

iA

Custom Production: SynFire® iAstrocytes

Astrocytes

Astrocytes are a type of glial cell that make up the majority of the cells in the central nervous system (CNS). Astrocytes perform critical roles in the CNS through interactions with other cell types such as neurons, other glia, and blood vessels. They have high affinity uptake systems for neurotransmitters, such as glutamate. Astrocytes have several projections, terminating at neuronal synapses, that regulate synapse formation and function. Astrocytes are also immune responsive cells that secrete cytokines and maintain and regulate the blood-brain barrier. Together, these demonstrate that astrocytes are an essential player in the maintenance of a healthy CNS.

NeuCyte SynFire iAstrocytes are fully differentiated human iPSC-derived astrocytes that can be used alone or together with the SynFire platform to generate an isogenic co-culture. They are cryopreserved and assay ready after 5 days in culture.

SynFire iAstrocyte Characterization

NeuCyte iAstrocyte protein expression has been characterized. They display a typical astrocyte morphology and express canonical astrocytic markers (Figure 1Ai-iv). RNAseq data revealed that SynFire iAstrocytes have gene expression profiles similar to primary human astrocytes (Figure 1B) with low variability. SynFire iAstrocytes also exhibit low expression of non-astrocytic markers (Figure 1C).

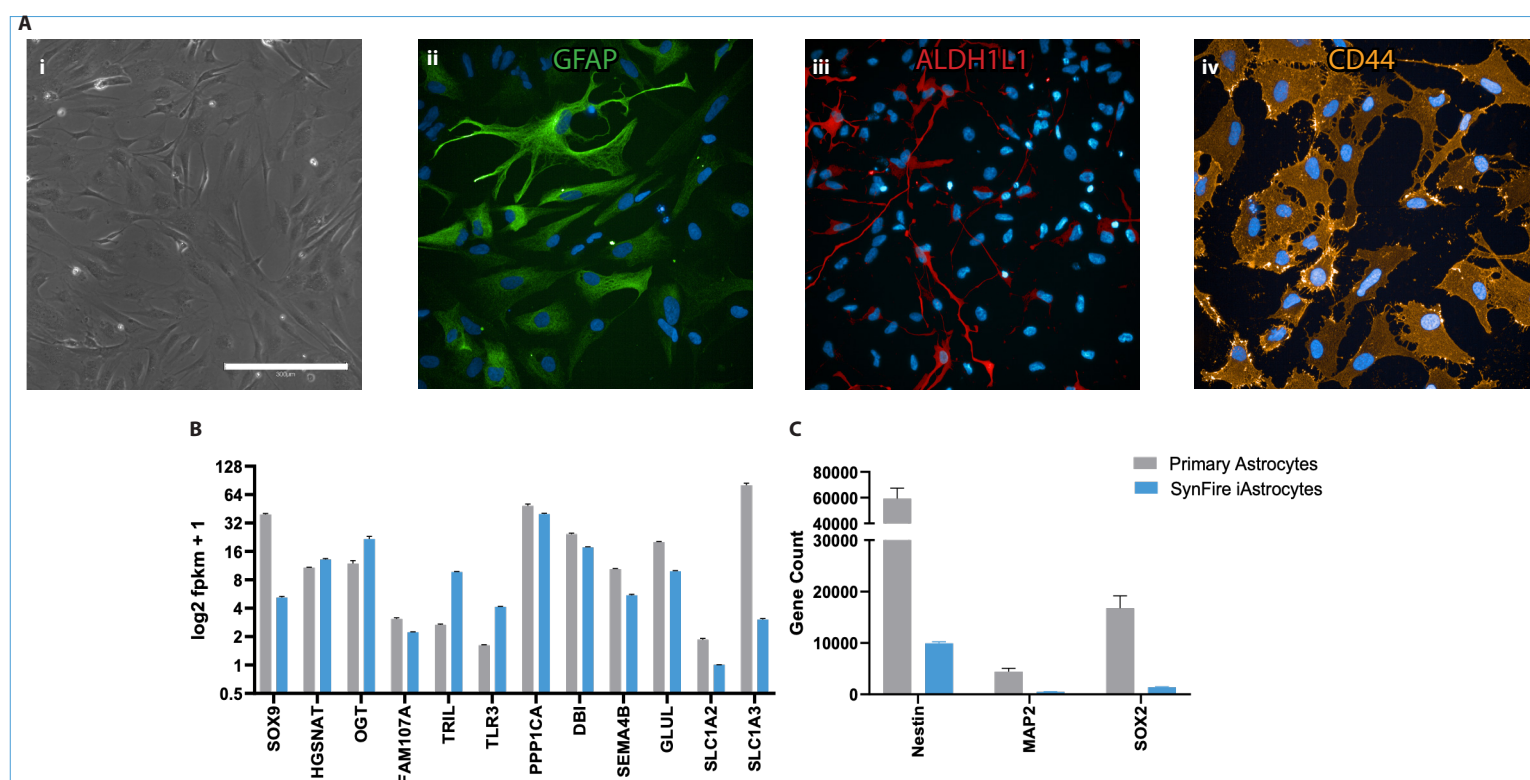


Figure 1. SynFire iAstrocytes express canonical astrocyte markers. (Ai) SynFire iAstrocytes demonstrate typical astrocyte morphology 5 days post thaw. Scale bar = 300 μ m. (Aii-iv) SynFire iAstrocytes express canonical astrocyte-specific proteins such as glial fibrillary acidic protein (GFAP), aldehyde dehydrogenase 1 family member L1 (ALDH1L1), and CD44 as shown by immunocytochemistry. Scale Bar = 100 μ m. RNA expression of (B) astrocyte markers and (C) non-astrocyte markers in SynFire iAstrocytes and human primary astrocytes (n=3).

