



## Human Cardiac Myocytes-adult (HCMa)

Catalog Number: 6210

### Cell Specification

The cardiac myocyte is the most physically energetic cell in the body. Its contraction is myogenic, i.e. it is independent of nervous stimulation. All cardiac myocytes are capable of spontaneous rhythmic depolarization and repolarization of their membrane. Cardiac myocytes occupy as much as 75% of cardiac mass but constitute only about one third of the total cell number in the heart. They are highly specialized high-oxygen-content cells and house a large number of mitochondria [1]. Differentiated cardiac myocytes have little capacity to proliferate and show the hypertrophic growth in response to alpha1-adrenergic stimuli via the Ras/MEK pathway [2]. Cardiac myocyte hypertrophy and apoptosis have been implicated in the loss of contractile function during heart failure. Cardiac myocytes have a complex network of signals that regulates their essential role in the rhythmic pumping of the heart [3]. This network is an appealing model system in which to study the basic principles of cellular signaling mechanisms leading to cardiac myocyte death.

HCMa from ScienCell Research Laboratories are isolated from human heart tissue. HCMa are cryopreserved immediately after purification and delivered frozen. Each vial contains  $>5 \times 10^5$  cells in 1 ml volume. HCMa are characterized by immunofluorescent method with antibodies to myosin. HCMa are negative for HIV-1, HBV, HCV, mycoplasma, bacteria, yeast and fungi. HCMa are guaranteed to further culture at the conditions provided by ScienCell Research Laboratories.

### Recommended Medium

It is recommended to use Cardiac Myocyte Medium (CMM, Cat. No. 6201) for the culturing of HCMa *in vitro*.

### Product Use

HCMa 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] Bodyak, N., Kang, P. M., Hiramura, M., Suljoadikusumo, I., Horikoshi, N., Khrapko, K. and Usheva, A. (2002) Gene expression profiling of the aging mouse cardiac myocytes. *Nucleic Acids Research* 30(17):3788-3794.
- [2] Tamamori-Adachi, M., Ito, H., Nobori, K., Hayashida, K., Kawachi, J., Adachi, S., Ikeda, M. A. and Kitajima, S. (2002) Expression of cyclin D1 and CDK4 causes hypertrophic growth of cardiomyocytes in culture: a possible implication for cardiac hypertrophy. *Biochem Biophys Res Commun* 296(2):274-80.
- [3] Sambrano, G.R., Fraser, I., Han, H., Ni, Y., O'Connell, T., Yan, Z. and Stull, J. T. (2002) Navigating the signaling network in mouse cardiac myocytes. *Nature* 420(6916):712-4.

## **Instruction for culturing cells**

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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- or fibronectin-coated culture vessels. A seeding density of 7,500 cells/cm<sup>2</sup> is recommended.  
*Note: Dilution and centrifugation of cells after thawing are not recommended since these actions are more harmful to cells than the effect of DMSO residue in the culture. It is also important that HCMa are plated in poly-l-lysine- or fibronectin-coated culture vessels that promote myocytes attachment growth.*
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 spindle shaped, usually in a homogeneous bundle or sheet of cells rather than scattered single cells 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).