Rat Microglial Cells

Cat. No. : CP-R110

General Information

Species	Rat/SD rats
Tissue Type	Nervous system
Tissue	Cerebral cortex tissue
Cell Type	Glial cell
Morphology	Spindle-shaped; polygonal
Growth Properties	Adherent
Storage Conditions	For long-term cryopreservation, cryovials should be stored in liquid nitrogen at −150°C to −196°C. Storage at −80°C is restricted to short-term interim use only.

Culture Conditions and Handling

Complete Medium	Rat Microglial Cell Complete Medium[CM-R110]
Population Doublings	Not recommended for expansion or long-term culture
Subcultivation Ratio	Non-subculturable
Dissociation Reagent	Lidocaine (12 mM)
Medium Renewal	Every 2 to 3 days
Freezing Medium	General Freezing Medium[PB180436]
Incubation Atmosphere	Air, 95%; CO_2, 5%
Temperature	37°C
Instructions	1. Check all containers for leakage or breakage. 2. Remove the frozen cells from the dry ice packaging and immediately transfer them to liquid nitrogen (liquid or vapor phase) for long-term cryopreservation.
Subculturing Procedure	Special Cell Dissociation Method 1 1. Aspirate the culture medium from the T25 flask and wash the cells once with phosphate-buffered saline (PBS). 2. Add 1 mL of lidocaine (12 mM) dissociation solution to the flask. Gently swirl the flask to ensure the solution fully covers the bottom surface, then incubate at 37°C for 3 min (must not exceed 5 min). Examine the cells under an inverted microscope. Once cells become rounded and retracted, add 5 mL of complete growth medium to dilute the digestion solution. 3. Gently pipette to mix and dissociate the cells. Collect the cell suspension and centrifuge at 1200 rpm for 5 min; discard the supernatant. 4. Resuspend the cells in complete growth medium, count and seed into the corresponding experimental vessels. Start experiments once cells have fully adhered (expected to adhere within 2 h, fully spread at 12–24 h). 5. Once the cells have fully adhered, assess cell viability and confluency under a microscope prior to downstream experiments. Subsequently, refresh the medium with fresh complete growth medium per the standard cell maintenance protocol. Special Cell Dissociation Method 2

Subculturing Procedure

1. If digestion fails, change the digestion solution to 0.25% trypsin and follow the procedure described in Dissociation Method 1 above.
2. If digestion still fails, add 3 mL of complete growth medium to neutralize digestion, then use a sterile cell scraper to directly scrape the cells (this method is not recommended and is a last resort, as it may cause mechanical damage and cell death).

Background

Rat microglial cells (*Rattus norvegicus*) are isolated from cerebral cortex tissue. They are the most predominant innate immune cells in the central nervous system, accounting for approximately 20% of the total glial cell population. Morphologically, they are equivalent to macrophages in the brain and spinal cord, and express CD11b. Their core functions include: continuously clearing damaged neural tissue, plaques, and infectious substances from the central nervous system; expressing class II major histocompatibility complex and presenting antigens; and secreting cytokines to regulate the neuroinflammatory microenvironment. Overactivation of rat microglial cells leads to the release of neurotoxic substances, which is closely associated with Parkinson's disease and Alzheimer's disease. In vitro-cultured rat microglial cells serve as an important cell model for investigating neuroinflammation.

Rat microglial cells isolated from Procell Laboratory are prepared by enzymatic digestion, followed by differential adhesion. After several days of nutrient deprivation in culture medium, suspended cells are harvested via shaking incubation. Each vial contains approximately 5×10^5 cells.

Rat microglial cells isolated from Procell Laboratory exhibit positive immunofluorescence staining for CD11b, with a purity greater than 90%. In addition, the cells test negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast, and fungi.

Handling Recommendations for Cryopreserved Cells

Preparations Before Thawing

1. Primary cells have high nutritional demands; therefore, prepare complete culture medium in advance.
2. Preheat the complete culture medium to 37°C for 30 minutes.
3. Prepare 9 mL of complete medium within a sterile centrifuge tube to dilute the cryoprotectant present in the frozen cell suspension.
4. Use sterile gloves to protect the cryovial from contact with the water bath water, and preventing cell contamination.

Thawing Procedure

1. Retrieve the cryovial containing frozen cells from liquid nitrogen storage. Place it in sterile gloves and immediately submerge it in a 37°C water bath.
2. Thaw the cells rapidly (<1 minute) by gently swirling the vial in the 37°C water bath until only a small ice crystal remains.
3. Transfer the vial to a laminar flow hood. Wipe the exterior of the vial with 75% ethanol before opening.
4. Transfer the thawed cells dropwise into a preheated 9 mL centrifuge tube containing complete medium.
5. Centrifuge the cell suspension at approximately 250 × g for 5 minutes. For cells characterized by low density and small volume, such as lymphocytes and suspended cells, the centrifugation speed can be appropriately increased to 400 × g for 8 minutes.
6. After centrifugation, discard the supernatant and retain the cell pellet.

7. Gently resuspend the cells in complete growth medium, then transfer them to an appropriate culture vessel and place it in the recommended culture environment.

Notes

1. The entire recovery process should be completed as quickly as possible.
2. Select the culture vessel size based on the number of cells in the cryovial. Procell single cryovials are recommended for resuspension in 6 cm dishes or T25 flasks.
3. Minimize the time thawed cells are kept at room temperature. DMSO must be immediately diluted or removed by centrifugation.

Precautions After Receipt of Frozen Cells

1. Upon unpacking, inspect the condition of the frozen cells and dry ice, and take photographs immediately. The following after-sales service will be provided based on these photographs, including assessment of the remaining dry ice, verification that the cryovial was fully buried in dry ice, and evaluation of whether the cells thawed and refrozen during transit.
2. Upon receipt, the cells should be transferred to liquid nitrogen immediately or directly resuscitated. If liquid nitrogen is unavailable, the cells can be temporarily stored at -80°C, however, the storage period should be limited to less than one week whenever possible. Prolonged storage at -80°C may gradually reduce post-thaw cell viability, and the extent of this viability loss is unpredictable.
3. Ensure that the operator has sufficient knowledge and experience in cell culture, and the laboratory is equipped with essential instruments, including a biosafety cabinet, CO_2 incubator, inverted microscope, centrifuge, water bath. Carefully review the cell instruction manual to understand key cell characteristics including growth properties (adherent or suspension), morphology, basal medium requirements, serum concentration, cytokine supplementation, subcultivation ratio, medium renewal schedule.
4. After resuscitation, observe the cells under a microscope and record the cell status by taking photographs (1-3 images each at 100× and 200× magnification for 3 consecutive days). These images will serve as supporting documentation for follow-up services. In addition, a small aliquot of cells may be used to assess cell viability by automated cell counting or trypan blue staining.

Note: Cells should not be observed too frequently within the first 24 hours after resuscitation, as this may affect cell growth or adherence. Observation once per day is sufficient.

5. Primary cells have a limited number of passages; it is recommended that they be used as soon as possible.

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