

TrailBio® Pre-Myelinating Oligodendrocytes

Cells

Trailhead Biosystems® offers committed iPSC-derived pre-myelinating oligodendrocytes, providing the opportunity to study **functional myelination** in **neural co-culture**, **drug discovery for leukodystrophies**, and **human disease modeling**. Cells of the oligodendrocyte lineage play a key role in multiple disease states and serve as the major insulating cell type of the brain. Oligodendrocyte loss is observed in multiple sclerosis, primarily due to autoimmune destruction. This loss of oligodendrocyte number, or function, can lead to leukodystrophies, a typically fatal condition, resulting in loss of sensory functions and motor activity.

Platform

Using our proprietary **HD-DoE®** (High-dimensional design-of-experiments) technology, we created a multi-stage protocol resulting in rapid (20 days) and homogenous induction of pre-myelinating oligodendrocytes that can adopt a committed oligodendrocyte fate.

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 as determined by key cellular markers using immunocytochemistry (ICC) data.

Data

TrailBio® Pre-Myelinating Oligodendrocytes gene expression and functional assessment. Gene expression analysis show that upon differentiation, these cells express key oligodendrocyte lineage markers (Fig 1, qRT-PCR data at key time points). Functionality is demonstrated by the expression of key cellular markers which confirm their identity. (Fig 2, ICC staining of cellular markers.)

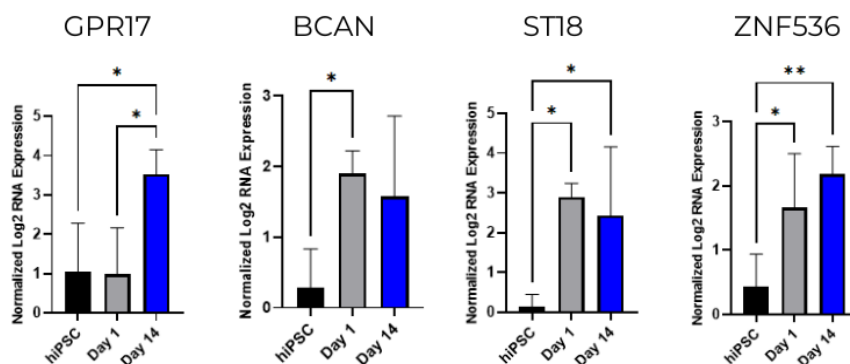
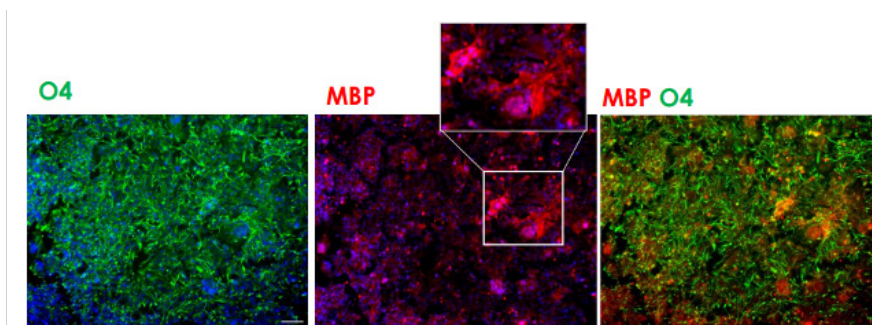


Fig 1. qRT-PCR Analysis of Gene Expression

At day 1 post-revival, the cells already show expression of oligodendrocyte markers such as ST18, SNF536, BCAN, and GPR17. By day 14, the expression levels of these markers increase substantially as the cells continue to mature along the oligodendrocyte pathway and acquire the expected gene expression profile over the 14-day differentiation time course.

Fig 2. Cell Characterization by ICC

ICC staining of TrailBio Pre-Myelinating Oligodendrocytes (at post-revival day 14) express oligodendrocyte lineage marker O4 (green) as well as the myelin basic protein MBP (red). This data indicates they acquire the characteristic profile of pre-myelinating oligodendrocytes. The staining reveals the branched morphology the cells develop by 14 days after thawing. Scale bar is 100µm.



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Format

Product	Cell Density	Product #
TrailBio® Pre-Myelinating Oligodendrocytes	5 X 10 ⁶	EC-01-05

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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