

# CellMatrix Basement Membrane Gel ATCC® No. ACS-3035

## CellMatrix Basement Membrane Gel supports in vitro angiogenesis assays

### Abstract

This study will test the ability of CellMatrix Basement Membrane Gel to support in vitro angiogenesis assays.

### Introduction

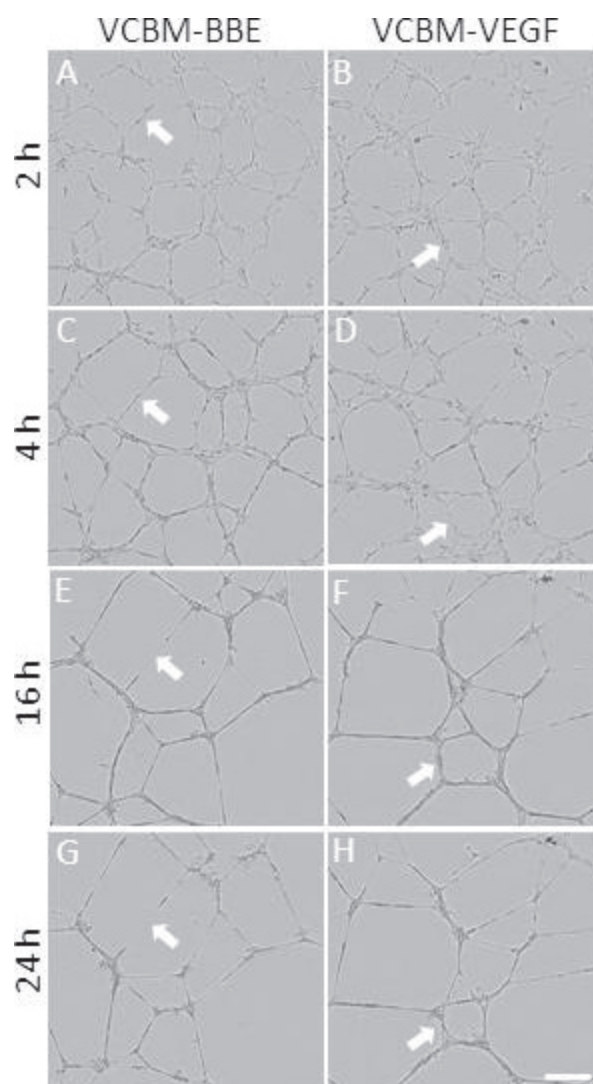
Angiogenesis can be examined in vitro by observing the differentiation of endothelial cells into tubule structures in a basement membrane gel<sup>1</sup>. Here, we tested the capability of CellMatrix, a basement membrane gel derived from the Engelbreth-Holm-Swarm (EHS) tumor cell line<sup>2</sup>, to induce tubule formation in primary normal human umbilical vein endothelial cells (HUVECs). We cultured primary normal HUVECs in Vascular Cell Basal Medium (VCBM) supplemented with either Bovine Brain Extract (BBE) or Vascular Endothelial Growth Factor (VEGF) and monitored tubule formation for 36 hours (h).

### Materials and Methods

Primary normal HUVECs (ATCC® PCS-100-010) were cultured in VCBM (ATCC® No. PCS-100-030) supplemented with either BBE (ATCC® No. PCS-100-040)<sup>3</sup> or VEGF (ATCC® No. PCS-100-041)<sup>4</sup> endothelial cell growth kits. A 24-well plate was coated with 200 µL/well of undiluted CellMatrix Basement Membrane Gel (ATCC® No. ACS-3035) and allowed to gel at 37°C for 30 min before the cells were seeded. HUVECs were dissociated and re-suspended in growth media, and seeded onto CellMatrix at  $4 \times 10^4$  cells/cm<sup>2</sup>. Tubule formation was monitored over time using phase contrast microscopy in an IncuCyte™ FLR (Essen BioScience, Ann Arbor, MI) with images acquired every 2 h for 36 h.

### Results and Discussion

ATCC primary HUVECs cultured in VCBM-BBE began to form tubules 2 h post seeding on CellMatrix (A, arrow), while the tubules in the VCBM-VEGF media were still relatively undeveloped (B, arrow). By 4 h post seeding, tubules were more advanced in the VCBM-BBE media compared to the tubules in the VCBM-VEGF media, but tubules in the VCBM-VEGF had formed at a greater density than in the VCBM-BBE media (compare C and D). The tubules cultured in VCBM-BBE formed faster than in the VCBM-VEGF media, but they also began to deteriorate earlier (at 16 h) than the tubules formed in the presence of VEGF (compare E and F, arrows). By 24 h, the tubules, in both media formulations, had begun to deteriorate (G, H, arrows).



**Figure 1:** Primary normal HUVECs develop tubules when cultured on CellMatrix™ basement membrane gel. Scale bar = 200 µm


Therefore, we find that CellMatrix Basement Membrane Gel is able to support angiogenesis of HUVECs cultured in VCBM supplemented with either BBE or VEGF Endothelial Cell Growth Kits. HUVECs form more stable tubules when VEGF growth kit supplements are added to the media. In contrast, when BBE growth kit supplements are added to the media, the HUVECs form tubules more rapidly, but these tubules are less stable and degrade earlier.


## Conclusion


CellMatrix Basement Membrane Gel provides a suitable platform for in vitro angiogenesis assays and allows for the observation of subtle differences in tubule growth under different culture conditions.

## References

- 1 Arnaoutova I, George J, Kleinman HK, Benton G. The endothelial cell tube formation assay on basement membrane turns 20: state of the science and the art. *Angiogenesis*. (2009);12(3):267-74.
- 2 ATCC Product Information Sheet: ACS-3035 CellMatrix Basement Membrane Gel.
- 3 ATCC Product Information Sheet: PCS-100-040 Endothelial Cell Growth Kit-BBE.
- 4 ATCC Product Information Sheet: PCS-100-041 Endothelial Cell Growth Kit-VEGF.

 10801 University Boulevard  
Manassas, Virginia 20110-2209

 703.365.2700

 703.365.2701

 [sales@atcc.org](mailto:sales@atcc.org)

 [www.atcc.org](http://www.atcc.org)

AN-022020-v06

© 2020 American Type Culture Collection. The ATCC trademark and trade name, and any other trademarks listed in this publication are trademarks owned by the American Type Culture Collection unless indicated otherwise.

These products are for laboratory use only. Not for human or diagnostic use. ATCC products may not be resold, modified for resale, used to provide commercial services or to manufacture commercial products without prior ATCC written approval.