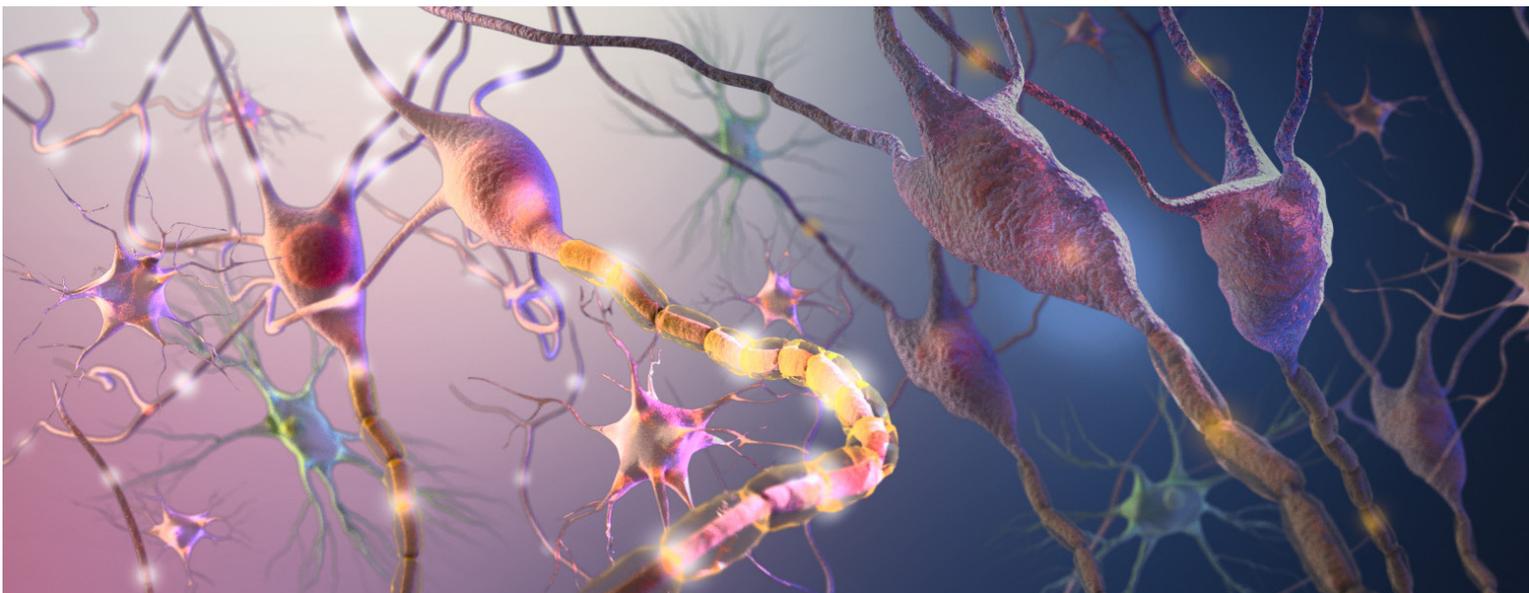


Assays for Neuroscience Research

IncuCyte® S3 Live-Cell Analysis System for Neuroscience

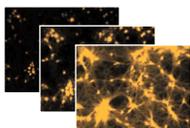


Developing the next generation of therapies for neurological and psychiatric disease relies on advanced technologies that provide detailed morphological and functional insight into living cells. The IncuCyte® S3 Live-Cell Analysis System for Neuroscience enables **real-time automated measurements** of the dynamic changes and interactions of cells of the nervous system while they sit undisturbed **inside your incubator**.

Key Advantages:

- Evaluate health, structure, and function with a single, flexible platform.
- Gain unprecedented access to phenotypic information with an end-to-end solution.
- Quantify both significant and subtle changes occurring over weeks or months.
- Enable upstream and downstream workflows with cell sparing and cell preserving assays.

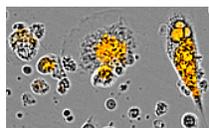
Neuronal Function



Neuronal activity assay

Record activity from thousands of cells to study changes in the neuronal network.

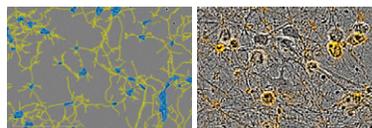
Neuroimmune Function



Phagocytosis and chemotaxis assays

Quantify microglial clearance of cell debris and visualize chemotactic migration.

Cell Health and Morphology



Neurite analysis assays

Visualize and measure changes in neurite length and branch points.

Apoptosis assay

Measure cell death continuously throughout your experiment.

