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:

In the 10th period, we reported that the compounds listed in ICH (S5), including thalidomide, could be detected by using RTK-SRF signal reporter cells (S. Kanno, et al., Journal of Bioscience and Bioengineering, 133, 3, 291- 299 (2022)). As a first step to spread this approach, we also reported a detailed experimental protocol in a scientific paper (S. Kanno, et al., Star Protocols, 3, 2, 101439 (2022)). As for the experiments, a real-time luminescence measurement system was introduced to improve the data accuracy of the kinetic assay, which was a feature of this method. In other words, the amount of luminescence was measured manually every few hours in the past, but the introduced device made it possible to perform real-time measurement. When measurements were continued for three days instead of the conventional one day using this device, it was also confirmed that the luminescence peak occurred not once, but at least twice. This is a fact that had been overlooked manually. In the 11th period, we would like to add a discussion on the biological significance of this phenomenon and the measurement mechanism.

Timeline:

March 1, 2022 -

Topics:

Poster presentation at 2022 ICCA-LRI and NITE Workshop, “Establishment of developmental toxicity test based on the integration of FGF signal disruption effects for safety evaluation of drugs and chemicals using human iPS cells”

Publications:

Seiya Kanno, Kashu Mizota, Yusuke Okubo, Tatsuto Kageyama, Lei Yan, Junji Fukuda, “Luciferase assay system to monitor fibroblast growth factor (FGF) signal disruption in human iPSCs”, Star Protocols, 3, 2, 101439, 2022

Seiya Kanno, Yusuke Okubo, Tatsuto Kageyama, Lei Yan, Junji Fukuda, “Integrated FGF signal disruptions in human iPS cells for prediction of teratogenic toxicity of chemicals”, Journal of Bioscience and Bioengineering, 133, 3, 291-299, 2022