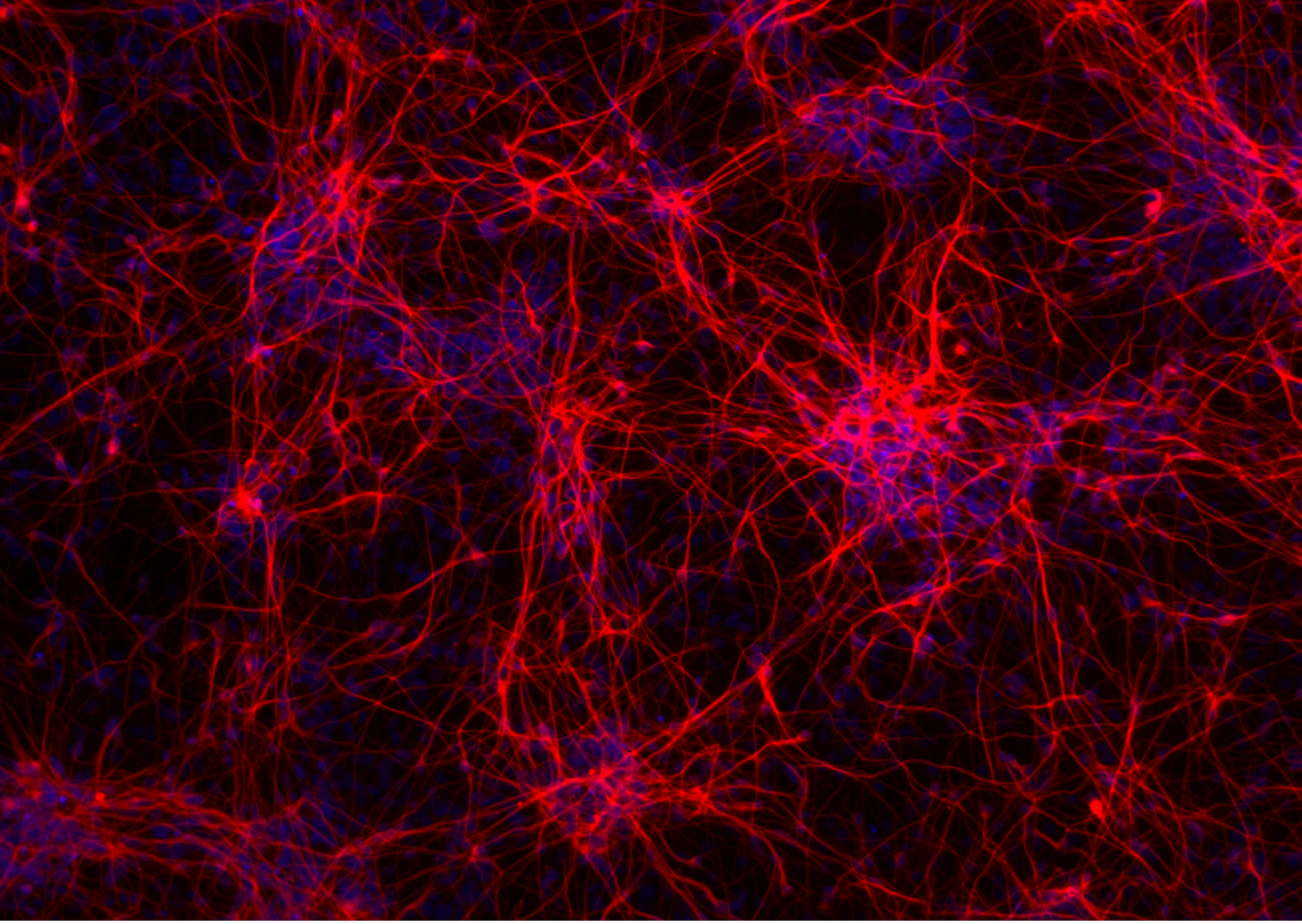


ioGlutamatergic Neurons™

Human iPSC-derived glutamatergic neurons

Powered by opti-ox™

Consistent. Defined. Scalable.

Learn more about ioGlutamatergic Neurons

ioCells™

About the cells

ioGlutamatergic Neurons have been deterministically programmed from human induced pluripotent stem cells (iPSC) using opti-ox™ technology. Within days, cells convert consistently to mature, functional glutamatergic neurons characterised by >80% expression of glutamate transporter genes VGLUT1 and VGLUT2.

