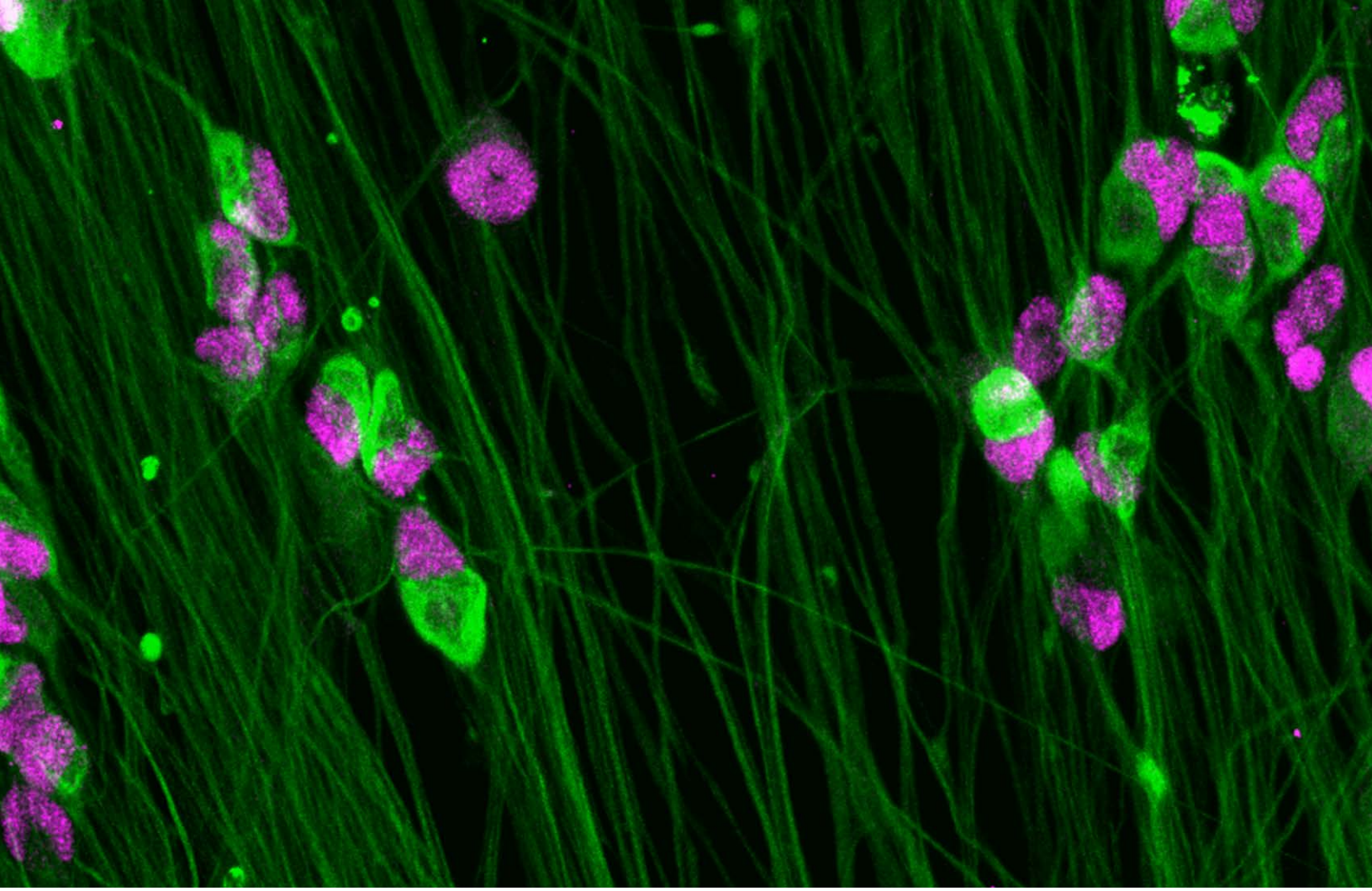


ioSensory Neurons™

Highly pure human iPSC-derived sensory neurons with a defined nociceptor identity

Learn more about ioSensory Neurons

ioCells™

About the cells

ioSensory Neurons are precision reprogrammed using opti-ox™ technology, meaning consistency is built-in. Within 7 days post-revival, ioSensory Neurons form a highly pure (>99%) sensory neuronal population with a defined nociceptor identity, characterised by the expression of the pan-sensory neuron markers, PRPH, BRN3A, ISL1 and TUBB3, and key markers of nociceptors, NTRK1 and TRPV1.

