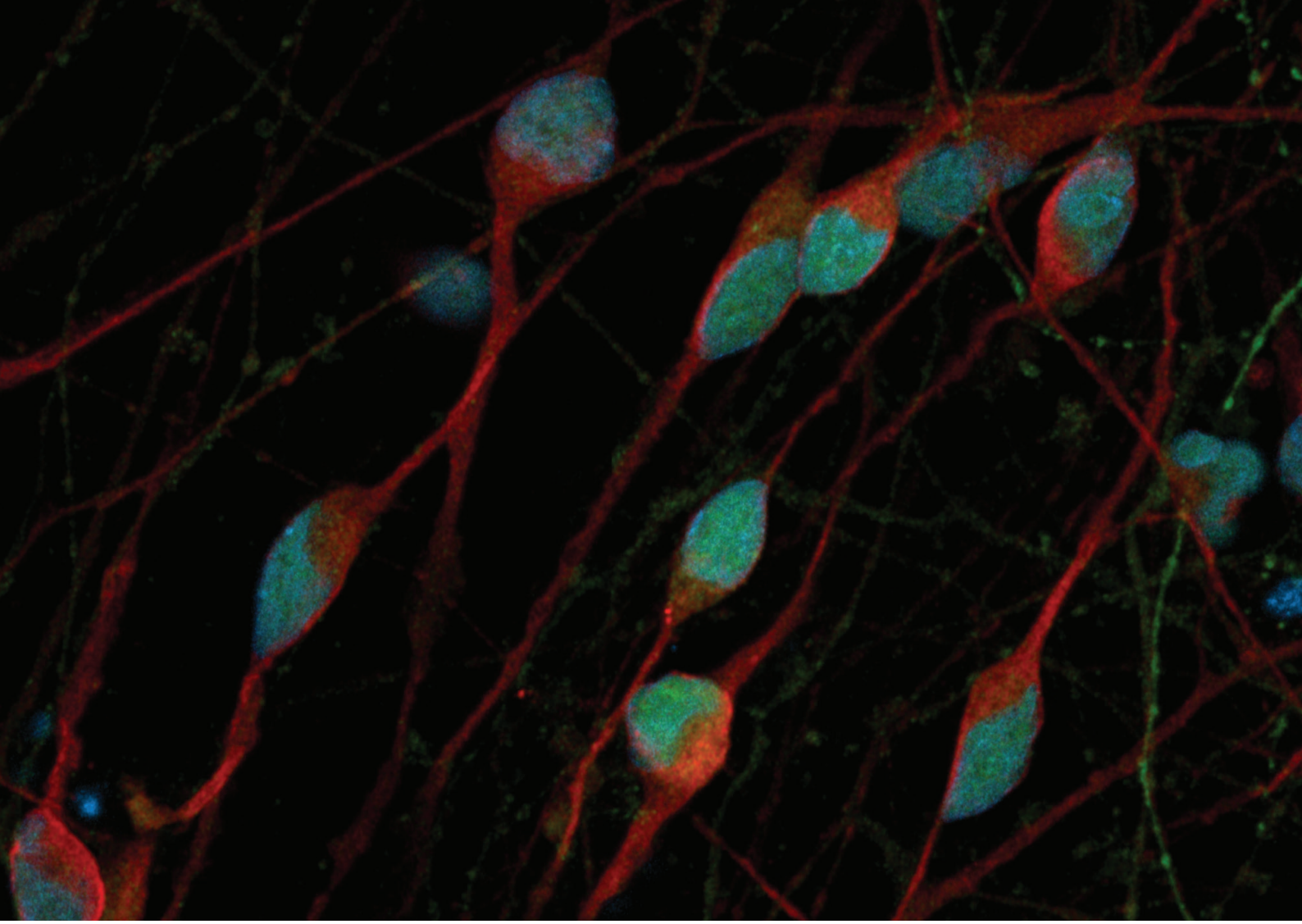


ioGABAergic Neurons

Human iPSC-derived GABAergic neurons

Powered by opti-ox™

Consistent. Defined. Scalable.

Learn more about ioGABAergic Neurons

ioCells™

About the cells

ioGABAergic Neurons are human iPSC-derived GABAergic neurons, deterministically programmed using opti-ox* technology. Within 4 days post-revival, they form a highly pure (>99%) population ready for experimentation, expressing the key marker genes, GAD1, GAD2, VGAT, DLX1, and DLX2. These inhibitory neurons show spontaneous activity via calcium imaging and are suitable for tri-culture studies with ioGlutamatergic Neurons and astrocytes. These cells provide an in vitro model for studying neural circuits, neurological diseases, and for drug development, and can be used as a genetically matched control alongside homozygous or heterozygous Alzheimer's disease model cells carrying the APP V717I (London) mutation.

Benchtop benefits

HIGHLY PURE

>99% of cells express key GABAergic markers within 4 days post-thaw, confirmed by single cell RNA sequencing.