Glutamatergic neurons are delivered cryopreserved and ready-to-culture making them a high-quality human model for fundamental research, disease modelling and drug discovery.

Benchtop benefits

QUICK

Ready for experimentation as early as 2 days post-revival and form functional neuronal networks at 17 days.

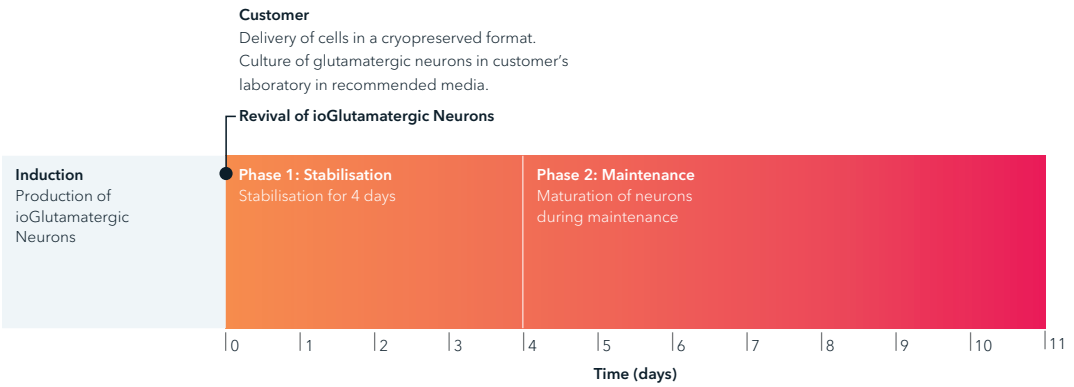
SCALABLE

Industrial scale quantities at a price point that allows the cells to be used from research to screening scale.

EASY TO USE

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

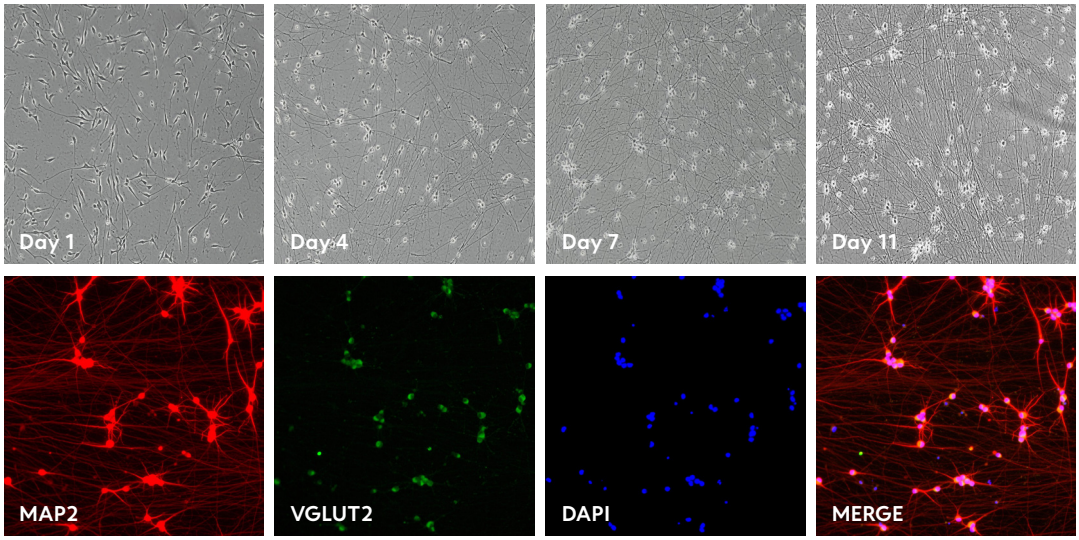
Cells arrive ready to plate



ioGlutamatergic Neurons are highly characterised and defined, so you know exactly what is in every vial.

ioGlutamatergic Neurons mature rapidly and form structural neuronal networks over 11 days (upper panel). 100X magnification.