These cells display spontaneous activity and show a functional nociceptor phenotype, as demonstrated by responsiveness to selective agonists for TRPV1, TRPM3, and TRPM8. ioSensory Neurons are a highly pure, easy to use and functional in vitro nociceptor model, enabling reliable chronic nociceptive pain research and therapeutics development for peripheral neuropathies.

Benchtop benefits

HIGHLY PURE

>99% pure sensory neurons with a defined nociceptor identity by day 7 post-revival, as confirmed by single cell RNA sequencing.

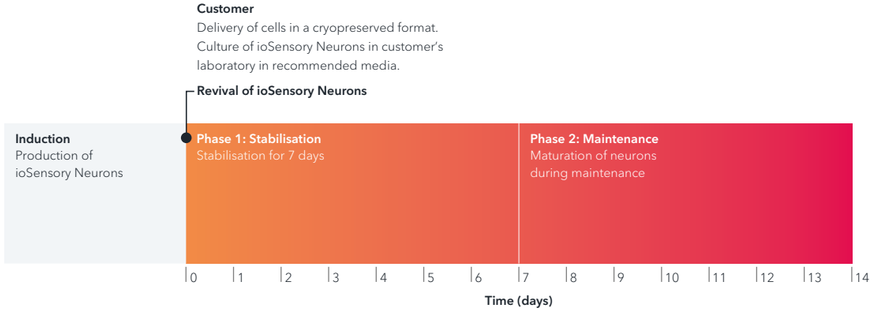
FUNCTIONAL

ioSensory Neurons display spontaneous activity and a functional nociceptor phenotype, as shown by calcium mobilisation in response to specific TRP agonists.

EASY TO USE

Cryopreserved cells arrive, programmed to mature rapidly upon revival. Simple two-step protocol using one medium – no mitomycin C treatment is necessary.

Cells arrive ready to plate

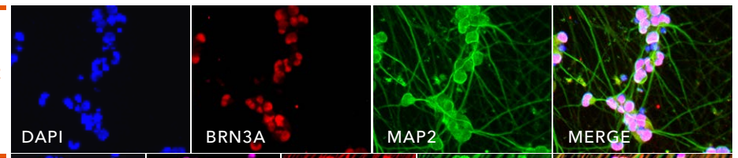


Highly characterised and defined, so you know exactly what is in every vial

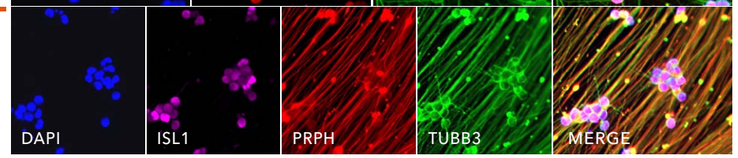
ioSensory Neurons express key pan-sensory neuron-specific markers. Immunofluorescent staining was performed on ioSensory Neurons at day 14 post-revival. The upper panel shows that ioSensory Neurons are positive for the pan-sensory marker BRN3A (red), the pan-neuronal marker MAP2 (green), and the DAPI counterstain (blue), and demonstrates that all MAP2 positive neurons have a sensory neuronal identity.

The lower panel shows that ioSensory Neurons are positive for the pan-sensory markers ISL1 (magenta) and PRPH (red), the pan-neuronal marker TUBB3 (green), and the DAPI counterstain (blue).

ioSensory Neurons express BRN3A and MAP2



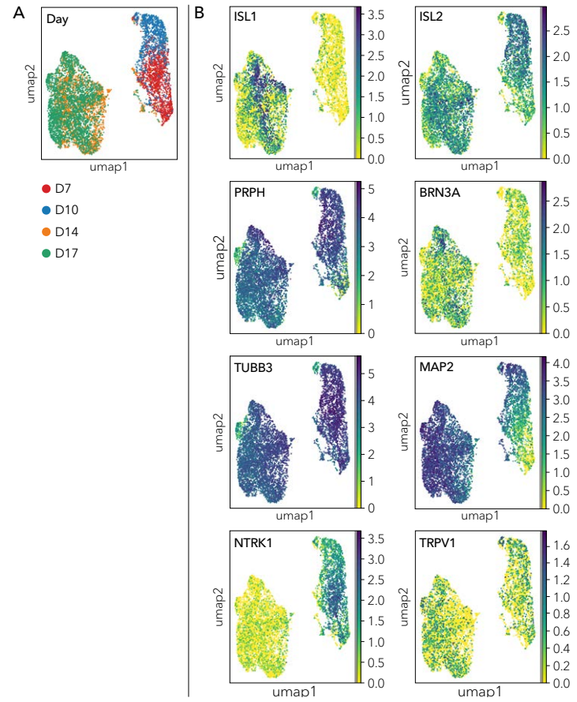
ioSensory Neurons express ISL1, PRPH and TUBB3