IncuCyte®

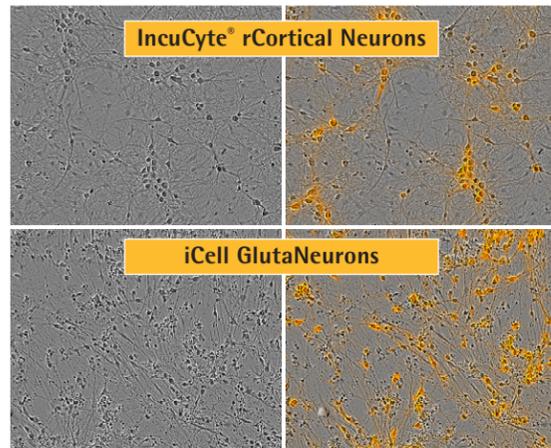
A SARTORIUS BRAND

IncuCyte® Neuronal Activity Assay

Gain insight into the activity and connectivity of neuronal networks with continuous imaging and analysis. IncuCyte® Neuronal Activity allows for direct, long-term measurements of synaptic activity for the characterization of neuronal cell models in physiologically relevant conditions.

Novel, Non-perturbing Reagent

- IncuCyte® Neuroburst Orange Reagent is designed for neuronal-specific expression of a genetically-encoded calcium indicator (GECI).
- Compatible with a variety of neuronal cell types, including primary neurons and iPSC-derived models.



Protect your sensitive cells.
Conduct long term studies of neuronal activity with continuous expression of IncuCyte® NeuroBurst Orange Reagent, without perturbing the health and morphology of your sensitive cells.

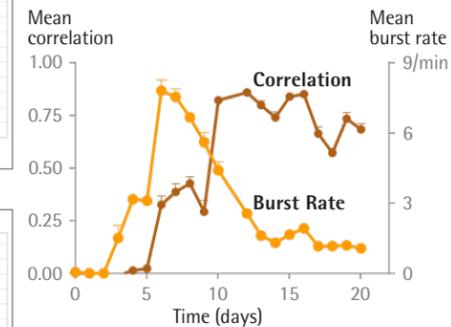
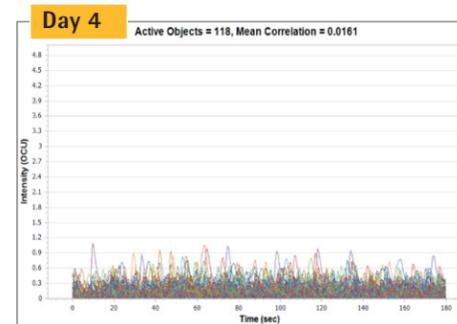
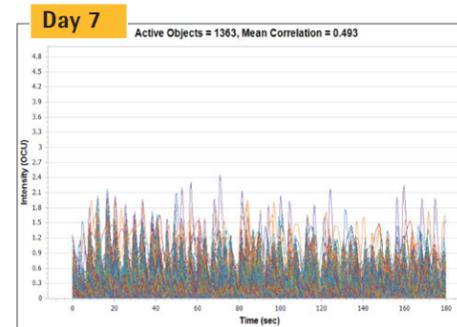


IncuCyte® S3 for Neuroscience is designed for analysis of sensitive cells over weeks or months.

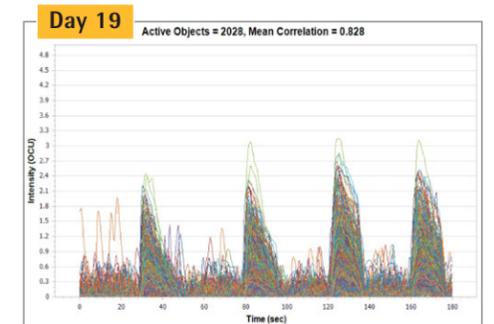
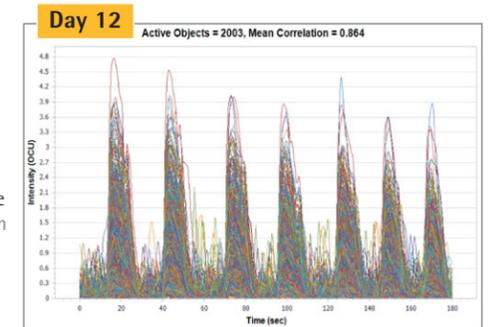
- Uninterrupted incubation provided by your incubator.
- Mobile optical train to reduce physical disturbance.

Conduct Chronic Studies of Activity

- Measure the activity of thousands of neurons. Find out when they become active and how their activity changes over time – all from inside your incubator.
- Monitor complex neuronal network activity at every time point using intuitive metrics and data visualization tools.

