

# Taiwan iPSC Bank for Precision Medicine and Cell Therapy

Dr. Patrick C.H. Hsieh

## **Abstract:**

Drug toxicity assessment using human induced pluripotent stem cells (hiPSCs) has revolutionized preclinical screening. We established a population-based hiPSC drug screening platform, identifying "super donors" to represent both Taiwan and a significant global population. A robust 1536-well, high-throughput toxicity screen on 2,375 approved compounds, including anti-COVID-19 drugs, showcased the potential of this innovative platform for precision medicine.

Moreover, our focus extends beyond drug screening to therapeutic applications. We embarked on a transformative journey in cell therapy by co-transplantation of hiPSC-derived endothelial cells (ECs) and cardiomyocytes (CMs) to address critical challenges in heart regeneration. In-depth studies demonstrated the synergistic effect of iPSC-ECs in promoting CM maturity and functionality, leading to enhanced graft size, vasculature, and improved cardiac function in both murine and non-human primate models of myocardial infarction.

Our groundbreaking results signify a promising strategy for clinical translation. The establishment of the Taiwan National iPSC Bank with super donor lines will further amplify the potential impact on global cell therapy initiatives. This talk explores the dual role of the Taiwan iPSC Bank, emphasizing its pivotal contributions to precision medicine through drug screening and its transformative potential in advancing therapeutic interventions for cardiovascular diseases on a global scale.