MS09-3 **A Comparison of Monkey and Human Embryonic Stem Cells: Differentiation of Embryonic Stem Cells into Hepatocytes and mRNA Expression of Cytochrome P450 Enzymes Responsible for Drug Metabolism**

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Embryonic stem (ES) cells retain the ability to differentiate into a variety of cell types *in vivo*. Hepatocytes derived from ES cells may be useful for pharmacokinetic examinations such as induction of drug metabolism enzymes and interactions of candidate drugs. Monkey ES cells might be useful as a substitute model for preclinical research using human ES cells, because the phenotype of monkey ES cells is known to be similar to that of human ES cells. However, to date there have been a few reported studies of differentiation of monkey ES cells into hepatocytes. We investigated the effects of embryoid body (EB) formation condition and extracellular matrix on differentiation of monkey ES cells into hepatocytes, and expression and induction of major CYP mRNAs responsible for drug metabolism in the cells. The expression levels of hepatocyte marker genes in the cells cultured for 2 days for EB formation from monkey ES cells were higher than those in cells cultured for 5 days. The mRNA expression levels of hepatocyte markers, CYP1A1 and CYP2C43 in cells cultured on Matrigel were considerably higher than those on Matrigel Reduced and collagen I. CYP1A1 and CYP3A8 mRNAs were significantly induced by 3-methylcholanthrene and rifampicin, respectively. On the other hand, CYP3A4 mRNA in the cells differentiated from human ES cells was not induced by rifampicin, although CYP1A1 mRNA was induced by omeprazole. These results suggested that monkey ES cells were differentiated into more matured hepatocytes than human ES cells, and were useful for pharmacokinetic examinations of candidate drugs.