Product sheet

BV2 Cells | 305156

General information

Description

BV2 cells are a type of microglial cell line derived from C57BL/6 murine, a widely used laboratory mouse strain for animal experiments. These microglial cells have been immortalized using the J2 retrovirus, which carries the v-raf and v-myc oncogenes, resulting in a stable cell line with unique characteristics. BV2 cells express nuclear v-myc and cytoplasmic v-RAF oncogenes, along with the env gp70 antigen on their surface, contributing to their role in immune responses and inflammation within the brain. One of the critical advantages of BV2 cells is their ability to retain the morphological and functional characteristics of primary microglia, the resident immune cells of the central nervous system, making them an ideal model for studying neurodegeneration and brain inflammation.

The role of microglia in neurodegeneration, toxicology, and immunity, particularly in conditions such as Alzheimer's disease, is an ever-growing field in biomedical research. Traditional studies often rely on primary microglia cultures and continuous cell preparations. Using a microglia-like cell line, such as BV2 cells, offers a promising alternative by providing a continuous and reproducible source of microglia. BV2 cells, due to v-raf/v-myc expression, show enhanced metabolism and growth, ideal for research on microglial activation and inflammation. Their expression of specific oncogenes and antigens mirrors macrophages, making them valuable for studying immune responses and disease mechanisms.

A recent re-evaluation of mice BV2 microglia cells examined their suitability as a substitute for primary microglia (PM). The response of BV2 cells to lipopolysaccharide was compared with that of microglia in both in vitro and in vivo settings, however, with the upregulation of genes being slightly less pronounced on average. BV2 cells displayed normal regulation of nitric oxide and functional response to IFN-gamma, critical parameters for their interaction with T cells, neurons, and other glial cells such as astrocytes. BV2 cells were also found to stimulate other glial cells effectively, leading to the production of interleukin-6 (IL-6) in astrocytes.

This interaction between astrocytes and microglia is crucial for understanding the complex cell-cell interactions and the inflammatory response in the brain, especially in the context of neurodegenerative diseases like Alzheimer's, where proteins such as NAPoe31 and NAPoe41, as well as pathways like the startle response and apoptosis, play significant roles.

BV2 cells offer a robust and reliable tool for researchers in microglial biology. Their expression of v-raf/v-myc oncogene products enables them to retain key characteristics of microglia and macrophages. BV2 cells have proven to be a valid substitute for primary microglia in various experimental settings, facilitating research on neurodegeneration, toxicology, immunity, and cell-cell interactions.

Organism	Mouse
Tissue	Brain
Synonyms	BV-2

Characteristics

Breed/Subspecies	C57BL/6

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Age	1 week
Gender	Female
Morphology	Morphology microglial
Growth properties	Adherent

Regulatory Data

Citation	BV2 (Cytion catalog number 305156)
Biosafety level	1
NCBI_TaxID	10090
CellosaurusAccession	CVCL_0182

Biomolecular Data

Handling

Culture Medium	RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)
Supplements	Supplement the medium with 10% FBS
Dissociation Reagent	Accutase
Subculturing	Gather the suspension cells in a 15 ml tube and gently wash the adherent cells with PBS lacking calcium and magnesium (use 3-5 ml for T25 flasks and 5-10 ml for T75 flasks). Apply Accutase (1-2 ml for T25 flasks, 2.5 ml for T75 flasks) ensuring full coverage of the cell layer. Allow the cells to incubate at room temperature for 10 minutes. Following incubation, combine and centrifuge both the suspension and adherent cells. After centrifugation, carefully resuspend the cell pellet and transfer the cell suspension into new flasks containing fresh medium.
Fluid renewal	2 to 3 times per week

Freeze medium	As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.
Thawing and Culturing Cells	1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit. 2. Upon receipt, either store the cryovial immediately at temperatures below -150°C to ensure the preservation of cellular integrity, or proceed to step 3 if immediate culturing is required. 3. For immediate culturing, swiftly thaw the vial by immersing it in a 37°C water bath with clean water and an antimicrobial agent, agitating gently for 40-60 seconds until a small ice clump remains. 4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening. 5. Carefully open the disinfected vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of room-temperature culture medium, mixing gently. 6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium. 7. Gently resuspend the cell pellet in 10 ml of fresh culture medium. For adherent cells, divide the suspension between two T25 culture flasks; for suspension cultures, transfer all the medium into one T25 flask to promote effective cell interaction and growth. 8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.
Incubation Atmosphere	37°C, 5% CO_2, humidified atmosphere.
Shipping Conditions	Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately −78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.
Storage Conditions	For long-term preservation, place vials in vapor-phase liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

Quality Control & Molecular Analysis

Sterility	Mycoplasma contamination is excluded using both PCR-based assays and luminescence-based mycoplasma detection methods. To ensure there is no bacterial, fungal, or yeast contamination, cell cultures are subjected to daily visual inspections.