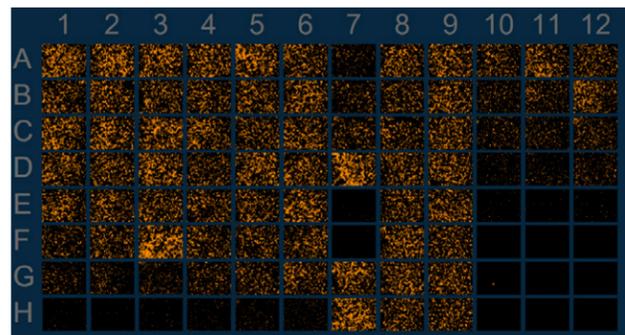


Gain crucial functional insight.
Monitor changes in activity over weeks or months for every active cell within every well of a 96-well plate.

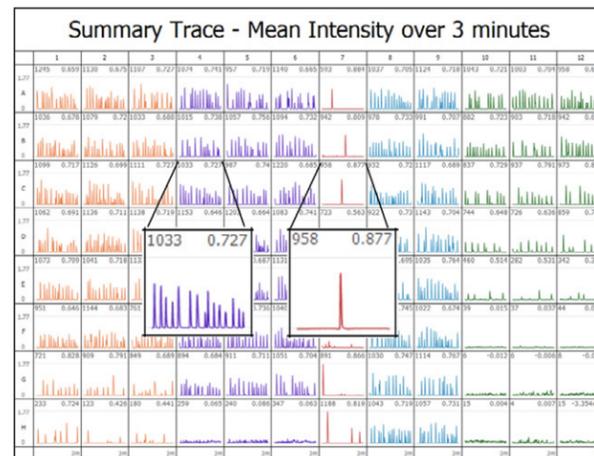


Analyze Thousands of Cells

- Capture short-term, calcium-flux kinetics with IncuCyte® Stare Mode.
- Record activity from thousands of cells while qualitatively monitoring cell morphology.



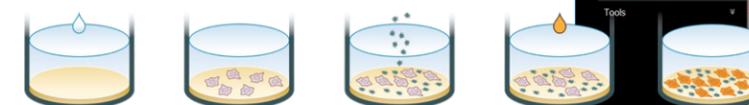
Visually verify experimental progress.
Use IncuCyte® VesselView to review images of all locations in the vessel at once and quickly assess experimental results, plus zoom in and play movies of activity on wells of interest.



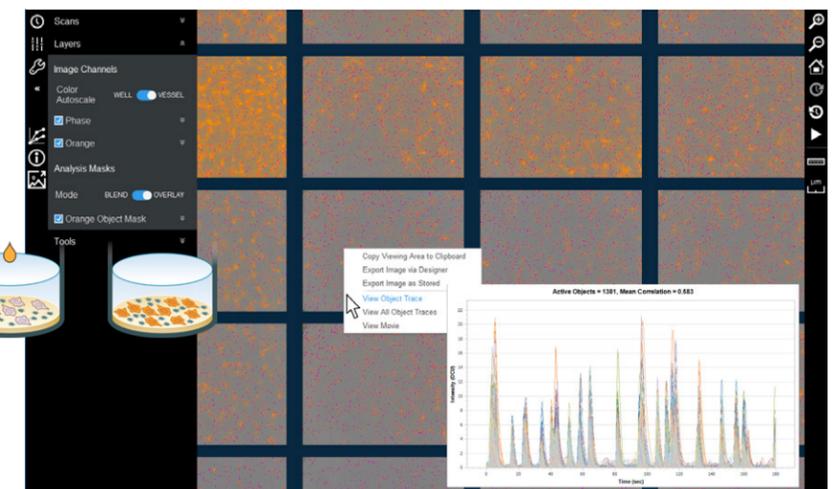
Assess and compare metrics with ease.
Use the microplate summary traces to review mean intensity, active object count and mean correlation for every time point.

Built for Every Scientist

- Enable scientific discovery with an end-to-end solution: reagent, protocol, plus built-in acquisition and analysis software.
- Guided interface enables rapid experimental set up and analysis, even for first time users.



Make the complex simple.
Combine the power of automated acquisition and analysis with our novel reagent and lab-tested protocol to gain unprecedented access to phenotypic information.

