READY-2-GO
NEURONAL MITOCHONDRIAL HEALTH ASSAY SERVICES

BACKGROUND

Mitochondria play a key role in driving critical cellular functions, including ATP generation, intracellular Ca^{2+} homeostasis, reactive oxygen species (ROS) formation, and apoptosis. Due to their relatively high energy demands, neuronal cells are particularly dependent upon mitochondrial function and therefore are likely more susceptible to perturbations of mitochondrial health. Unsurprisingly, aberrant mitochondrial function has been linked to progression of neurodegenerative diseases, including Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis (ALS), and frontotemporal dementia (FTD).

THE CHALLENGE

Mitochondrial health is intimately linked to the broader cell-health continuum. Evaluating measurements of mitochondrial health in the context of other general cell-health measurements is necessary to thoroughly evaluating therapeutic impact.

While these assays can be relatively straightforward to establish using immortalized cell lines such as PC-12 cells, those models may not be as physiologically relevant compared with human iPSC-derived neuronal cell types.

OUR SOLUTION

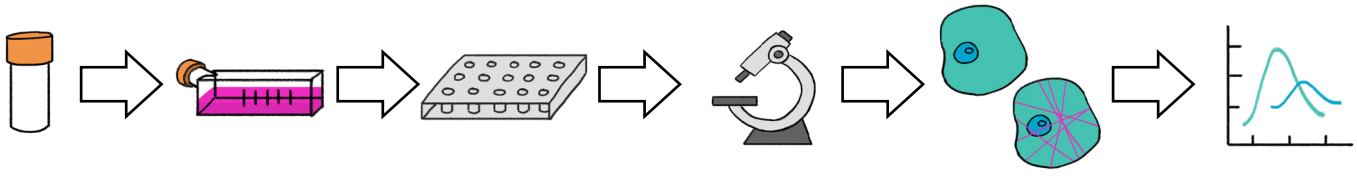
Our Ready-2-Go (R2G) Neuronal Mitochondrial Health Assay Service screens for changes in mitochondrial membrane potential in physiologically relevant, human iPSC-derived neuronal cells. This is done using a dye whose accumulation in mitochondria depends on mitochondrial membrane potential. We measure the fluorescence of this dye measured at both single-cell and population levels along with overall cell viability with a companion indicator dye. This enables us to assess the effects of your drug candidates in the full context of cell health and to better understand the variability of the response.

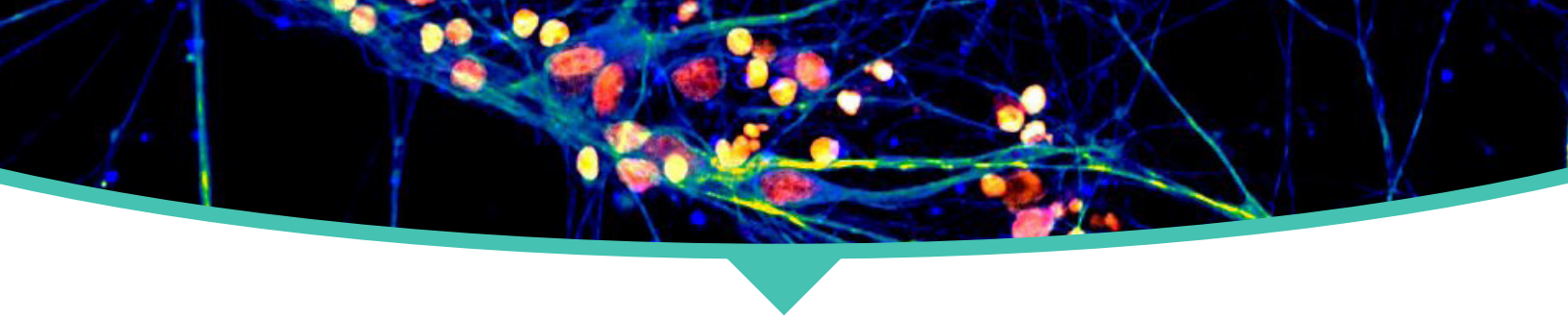
KEY FEATURES & BENEFITS

- **Deeper insights into neuronal cell health.** Multiplexed readouts of mitochondrial health and cell viability.
- **Greater assurance of data quality.** Minimal number of wash steps limits potential cell loss and assay noise.