Immunofluorescent staining on post-revival day 11 demonstrates homogenous expression of the pan-neuronal protein, MAP2 and glutamatergic neuron-specific transporter, VGLUT2 (lower panel).

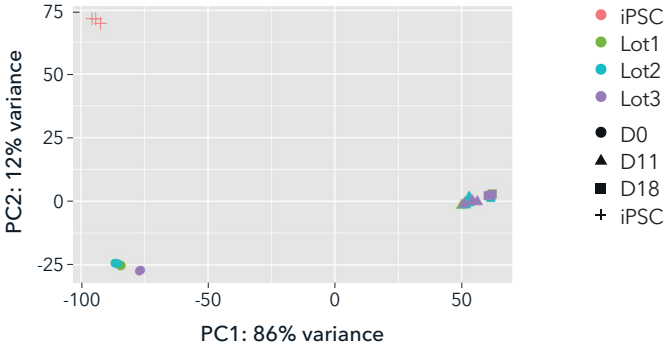


Get reproducible results from every vial with high lot-to-lot consistency

Whole transcriptome analysis demonstrates high lot-to-lot consistency across three manufactured lots

Bulk RNA-sequencing analysis was performed on three different lots of ioGlutamatergic Neurons on day 0, day 11 and day 18 post-revival. The experimental design included three operators, each handling one lot replicate of the different manufactured lots. (**A**) A principal component analysis (PCA) to assess gene expression variance between manufactured lots showed a tight clustering of the samples at each timepoint. (**B**) Differential expression test reveals no statistically significant differentially expressed genes across the three lots at day 11 (|logFC| > 0.5 and FDR < 0.01).

A



B

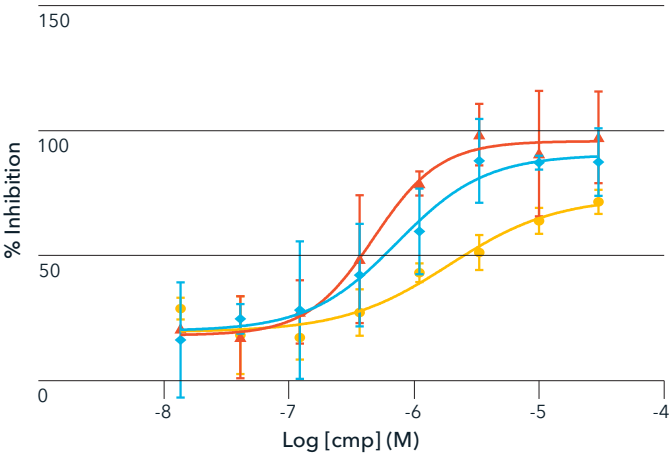
Differential Gene Expression at day 11

Lot 2 vs Lot 3	0
Lot 1 vs Lot 2	0
Lot 1 vs Lot 3	0
iPSC vs Lot 1	5,735

Robust and scalable cells suitable for high-throughput screening

ioGlutamatergic Neurons show good suitability for high-throughput screening in 384-well format plates

Cytotoxicity CellTiter-Glo® (CTG) and TR-FRET (HTRF®) assays for AKT serine/threonine kinase 1 (AKT) and Huntingtin (HTT) proteins were performed on ioGlutamatergic Neurons in 384-well plates treated with tool compound (cmp) at day 9 post-revival. Compound titration results in a concentration response curve for all three assays (mean±sd of 2 replicates). The CTG assay shows an excellent average signal/ background ratio and high suitability for HTS. The HTRF assays show a lower average signal/background ratio, due to lower assay sensitivity, indicating ioGlutamatergic Neurons are also suitable for HTRF assays. Data courtesy of Charles River Laboratories.



