Safety toxicity with cardiomyocytes derived from induced human pluripotent stem cells on FDSSS platform

1. Overview

Purpose:
- Introduction of induced human cardiomyocytes derived from induced pluripotent stem cells (iPSCs) to address cardiotoxicity of drug candidates.

Methods:
- Use of an FDSSS platform for real-time monitoring of cell behavior.

Results:
- iPSCs were used to assess the safety of cardiac toxicity of drug candidates.

2. Introduction

Today, the main source of information in the drug discovery process is the use of in vitro and in vivo models to assess potential toxicity. However, these models are limited in their ability to predict human toxicity, as they do not capture the complexities of the human cardiovascular system.

The development of induced pluripotent stem cells (iPSCs) has revolutionized the field of regenerative medicine and drug discovery. iPSCs can be differentiated into various cell types, including cardiomyocytes, which can be used to study drug-induced toxicity.

3. Material and Methods

Drug-induced toxicity tests were performed using an FDSSS platform. The platform allows for real-time monitoring of cell behavior, providing a more accurate prediction of potential toxicity.

4. Results

The results showed that iPSCs derived from induced pluripotent stem cells can be used to assess the safety of drug candidates. The platform allows for the monitoring of key parameters such as APD, P-P time, and average rising slope.

5. Conclusions

The use of induced pluripotent stem cells in toxicity testing has the potential to improve the accuracy of drug discovery processes. Future studies should focus on the development of more sophisticated platforms to better predict human toxicity.

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Fig. 1: Hamamatsu FDSSS platform

Fig. 2: Parameters calculated from raw data of Ca2+ transients

Fig. 3: Monitoring of compound due to their action on parameters of the calcium transient waveform.