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### Drug screening and discovery using human pluripotent stem cell derived cells

Drug-induced toxicity is a main reason for withdrawals of new drugs in late clinical phases and post-launch of the drugs. Thus, development of predictive *in vitro* assay for early toxicity evaluation is important for drug discovery process. Here, we show various kind of cells derived from human pluripotent stem cells (hPSCs) that could be used for early toxicity evaluation of drug candidates. From our inducing differentiation technology, we have routinely produced highly pure population ( $\geq 98\%$ ) of hepatocytes and cardiomyocytes from human embryonic stem cells (hESCs) and human induced pluripotent stem cells (hiPSCs). Furthermore, we optimized a culture condition of hPSC-derived functional cells suitable for toxicity tests *in vitro*, and we demonstrated the efficacy of our optimized hPSC-derived cell model for predicting toxicity against the several drugs. In conclusion, our hPSC-derived cell model could be a good alternative cell source for pre-clinical study such as predicting toxicity and efficacy test for the drugs, and translational research of disease cure.

### Biography

Dong-Hun Woo is a Chief Technology Officer (CTO) at NEXEL Co., Ltd. He received his PhD in Stem Cell Biology from Korea University. During this time, he worked on tissue regeneration through directed differentiation of human pluripotent stem cells into target cell types of the liver, pancreas, and brain. After PhD course, he initially extended his research into cancer stem cells, studying the molecular mechanisms underlying tumorigenicity of cancer stem cells in glioblastoma at the Lerner Research Institute of Cleveland Clinic in Cleveland, OH, USA. Then, he has his expertise in stem cell biology human pluripotent cell fate specification by bringing genome editing strategies to bear on induced pluripotent stem (iPS) cell models of human genetic diseases at the University of Pennsylvania, PA, USA. His current project involves the generation of functional cells from human pluripotent stem cells for drug screening and toxicity tests as Head of research programs at NEXEL Co., Ltd.

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