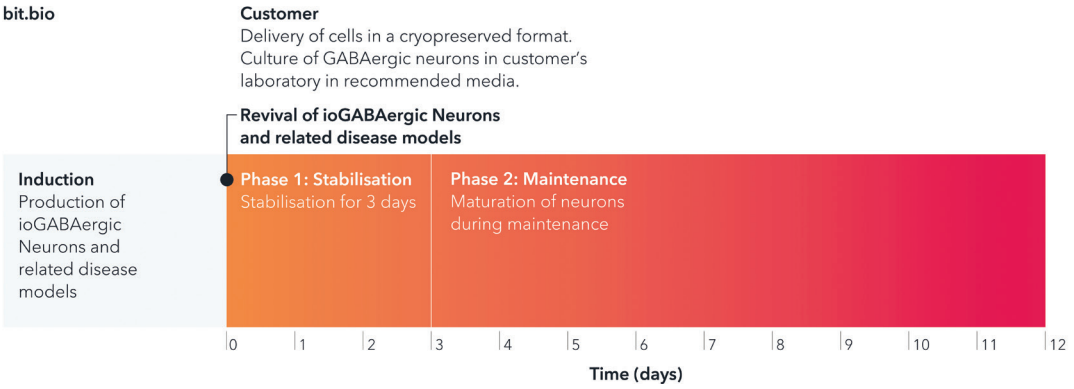
CONSISTENT

Get reproducible results from every vial with high lot-to-lot consistency, with less than 1% differentially expressed genes between lots, confirmed by bulk-RNA sequencing.

EASY TO USE

Cells arrive programmed to rapidly mature upon revival. One medium is required in a two-phase protocol.

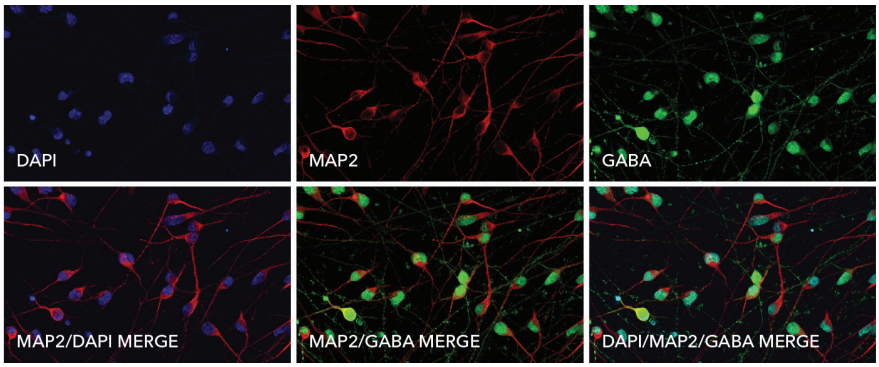
Ready within days



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

A

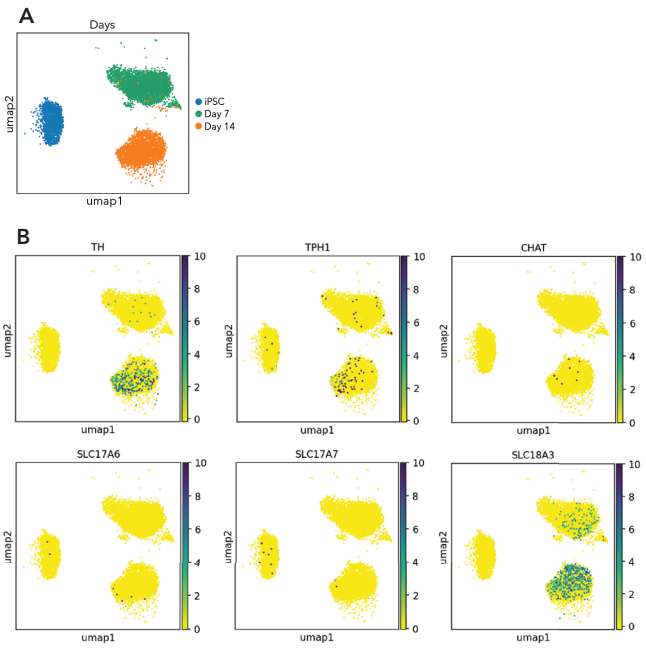
ioGABAergic Neurons express MAP2 and GABA



A. ioGABAergic Neurons express key GABAergic neuron-specific markers. Immunofluorescent staining of ioGABAergic Neurons at day 12 post-revival. The upper panel shows that ioGABAergic Neurons are positive for the pan-neuronal marker MAP2 (red), GABA (green), and the DAPI counterstain (blue). The lower panel shows that all MAP2 positive neurons have a GABAergic neuronal identity.

