



Rat Meningeal Fibroblasts (RMF)

Catalog Number: R1400

Cell Specification

Meningeal fibroblasts surrounding the brain participate actively in the normal development of the central nervous system. For example, they play important roles in both stabilizing the extracellular matrix of the pial surface and by organizing the radial glial scaffold and the lamination of the cerebellar cortex. Selective pharmacological destruction of the meningeal cells during a critical ontogenetic period leads to specific malformation of both the cerebella cortex and dentate gyrus [1]. Grafts of meningeal fibroblasts, which are derived from meninges overlying the cerebral cortex in adult rat spinal cord lesion, promote axonal regrowth [2]. In vitro study shows that meningeal cell chemotactically orient the migration of immature neurons [3].

RMF from ScienCell Research Laboratories are isolated from rat leptomeningi. RMF are cryopreserved at passage one culture and delivered frozen. Each vial contains $>5 \times 10^5$ cells in 1 ml volume. RMF are characterized by immunofluorescent method with antibodies to fibronectin and negative to GFAP, α -smooth muscle actin and Thy 1.1. RMC are negative for mycoplasma, bacteria, yeast and fungi. RMF are guaranteed to further expand for 15 population doublings at the condition provided by ScienCell Research Laboratories.

Recommended Medium

It is recommended to use Fibroblast Medium (FM, Cat. No. 2301) for the culturing of RMF *in vitro*.

Product Use

RMF 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] Hartmann, D., Sievers, J. Pehlemann, F. W. and Berry, M. (1992) Destruction of meningeal cells over the medial cerebral hemisphere of newborn hamster prevents the formation of the infrapyramidal blade of the dentate gyrus. *J. Comparative Neurol.* 320:33-61.
- [2] Franzen, R., Martin, D., Daloze, A., Moonen, G. and Schoenen, J. (1999) Grafts of meningeal fibroblasts in adult rat spinal cord lesion promote axonal regrowth. *Neuroreport* 10:1551-1556.
- [3] Hartmann, D., Schulze, M. and Sievers, J. (1998) Meningeal cells stimulate and direct the migration of cerebellar external granule cells in vitro. *J. Neurocytol.* 27:395-409.

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. 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, and transfer it to a sterile field. Rinse the vial with 70% ethanol, and then wipe to remove excess. 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.
2. Dispense the contents of the vial into the equilibrated, poly-L-lysine coated culture vessels. A seeding density of 7,500 cells/cm² 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 meningeal cells are plated in poly-L-lysine coated culture vessels that promote meningeal cell attachment.
3. Replace the cap or cover, and gently rock the vessel to distribute the cells evenly. Loosen caps if necessary to permit gas exchange.
4. Return the culture vessels to the incubator.
5. 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. A health culture will display stellate or spindle-shaped cell morphology, nongranular cytoplasm, and the cell number will be doubled after two to three days in culture.

Maintenance of Culture:

1. Change the medium to fresh supplemented medium the next morning after establishing a culture from cryopreserved cells. For subsequent subcultures, change medium 48 hours after establishing the subculture.
2. Change the medium every other day thereafter, until the culture is approximately 50% confluent.
3. Once the culture reaches 50% confluence, change medium every day until the culture is approximately 80% confluent.

Subculture:

1. Subculture the cells when they are 80% confluent.

2. Prepare poly-L-lysine coated cell culture flasks.
3. Warm medium, trypsin/EDTA solution, trypsin neutralization solution, and DPBS to **room temperature**. We do not recommend warming the reagents and medium at 37°C waterbath prior to use.
4. Rinse the cells with DPBS.
5. Incubate cells with 3 ml of trypsin/EDTA solution (in the case of T-25 flask) until 80% of cells are rounded up (monitored with microscope). Add 3 ml of trypsin neutralization solution to the digestion immediately and gently rock the culture vessel.
Note: Use ScienCell Research Laboratories' trypsin/EDTA solution that is optimized to minimize the killing of the cells by over trypsinization.
6. Harvest and transfer released cells into a 15 ml centrifuge tube. Rinse the flask with another 3 ml of growth medium to collect the residue cells. Examine the flask under microscope to make sure the harvesting is successful by looking at the number of cells left behind. There should be less than 5%.
7. Centrifuge the harvested cell suspension at 1000 rpm for 5 min and resuspend cells in growth medium.
8. Count cells and plate them in a new, poly-L-lysine coated flask with cell density as recommended.

Caution: Handling human derived products is potentially biohazardous. Although each cell strain testes 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).