

# TrailBio® A9 Dopaminergic Neurons

## Cells

Trailhead Biosystems® offers committed dopaminergic neurons from human iPSC cultures. These cells offer the opportunity for investigation of **Parkinson's Disease** in vitro and **in vivo**, **drug discovery**, **human disease modeling**, and more. Substantia Nigra pars compacta (SNc) dopaminergic neurons of the CNS play a key role in motor and non-motor functions and their loss in Parkinson's Disease leads to devastating complications. In vitro cell models of iPSC-derived TH+ cells of SNc neurons, can vastly help with development of effective treatments.

## Platform

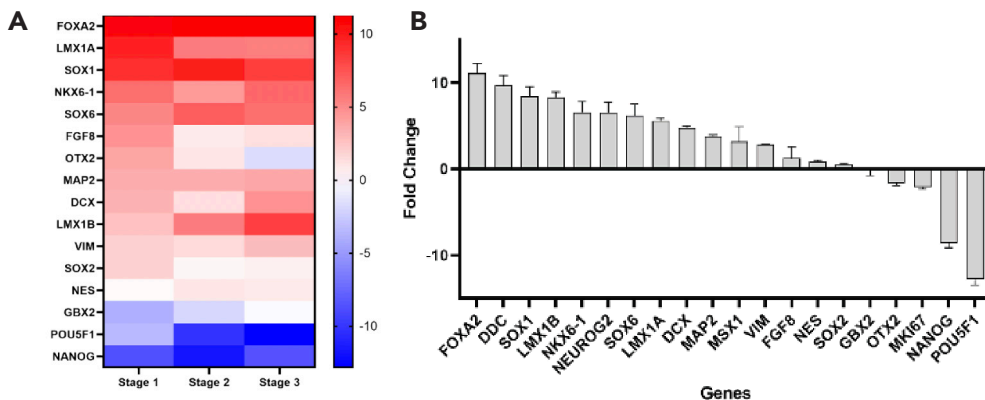
Using **HD-DoE®**, we created a multistage protocol for the rapid (6 days) and homogenous induction of midbrain progenitors which are capable of effectively maturing to dopaminergic neurons which can be identified using cellular markers.

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

## Data

TrailBio® A9 Dopaminergic Neurons gene expression and functional assessment. Gene expression analysis shows that upon differentiation, these cells express midbrain dopaminergic progenitor markers (Fig 1, RNA-seq data at key time points). Functionality is demonstrated by expression of key cellular markers which confirm their identity. (Fig 2, immuno-cytochemistry staining of cellular markers.)

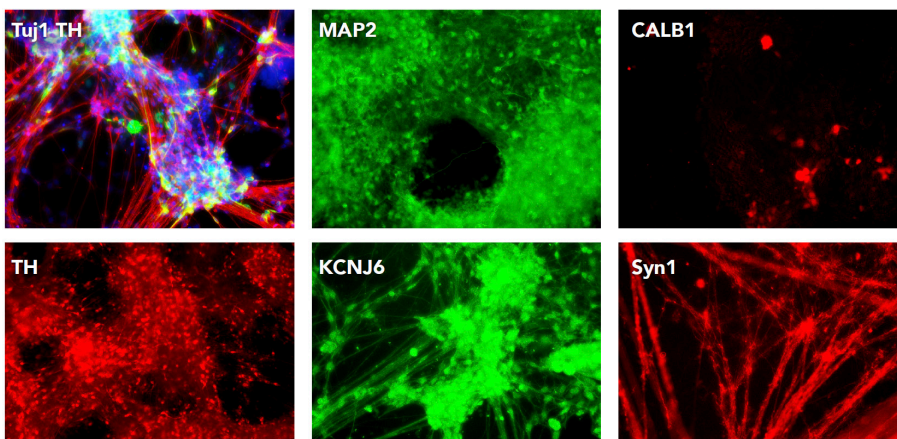


**Fig 1. RNA-seq Analysis of Gene Expression**

RNA-seq analysis of midbrain dopaminergic progenitors.

(A) heatmap of normalized counts on day 6.

(B) Bar plot shows fold change of gene profile of differentiation dopaminergic neurons on day 9.



**Fig 2. Cell Characterization by ICC**

Staining of TrailBio® A9 Dopaminergic Neurons (at post-revival day 1). Cells express midbrain neuronal characteristic markers including Tyrosine Hydroxylase (TH), Potassium channel, inwardly rectifying, subfamily J6 (KCNJ6).

Mature neuronal markers such as Microtubule-Associated Protein (MAP2) and Synapsin1 (Syn1) are also expressed.

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## Format

Product	Cell Density	Product #
TrailBio® A9 Dopaminergic Neurons	5 X 10 <sup>6</sup>	EC-03-05

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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