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Induced Pluripotent Stem Cell-derived Cardiomyocytes can Serve as Acellular Models for Cardiac Toxicity Testing

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Abstract

Induced pluripotent stem cell (iPSC) science is developing thrilling new possibilities for cardiovascular lookup by or divulge drug sensitivities. In this review, the practicable usefulness of iPSC-derived cardiomyocytes in drug improvement as nicely as in drug toxicity checking out is discussed, with a center of attention on the achievements that have been already made in this regard. Moreover, the critical steps that have to be taken earlier than this science can be widely used in drug discovery and toxicology assessments are highlighted.

Ke W d : I d ced ; ; D ; D de e

I d c

e d c e a a ce ca be e a ed ce (d ced ce , PSC), cce d e e a a ce e e a , ad ec ca e a ada a e ce ce a ce a e e a ed a e ec a e a d e ea b e a ca . e ce ce a a e ec a d a ac d c e c a ca d a c a ed c e, c dea ce e (e. ., ca d c e) a ca ', be e e ac ed a ba d a e . A e ab e c PSC ec ca - e ca d a c a ed, e ab e e e d e e a e a d c a bee a ead ed e a e e e ec a PSC. e a e a a e e ea b e PSC-de ed ca d c e c e ., ac e ac e e e a a e bee a ead ade e a d, a d a ab e a e a e be a e ea e a ec ca - ca be de ed d e e a d c e [1].

P b e A ca f I d ced P e S e Ce -De ed Ca d c e D De e e a d T c Te

e de ca a d c a ac e a b ed a e, e c ee c d b a e a a ed e ec, a e a e a e e d ca d da e ab e de e a e a e de e dab e c ec e [2]. S c a e a a c e ca be e ee ed a ba ed ed a ce, a ed ce e, a a de ; e e, ca d a c a a ac e e a e da bac ec e - ed a e a a c e a ba ed ca d c e.

P a a ca d c e a e e e a d ca ', be ed bc e e e ded e e a ed [3]. I a ed a ca d c e e e e a a a a e ece a e e e ca d ac c a e a e a a ab e. A e a e , a e c e de ed e b c ce , c a a e b c d e (HEK) e , ca be ed e e a e e e e c e a a ab e d a ec e. a e a a e c e ad a ec e e e ec a ec a , e e a ec d e c d' a ce (ca d c e) c e. , c e , a e be c e e a a de . F e a e, e e ca - d ed ce a e e a ed d ab e a de e a c a ea d ea e. H e e, ece a a a ea a cab e a e ca d c e ab a a a a e ed a e e e a ca d ac a d de [4].

Ma f d ced P e S e Ce -de ed Ca d c e

A e a e ed a ce e ed ed b ea e a ca d c e e ea ed e e a d c a e a e c a e a I a a ec , ece a e ea e c a ab e e a a ca d c e. M ca , ece ac a -de e ed a e e b e e . F c a , ece a e e a c a ac e ed c ac , c a e e d c e ed e c a ca d c e [5]. e da c e b a e ab e c e e b e a a ca d c e , a d e a b e e c e a da de a e c a ab e e e e 10- ee - de b c

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c a e a c b a. ce be a ee a ca d c e b e: ce a a-, e c a - a d da- e e e. W e ca be e a ded a be e d e e c ec ca e a e e e e e e, add a d e d de a. d ca. a a e e b a. ce ca a, be d ed e ead a e a ce. Pa c a , b e b cc a a a. d d c e e a. a ab e e ce , c e e a ac c a, e e ce a a. a-, e c a - da- e. I a a e ece a ec e e ec a ca d ac b e ec ca. , a d e e a e bee ade. e a ce c a. e e.e e e. a e e ce-de ed ca d c e [7]. F e a e, b. NRG-1b/ERBB a a bee e e bea e a e da- e ce , a d e. d d ca. bea a. a e e c a ec ca. e d a. ca d ac ESC d e e a. .