

Simple Test for Evaluation the Safeness of Human Induced Pluripotent Stem Cells

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Realization of cell therapy based on induced Pluripotent Stem (iPS) cells is one of supreme goals we should pursue albeit the road is likely to be tough. Although there are some challenges such as the establishment of suitable differentiation methods and removal of xeno components from the culture, we herein focused on the methodology for the screening of iPS cell clones which is a iPS cell-specific issue.

Unlike embryonic stem (ES) cells, plural iPS cell clones can be generated from single donor. As well as being advantage, it could be a cause of concern for researchers choosing high-quality iPS cell clones from many candidates. And recently we can use many type of gene transfer methods and cell sources for generation of iPS cells. We have to directly compare and evaluate iPS cells established by different methods derived from different sources in order to generate clinical grade-iPS cells.

The method of iPS cell evaluation should meet requirement as follows. First, it should be simple and reproducibly. From this aspect, the system seems to be an in vitro assay before animal transplantation tests. In addition, ES cells should be used as controls in this assay. Previous reports suggested that the differences of genetic backgrounds among ES cell clones affected their characters. This assay has not to reflect these differences, and genuinely evaluate the safeness of iPS cell clones.

In this presentation, we show the progression in the evaluation of iPS cell clones derived from various sources on cell origins, age, and sex and established by using various methods on combinations of factors, and gene transfers with and without genome integration. And establishment of safer methods and conditions for clinical grade-iPS cells will be discussed.