PROCESS OVERVIEW

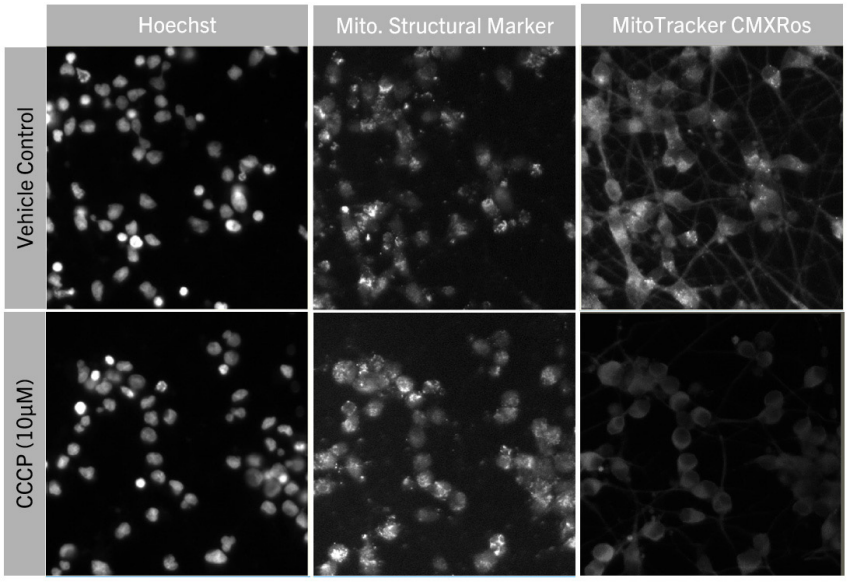
Thaw cells → Grow cells → Set up cell assay → Image cells → Analyze cells → Report out

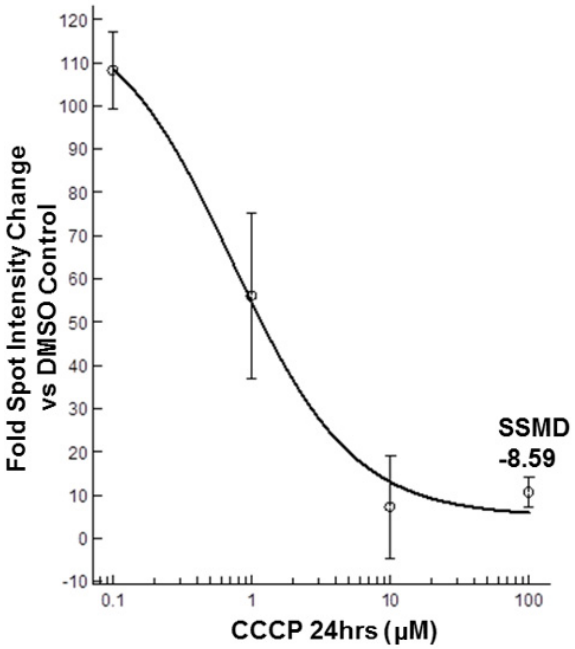




HOW IT WORKS

Cells are seeded into 384-well plates and cultured for 7 days prior to treatment. Cells are then incubated in the presence of drug for 24 and 48 hours. At these times, cells are stained for imaging and analysis. In addition to scoring mitochondrial health for all cells, this service affords gating of 3 populations of cells – total cells, live cells, and dead cells. In the images below, human iPSC-derived neuronal cells were treated with CCCP for 24 hours. Nuclei were stained with Hoechst and mitochondria with a structural marker and MitoTracker CMXRos.





ASSAY SERVICE DETAILS

	Ready-2-Go Neuronal Mitochondrial Health	Bespoke Assay Services
Cell Type	iCell Glutaneurons (Fujifilm Cellular Dynamics, Inc.)	If you would like to expand the service offering beyond R2G shown on left, please contact us at info@phenovista.com or reach out to your local sales representative.
Markers	Hoechst (all nuclei), MitoTracker CMXRos, DRAQ7 (dead cell nuclei)	
Dosing	6 doses of your test article	
Time Points	24 and 48 hours	
Reference Compound	FCCP	
Assay Readouts	Total cell count, mitochondrial potential, % viability	

* Vehicle and untreated controls also included.

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