

Functional alterations in human pluripotent stem cell-derived cardiomyocyte due to *in vitro* culture and reversing effect of vitamin C

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Human pluripotent stem cells (hPSCs) have capacities to self-renew indefinitely and differentiate into three germ layer cells including cardiomyocyte (CM). This property of hPSC-derived CM makes them considered as an ideal model for various studies. Aging of CM is found in natural human CM, however, due to limitation in use of human cells, hPSC-derived CM could be a model for aging of CMs. In this study, we demonstrated the functional alteration in hPSC-derived CMs and reversing effect of vitamin C. Human PSC-derived CMs are classified due to *in vitro* cultivation period as early-, middle- and late-stage.

Through SA β -gal staining, alterations in hPSC-derived CMs were evaluated and to reverse the alteration, various concentrations (0, 100, 250 μ M) of vitamin C was treated during culture. The functionality of hPSC-derived CMs was evaluated by JC-1 staining, the specific dye for mitochondrial membrane potential.

Middle and late-stage hPSC-derived CM showed increased number of pigmented cells and decreased beating rate in correlation with *in vitro* culture period. Positively-stained cells of SA- β -gal staining were abundant in late-stage hPSC-derived CMs. Treatment of vitamin C significantly reduced the portion of positively-stained cells at each stage and affected largely in late stage cells. Positive population of JC-1 staining was correlated to the alteration of hPSC-derived CMs.

In this study, we tried to find out the functional alterations of hPSC-derived CM and proved the reverse effect of vitamin C. These results suggested the possible usage of them for further studies related to aging of human cardiomyocyte (A111539).

Biography

Seung-Yup Ku has earned his M.D. and Ph.D. degree at Seoul National University College of Medicine and completed postdoctoral studies from Weill Cornell Medical College. He is now professor of Dept. of Obstetrics and Gynecology. He has published more than a hundred of papers in reputed journals and has been serving as an associate editor of *Korean Journal of Tissue Engineering and Regenerative Medicine*, an editorial board member of *Journal of Regenerative Medicine and Tissue Engineering* (JRMTE).

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