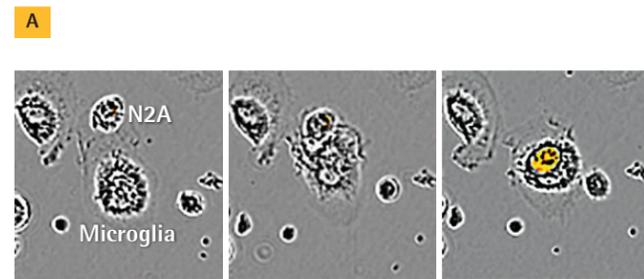


IncuCyte® Phagocytosis Assays

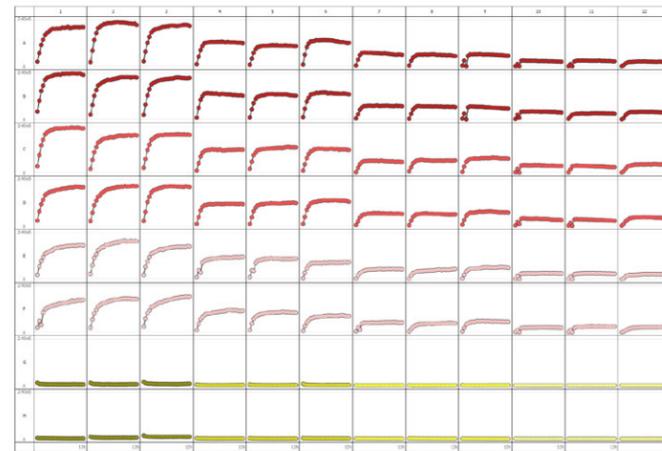
For many years the function of microglia was unclear. Today, it is known that these cells mediate immune responses in the central nervous system by acting as macrophages, clearing cellular debris and dead neurons from nervous tissue through the process of phagocytosis. The IncuCyte S3 for Neuroscience enables real-time, automated phagocytosis assays inside your cell culture incubator.

Visualize and quantify microglial cell clearance

Observe microglial efferocytosis of apoptotic neurons with images and movies using pH sensitive fluorescent probes specifically designed for the IncuCyte S3 for Neuroscience.



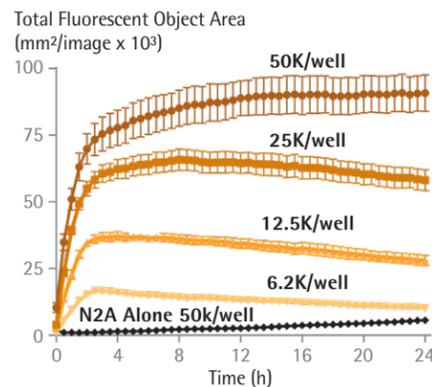
C iPSC Microglia Efferocytosis of N2A—Plate 2 Mean vs Time
Total Orange Object Area ($\mu\text{m}^2/\text{image}$) over 12 hours



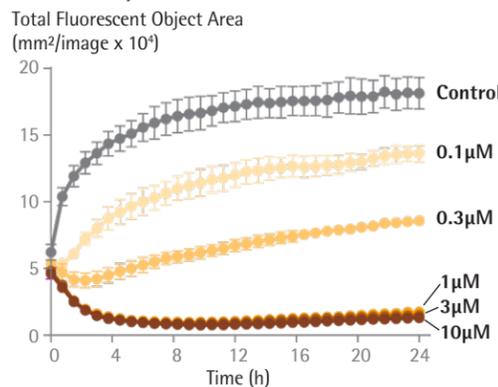
Visualization and kinetic measurement of microglial efferocytosis of apoptotic neuronal cells.

Validate and observe microglial efferocytosis of pHrodo labeled apoptotic Neuro-2A cells (N2A) with images and movies over time (A). Determine the optimal ratio of target to effector cells that produces optimal signal by generating time courses (B) that can also be visualized in microplate format (C). Measure the pharmacological inhibition of efferocytosis (D), and quantify IC_{50} values at any time point (E).

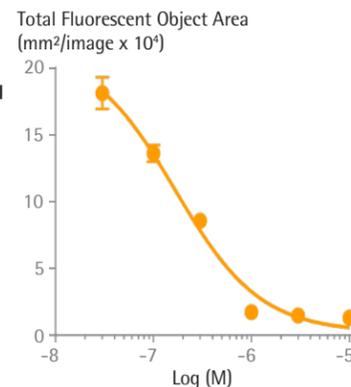
B Neuro-2A Efferocytosis



D Inhibition of Efferocytosis with Cytochalasin D



E Cytochalasin D IC_{50}



Key Advantages:

