

**Title of Research:**

XX-XX-XX

## **Establishment of Human iPSC Reporter-Based Developmental Toxicity Assay that Detects FGF Signal Disruption**

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**Summary of Research:**

The aim of this study was to develop an in vitro assay (DynaLux/c) that can predict human developmental toxicity, in order to solve the problems of current developmental toxicity testing methods, such as the low accuracy of predictions for humans due to interspecies differences. Focusing on the FGF signaling pathway, which plays an important role in the developmental process, we proposed a testing system that evaluates developmental toxicity by detecting the disruption of the FGF signaling pathway by chemical substances using human iPSC cells. In addition, real-time luminescence measurement was introduced to overcome the problem of manual luminescence measurement in this assay, and it became possible to monitor signal disruption for longer periods of time and in more detail. In this study, we increase the number of compounds to 19 in this research, compared to the three compounds that had been judged in the past, and that we obtained a very high judgment rate by using DynaLux/c with real-time luminescence measurement.

**Timeline:**

March 1, 2024 –

**Topics:**

Presentation at the 2024 JCIA LRI Research Report Meeting, “Establishment of Human iPSC Reporter-Based Developmental Toxicity Assay that Detects FGF Signal Disruption”

**Publications:**

Yusuke Okubo, Yoko Hirabayashi, Junji Fukuda, *Advances in Genomic Toxicology: In vitro Developmental Toxicity Test based on Signal Network Disruption Dynamics*, *Current Opinion in Toxicology*, 39, 100489 (2024) doi.org/10.1016/j.cotox.2024.100489

Kashu Mizota, Rintaro Ohara, Rieko Matsuura, Yoko Hirabayashi, Yoshihiro Nakajima, Yusuke Okubo, Junji Fukuda, *Developmental Toxicity Assessment Using Human iPSCs by Automated Measurement of FGF Signaling Disruption*, 58th Congress of the European Societies of Toxicology, Copenhagen, Denmark, poster, 2024.09.08-11

Okubo Yusuke, Mizota Kashu, Matsuura Rieko, Hirabayashi Yoko, Nakajima Yoshihiro, Fukuda Junji: *in vitro* developmental toxicity testing based on real-time monitoring for signal disruption. 58th Congress of the European Societies of Toxicology, Copenhagen, Denmark, poster, 2024.09.08-11