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Poster Sessions

TRP channel responses in human iPSC derived sensory neurons using MEA system

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Functional evaluation assays using human induced pluripotent stem cell (hiPSC)-derived sensory neurons are expected to predict the pain-related toxicity of drugs and the pharmacological effects. However, evaluation assays in hiPSC-derived sensory neurons has not been established, and electrophysiological response to pain-related molecules are not known. In this study, we aimed to evaluate the physiological responses to pain-related molecules including anti-cancer drugs in cultured hiPSC-derived sensory neurons using high-throughput multi-electrode array (MEA) system. Evoked responses depending on TRPV1, TRPM8, and TRPA1 channel in capsaicin, menthol, and AITC administration were detected. We also confirmed that hiPSC-derived sensory neurons have the property of increasing spontaneous activity with increasing temperature, and that are heterogeneous cell populations against temperature change. Cold hypersensitivity responses were also detected in concentration dependent manner of oxaliplatin. These results indicated that this MEA evaluation method using human iPSC-derived sensory neurons is effective as a pain assessment for human peripheral neuropathy.