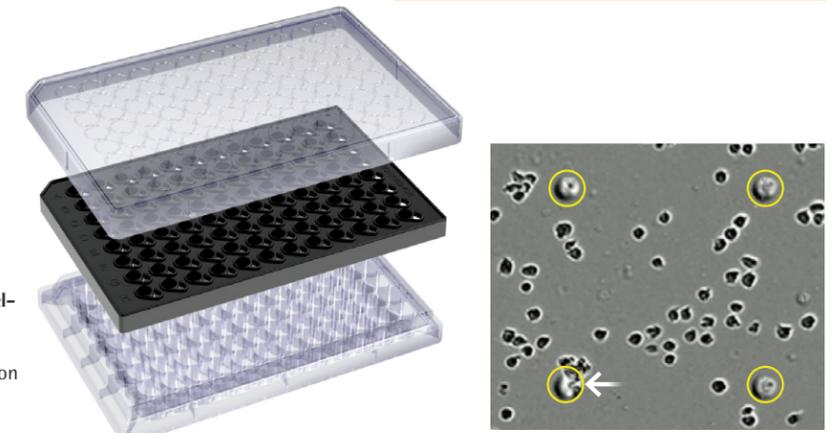
- Generate quantitative, reproducible and specific measurements of engulfed cells.
- Visualize and validate dynamic phagocytic cell clearance of cellular debris and dead neurons with images and movies.
- Perform non-perturbing labeling of targets with the IncuCyte® pHrodo® Orange Cell labeling Kit.
- Efficiently study the full time course of phagocytosis using the model of your choice in microplate format.

IncuCyte® Chemotaxis Assays

Chemotaxis is the directional movement of cells in response to a chemical stimulus and is an essential component of the immune response. IncuCyte® Chemotaxis Migration Assays are an integrated solution for real-time visualization and automated analysis of chemotactic migration.

Visualize cell movement and morphology with IncuCyte® ClearView Chemotaxis Plates

IncuCyte ClearView 96-well Chemotaxis Plates have the optical clarity of microfluidic devices, supporting your kinetic data with images and movies and visualizing every cell throughout your experiment in real time.



Each well of our innovative IncuCyte ClearView 96-well Chemotaxis Plate provides an optically clear surface for label-free imaging and analysis of chemotactic cell migration. Cells are added to the upper chamber and chemoattractant to the lower reservoir plate. Chemotactic transmembrane migration is automatically quantified as the cells migrate through laser etched pores (yellow circles) toward the chemoattractant.

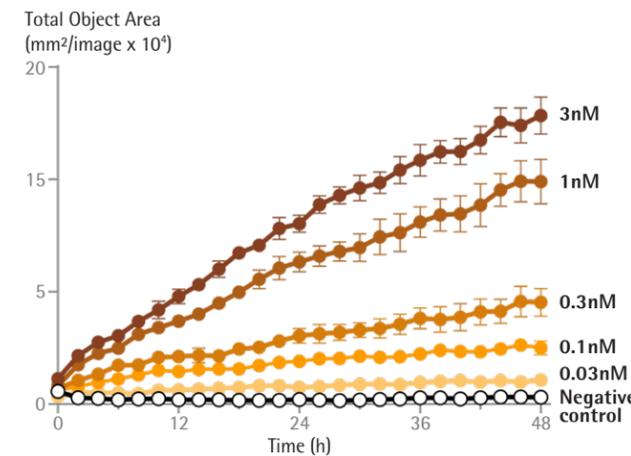
Key Advantages:

- Link real-time measurements to visual assessments of morphology and gain deep phenotypic insight.
- Analyze sensitive and rare cells with a cell sparing, highly reproducible 96-well assay.
- Measure label-free or labeled cell migration without fixing, staining or cell scraping steps.

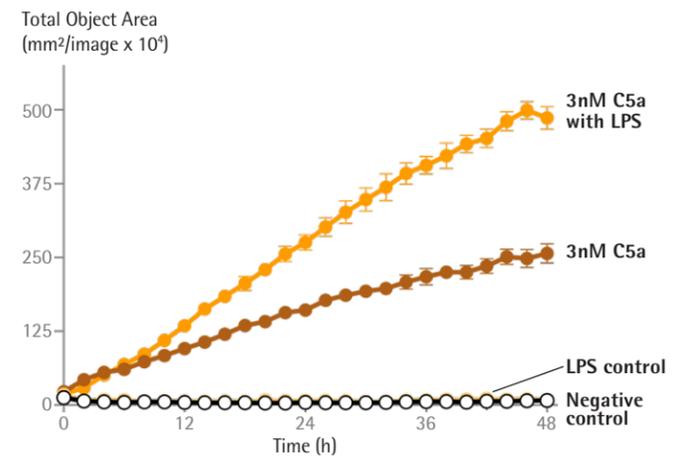
Generate kinetic cell migration data with very few cells and minimal hands-on time

Use the IncuCyte ClearView chemotaxis cell migration assay to look at microglial chemotaxis in immortalized microglial cell lines and iPSC-derived microglia, utilizing only 1000 to 5000 cells per 96-well chemotaxis plate.

A Migration Towards C5a



B Migration Towards C5a with LPS Activation



Quantify concentration-dependent migration towards chemoattractants. The C8-B4 immortalized microglia cell line directionally migrates towards Complement component 5a (C5a) in a concentration-dependent manner (A). LPS activation increases the rate of migration towards C5a (B).

