Office of Technology Transfer
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Immortalized Endothelial Cells

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Applications

This invention consists of the first immortalized human microvasculature endothelial cell line. These cells have great potential in endothelial cell research and drug development.

Summary

Endothelial cells are critical in diverse biologic and pathologic processes such as inflammation, wound healing, angiogenesis, tumor metastases, clotting, thrombosis, and atherogenesis. Despite their importance, the study of endothelial cells has been limited due to the difficulty of obtaining and growing such cells. Some progress has been made through the isolation and growth of endothelial cells from umbilical veins. However, these large vessel endothelial cells have limited life span, require significant concentrations of serum for growth, and exhibit lot-to-lot variability in functional assays. Furthermore, the vast majority of pathophysiologic events involving endothelial cells occur at the level of the microvasculature, and endothelial cells derived from large vessels exhibit a distinct phenotype, which differs from small-vessel endothelial cells.

This technology makes available for the first time, immortalized human microvasculature endothelial cells. The cells are derived from human foreskin, (HMEC-1) pulmonary and hepatic endothelium. HMEC-1 cells have been passaged 50 times and show no sign of senescence, whereas previous endothelial cells undergo senescence at passages 8-10. Significantly, HMEC-1 cells retain microvascular endothelial cell characteristics. HMEC-1 cells exhibit typical cobblestone morphology when grown in monolayer culture, express and secrete von Willebrand's Factor, take up acetylated low-density lipoprotein and rapidly form tubules when cultured on martigel. HMEC-1 grows in the absence of human serum, and express cell surface molecules typically associated with endothelial cells and cell adhesion molecules.

Key Words

Immortalized cell line, Endothelial cells, Microvasculature

Patent Status

Non-patented know-how

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