Title of Research:

19_R01-01

Development of rapid, accurate, and low-cost AI drug hazard assessment method by human stem cell test

Principal Investigator:

Wataru Fujibuchi, Ph.D.
Professor, Center for iPS Cell Research and Application (CiRA), Kyoto University
53 Kawahara-cho, Shogoin, Sakyo-ku, Kyoto 606-8507
Tel: 075-366-7012 email: fujibuchi-g@cira.kyoto-u.ac.jp

Summary of Research:

We developed a new method “hEST”, which has more than 95% accuracy predicting neurotoxicity, and genotoxic/non-genotoxic carcinogen categories, using machine learning of gene network data obtained from exposure of human embryonic stem cells to chemicals. This year, we selected 9 hepatotoxins and 10 non-hepatotoxins as negative control for SVM. 1) We determined IC10 concentration for all chemicals and obtained gene expression data from 19 chemical exposure samples. As a results, 2) we can predict at more than 90 % accuracy.

Timeline:

March 1, 2020 - February 28, 2021

Topics:

Oral presentation at JCIA LRI Annual Workshop 2020 “Development of rapid, accurate, and low-cost AI drug hazard assessment method by human stem cell test” (On-line, August 21st, 2020)

Publications:

Panina, Y., Yamane, J., Kobayashi, K., Sone, H., Fujibuchi, W. 2021. Human ES and iPS cells display less drug resistance than differentiated cells, and naïve-state induction further decreases drug resistance. J. Toxicol. Sci. 46 (3), pp. 131-142.