Human Oligodendrocyte Precursor Cells-oligospheres (HOPC-os)

Catalog #1610

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 the presence of platelet-derived growth factor or factors produced by astrocytes [4] and differentiate into mature oligodendrocytes. Based on these qualities, OPC provide an exceptional population to study developmental transitions.

HOPC-os from ScienCell Research Laboratories are isolated from human brain. HOPC-os are cryopreserved and delivered frozen. Each vial contains >1 x 10^6 cells in 1 ml volume. HOPC-os are characterized by immunofluorescence with antibodies specific to A2B5 and O4. HOPC-os are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast, and fungi. HOPC-os are guaranteed to further culture under the conditions provided by ScienCell Research Laboratories; however, *HOPC-os are not recommended for expanding or long-term cultures since the cells do not proliferate in culture*.

Recommended Medium

It is recommended to use Oligodendrocyte Precursor Cell Medium (OPCM, Cat. #1601) for culturing HOPC-os *in vitro* and Oligodendrocyte Precursor Cell Differentiation Medium (OPCDM, Cat. #1631) for differentiating HOPC-os.

Product Use

HOPC-os are for research use only. They are not approved for human or animal use, or for application in *in vitro* diagnostic procedures.

Storage

Upon receiving, directly and immediately transfer the cells from dry ice to liquid nitrogen and keep the cells in liquid nitrogen until they are needed for experiments.

Shipping

Dry ice.

References

[1] Raff MC, Miller RH, Noble M. (1983) "A glial progenitor cell that develops in vitro into an astrocyte or an oligodendrocyte depending on the culture medium." *Nature*. 303: 390-6.

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

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

[4] Noble M, Murray K, Stroobant P, Waterfield MD, 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: 560-2.

Instructions for culturing cells

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

Initiating the culture:

1. Prepare a poly-L-lysine-coated culture vessel (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, Cat. #0413). Leave the vessel in a 37°C incubator overnight (or for a minimum of one hour).
2. Prepare complete medium. Decontaminate the external surfaces of medium bottle and medium supplement tubes with 70% ethanol and transfer them to a sterile field. Aseptically transfer supplement to the basal medium with a pipette. Rinse the supplement tube with medium to recover the entire volume.
3. Rinse the poly-L-lysine-coated vessel twice with sterile water and then add 15 ml of complete medium. Leave the vessel in the sterile field and proceed to thaw the cryopreserved cells.
4. Place the frozen vial in a 37°C water bath. Hold and rotate the vial gently until the contents completely thaw. Promptly remove the vial from the water bath, wipe it down with 70% ethanol, and transfer it to the sterile field.
5. Carefully remove the cap without touching the interior threads. Gently resuspend and dispense the contents of the vial into the equilibrated, poly-L-lysine-coated culture vessel. A seeding density of 10,000-50,000 cells/cm^2 is recommended, with an optimal range of 20,000-25,000 cells/cm^2.

   Note: Dilution and centrifugation of cells after thawing are not recommended since these actions are more harmful to the cells than the effect of residual DMSO in the culture. It is also important that cells are plated in poly-L-lysine-coated culture vessels to promote cell attachment.
6. Replace the cap or lid of the culture vessel and gently rock the vessel to distribute the cells evenly. Loosen cap, if necessary, to allow gas exchange.
7. Return the culture vessel to the incubator.
8. For best results, do not disturb the culture for at least 16 hours after the culture has been initiated. Refresh culture medium the next day to remove residual DMSO and unattached cells, then every other day thereafter.

Maintaining the 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 with 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 WE, Polt S. (1988) "Guidelines to avoid personal contamination by infective agents in research laboratories that use human tissues." *J Tissue Cult Methods*. 11: 191-9.