7270 Trade Street, Suite 102, San Diego, CA 92121
Tel: (858)412-5988 Fax: (858)368-8716
Technical Supports: supports@ixcellsbiotech.com
Orders: orders@ixcellsbiotech.com

Human Sensory Neurons (iPSC-derived)

Catalog Number	40HU-013	**Cell Number**	1 million cells/vial (Cryopreserved) 2 million cells/vial (Cryopreserved)
Species	*Homo sapiens*	**Storage Temperature**	Liquid nitrogen

Product Description

Sensory neurons play a crucial role in the detection and response to different types of sensory stimuli, such as touch, temperature, and pain. As one of the most significant neuronal subtypes in the human peripheral nervous system, they form neuronal-glial networks that are responsible for a variety of motor and sensory mediated functions [1]. Dysfunction of sensory neurons can lead to various neurological disorders such as pain, illnesses of the sensory neurons, amyotrophic lateral sclerosis (ALS), and problems with mechano- or temperature perception [2]. Understanding the biology of iPSC-derived sensory neurons can help with new treatments for these disorders, as well as improve our understanding of normal sensory function [3].

iXCells Biotechnologies is proud to provide fully differentiated and functional human iPSC-derived human sensory neurons that display typical neuronal morphology and express key markers of e.g.,Peripherin, BRN3A (Figure 1) when cultured in the Human Sensory Neuron Maintenance Medium (Cat# MD-0114-100ML). In addition, our iPSC-derived sensory neurons can also be co-cultured with glia or other cell types for drug screening platforms.

