

Improve Serum-Free Neuronal Cell Culture with GIBCO® Media and Reagents

- *Formulated for neuronal cells' special requirements*
- *Culture neurons at low density with normal morphology*
- *B-27, N-2, G-5 serum-free supplements available for specific applications*
- *Custom products and packaging available*

Product	Optimized For	Applications
Neurobasal™ Medium	Fetal neurons	Basal medium lacking excitatory amino acids used or in conjunction with supplements to make a complete serum-free medium. Long-term growth of neurons.
Neurobasal™ Medium without Phenol Red		
Neurobasal™-A Medium	Adult and postnatal neurons (> 1 week old)	Growth and maintenance. Minimizes glial cell proliferation. B-27 Minus AO to study free-radical damage, apoptosis. (B-27 Minus AO is formulated without any cortical antioxidants.)
Neurobasal™-A Medium without Phenol Red		
with B-27 Serum-Free Supplement	Primary embryonic hippocampal neurons; primary neurons from striatum, substantia nigra, septum	Study growth of CNS progenitor or stem cells.
with B-27 Supplement Minus AO		
with B-27 Supplement Minus Vitamin A (Retinoic Acid)		
with N-2 Supplement	Primary embryonic hippocampal neurons, tumor cell lines of neuronal origin (PC12, B104, N1E-115 and NS20)	Maintenance of primary neurons (low protein, < 125 µg/ml). Growth and maintenance of neuronal tumor cell lines.
with G-5 Supplement	Primary glial cells, tumor cell lines of glial origin (U-251, MGsp, C62BD, RN-22), astrocytes, microglia, oligodendrocytes	Growth and maintenance of primary and serial tumor glial cells.

■ Serum-Free Media

Neurobasal™ Media

GIBCO® Neurobasal™ Media are basal media formulated to meet special requirements of neuronal cells. When supplemented with B-27 Supplement, they allow for long-term maintenance of the normal phenotype and growth of neuronal cells, and maintain pure populations of neuronal cells without the need for an astrocyte feeder layer.

These media are formulated without L-glutamine for added stability. Addition of Serum-Free Supplements is required.

- **Neurobasal™ Medium** is optimized for long-term growth of fetal hippocampal neurons and many other neurons of the Central Nervous System (CNS) and Peripheral Nervous System (PNS).

- **Neurobasal™-A Medium** is optimized for long-term growth and viability of rat postnatal and adult hippocampal, and many other neurons of the CNS and PNS. When supplemented with B-27 Supplement Minus Vitamin A, bFGF, and EGF, Neurobasal-A Medium is an optimized growth medium for primary CNS progenitors and neurospheres.

- **Neurobasal™ Medium and Neurobasal™-A Medium without Phenol Red** are available for receptor studies, downstream protein purification studies, or other processes where the presence of phenol red is undesirable.

SFM

Serum-Free Media

GIBCO® Serum-Free Media do not require supplementation with serum, but may contain discrete proteins or bulk protein fractions.

PFM

Protein-Free Media

GIBCO® Protein-Free Media contain no proteins, but may contain plant or yeast hydrolysates. Many are animal-origin-free.

CDM

Chemically-Defined Media

GIBCO® Chemically-Defined Media contain no proteins, hydrolysates, or components of unknown composition. These media are animal-origin-free and all components have a known chemical structure.

- Completely defined system eliminates variability
- Consistent performance improves reproducibility
- Decrease possibility of contamination by adventitious agents
- Save time with simplified purification and downstream processing

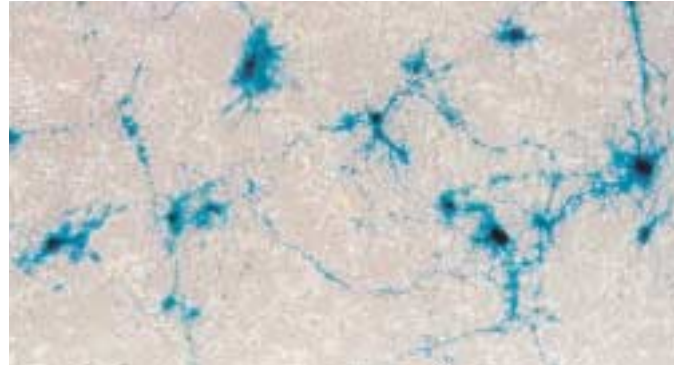


Figure 1. Primary rat cortical neurons, E18, were plated in GIBCO® Neurobasal™ Medium at 2×10^5 cells/well in 24-well plates. Cells were transfected 4 days later using 0.8 µg of pCMV-SPORTβ-Gal DNA, purified using Concert™ High Purity Plasmid Purification System, and 4 µl of Lipofectamine™ 2000 Reagent.

Serum-Free Supplements for Use with Neurobasal™ Media

B-27 Supplement for Hippocampal and Other CNS and PNS Neurons

B-27 Supplement is a serum-free supplement for low-density plating, long-term viability, and growth of hippocampal and other CNS and PNS neurons.

When added to Neurobasal™ Media, B-27 Supplement supports the growth of neuronal cells without an astrocyte feeder layer, and is effective for the growth of neuronal tumor cell lines.

B-27 Supplement Minus AO (without Antioxidants)

Ideal in studies of oxidative damage, apoptosis, or age-related neurodegenerative diseases where free radical damage to neurons occur.

B-27 Supplement Minus Vitamin A (Retinoic Acid)

Retinoic Acid is known to induce differentiation of CNS progenitors. This supplement can be used for the growth of neurospheres/CNS progenitor or stem cells when combined with Neurobasal™ Media.

