1-P-074

Poster Sessions

Electropharmacological effects of multi-ion channel blockers assessed in hiPSC-CMs sheets with MEA system

Hiroko Izumi-Nakaseko^{1,2}, Mihoko Hagiwara-Nagasawa¹, Atsuhiko T. Naito^{1,2}, Ai Goto², Koki Chiba², Yuko Sekino^{1,3}, Yasunari Kanda⁴, Atsushi Sugiyama^{1,2}

¹Dept. Pharmacol., Faculty Med., Toho Univ., ²Dept. Pharmacol., Grad. Sch. Med., Toho Univ., ³Endowed Lab. of Human Cell-based Drug Discovery, Grad. Sch. Pharmaceutical Sci., Univ. Tokyo, ⁴Div. Pharmacol., NIHS

[Purpose] We examined electrophysiological indices of human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) sheets in order to quantitatively estimate multichannel blocking actions of bepridil and amiodarone using MEA system in comparison with that of E-4031. [Methods] We analyzed the field potential duration (FPD), effective refractory period, current threshold and conduction property using a programmed electrical stimulation protocol to obtain the post repolarization refractoriness (PRR) and coefficient *a* of the relationship between the pacing cycle length and FPD. [Results & Conclusions] Electropharmacological profiles of drugs were successfully characterized; namely, 1) the changes in the current threshold and conduction property provided important information of Na⁺ channel blocking kinetics, 2) the change of coefficient *a* reflected drug-induced inhibition of hERG K⁺ channel, 3) the PRR indicated the relative contribution of these drugs to Na⁺ and K⁺ channel blockade, and 4) L-type Ca²⁺ channel blocking action was obvious in the field potential waveform of the hiPSC-CMs sheets, which will help to predict whether the net balance of Ca²⁺ and K⁺ channel blockade of a drug is proarrhythmic or antiarrhythmic.