Mouse Oligodendrocyte Precursor Cell (MOPC)

Catalog Number: M1600

Cell Specification

The precursor cells for oligodendrocytes were first discovered in 1993 by Raff, Miller and Noble [1] and have been extensively studied. These precursor cells are referred in the literature as either oligodendrocyte-type-2 astrocyte progenitor cells or oligodendrocyte precursor cells (OPC). The developing and adult central nervous system both contain OPC [2, 3]. Oligodendrocytes, the myelin-forming cells of the central nervous system, develop from OPC. In culture, OPC can be generated from neural progenitors or neural stem cells in the presence of basic fibroblast growth factor and they proliferate in presence to platelet-derived growth factor or factors produced by astrocytes [4] and differentiate into mature oligodendrocytes. Because of this, they have provided an exceptional population in which to study developmental transitions.

MOPC from ScienCell Research Laboratories are isolated from neonate day 2 mice brain tissues. MOPC are cryopreserved immediately after purification and delivered frozen. Each vial contains >1 x 10^6 cells in 1 ml volume. MOPC are characterized by immunofluorescent method with antibodies to A2B5 and nestin. MOPC are negative for mycoplasma, bacteria, yeast and fungi. ROPC are guaranteed to further culture at the conditions provided by ScienCell Research Laboratories.

Product Use

MOPC are for research use only. It is not approved for human or animal use, or for application in *in vitro* diagnostic procedures.

Storage

Directly and immediately transfer cells from dry ice to liquid nitrogen upon receiving and keep the cells in liquid nitrogen until cell culture needed for experiments.

Shipping

Dry ice.

Reference

[1] Raff, M. C., Miller, R. H. and Noble, M. (1983) A glial progenitor cell that develops in vitro into an astrocyte or an oligodendrocyte depending on the culture medium. Nature 303:390-396.

[2] ffrench-Constant, C. and Raff. M. C. (1986) Proliferating bipotential glial progenitor cells in adult rat optic nerve. *Nature* 319:499-502.

[3] Wolswijk, G. and Noble, M. (1989) Identification of an adult-specific glial progenitor cell. *Development* 105:387-400.

[4] Noble, M., Murray, K., Stroobant, P., Waterfield, M. D. Riddle, P. (1988) Platelet-derived growth factor promotes division and motility and inhibits premature differentiation of the oligodendrocyte/type-2 astrocyte progenitor cells. Nature 333:560-562.

Instruction for culturing cells

Caution: Cryopreserved cells are very delicate. Thaw the vial in a 37°C waterbath and return them to culture as quickly as possible with minimal handling!

Set up culture after receiving the order:

1. Prepare a poly-L-lysine coated flask (2 μg/cm^2, T-25 flask is recommended). Add 5 ml of sterile water to a T-25 flask and then add 5 μl of poly-L-lysine stock solution (10 mg/ml, ScienCell cat. no. 0413). Leave the flask in incubator overnight (minimum one hour at 37°C incubator).
2. Prepare complete medium: decontaminate the external surfaces of medium and medium supplements with 70% ethanol and transfer them to sterile field. Aseptically open each supplement tube and add them to the basal medium with a pipette. Rinse each tube with medium to recover the entire volume.
3. Rinse the poly-L-lysine coated flask with sterile water twice and add 7 ml of complete medium to the flask. Leave the flask in the hood and go to thaw the cells.
4. Place the vial in a 37°C water bath, hold and rotate the vial gently until the contents are completely thawed. Remove the vial from the water bath immediately, wipe it dry, rinse the vial with 70% ethanol and transfer it to a sterile field. Remove the cap, being careful not to touch the interior threads with fingers. Using 1 ml Eppendorf pipette gently resuspend the contents of the vial.
5. Dispense the contents of the vial into the equilibrated, poly-L-lysine coated culture vessels. A seeding density of ≥10,000 cells/cm^2 is recommended.
   Note: Dilution and centrifugation of cells after thawing are not recommended since these actions are more harmful to the cells than the effect of DMSO residue in the culture. It is also important that cells are plated in poly-L-lysine coated culture vessels that promote cell attachment.
6. Replace the cap or cover, and gently rock the vessel to distribute the cells evenly. Loosen cap if necessary to permit gas exchange.
7. Return the culture vessels to the incubator.
8. For best result, do not disturb the culture for at least 16 hours after the culture has been initiated. Change the growth medium the next day to remove the residual DMSO and unattached cells, then every other day thereafter.

Maintenance of Culture:

1. Change the medium to fresh supplemented medium the next morning after establishing a culture from cryopreserved cells.
2. Change the medium every two to three days thereafter.

It is not recommended that precursor cells be subcultured beyond their initial plating.

Caution: Handling animal derived products is potentially bioharzadous. Proper precautions must be taken to avoid inadvertent exposure. Always wear gloves and safety glasses when working these materials. Never mouth pipette. We recommend following the universal procedures for handling products of human origin as the minimum precaution against contamination [1].

[1]. Grizzle, W. E., and Polt, S. S. (1988) Guidelines to avoid personal contamination by infective agents in research laboratories that use human tissues. J Tissue Culture Methods. 11(4).