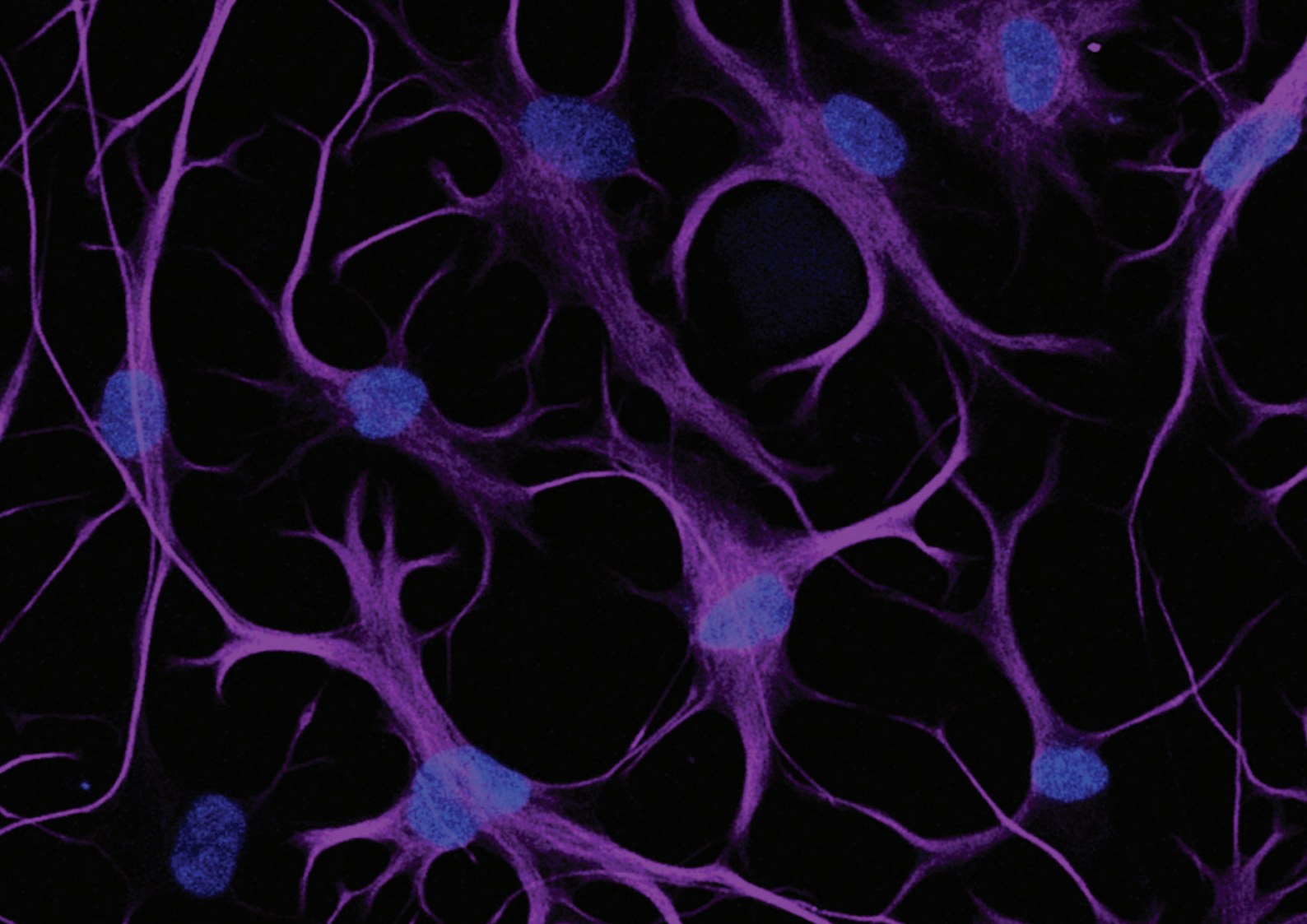




ioAstrocytes

Early Access to
human iPSC-derived
astrocytes

Powered by opti-ox™

Consistent. Defined. Scalable.

