

PrimaPure™



A division of Gene Therapy Systems, Inc.

Bovine Pulmonary Artery Endothelial Cells (BPAEC)

Catalog #	Description/Content	Amount
PB30205	BPAEC	>500,000 cells
PB30205K	BPAEC Complete System	1 Kit*
*Each Complete System contains an ampoule of cryopreserved BPAEC (PB30205), 500 ml of Bovine Endothelial Cell Growth Medium (PMB211500), and a Subculture Reagent Kit (PR090100K).		

Related Products	Catalog #
Bovine Endothelial Cell Growth Medium, 500 ml	PMB211500
Subculture Reagent Kit, including 100 ml each of HBSS, Trpsin/EDTA, and Trpsin Neutralizing Solution	PR090100K
GenePORTER® 2 Transfection Reagent, 0.75 ml	T202007
GeneSilencer® siRNA Transfection Reagent, 200 reactions	T500750

Storage:	Store cryopreserved vials in liquid nitrogen immediately upon arrival. Store the growth medium at 4°C in the dark immediately upon arrival. Store the Subculture Reagent Kit at -20°C upon arrival and store the reagents at 4°C upon thawing.
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INTRODUCTION

Bovine pulmonary artery endothelial cells (BPAEC) are derived from the arteries of USDA-inspected cattle. They are cryopreserved at second passage and can be cultured and propagated at least 16 population doublings. These cells play critical roles in cardiac homeostasis. Changes in structure and function of endothelial cells have been linked to vascular diseases such as thrombosis^{1,2}, atherosclerosis³, and hypertension⁴. They are an economical alternative suitable for the studies of endothelial function and endothelial metabolism. A more sophisticated cell culture system, closer to the *in vitro* interactions of endothelia and smooth muscle cells, is generated by co-culture with species-matched bovine arterial smooth muscle cells.

MATERIALS AND METHODS

I. Preparation for Culturing

1. Make sure your Class II Biological Safety Cabinet, with HEPA filtered laminar airflow, is in proper working condition.
2. Clean the Biological Safety Cabinet with 70% alcohol to ensure it is sterile.
3. Turn the Biological Safety Cabinet blower on for 10 min. before cell culture work.
4. Make sure all serological pipettes, pipette tips, and reagent solutions are sterile.
5. Follow the standard sterilization technique and safety rules:
 - a. Do not pipette with mouth.
 - b. Always wear gloves and safety glasses when working with animal cells even though USDA has inspected all the animals.
 - c. Handle all cell culture work in a sterile hood.

II. Culturing Bovine Endothelial Cells

1. Take the Bovine Endothelial Cell Growth Medium from the refrigerator. Decontaminate the bottle with 70% alcohol in a sterile hood.
2. Pipette 15 ml of Bovine Endothelial Cell Growth Medium* into a T-75 flask.

*Keep medium to surface area ratio at 1 ml per 5 cm². Example: 5 ml for a T-25 flask or a 60 mm tissue culture dish; 15 ml for a T-75 flask or a 100 mm tissue culture dish.
4. Remove the cryopreserved vial of BPAEC from the liquid nitrogen storage tank. Use proper protection for your eyes and hands.

5. Turn the vial cap a quarter turn to release any liquid nitrogen that may be trapped in the threads, then re-tighten the cap.
6. Thaw the cells quickly by placing the lower half of the vial in a 37°C water bath for 1-2 minutes.
7. Take the vial out of the water bath and wipe dry.
8. Decontaminate the vial exterior with 70% alcohol in a sterile Biological Safety Cabinet.
9. Remove the vial cap carefully. Do not touch the rim of the cap or the vial.
10. Resuspend the cells in the vial by gently pipetting the cells 5 times with a 2 ml pipette. Be careful not to pipette too vigorously as to cause foaming.
11. Pipette the cell suspension (1ml) from the vial into the T-75 flask containing 15 ml of Bovine Endothelial Cell Growth Medium.
12. Cap the flask and rock gently to evenly distribute the cells.
13. Place the T-75 flask in a 37°C, 5% CO₂ humidified incubator. Loosen the cap to allow gas exchange. For best results, do not disturb the culture for 24 hours after inoculation.
14. Change to fresh Bovine Endothelial Cell Growth Medium after 24 hours or overnight to remove all traces of DMSO.
15. Change Bovine Endothelial Cell Growth Medium every other day until the cells reach 60% confluent.
16. Double the Bovine Endothelial Cell Growth Medium volume when the culture is >60% confluent or for weekend feedings.
17. Subculture the cells when the BPAEC reach 80% confluent.

III. Subculturing Bovine Endothelial Cells

1. Remove the Subculture Reagent Kit from the -20°C freezer

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- and thaw overnight in a refrigerator.
2. Make sure all the subculture reagents are thawed. Swirl each bottle gently several times to form homogeneous solutions.
 3. Store all the subculture reagents at 4°C for future use. The activity of Trypsin/EDTA Solution will be stable for 2 weeks when stored at 4°C.
 4. Aliquot Trypsin/EDTA solution and store the unused portion at -20°C if only portion of the Trypsin/EDTA is needed
 5. Take the Bovine Endothelial Cell Growth Medium from the refrigerator. Decontaminate the bottle with 70% alcohol in a sterile hood.
 6. Pipette 30 ml of Bovine Endothelial Cell Growth Medium to a T-175 flask (to be used in Step 9 below).
NOTE: Trypsinize Cells at Room Temperature. Do Not Warm Any Reagents to 37° C.
 7. Remove the medium from culture flasks by aspiration.
 8. Wash the monolayer of cells with HBSS and remove the solution by aspiration.
 9. Pipette 6 ml of Trypsin/EDTA Solution into the T-75 flask. Rock the flask gently to ensure the solution covers all the cells.
 10. Remove 5.5 ml of the solution immediately.
 11. Re-cap the flask tightly and monitor the trypsinization progress at room temperature under an inverted microscope. It usually takes about 1 minute for the cells to become rounded but still attached to the flask. (When rounded cells detach by themselves without hitting, it means cells are over trypsinized.)
 12. Release the rounded cells from the culture surface by hitting the side of the flask against your palm until most of the cells are detached.
 13. Pipette 8 ml of Trypsin Neutralizing Solution to the flask to inhibit further tryptic activity.
 14. Transfer the cell suspension from the flask to a 50 ml sterile conical tube.
 15. Rinse the flask with an additional 5 ml of Trypsin Neutralizing Solution and transfer the solution into the same conical tube.
 16. Examine the T-75 flask under a microscope. If there are >20% cells left in the flask, repeat Steps 7-15.
 17. Centrifuge the conical tube at 220 x g for 5 minutes to pellet the cells.
 18. Aspirate the supernatant from the tube without disturbing the cell pellet.
 19. Flick the tip of the conical tube with your finger to loosen the cell pellet.
 20. Resuspend the cells in 5 ml of Bovine Endothelial Cell Growth Medium by gently pipetting the cells to break up the clumps.
 21. Count the cells with a hemocytometer or cell counter. Inoculate at 7,500 cells per cm² for rapid growth, or at 4,000 cells per cm² for regular subculturing.

REFERENCES

1. Jaffe, E.A., (1977) *New Engl. J. Med.* **296**: 377.
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3. Ross, R.N., (1993) *Nature* **362**: 801.
4. Ryan, U.S., (1985) *Handbook Physiology: The Respiratory System*, 351.

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