Synopsis of Original Research Paper

Development of cosmetics safety test using human trophoblast stem cells.

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Recently mouse embryonic stem cells have been applied as system for toxicity testing in Europe. However, a mouse ES cell test (EST) may not be sufficiently rigorous for human toxicity testing, while the use of human ES cell presents an ethical problem. Tests using human trophoblastic stem (TS) cells, which are derived from the placenta, sidestep a potential to these issues. A test based on human TS cell would have relevance to the human embryo during pregnancy and could therefore be useful in testing low-dose toxic substances, which may alter the epigenome. The purpose of this study is to establish whether human TS cell have relevance to epigenetic teratogenicity testing. We have developed a new toxic screening methods using human TS cells to evaluate the effect of the synthetic perfume Hydroquinone (HQ) , 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta[g]-2-benzopyran solution (HHCB) and Methyl P-Hydroxybenzoate (MP) 1) the rate of cell growth: human TS cells were more sensitive in growth rate than human ES cells (IC50). 2) the rate of trophoblast differentiation: the differentiation marker, hCGB was increased with dose-dependent manner. 3) mRNA expression: micro RNAs (miR-1323, miR-518b) are sensitive, with the substance. 4) DNA methylation: DNA methylation of imprinted genes (*H19*, *PEG3*) are increased with dose-dependent manner. We concluded that we have first establishment human TST method and establishment of bioassay system of TST. We next will apply the TST method to human disease-specific TS cells.