Learn more about
ioAstrocytes

ioCells™



About the cells

ioAstrocytes are functional human iPSC-derived astrocytes, deterministically programmed using opti-ox technology that convert consistently into defined astrocytes within days. Cells demonstrate expected stellate morphology, express key astrocytic markers (SOX9, EAAT1, S100B and Vimentin), are capable of phagocytosis, cytokine secretion, and modulation of neuronal activity in co-culture.

Benchtop benefits



CO-CULTURE READY

ioAstrocytes support functional neuronal networks within co-culture settings, enabling in-vitro modelling of complex CNS biology.



FUNCTIONAL

Display key phagocytic and cytokine secretion functions as well as a demonstrable influence on neuronal network activity.

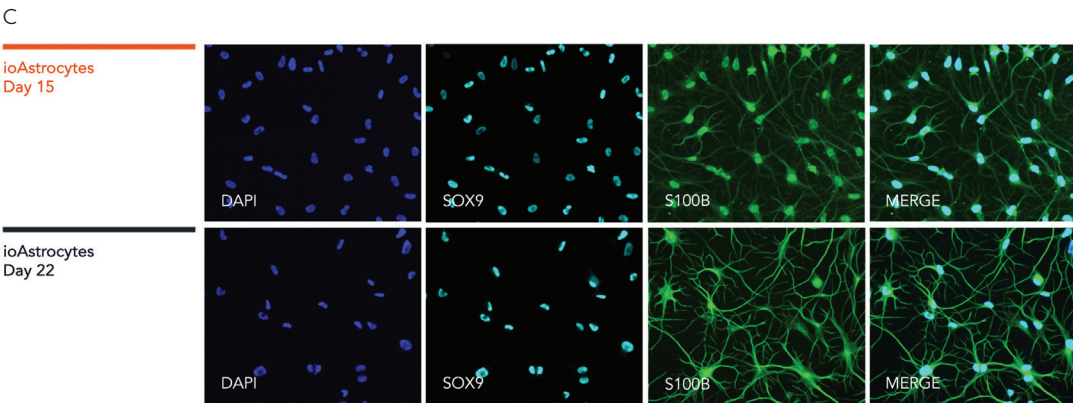
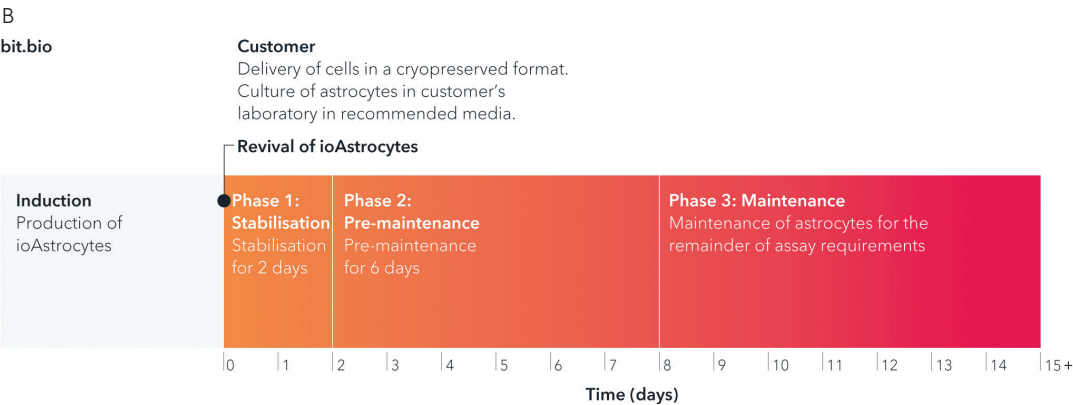
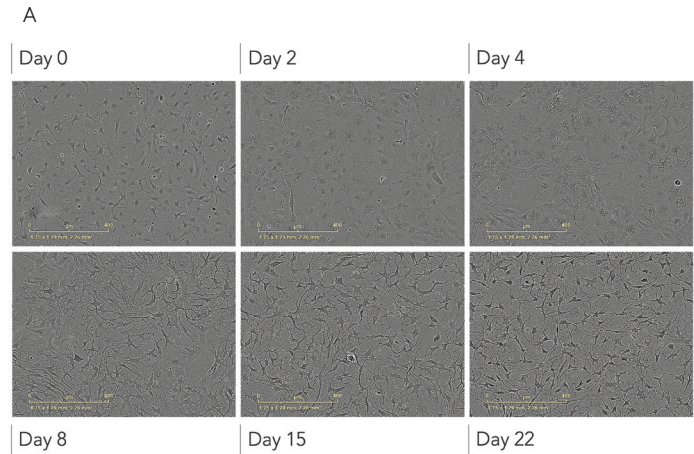