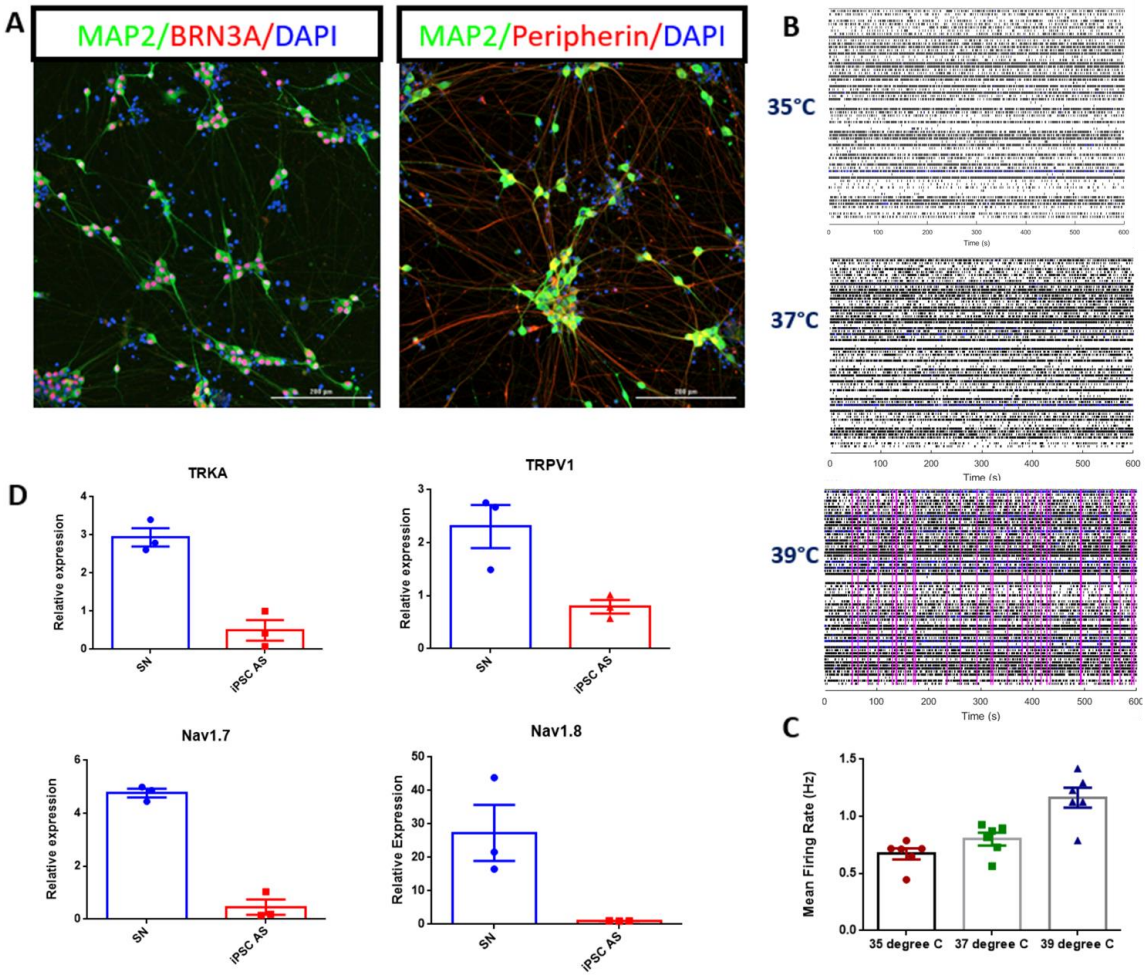

***Figure 1**. Human iPSCs-derived sensory neurons show expression of characteristic biological markers. (A) Immunostaining of iPSC-derived astrocytes expressing MAP2 (green), BRN3A (red), Peripherin (red) 7 days post-thaw. All cells were counterstained for DAPI (blue). Scale bars, 200 µm. (B) Example raster plot showing spikes (black lines) and network bursts (pink lines) at different temperatures in the MEA for sensory neurons grown for two weeks. (C) The electrical parameters were measured in the MEA over different temperatures and the results are graphed as mean ± SEM for mean firing rate. (D) Gene expression values for NTRK1 (TRKA), TRPV1, SCN9A (Nav1.7) and SCN10A (Nav1.8) from three weeks post-thaw sensory neurons and control (iPSC-derived Astrocytes). Results are graphed as mean ± SEMs.*

Product Details

Tissue Origin	Human iPSC-derived sensory neurons
Package Size	1.0 million cells/vial; 2.0 million cells/vial;
Shipped	Cryopreserved
Storage	Liquid Nitrogen
Media	Human Sensory Neuron Maintenance Medium (Cat# MD-0114-100ML) Recovery Supplement (Cat# MD-0110-20µL) Y27632 (Cat# MD-0025-2MG)

Protocols

Monoculture of hiPSC-Derived Sensory Neurons

The following protocol is based on 48-well plate format

1. Prepare the coating vessel before thawing the cells. Coated plate preparation: coat the plates with Poly-L-ornithine solution (10 µg/ml; Sigma, P4957) in water overnight in the incubator, wash twice with water the next day and coat the plates with laminin (5 µg/ml; Thermo, 23017015) in dPBS overnight. Do not let dry at any stage.

   ***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 **Human Sensory Neuron Maintenance Medium (Cat# MD-0114-100ML).**

4. Centrifuge at 300*g* for 5 minutes at room temperature.

5. In the meantime, calculate the volume of cell suspension needed to plate the neurons and prepare the media by adding the **Recovery Supplement** (MD-0110-20uL; 1:2000 dilution) and 10µM **Y27632** (MD-0025-2MG) to the Human Sensory Neuron Maintenance Medium, e.g. for 5 mL of Human Sensory Neuron Maintenance Medium add 2.5 µL of Recovery Supplement.

6. Remove the supernatant and re-suspend the cells in Human Sensory Neuron Maintenance Medium + Recovery Supplement + Y27632. Recovery supplement and Y27632 should be removed the next day.

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

   ***Note:** We recommend seeding 100K-200K cells per cm^2 depending on the application. Cell debris may be observed after cell recovery. Refer to the CoA of each lot to determine the seeding density for your experiment.*

8. Perform half medium change every 3-4 days. Most of the cells should express high levels of MAP2 and Peripherin, 5-7 days after thaw.

References

[1] Basbaum AI, Bautista DM, Scherrer G, Julius D. Cellular and molecular mechanisms of pain. Cell. 2009 16;139: 267-84.
[2] Fargeot G, Echaniz-Laguna A. Sensory neuronopathies: new genes, new antibodies and new concepts. J Neurol Neurosurg Psychiatry. 2021 9:jnnp-2020-325536
[3] Lampert A, Bennett DL, McDermott LA, Neureiter A, Eberhardt E, Winner B, Zenke M. Human sensory neurons derived from pluripotent stem cells for disease modelling and personalized medicine. Neurobiol Pain. 2020 18;8:100055.

Disclaimers