



The HOPX and BLBP landscape and gliogenic regions in the developing human brain

Background

- Outer radial glial cell (oRGs) are neural stem cells that give rise to neurons and glia and contribute to cell migration and expansion of the developing neocortex.
- Many neurodevelopmental diseases are caused by defects in neurogenesis and neuronal migration associated with radial glia cells.
- Homeodomain-only protein (HOPX) is thought to be a marker of oRGs located in the ventricular and subventricular zone of the developing neocortex as well as a marker of astroglial lineage and possible players in gliomas.

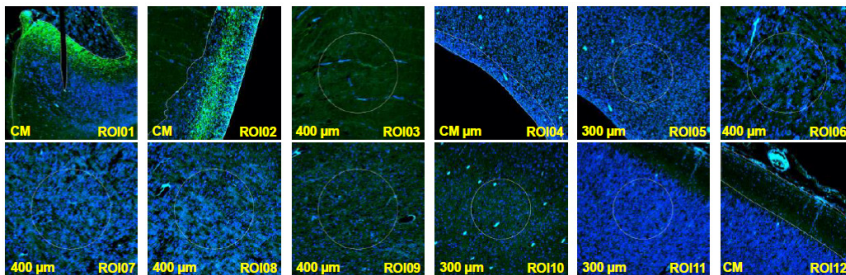
Research Question

What role does the spatiotemporal gene expression of HOPX and BLBP (Brain Lipid Binding Protein) have in the role of astroglialogenesis in the developing frontal, parietal, temporal and occipital human neocortex and brain stem regions?

Experimental Setup

Instrument	GeoMx [®] DSP
Sample Type	FFPE
Tissue Type	Human Fetal Brain
Assay	Neural Cell Profiling Core Module, AD Pathology Module, PD Pathology Module
Analyte	Protein
Readout	nCounter [®] Analysis System

Spatiotemporal differences in gene expression in different HOPX expressing regions of the brain were analyzed in detail using the GeoMx DSP.



Circular and free-hand drawn regions of interest (ROIs) were selected based on staining for HOPX, GFAP, and BLBP in the coronal sections of the frontal, parietal, temporal, and occipital lobes as well as in the sagittal section of the brainstem and cerebellum. Figure reproduced from Holst et al. J Anat. 2023 Feb 16, 243: 23–38 under the **Creative Commons license**.

Results & Conclusions

- The expression pattern of HOPX along with BLBP was investigated in detail in the developing neocortex.
- Results indicate HOPX as a marker of radial glial cells and the astroglial lineage in cortical regions.
- HOPX only stains fractions of astrocytes as it does not overlap completely with GFAP immunostaining.
- HOPX also diverged from BLBP staining in some areas, indicating that HOPX marks subgroups of radial glial cells or more differentiated progeny.
- Strong HOPX expression was found in dorsal aorta corresponding to aorta-gonad-mesonephros stem cell system prior to HOPX presence in the CNS.
- HOPX is a pleiotropic protein and its expression in a range of cell types indicates a more complex role of HOPX in the developing brain.

Holst et al. J Anat. 2023 Feb 16, 243: 23–38 <https://doi.org/10.1111/joa.13844>

For more information, please visit nanosttring.com/geomx

NanoString Technologies, Inc.

530 Fairview Avenue North
Seattle, Washington 98109

T (888) 358-6266
F (206) 378-6288

nanosttring.com
info@nanosttring.com

Sales Contacts

United States us.sales@nanosttring.com
EMEA: europe.sales@nanosttring.com

Asia Pacific & Japan apac.sales@nanosttring.com
Other Regions info@nanosttring.com