IncuCyte® Neurite Analysis Assays

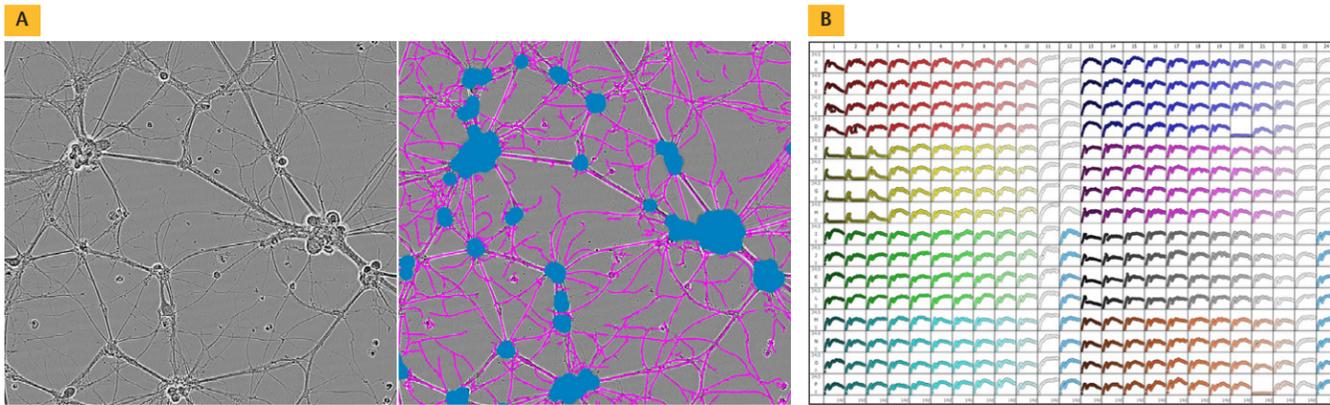
Characterization of neurite outgrowth and disruption is key to the study of neuropathological disorders, neuronal injury and regeneration. IncuCyte Neurite Analysis enables continuous analysis of neurite outgrowth and stability – inside your incubator.

Quantify neurite outgrowth or disruption in real time

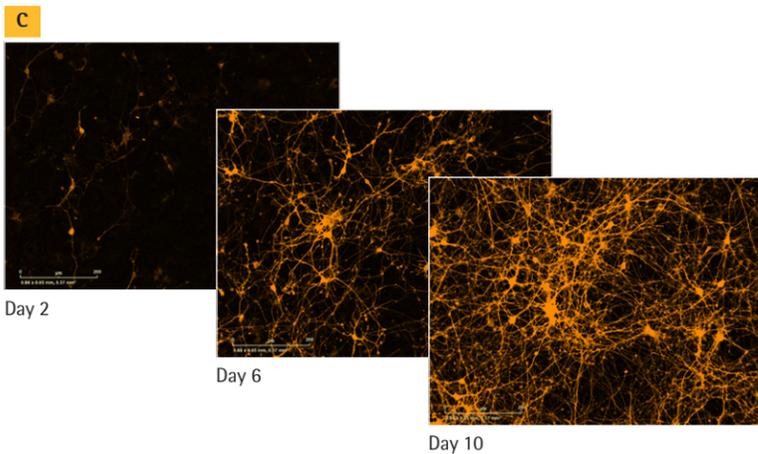
Flexible IncuCyte assays enable dynamic neurite analysis in your choice of cell models. Perform label-free analysis of neurons in monoculture, or use non-perturbing IncuCyte® NeuroLight Orange fluorescent reagent and NeuroPrime cell kits to selectively study neurons in co-culture.

Key Advantages:

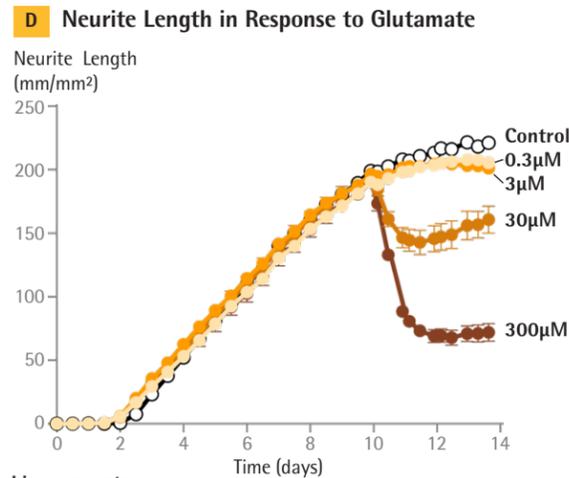
- Generate kinetic, image-based and automated measurements using IncuCyte® NeuroTrack software.
- Capture transient events often missed with end-point assays – IncuCyte enables non-invasive, repeated measurements of the same neuronal network.
- Generate more information-rich data using simple, cell sparing protocols – no cell lifting or fixing/staining.



