



ABSTRACT

Introduction: The phenotypic characteristics of the human blood-nerve barrier (BNB) provide functional insights important to endoneurial homeostasis and disease states.

Objectives: Determine the expression of transporters, cell adhesion molecules and tight junction proteins on primary human endoneurial endothelial cells (pHEndECs) that form the BNB.

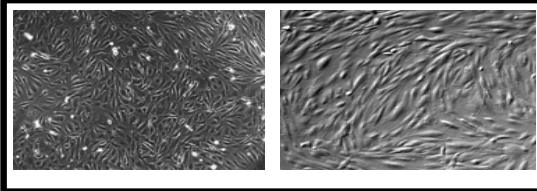
Methods: pHEndECs isolated from decedent sciatic nerves were plated at 10,000-15,000 cells/cm² on collagen-coated Petri dishes, glass coverslips or transwell inserts. Proliferation assays were performed and confluent layers characterized using enzyme- and immuno-cytochemistry, flow cytometry and polymerase chain reaction at passages 3-10.

Results: pHEndECs double in number every 48 hours during the logarithmic phase of growth. pHEndECs express enzymes alkaline phosphatase and γ -glutamyl transpeptidase; transporters glucose transporter-1, p-glycoprotein, large neutral amino acid transporter-1, monocarboxylic acid transporter-1 and creatine transporter. There is basal expression of CD34, and cellular adhesion molecules intercellular adhesion molecule-1, vascular cell adhesion molecule-1 and fibronectin connecting segment-1. Tight junction proteins zona occludens-1, occludin, claudins-1,-2 and -5, and junctional adhesion molecule-A are also expressed, indicative of the restrictive BNB.

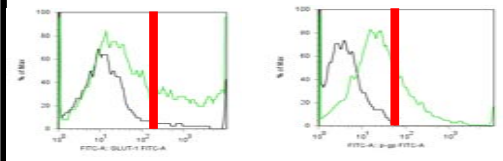
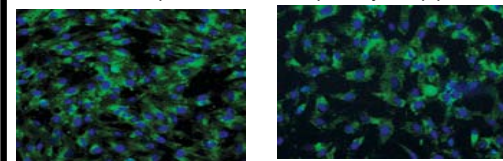
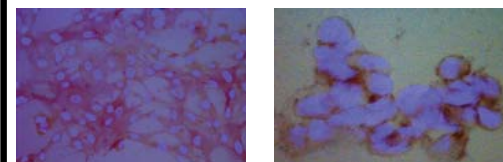
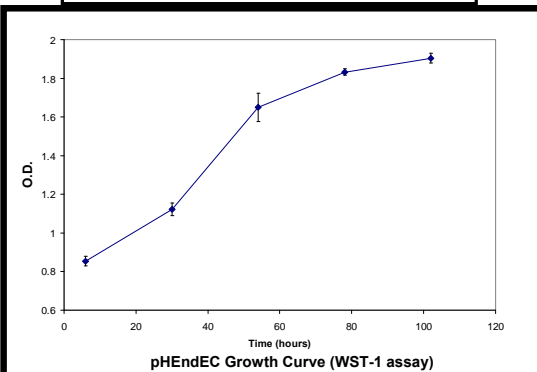
Conclusions: pHEndECs retain essential phenotypic characteristics during serial passaging and provide a cell line to study physiological and pathologic processes at the BNB *ex vivo*.

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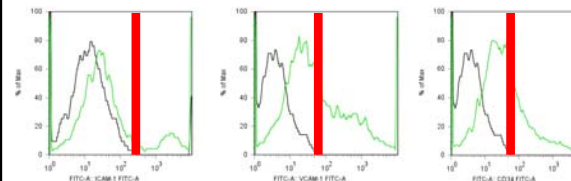
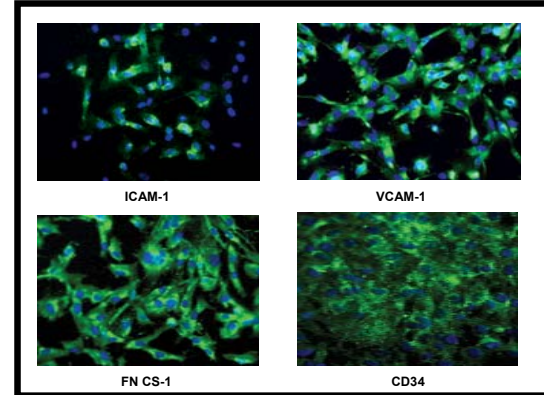
Primary Human Endoneurial Endothelial Cells (pHEndECs)



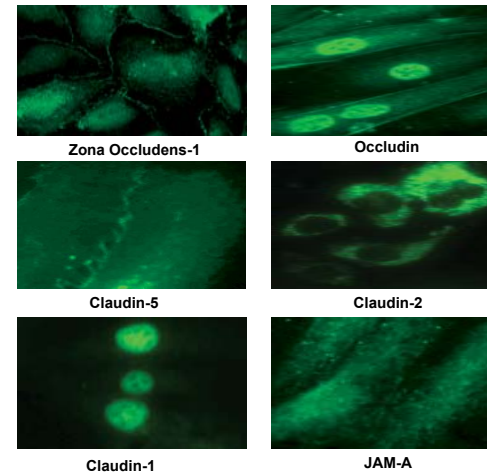
Phenotypic Characterization of pHEndECs



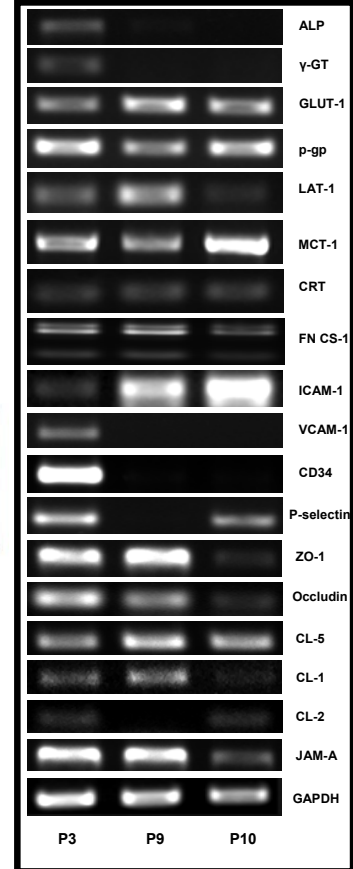
Cellular Adhesion Molecules



INTERCELLULAR TIGHT JUNCTION PROTEIN EXPRESSION



Polymerase Chain Reaction



POTENTIAL APPLICATIONS OF THE IBNB

- Endogenous solute/ macromolecular transport studies
- Drug transport studies
- Toxin/ xenobiotic influx/ efflux studies
- Mechanisms of leukocyte transmigration
- Microbial invasion processes
- Chemokine translocation/ presentation mechanisms