GS01-2 **Development of the cell motion imaging to establish the method of the evaluation by the human iPS-derivedcardiomyocytes**

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[Introduction] Prediction of clinical pharmacological manifestation using cell model is a major issue in drug development. Current approaches to assess cardiac contractility *in vitro* are limited to low-throughput methods. Thus, we developed middle-through and noninvasive assay system with motion field imaging (MFI) using high speed video image of human iPS-derived cardiomyocytes (hiPS-CMs) which shows cell-to-cell variation such as atrial- and ventricle-like myocytes. To enhance accuracy of safety assessment, we tested whether the MFI method can discriminate atrial- and ventricle-like myocytes, and perform pharmacological assay for each cell-type.

[Method] Atrial and ventricular myocytes extracted from adult murine heart and hiPSC-CMs (iCell, Cor4U) were analyzed by MFI with SI8000 system (Sony corporation). Murine cardiomyocytes were paced at 0.5 Hz. After MFI of hiPS-CMs, cell-types were classified by immunostaining using anti-MLC2a and anti-MLC2v.

[Result/Conclusion] In adult cardiomyocytes, both contraction and relaxation velocities in atrial myocytes were faster than those in ventricular myocytes. Human iPS-CMs showed the same trends on contractile functions, and each cell-type showed distinct pharmacological response, suggesting a substantial potential to enhance accuracy of pharmacological assessment. Supported by JSPS and the Cooperation Program (TMDU-Sony IP&S, Inc.).