Signal/Background	
CellTiter-Glo®	327
HTT HTRF®	1.65
AKT HTRF®	1.95

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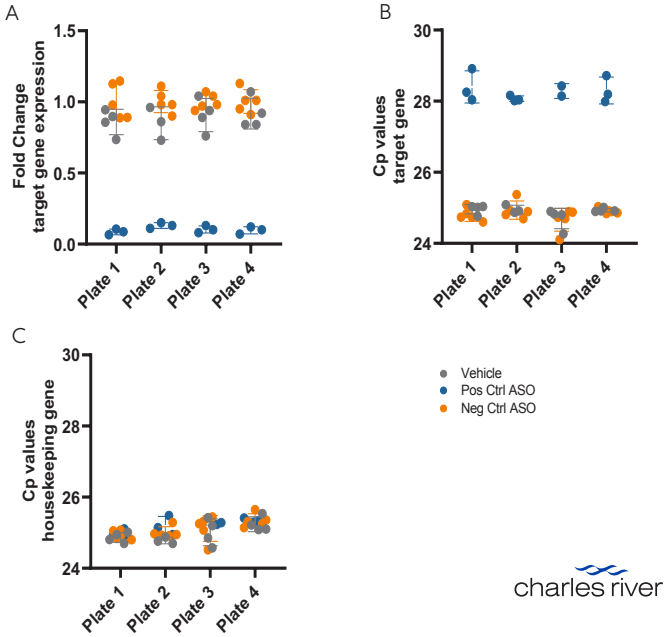
A physiologically-relevant model for efficacy screening of candidate ASOs

ioGlutamatergic Neurons are compatible with delivery of antisense oligonucleotides (ASOs) by gymnosis

The effect of positive and negative control ASOs with gapmer chemistry was measured by RT-qPCR. The positive control ASO induced ~90% knockdown of the target gene, shown by a decrease in the target gene expression (A) and higher Cp values for the target gene, indicating lower initial amount of the target sequence (B). There was no effect of the control ASOs on housekeeping gene expression as compared to vehicle-transfected controls (C). No marked intra- or inter-plate variability was observed between positive and negative control ASOs (A-C). Data courtesy of Charles River Laboratories.



charles river

Cat no
io1001

Starting material
Human iPSC line

Karyotype
Normal (46, XY)

Seeding compatibility
6, 12, 24, 48, 96 & 384 well plates

Shipping info
Dry ice

Donor
Caucasian adult male,
age 55-60 years old
(skin fibroblast)

Vial size
Small: >1 x 10^6 viable cells
Large: >5 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
30,000 cells/cm^2

User storage
LN2 or -150°C

Format
Cryopreserved cells

Product use
ioCells are for research use only

Applications
Drug discovery
Neurotoxicology
High throughput screening
CRISPR Screening
3D bioprinting

Discover our range of ioGlutamatergic Neurons for disease modelling, CRISPR screens, live-cell imaging, and multi-cell in vitro models.

ioDisease Model Cells for Amyotrophic Lateral Sclerosis (ALS)

ioGlutamatergic Neurons
TDP-43 M337V

ioDisease Model Cells for Alzheimer's Disease

ioGlutamatergic Neurons
APP V717I

ioGlutamatergic Neuron
APP KM670/671NL

ioGlutamatergic Neurons
PSEN1 M146L

ioGlutamatergic Neurons
APOE 4/4

ioGlutamatergic Neurons
APOE 3/3

ioDisease Model Cells for Frontotemporal Dementia (FTD)

ioGlutamatergic Neurons
MAPT S305N

ioGlutamatergic Neurons
MAPT S305N + P301S

ioDisease Model Cells for Gaucher Disease

ioGlutamatergic Neuron
GBA null/R159W

ioDisease Model Cells for Huntington's Disease

ioGlutamatergic Neuron
HTT 50CAG/WT

ioDisease Model Cells for Parkinson's Disease

ioGlutamatergic Neurons
PRKN R275W

ioGlutamatergic Neuron
PINK1 Q456X

ioGlutamatergic Neuron
SNCA A53T

CRISPR-Ready ioCells

CRISPRko-Ready ioGlutamatergic Neurons (express Cas9 for rapid gene knockout generation)

CRISPRa-Ready ioGlutamatergic Neuron (express dCas9-activator fusion for upregulating gene expression)

CRISPRi-Ready ioGlutamatergic Neurons (express dCas9-repressor fusion to inhibit gene expression)

ioTracker Cells™

GFP ioGlutamatergic Neurons
(express GFP for live-cell imaging)

Multi-cell culture protocols

ioMicroglia and ioGlutamatergic Neurons

ioAstrocytes and ioGlutamatergic Neurons

ioGABAergic Neurons, ioGlutamatergic Neurons, and astrocytes

ioGlutamatergic Neurons, ioMicroglia and ioAstrocytes

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

bit.bio
THE CELL CODING COMPANY