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

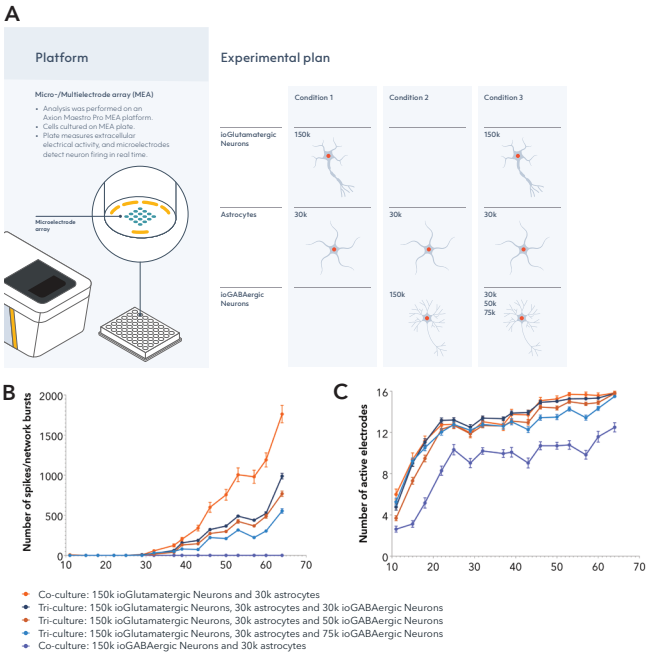
A. Single cell RNA-sequencing analysis was performed, using 10x Genomics, with ioGABAergic Neurons at three specific timepoints (iPSC, day 7 and 10).
B. By day 7, the expression of key GABAergic marker genes, GAD1, GAD2, SLC32A1/VGAT, DLX2 and DLX5, together with the pan-neuronal marker MAP2, could be detected in post-mitotic GABAergic neurons.



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

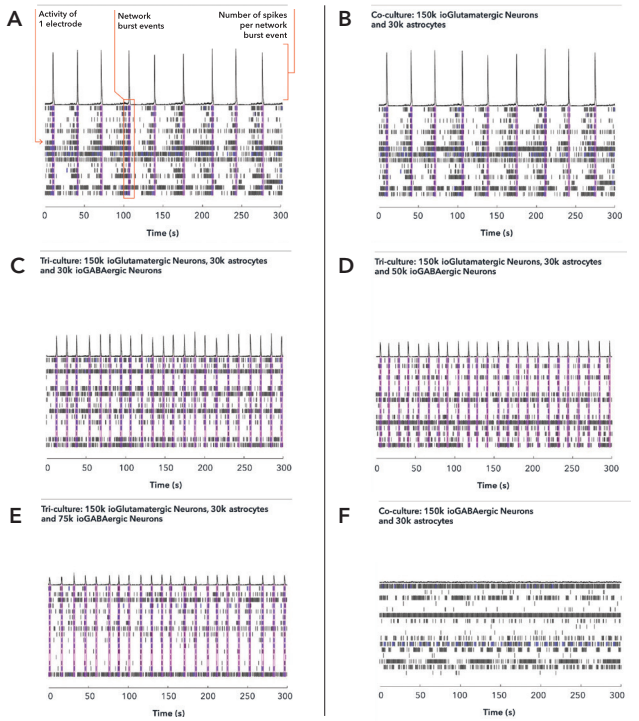
ioGABAergic Neurons form functional neuronal networks and modulate network activity in tri-cultures with ioGlutamatergic Neurons and astrocytes

A. Experimental setup of co- and tri-cultures of ioGABAergic Neurons, ioGlutamatergic Neurons and hiPSC-derived astrocytes.
B. Co-cultures of ioGlutamatergic Neurons and astrocytes show the strongest synchronised network activity. Increasing numbers of ioGABAergic Neurons in tri-cultures reduce this synchronised network activity. No network bursting in co-cultures of ioGABAergic Neurons and astrocytes indicates a highly pure population of ioGABAergic Neurons. **C.** Co-culture and tri-culture conditions show an increase in spontaneous activity up to 25 DIV, followed by a plateau, indicating activity over 64 DIV. Data generated with Charles River Laboratories.



ioGABAergic Neurons exert an inhibitory effect on the excitatory ioGlutamatergic Neurons within the tri-cultures leading to a higher network burst rate

A. Effect of increasing numbers of ioGABAergic Neurons in co- and tri-cultures investigated by MEA analysis at 53 DIV. Raster plots display activity of 16 electrodes over 300 seconds. **B.** Co-culture with ioGlutamatergic Neurons and astrocytes shows the strongest network bursts indicated by increased spiking activity and lower network burst rate (NBR) compared to tri-cultures. **C to E.** Increasing numbers of ioGABAergic Neurons to tri-cultures has an inhibitory effect on ioGlutamatergic neuron activity, as expected.
F. Co-culture of ioGABAergic Neurons and astrocytes shows no network bursts, indicating a highly pure population of ioGABAergic Neurons. Analysis was performed on an Axion Maestro Pro MEA platform. Data generated with Charles River Laboratories.



Product information

Cat no
io1003

Starting material
Human iPSC line

Karyotype
Normal (46, XY)

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

Shipping info
Dry ice

Donor
Caucasian adult male
(skin fibroblast)

Vial size
Small: >3 x 10^6 viable cells

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

Differentiation method
opti-ox deterministic cell
programming

Recommended seeding density
150,000 cells/cm^2

User storage
LN2 or -150°C

Format
Cryopreserved cells

Product use
ioCells are for research use only

Applications
Disease research
Co-culture studies
Calcium imaging
Transcriptome analysis
MEA analysis
ASO screening

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 deterministic cell programming 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

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