CONSISTENT

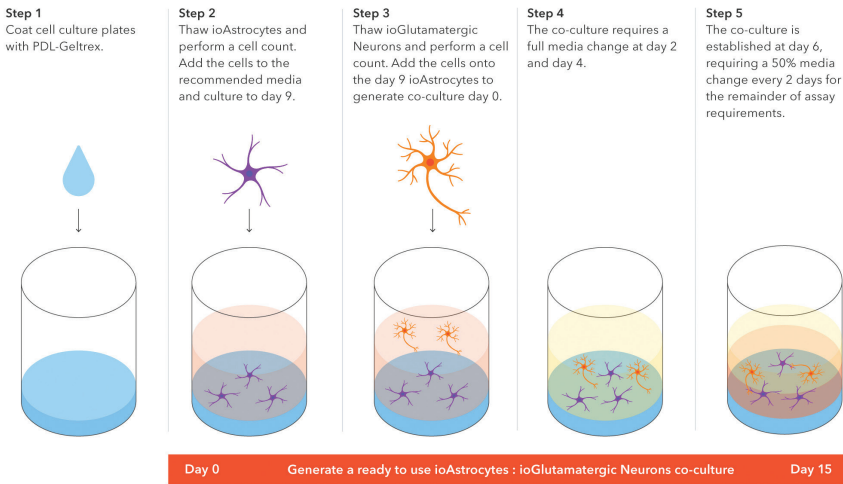
Get reproducible results from every vial with lot-to-lot consistency of highly characterised & defined human iPSC-derived cells.

Ready within days

A. ioAstrocytes acquire a stellate shape with branched, elongating processes that continue to intensify. **B.** The protocol for the generation of these cells is a three-phase process: 1. Stabilisation for 2 days. 2. Pre-maintenance for an additional 6 days. 3. From day 8 onwards, maintenance of cells according to the protocol and recommended media for the duration of assay requirements. **C.** ioAstrocytes express key astrocyte markers S100B, SOX9 & Vimentin (data now shown) by immunocytochemistry.



Co-culture protocol

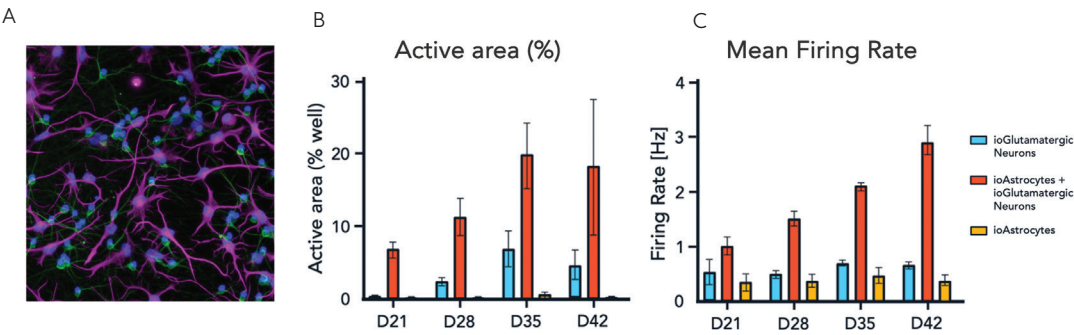


Examples of readouts

- Cell viability
- Gene expression profiling
- Protein expression
- Morphology & live imaging
- Electrophysiological assessments
- Synaptic function & formation
- Neurotransmitter levels & uptake
- Calcium imaging
- Metabolic activity
- Neurotoxicity and Neuroprotection

