovirus-mediated transduction of four transcription factors, namely Oct3/4, Sox2, Klf4, and c-Myc. iPS cells inherit the genetic background of donor somatic cells and can differentiate into all three germ layers; therefore, iPS cells can be used for studies of various diseases. iPS technology has opened an avenue to generate disease-specific pluripotent stem cells that can differentiate into specific types of cells (disease-targeted cells) that are significantly involved in disease mechanisms, thereby, iPS cells can be a disease model used for understanding disease mechanisms, drug screening and toxicology. Modeling neurological diseases with human iPS cells first succeeded in early-onset neurological diseases, including spinal muscular atrophy and familial dysautonomia, which are mostly triggered by gene mutation. For late-onset neurodegenerative disorders, such as Parkinson’s and Alzheimer’s diseases, where most patients are sporadic and the genetic background is unclear, iPS cells will be generated from the patients and tested as to whether they can be applied to modeling of such late-onset diseases. The application of iPS cells to transplantation therapies involves hurdles awaiting solution, such as tumor formation. Tottori J. Clin. Res. 4(1), 75-78, 2011

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