

# TrailBio® Vascular Leptomeningeal Cells

## Cells

Trailhead Biosystems® offers committed iPSC-derived **vascular leptomeningeal cells** (VLMCs), providing the opportunity to study the interface at the **blood brain barrier** at the brain and spinal cord. VLMCs are unique fibroblast-like cells found at this interface. These cells line the blood vessels in the subarachnoid space and express specific markers confirming their unique identity and function at this interface. VLMCs are important in the study of the blood-brain barrier, **cerebrospinal fluid dynamics**, **drug discovery of cerebrovascular disorders** and **disease modeling** of leptomeningeal pathologies.

## Platform

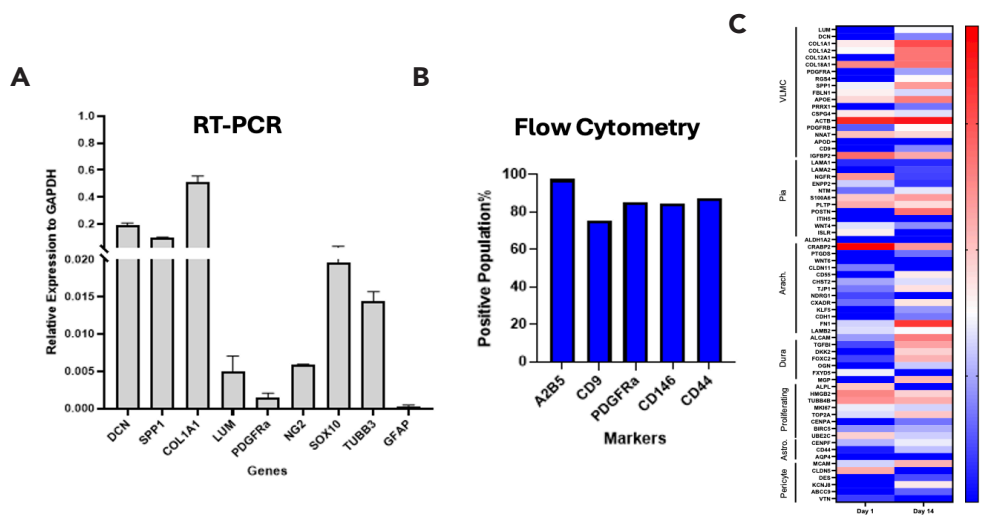
Using our proprietary **HD-DoE®** (High-Dimensional Design-of-Experiments) technology, we created a multi-stage protocol for induction of VLMCs from iPSCs that express known VLMC markers.

## Quality

Quality is defined at multiple stages during manufacturing using flow cytometry, gene expression by qRT-PCR, bulk RNA-seq data, and functionality of cells is determined by key cellular markers using immunocytochemistry (ICC) data.

## Data

TrailBio® Vascular Leptomeningeal Cells gene expression and functional assessment. Gene expression analysis showed that upon differentiation, cells express key identifying genes (Fig 1-A RT-PCR data showing expression of VLMC genes on the last day of differentiation). Cellular identity is demonstrated by expression of key cellular markers. (Fig 2, ICC staining of cellular markers.)



**Fig 1. Gene Expression**

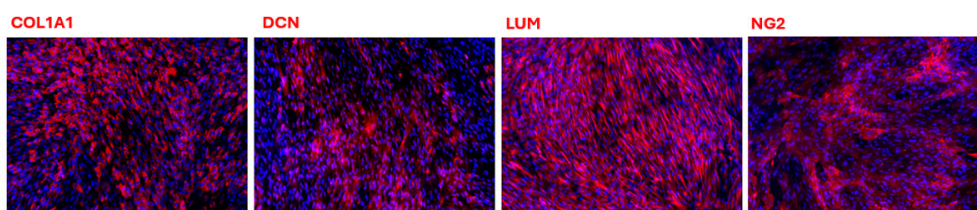
(A) RT-PCR data shows expression of VLMC genes.

(B) Flow Cytometry shows homogeneity of generated cells

(C) Normalized log count data extracted from bulk RNA-seq data show gene profile of VLMCs that confirms expression of leptomeningeal genes at two timepoints during differentiation. These genes are present at pia mater, arachnoid mater and dura mater.

**Fig 2. Cell Characterization by ICC**

iPSC-derived VLMCs expressing extracellular matrix proteins Collagen Type 1A1 (COL1A1) and Lumican (LUM). These cells also express glial markers Decorin (DCN) neural/glial antigen 2 (NG2).



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## Format

Product	Cell Density	Product #
TrailBio® Vascular Leptomeningeal Cells	5 X 10 <sup>6</sup>	Early Access

Production	
Donor Information	Human Male
Source Cell	iPSCs from CD34+ Cord Blood
Karyotype	Normal
Configuration	Cryopreserved Cells in Vials

Handling	
Shipping info	Dry Ice
Storage	Liquid Nitrogen
Usage	Research Use Only

## Trailhead® Cells

- **Built from Scratch:** We create novel protocols for producing specialized human iPSC-derived cells
- **HD-DoE® Platform:** Protocols are built by exploring high-dimensional space of regulatory inputs
- **Data, Not Hypothesis, Driven:** Our methods are based on empirical data obtained using HD-DoE®
- **Quality by Design:** Product development adheres to a Quality-by-Design standard at all stages
- **Cellular Identity:** Cell fate is confirmed by molecular and functional attributes

## Applications

Trailhead's cells are well suited for use in 2D and 3D applications, including drug discovery, disease-modeling, drug toxicity, 3D tissue printing, organoid formation, tissue on-a-chip manufacturing, and functional assay development.

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