Perform label-free analysis of neurite length, branch points and cell body clusters automatically and at 96-/384-well throughput. High Definition (HD) phase images of rat cortical neurons are easily segmented using IncuCyte NeuroTrack software to identify neurites and cell bodies (A). PlateGraphs show kinetic data in every well, enabling rapid visualization and evaluation of treatment trends in a 384-well screening plate (B).



Analyze neurite dynamics over extended time periods within co-cultures using non-perturbing reagents. Infect neuronal cell types with IncuCyte® NeuroLight Orange Lentiviral reagent to ensure neuron-specific labeling. Rat cortical neurons cultured in the presence of astrocytes were transduced and imaged over 14 days and treated with glutamate at day 10 (C). Time course analysis reveals concentration-dependent treatment effects (D).



IncuCyte® Apoptosis Assay

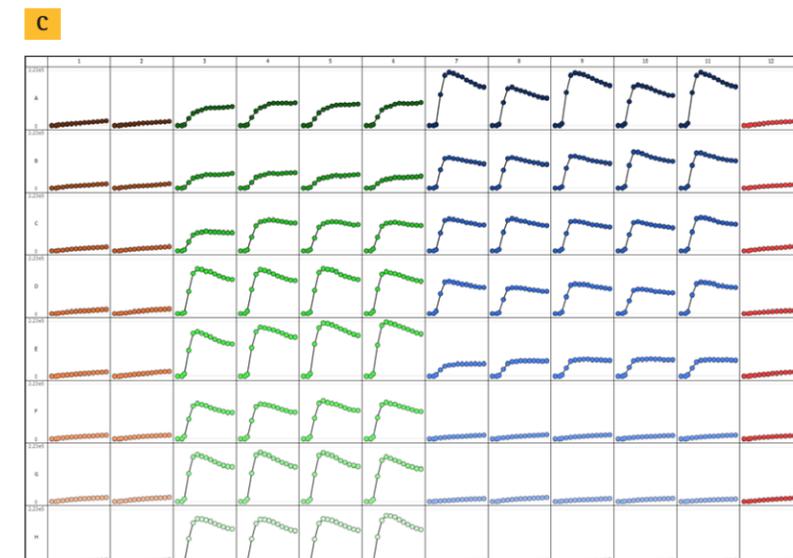
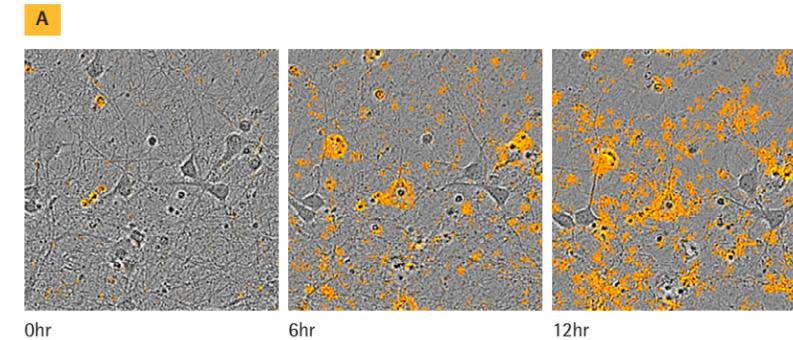
Measurements of cell viability are central to the study of drug candidates, culture conditions and the impact of environmental factors on neuronal cell health and function. The IncuCyte Apoptosis Assay enables automated analysis of neuronal cell death using mix-and-read IncuCyte® Annexin V Orange reagent.

Automatically quantify cell health in real time

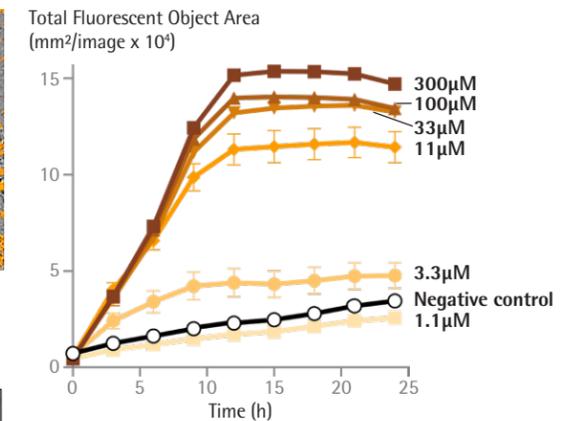
Use non-perturbing Annexin V Orange fluorescent reagent to determine the onset of neural apoptosis, and eliminate the need to define a single assay endpoint.