Single cell RNA-sequencing shows ioSensory Neurons form a >99% pure population of sensory neurons

A. Single cell RNA-sequencing analysis was performed, using 10x Genomics, with ioSensory Neurons at four specific timepoints (days 7, 10, 14 and 17).
B. By day 7, the population expresses key pan-sensory neuron markers, ISL1, ISL2, PRPH, BRN3A, and key pan-neuronal markers, TUBB3 and MAP2, indicating a >99% pure population of post-mitotic sensory neurons. A high proportion of cells also express key nociceptor markers, NTRK1 and TRPV1.

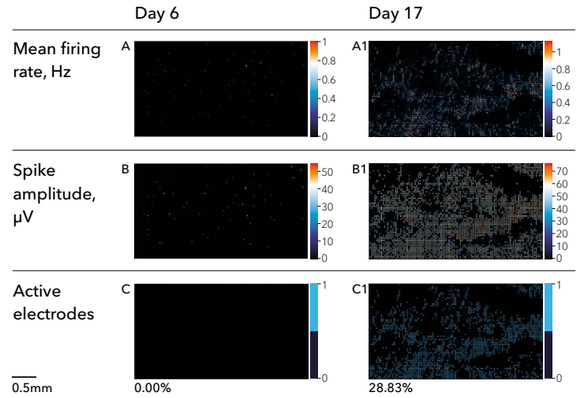
**Note, this data is from cells in continuous culture and not cryopreserved cells.*



Rapid gain of functional activity – ioSensory Neurons display spontaneous activity that matures over time

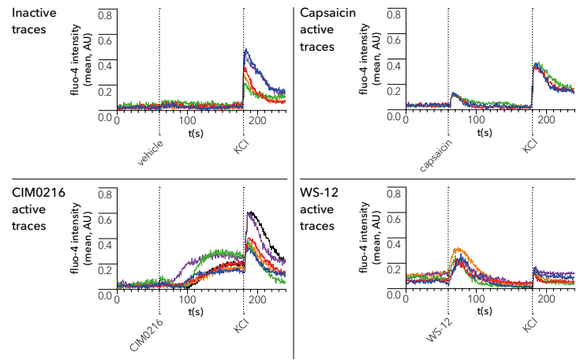
Multi electrode array (MEA) recordings of ioSensory Neurons at days 6 and 17. The activity maps show firing rate (A), spike amplitude (B) and % of active electrodes (C). Results demonstrate a time-dependent increase of spontaneous activity during neuronal maturation from day 6 to day 17. Analysis was performed on a Maxwell Biosystem's MaxTwo multi-well system.

**Note, this data is from cells in continuous culture and not cryopreserved cells.*



Rapid gain of functional activity – ioSensory Neurons display a functional nociceptor phenotype

Calcium mobilisation imaging upon stimulation of ioSensory Neurons with pharmacological agonists targeting thermosensitive TRP channels such as TRPV1 (capsaicin), TRPM3 (CIM0216) and TRPM8 (WS-12). Active traces represent the increase in intracellular calcium mobilisation of individual cells upon exposure to noxious stimuli but not to vehicle at day 14 post-revival. This indicates that cells display a functional nociceptor phenotype within 14 days post-revival.



Product information

Cat code
io1024

Starting material
Human iPSC line

Karyotype
Normal (46, XY)

Seeding compatibility
6, 12, 24, 96 & 384 well plates

Shipping info
Dry ice

Donor
Caucasian adult male
(skin fibroblast)

Vial size
Small: >2 x 10^6 viable cells

Quality control
Sterility, protein expression (ICC)
and gene expression (RT-qPCR)

Differentiation method
opti-ox™ cell reprogramming

Recommended seeding density
60,000 cells/cm^2

User storage
LN2 or -150°C

Format
Cryopreserved cells

Product use
ioCells™ are for
research use only

Applications
Chronic pain research & drug development, MEA analysis, calcium imaging, transcriptome analysis, neurotoxicology

bit.bio
THE CELL CODING COMPANY

Who we are

bit.bio combines the concepts of cell programming and biology to provide human cells for research, drug discovery and cell therapy, enabling a new generation of medicines.

This is possible with our precision human cellular reprogramming technology opti-ox™ – a gene engineering approach that enables unlimited batches of any human cell to be manufactured consistently at scale

For general information,
email info@bit.bio

To learn more,
visit www.bit.bio