SynFire® iAstrocyte Functional Characterization

As immunocompetent cells, astrocytes respond to pro-inflammatory stimuli by releasing cytokines. NeuCyte SynFire iAstrocytes secrete IL-6 at similar levels to primary human astrocytes following 24 hours of lipopolysaccharide stimulation (Figure 2).

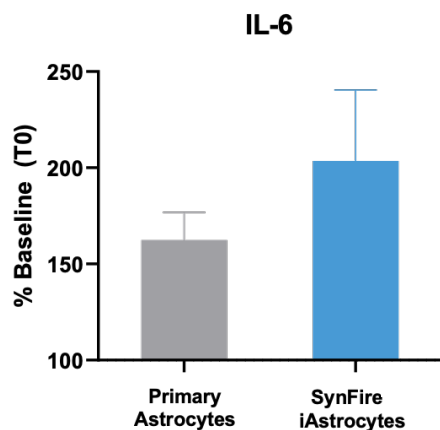


Figure 2. SynFire iAstrocytes are immunoreactive. SynFire iAstrocytes and human primary astrocytes, plated for 5 days, secrete the cytokine IL-6 at similar levels in response to 24-hour lipopolysaccharide (5 µg/ml) stimulation (n=3).

**Speak to us about custom
production of your iAstrocytes**

SynFire iAstrocyte Product Specifications

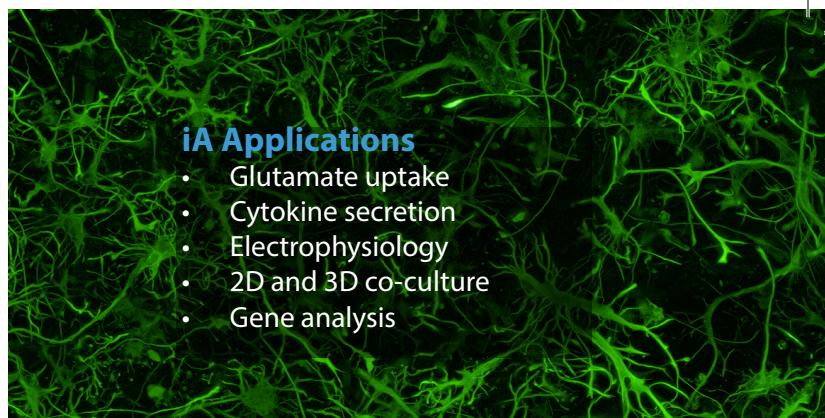
Species: Human

Source: Differentiated from NeuCyte SynFire human iPSC line

Catalog number:

>1.0x10⁶ cells per vial: 1004000001

>3.5x10⁶ cells per vial: 1004000003



iA Applications

- Glutamate uptake
- Cytokine secretion
- Electrophysiology
- 2D and 3D co-culture
- Gene analysis

Integration into the SynFire Platform

SynFire iAstrocytes integrate into the SynFire platform to generate an isogenic model in both 2D and 3D (Figure 3 A-B). When co-cultured with SynFire glutamatergic and GABAergic neurons, iAstrocytes support the development of synchronous neuronal network activity assayed by MEA (Figure 3 C-D).

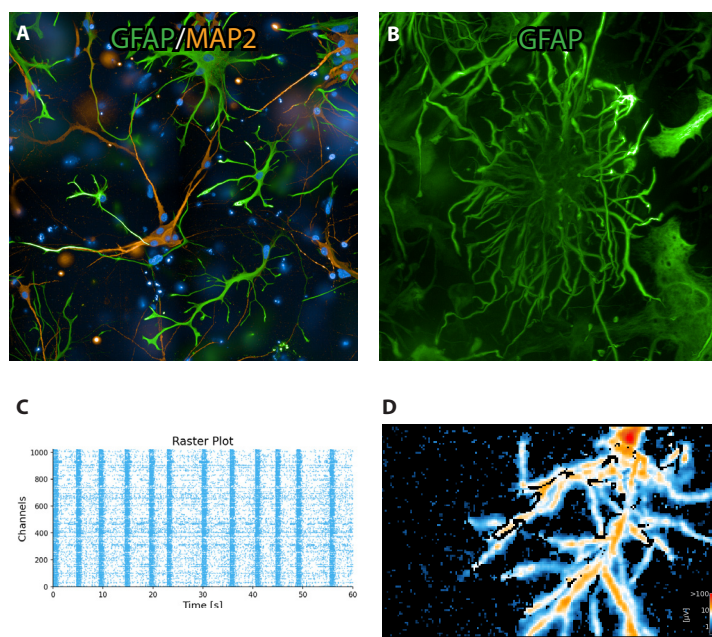


Figure 3: SynFire iAstrocytes integrate into the SynFire platform.

SynFire iAstrocytes co-cultured with SynFire glutamatergic and GABAergic neurons for (either A) 21 days in 2D or (B) 21 days embedded together in 3D hydrogel. (C) Representative raster plot from neurons and iAstrocytes co-cultured on high-density micro-electrode arrays for 35 days (D) Representative axon tracing on high density multi-electrode array (HD-MEA) from SynFire neurons co-cultured with iAstrocytes for 35 days.



NeuCyte
Translatable Neuroscience

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