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# Human Motor Neurons (iPSC-derived, Normal)

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| **Catalog Number** | 40HU-005<br>40HU-006 | **Cell Number** | 1.0 million cells/vial (Cryopreserved)<br>2.0 million cells/vial (Cryopreserved)<br>4.0 million cells/vial (Cryopreserved) |
| **Species** | *Homo sapiens* | **Storage Temperature** | Liquid nitrogen |

## Product Description

Spinal motor neurons (MNs) are a highly specialized type of neurons that reside in the ventral horns and project axons to muscles to control their movement. Neurodegenerative diseases, such as spinal muscular atrophy (SMA), amyotrophic lateral sclerosis (ALS), Charcot-Marie-Tooth and poliomyelitis disease are a result of the progressive degeneration of motor neurons [1]. Furthermore, motor neurons derived from normal, or patient induced pluripotent stem cells (iPSCs) enable the generation of cell models with features relevant to human physiology, thus making it a valuable tool for biochemical analysis, disease modelling and other broad range of clinical applications [2,3].

iXCells Biotechnologies is proud to provide the world's first fully differentiated and functional human iPSC-derived motor neurons that display typical neuronal morphology and express all key markers of motor neurons, e.g., HB9 (MNX1), ISL1, ChAT (Figure 1) when cultured in the Motor Neuron Maintenance Medium (Cat# MD-0022). In addition, our iPSC-derived motor neurons can also be co-cultured with myotubes or glial cells for drug screening platforms.

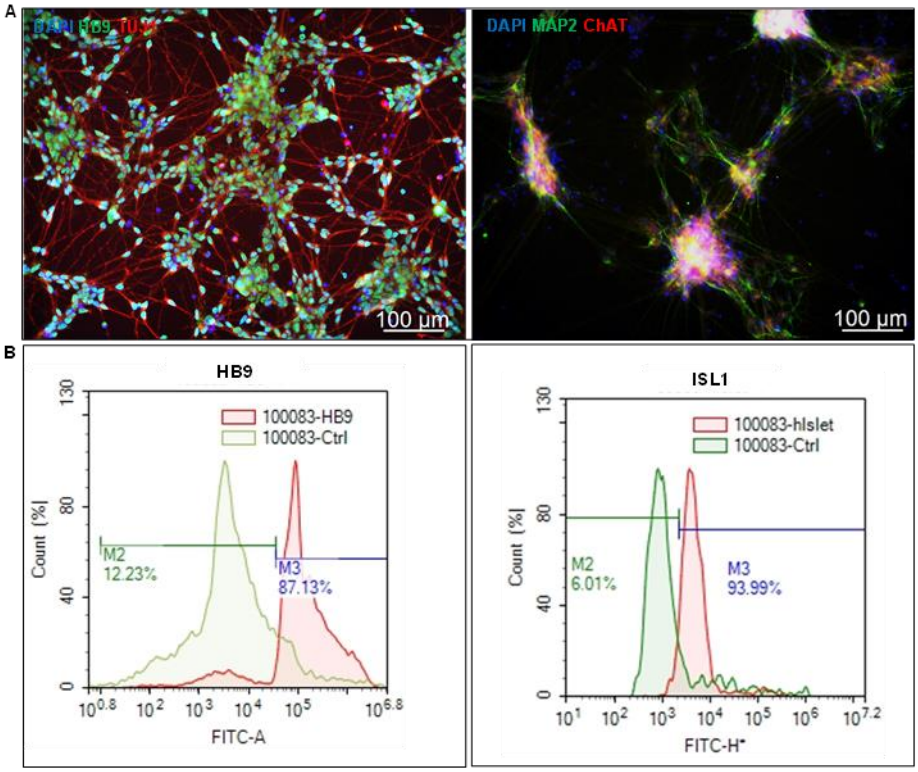


**Figure 1 A**) Immunofluorescence staining showing HB9 and ChAT positive cells on day 2 and 7 in culture respectively. (**B**) Flow cytometry measurements demonstrate >85% HB9 and >90% ISL1 positive cells on day 1-2.

## Product Details

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| **Tissue Origin** | Human iPSC-derived motor neurons (Normal, ALS) |
| **Package Size** | 1.0 million cells/vial; 2.0 million cells/vial; 4.0 million cells/vial (frozen) |
| **Shipped** | Cryopreserved |
| **Storage** | Liquid Nitrogen |
| **Media** | Motor Neuron Maintenance Medium (Cat # MD-0022) |

## Protocols

### Mono-culture of hiPSC-Derived Motor Neurons

**The following protocol is based on 12-well plate format**

1. Prepare the coating vessel before thawing the cells. Please refer to the iXCell's coating protocol.

   ***Note**: Upon receipt of the frozen cells, it is recommended to thaw the cells and initiate the culture immediately in order to retain the highest cell viability.*

2. To thaw the cells, put the vial in 37°C water bath with gentle agitation for ~1-2 minutes. Keep the cap out of water to minimize the risk of contamination.

3. Pipette the cells into a 15 mL conical tube with 5 mL **Motor Neuron Maintenance Medium (Cat# MD-0022)**.

4. Centrifuge at 600*g* for 5 minutes at room temperature.

5. Remove the supernatant and re-suspend the cells in **Motor Neuron Maintenance Medium**.

   ***Optional**: Cells can be resuspended in Motor Neuron Maintenance Medium supplemented with 10μM Y27632 to minimize cell death. Y27632 can be removed after 24 hours by replenishing fresh medium carefully.*

6. Seed the cells on precoated plate at the desired density. Incubate in 37°C $CO_2$ incubator overnight.

   ***Note:** We recommend seeding 100-300K cells per $cm^2$ depending on the application. Cell debris may be observed after cell recovery because the cryopreserved neurons are fragile. Refer to the CoA of each lot to determine the seeding density for your experiment.*

7. Perform half medium change every 2-3 days. Most of the cells should express high levels of HB9 and ISL1 1-2 days after thaw, and express high levels of ChAT and MAP2 7-10 days after thaw.

   ***Note:** Pure motor neurons tend to aggregate and detach from the plates. Change 50% of the medium with extra care to avoid cell loss.*

## References


[1] Brady ST. (1993). "Motor neurons and neurofilaments in sickness and in health. *Cell*. 9;73(1):1-3.

[2] Dolmetsch R, Geschwind DH. (2011) "The human brain in a dish: the promise of iPSC-derived neurons". *Cell*. 145(6):831-4.

[3] Payne NL, Sylvain A, O'Brien C, Herszfeld D, Sun G, Bernard CC. (2015) "Application of human induced pluripotent stem cells for modeling and treating neurodegenerative diseases." *Nat Biotechnology*. 25;32(1):212-28.

## Disclaimers

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