27O-ISMS01 Generation of Hepatocytes from Human ES/iPS Cells for Medicinal Sciences

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Because drug-induced liver injury is one of the main reasons for drug development failures, it is important to perform drug toxicity screening. Currently, primary human hepatocytes are most widely used for the prediction of drug-induced liver injury. However, the sources of primary human hepatocytes are limited, making it difficult to supply the abundant quantities required for drug toxicity screening. Therefore, there is an urgent need for a novel unlimited, efficient, inexpensive, and predictive model which can be applied for drug toxicity screening. Human embryonic stem (ES) cells and induced pluripotent stem (iPS) cells are able to replicate indefinitely and differentiate into most of the body's cell types, including hepatocytes. It is expected that hepatocytes generated from human ES/iPS cells will be a useful tool for drug toxicity screening. To apply human ES/iPS cell-derived hepatocytes to various applications including drug toxicity screening, homogenous and functional hepatocytes have to be generated from human ES/iPS cells. Today, we will introduce our hepatocyte differentiation technology from human ES/iPS cells and method to predict drug-induced liver injury using human ES/iPS cell-derived hepatocytes.