N-2 Supplement for Neural Stem Cells

N-2 Supplement is a chemically-defined, serum-free supplement for the growth of primary embryonic neurons as well as embryonic neurospheres/CNS progenitor cells when combined with bFGF plus EGF in Neurobasal™ Media or D-MEM.

G-5 Supplement for Primary and Serial Tumor Cell Lines of Glial Origin.

G-5 Supplement is a chemically-defined, serum-free supplement for the growth of glial cell lines. It also supports the growth of primary and serial tumor lines of the astrocytic phenotype when added to Neurobasal™ Media, D-MEM, D-MEM/F12, E-MEM, or other basal formulations.

Neurotrophins and Other Growth Factors

- Brain-Derived Neurotrophic Factor (BDNF), Human, Recombinant
- Glial-Derived Neurotrophic Factor (GDNF), Human, Recombinant
- Basic Fibroblast Growth Factor (bFGF), Human, Recombinant
- Nerve Growth Factor 2.5S (NGF 2.5S), Murine, Natural
- Nerve Growth Factor 7S (NGF 7S), Murine, Natural
- Epidermal Growth Factor (EGF), Human, Recombinant
- Insulin-Like Growth Factor-I (IGF-I), Human, Recombinant
- Acidic Fibroblast Growth Factor (aFGF), Human, Recombinant

Invitrogen ViraPower™ Lentiviral Expression System

The ViraPower™ Lentiviral Expression System readily transduces both dividing and non-dividing cell types (neurons), enabling analysis of long-term gene expression. Use this system to broaden your ability to analyze gene expression beyond the limitations of traditional transfection reagents, adenoviral, or other retroviral systems.

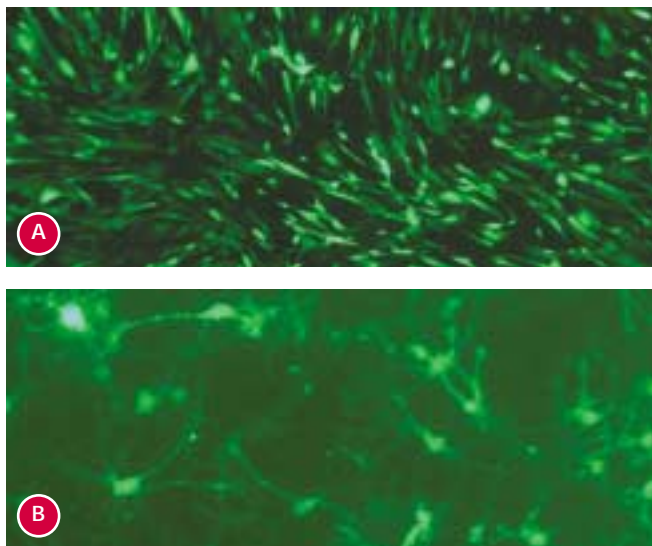


Figure 2. Lentivirus readily transduces non-dividing cell types. A. Contact-inhibited, non-dividing, quiescent primary human foreskin fibroblasts were transduced with pLenti6/CMV/V5-GFP at an MOI of 5. GFP was detected 48 hours post-transduction by fluorescent microscopy.

B. Adult hippocampal neurons were grown in astrocyte-free culture. Cells were transduced at an MOI of 1, with pLenti6/CMV/V5-GFP. GFP was detected 48 hours post-transduction by fluorescent microscopy.

Custom Production and Packaging

When you need a unique formulation or special packaging, our Custom Product Services team can modify GIBCO® catalog media formulations and packaging to meet your particular requirements.

The Custom Product Services team can also assess feasibility and provide options for formulation design, testing, and packaging for your proprietary formulations.

For information, call 1-800-955-6288, Ext. 46966.

References

Neurobasal™ Media

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B-27 Supplements

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N-2 Supplement

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G-5 Supplement

- Bottenstein, J.E. (1986) *Ad. Bioscience.* **61**, 3.

ViraPower™ Lentiviral Expression System

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Ordering Information

Description	Catalog No.	Size
Neurobasal™ Medium (1X), liquid	21103-049	500 ml
Neurobasal™ Medium without Phenol Red (1X), liquid	12348-017	500 ml
Neurobasal™-A Medium (1X), liquid	10888-022	500 ml
Neurobasal™-A Medium without Phenol Red (1X), liquid	12349-015	500 ml
B-27 Serum-Free Supplement (50X), liquid	17504-044	10 ml
B-27 Supplement Minus AO (50X), liquid	10889-038	10 ml
B-27 Supplement Minus Vitamin A (Retinoic Acid) (50X), liquid	098-0153SA	10 ml
N-2 Supplement (100X), liquid	17502-048	5 ml
G-5 Supplement (100X), liquid	17503-012	1 ml

Related Products

Growth Factors

Brain-Derived Neurotrophic Factor (BDNF), Human, Recombinant	10908-010	5 µg
Glial-Derived Neurotrophic Factor (GDNF), Human, Recombinant	10907-012	5 µg
Basic Fibroblast Growth Factor (bFGF), Human, Recombinant	13256-029	10 µg
Nerve Growth Factor 2.5S (NGF 2.5S), Murine, Natural	13257-019	10 µg
Nerve Growth Factor 7S (NGF 7S), Murine, Natural	13290-010	100 µg
Epidermal Growth Factor (EGF), Human, Recombinant	13247-051	100 µg
Insulin-Like Growth Factor-I (IGF-I), Human, Recombinant	13245-063	10 µg
Acidic Fibroblast Growth Factor (aFGF), Human, Recombinant	13241-013	10 µg

Lentiviral Expression

ViraPower™ Lentiviral Directional TOPO® Expression Kit	K4950-01	1 Kit
ViraPower™ Lentiviral Gateway® Expression Kit	K4960-00	1 Kit

All media listed above can be customized to suit your needs. Please inquire.




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