FUJIFILM
Cellular Dynamics

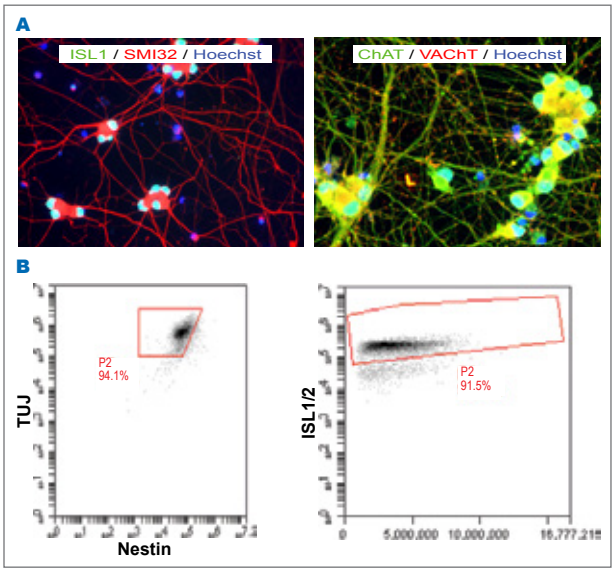
PRODUCT DATASHEET

iCell® Motor Neurons

Motor neurons provide the connection between the brain and our muscles and are responsible for our breathing, walking, reflexes, and general fine motor skills. The impact and relevance that motor neurons have in our health has driven decades of research towards a better understanding of their biology.

Neurodegenerative diseases, such as amyotrophic lateral sclerosis (ALS) and spinal muscular atrophy (SMA), are the result of the progressive degeneration of motor neurons and nearby cells. In order to provide researchers with a model system for understanding basic motor neuron biology and to develop treatments for these diseases, FUJIFILM Cellular Dynamics, Inc. (FCDI), offers iCell® Motor Neurons, a highly pure population of human spinal motor neurons derived from induced pluripotent stem cells (iPSCs).

Fully functional, iCell Motor Neurons express key transcription factors and markers (i.e. ISL1, HOXB4, FOXP1) that are characteristically found in adult human spinal motor neurons. They highly express cholinergic markers, such as ChAT, VAChT, ACHE, and other choline transporters, and are able to connect to muscle cells. iCell Motor Neurons can be co-cultured with skeletal myotubes and glial cells from primary cultures or iPSC-derived sources making them a critical tool for studying neurodegenerative disorders and for drug screening platforms. Additionally, FCDI offers genetically engineered iCell Motor Neurons with SOD1 and TDP43 mutations, thus providing ALS cellular models. iCell Motor Neurons are cryopreserved and available in large-scale quantities to enable investigation of native neural biology and neurodegenerative diseases.



▲ **Figure 1: iCell Motor Neurons Exhibit Expected Characteristics**
(A) Immunostaining shows the expression of motor neuron markers ISL1 and SMI32, as well as the cholinergic marker choline cetyltransferase (ChAT) and the vesicle acetylcholine transporter (VAChT) specific to this cell type. (B) Flow cytometry measurements demonstrate a highly pure population of fully differentiated neurons (TUJ1^{+}/ nestin^{-}) with a spinal motor lineage specificity (ISL1^{+}).

Advantages

- **Human relevance:** iCell Motor Neurons recapitulate human spinal motor neurons biology and functionality.
- **Reproducible research:** High purity (>80% ISL1^{+} at 14 DIV) and rigorous quality control ensure consistent mechanistic studies of neurodegenerative diseases.
- **Rapid results:** Get results faster with optimized media and fully differentiated cryopreserved neurons, not precursors. Just thaw, plate, and assay.
- **Diverse availability:** Motor neurons are available with SOD1 and TDP43 mutations in addition to isogenic controls.

Applications

iCell Motor Neurons are amenable to a variety of uses, including co-culture with human skeletal myotubes or plating on multielectrode array (MEA) platforms. Additional suitable applications are:

Cell-based Assays

- Cell viability
- Calcium signaling
- Metabolic assays
- Mitophagy
- Neurite outgrowth and retraction

Electrophysiological Applications

- Conventional patch clamp recording
- MEA recording

Specifications

Cell Type	Motor neurons
Organism	Human
Source	Differentiated from an FCDI reprogrammed human iPS cell line
Quantity	≥1.0 x 10^6 , ≥1.6 x 10^6, or ≥3.0 x 10^6 viable cells per vial
Shipped	Frozen

Ordering Information

Item	Component(s)*	Catalog Number
iCell Motor Neurons Kit, 01279	≥1.0 x 10^6 viable cells 100 ml Neural Base Medium 1 2 ml Neural Supplement A 1 ml Nervous System Supplement	R1051
	≥1.6 x 10^6 viable cells 100 ml Neural Base Medium 1 2 ml Neural Supplement A 1 ml Nervous System Supplement	MNC-301-030-000.5-PT
	≥3.0 x 10^6 viable cells 100 ml Neural Base Medium 1 2 ml Neural Supplement A 1 ml Nervous System Supplement	R1049
iCell Neural Base Medium 1	100 ml Neural Base Medium 1	M1010
iCell Neural Supplement A	2 ml Neural Supplement A	M1032
iCell Nervous System Supplement	1 ml Nervous System Supplement	M1031

* A User's Guide is provided in each iCell Motor Neurons Kit.

For More Information

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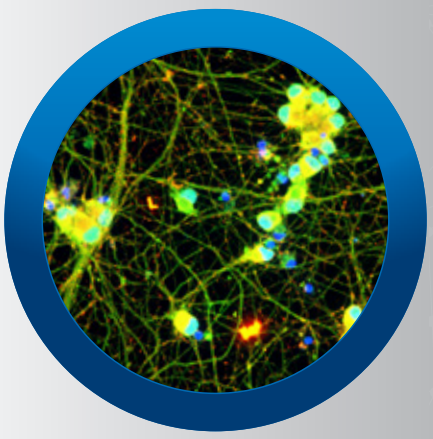
iCell Products

Provide access to biologically relevant, human iPS cells for disease modeling, drug discovery, toxicity testing, and regenerative medicine. FCDI's rapidly growing portfolio of iCell products includes human cardiomyocytes, GABAergic, glutamatergic, dopaminergic and motor neurons, hepatocytes, endothelial cells, astrocytes, hematopoietic progenitor cells, skeletal myoblasts, macrophages, and others.

Visit the FCDI website for the most current list of supported cell types.



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