



Human Oligodendrocyte Precursor Cell (HOPC)

Catalog Number: 1600

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.

HOPC from ScienCell Research Laboratories are isolated from human brain tissue. HOPC are cryopreserved immediately after purification and delivered frozen. Each vial contains $>1 \times 10^6$ cells in 1 ml volume. HOPC are characterized by immunofluorescent method with antibodies to A2B5 and nestin. HOPC are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast and fungi. HOPC are guaranteed to further culture at the conditions provided by ScienCell Research Laboratories.

Recommended Medium

It is recommended to use Oligodendrocyte Precursor Cell Medium (OPCM, Cat. No. 1601) for expanding HOPC *in vitro* and Oligodendrocyte Precursor Cell Differentiation Medium (OPCDM, Cat. No. 1631) for the differentiation of HOPC.

Product Use

HOPC 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] French-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 ordering:

1. Prepare a poly-L-lysine coated flask (2 $\mu\text{g}/\text{cm}^2$, T-45 flask is recommended). Add 5 ml of sterile water to a T-45 flask and then add 9 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 20 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 waterbath, hold and rotate the vial gently until the contents are completely thawed. Remove the vial from the waterbath 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 a 1 ml eppendorf pipette gently re-suspend 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 20,000 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 Oligodendrocyte precursor cells are plated in poly-L-lysine coated flask that promotes cell attachment and growth.

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 human derived products is potentially biohazardous. Although each cell strain tests negative for HIV, HBV and HCV DNA, diagnostic tests are not necessarily 100% accurate, therefore, 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).