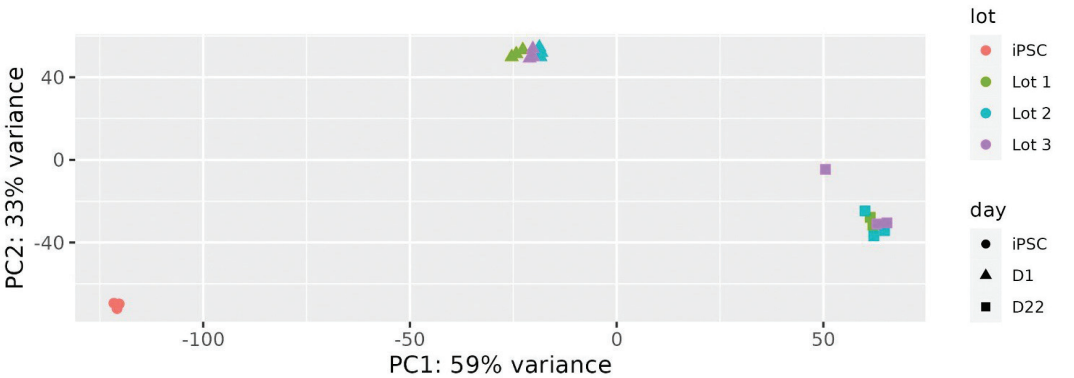
This protocol facilitates research into complex neuroglial interactions describing a method of co-culturing ioAstrocytes with ioGlutamatergic Neurons and associated disease models. The protocol includes step-by-step instructions, open-source media and recommendations on required equipment.

Modulation of neuronal activity in co-culture



A. Immunocytochemistry image of ioAstrocytes and ioGlutamatergic Neurons in co-culture; staining shows expression of pan-neuronal marker MAP2 (green), astrocyte marker S100B (purple) and DAPI nuclear staining (blue). **B and C.** High-density multi electrode measurements of the neuronal activity of mono- and co-cultures of ioGlutamatergic Neurons and ioAstrocytes, showing the active area (% of well) and mean firing rate (Hz) at different time points. ioAstrocytes were directly derived from iPSC after a 10-day reprogramming protocol (D10), and then harvested to seed with Day 0 (D0) ioGlutamatergic Neurons to establish their co-cultures. D10 ioAstrocytes and D0 ioGlutamatergic Neurons were also used to generate the respective mono-cultures.

Lot-to-lot consistency for experimental reproducibility



Bulk RNA-sequencing analysis was performed on three different lots of manufactured product at day 1 and day 22 post revival. Principal component analysis (PCA) represents the variance in gene expression between the three different lots of ioAstrocytes. This analysis shows lots clustering very closely (<0.5% differentially expressed genes) demonstrating high consistency at each given timepoint. This lot-to-lot consistency of ioAstrocytes will help reduce experimental variation and increase the reproducibility of data. Colours represent the parental non-induced hiPSC cell line and the three lots of ioAstrocytes; shapes represent different timepoints.

Product information

Cat no

ioEA1093 Early Access

Starting material

Human iPSC line

Seeding compatibility

6, 12, 24, 96 and 384 well plates

Shipping info

Dry ice

Donor info

Caucasian adult male
(skin fibroblast)

Vial size

Small: $\geq 1 \times 10^6$ viable cells

Quality control

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

Differentiation method

opti-ox deterministic cell
programming

Recommended seeding density

30,000/cm²

User storage

LN2 or -150°C

Format

Cryopreserved cells

Product use

ioCells are for research use only

Applications

Neurodegenerative disease
modelling
Drug screening & development
Neuropharmacology
Neuroinflammation research
Biomarker discovery

This product is a part of an Early Access program. The performance characteristics of this product has not been fully established; therefore, the product format, user manual and presentation may be subject to change in the final catalogue product.

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

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