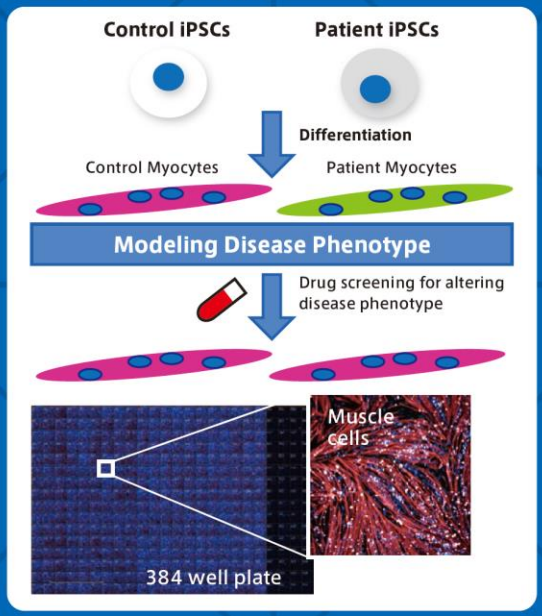
Hidetoshi Sakurai

〈Muscular Dystrophy Project : Drug discovery for intractable muscular disease using patient-derived iPSCs〉

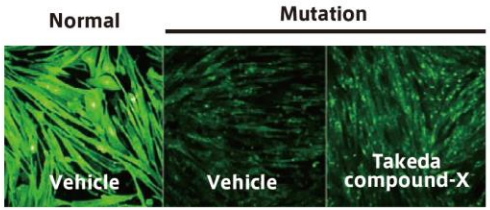
Dr. Sakurai's team will create novel therapeutic drugs for intractable muscular diseases such as Miyoshi myopathy and Duchenne muscular dystrophy and investigate muscular disease models. To achieve this goal, they utilize patient-derived iPSCs as a tool for disease modeling and drug screening.

<Concept/Strategy>



<Progress>

Miyoshi Myopathy : Identified "drug seeds" elevating dysferlin protein levels by high-content and high-throughput drug screening using patient iPSC-derived myotubes.
Optimization of seed compound is underway to deliver a novel therapeutic drug.



Recovery of dysferlin protein level (detected by immunocytochemistry)

<Concept>

- Both iPSCs derived from healthy subjects and patients are differentiated into skeletal muscle cells (myotubes) on 384-well plates.
- A high-throughput drug screening and evaluation system are developed by visualizing pathological changes observed only in patient iPSC-derived myotubes.
- Compounds that improve pathological changes are selected and optimized.

<Progress>

- Miyoshi myopathy : Identification of "seed compounds" from Takeda compound library (left panel)
- Duchenne muscular dystrophy : Identification of a therapeutic target for abnormal Ca2+ metabolism in patient iPSC-derived myotubes.