Key Advantages:

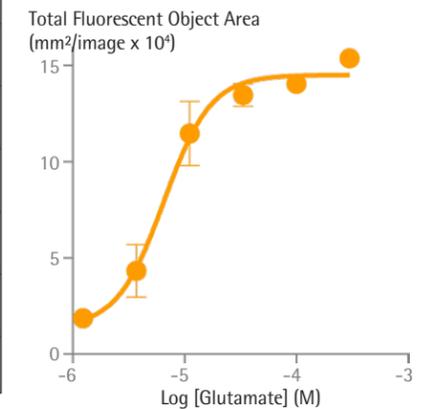
- Real-time, automated analysis of the time course of apoptosis suitable for pharmacology studies.
- Visualize morphological changes and validate treatment effects with images and movies.
- Maintain cell health and morphology while reducing loss of precious cells with non-perturbing, mix-and-read reagents.



B Annexin Signal from Glutamate Treatment



D Glutamate IC₅₀



Measure time course and concentration-dependent effects on cell viability continuously and noninvasively. Addition of IncuCyte® Annexin V Orange Reagent is non-perturbing and yields an easily measured fluorescent signal. Observe the kinetics of cell death by analysis of fluorescent signal in images and movies throughout your experiment (A). Analyze the time course of concentration-dependent treatment of neuronal cultures using kinetic readouts (B). Image and analyze every well of a 96- or 384- well plate automatically to provide a microplate readout of cell death over time (C), and transform data into concentration response curves to compare pharmacology (D).

Ordering information

Product	Description	Cat. No.
IncuCyte® S3 Live-Cell Analysis System for Neuroscience	Includes image acquisition and analysis system with – 4x, 10x, and 20x objectives – Controller with 16.4 TB storage – HD Dual Color Orange/NIR Optical Module	4763
Neuronal Activity		
IncuCyte® S3 Neuronal Activity Analysis Software Module	Enables microplate analysis of neuronal activity via fluorescent calcium detection and movie mode acquisition.	9600-0032
IncuCyte® NeuroBurst Orange Lentiviral Reagent	Live-cell neuronal labeling reagent for long-term expression of a fluorescent genetically-encoded calcium indicator.	4736
IncuCyte® NeuroActive Orange Cell Kit	One kit: – IncuCyte® NeuroBurst Orange Lentiviral Reagent – IncuCyte® rAstrocytes – IncuCyte® rCortical Neurons	4761
Phagocytosis		
IncuCyte® pHrodo® Orange Cell Labeling Kit for Phagocytosis	Kit includes reagents to label your choice of target cells in a 96-well format – IncuCyte® pHrodo® Orange Cell Labeling Dye – IncuCyte® Wash Buffer – IncuCyte® Labeling Buffer – DMSO to solubilize dye	4649
Chemotaxis		
IncuCyte® Chemotaxis Software Module	Enables microplate analysis of label-free and fluorescently labeled chemotactic cell migration	9600-0015
IncuCyte® ClearView 96-well Chemotaxis Plate	Optically clear plate for analysis of chemotactic cell migration	4582
IncuCyte® ClearView 96-well Chemotaxis Plate – Case of 10 Plates	Optically clear plates for analysis of chemotactic cell migration – Case of 10 Plates	4648
Neurite Dynamics		
IncuCyte® NeuroTrack Software Module	Enables microplate analysis of neurite dynamics with or without labels	9600-0010
IncuCyte® NeuroLight Orange Lentiviral Reagent	Live-cell neuronal labeling reagent for long-term expression of an orange fluorescent protein	4758
IncuCyte® NeuroPrime Orange Cell Kit	Kit includes – IncuCyte® NeuroLight Orange Lentiviral Reagent – IncuCyte® rAstrocytes – IncuCyte® rCortical Neurons	4760
Neuronal Cell Health		
IncuCyte® Annexin V Orange Reagent for Apoptosis	One vial of lyophilized reagent sufficient for 100-200 live-cell apoptosis tests in 96-well format	4769

Further Reading

See more exciting data, movies, application notes and scientific posters by visiting: www.essenbioscience.com/neuroscience

Harness the power of live-cell analysis with a full range of IncuCyte reagents and consumables to revolutionize the way you quantify cell behavior. To view a complete listing of our reagents and consumables visit:

essenbioscience.com/reagents

To place an order or request additional information

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sales@essenbio.com

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+1 734-769-1600, ext. 3

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+44 (0) 1707-358688

For Japan, Australia and other countries around the world:
+81-3-5826-4795

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 twitter.com/EszenBioScience

We've made ordering reagents much easier! Visit our online store:

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