

The Current State of Realistic Heart Models for Disease Modelling and Cardiotoxicity

HiPSC-CMs* in cardiotoxicity and disease modelling

(*human induced pluripotent stem cell-derived cardiomyocytes)



EMAPS

ISSUE

Drug reaches the market with cardiac side effects
→ dangerous for patients



A potential drug candidate fails safety tests → loss of time and money spent on the discovery

APPROACH



Exploring alternative ways for early detection of cardiotoxic effects of a drug compound.

Focusing on the available human-based *in vitro* models (animal-free)

Differentiation of human heart cells from induced pluripotent stem cells for non-animal assays

CHALLENGES



Onset of heart diseases usually happens later in life

Human heart cells change over time, they grow and get older together with the body

Need to promote maturation of cardiomyocytes in a Petri-dish

KEY RESEARCH AND FINDINGS

Review of stem cell-derived heart cell maturation and their role in cardiac toxicity

In-depth look at cellular heart disease models and computational simulations



Overview of new technologies like heart-on-a-chip platforms, scaffold and *in silico* applications

Critical review of the most relevant heart diseases

