

# B-27 Plus Neuronal Culture System

## Achieve improved neural activity and network formation

The Gibco™ B-27™ Plus Neuronal Culture System enables the highest neuronal cell survival, increases and accelerates neurite outgrowth, and improves maturation and functionality of neurons, compared to other commonly used media systems. An independent evaluation of the B-27 Plus system by scientists at Axion BioSystems using their Maestro Pro™ microelectrode array (MEA) platform verified that it indeed outperforms other media in the three following key areas of *in vitro* neural functional assays:

- Supports long-term culture with a high degree of electrode coverage
- Encourages substantial spontaneous activity
- Facilitates network maturation, as demonstrated by synchronous activity (Figure 1)

Therefore, the B-27 Plus Neuronal Culture System is an optimal media system for functional *in vitro* neural assays to advance drug discovery, disease modeling, and safety pharmacology and toxicology applications.



### Increased neural activity

Primary rat cortex neurons seeded on CytoView™ MEA 48-well plates from Axion (n = 3) were maintained for 35 days *in vitro*, with half-medium changes every 2–3 days. Recordings were acquired 24 hours after media changes using the Maestro Pro MEA platform, and then analyzed using the AxIS Navigator™ software. Different media types produced distinct patterns of neural activity (Figure 1). Qualitatively, the B-27 Plus system exhibited neural coverage across the entire array (see activity map, left) and a strong, synchronized network phenotype, as illustrated in the raster plot (right). The overall excitability of a neural network may be quantified by the mean firing rate (MFR), defined as the total number of action potentials detected per second. Figure 2 shows that the B-27 Plus system, compared to the other tested media, promoted a higher degree of firing activity as the network matured.

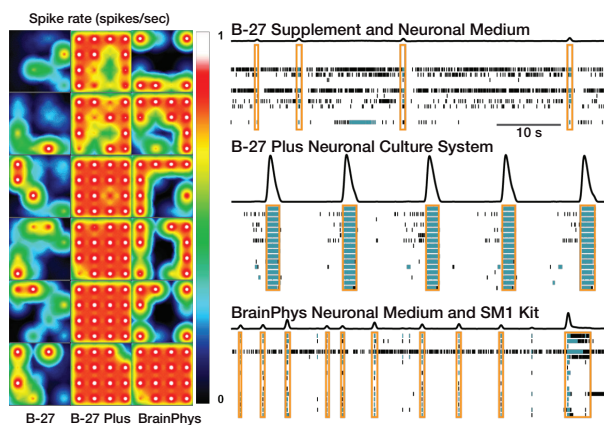


Figure 1. Distinct patterns of neural activity in different media types.

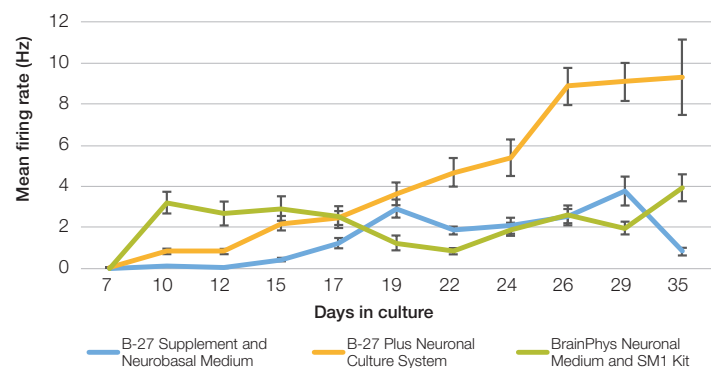
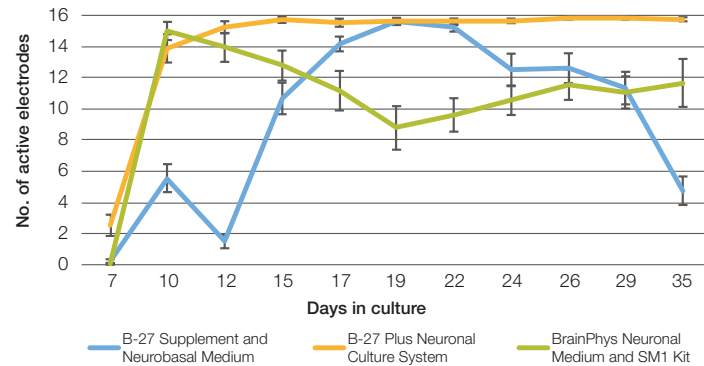


Figure 2. Comparison of neural activity across different media. The B-27 Plus Neuronal Culture System promotes more neural activity.

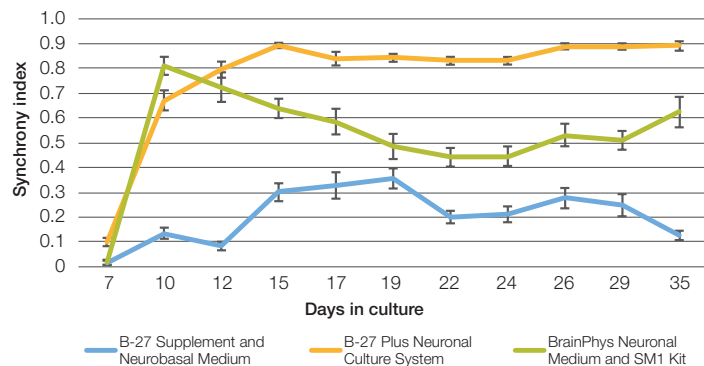
### Improved cell survival and network maturation

Reliable assessment of network electrophysiology requires measurements from many neurons in a network. The B-27 Plus system activated  $\geq 15$  electrodes out of a possible 16 electrodes per well in a 48-well MEA plate, the highest of all media tested (Figure 3). The number of active electrodes was also stable over many days in culture.



**Figure 3. Comparison of cell survival in different media.** The B-27 Plus Neuron Culture System supports long-term cell culture for reliable electrophysiological measurements.

Synchronized network activity arises from strong and numerous synaptic connections between the neurons in a mature network. The B-27 Plus system facilitated stronger network development, as demonstrated by the higher degree of synchrony compared to in the other tested media systems (Figure 4).



**Figure 4. Comparison of neuronal network maturation in different media.** The B-27 Plus Neuron Culture System facilitates improved network maturation.

### Summary

The B-27 Plus Neuron Culture System outperforms other media systems in three key areas as shown in Table 1.

**Table 1. Summary of performance of three media systems in three key neuronal aspects.**

	B-27 Supplement and Neurobasal Medium	B-27 Plus Neuron Culture System	BrainPhys Neuron Culture System and SM1 Kit
Cell survival (coverage)	••	•••	••
Electrophysiological activity (MFR)	•	•••	•
Network maturation (synchrony)	•	•••	••

Order the B-27 Plus Neuron Culture System to pair with the Maestro™ MEA platforms for *in vitro* neural assays, to maximize your success in culturing neurons and performing downstream electrophysiological assays.

### Ordering information

Product	Cat. No.
B-27 Plus Neuron Culture System	A3653401

Find out more at [thermofisher.com/b27plus](http://thermofisher.com/b27plus)