Chronic cardiotoxicity testing in human-induced pluripotent stem cell-derived cardiomyocytes using impedance and multielectrode array

Commonly used acronym: *Chronic cardiotoxicity testing in hiPSC-CMs using impedance and MEA*

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Organisation

Name of the organisation Janssen Pharma of JNJ

Department Research and Development

Country Belgium

Geographical Area Flemish Region

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Translational - Applied Research, Other: Safety pharmacology/toxicology testing
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	human induced pluripotent stem cell-derived cardiomyocytes

DESCRIPTION

Method keywords

in vitro assay

multi electrode array

predictivity

hiPSC-CMs

Scientific area keywords

drug-induced cardiotoxicity
arrhythmias
Cardiac electrophysiology
Drug safety

Method description

Human-induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) were seeded in 48-well multielectrode array (MEA) plates and were treated with four doses of reference compounds (covering and exceeding clinical free plasma peak concentrations) and MEA recordings were conducted for 4 days. Functional-electrophysiological (field-potentials) and viability (impedance) parameters were recorded with a MEA machine.

Lab equipment

Multielectrode array

Method status

Internally validated
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Human-based model, repeated and non-invasive recordings, chronic

Challenges

Cell maturation

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Altrocchi C, Van Ammel K, Steemans M, Kreir M, Tekle F, Teisman A, Gallacher DJ and Lu HR (2023) Evaluation of chronic drug-induced electrophysiological and

cytotoxic effects using human-induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs). Front. Pharmacol. 14:1229960. doi: 10.3389/fphar.2023.1229960

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