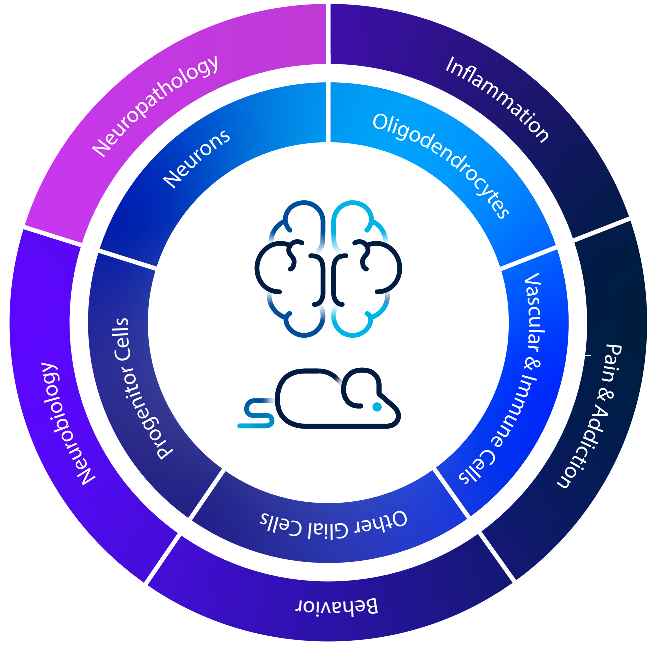
bio-techne® | ACD™

Reveal New Spatial Insights in Neurobiology and Neuropathology Mouse Models with RNAscope™ ISH Assays



Your Genes. Your Way.

Easily interrogate just the genes you want in the combinations you need to achieve your research goals.

Select from a list of proven probes for cell type identification and add any additional RNA markers from an online catalog of 1000's of predesigned neural probes. If we don't have the target you need, you can easily design a new custom probe using ACD expert probe design.

Your Success.

- Spatially interrogate neuronal cell subtypes and networks at single-cell resolution.
- Characterize changes in cellular localization and activation in health and disease states.
- Easily visualize GPCR target genes with high specificity.
- Uncover the role of unique splice variants, miRNAs, and circRNAs in spatial context.

RNAscope Probes for Mouse Cell Types

Mouse Neurons		
Cell Type	**Top Probes**	**Reference RNAscope Probe Publications**
Mature neurons	*Map2, Rbfox3, Tubb3*	• Meneghello et al., Neuroscience, 2015. • Nakazato et al., Sec. Multiple Sclerosis and Neuroimmunology, 2020. • Lorsch et al., Nature neuroscience, 2019.
Cholinergic neurons	*Ache, Chat, Slc18a3*	• Steinkellner, Thomas et al., eNeuro, 2019. • Skirzewski, M. et al., Nature Communications, 2022. • Francis, T. Chase et al., Neuron, 2019.
Dopaminergic neurons	*Slc6a3, Slc17a6, Th*	• Buck, Silas A et al., The Journal of neuroscience, 2021. • Venkataraman, A. et al., Neuropsychopharmacology, 2021. • Chefer, Vladimir I et al., Neuropsychopharmacology, 2013.
GABAergic neurons	*Gad1, Slc6a1, Slc32a1*	• Wang, Lei et al., Neuropharmacology, 2016. • Rizzi, Giorgio, and Kelly R Tan. Cell reports , 2019. • Szlaga, Agata et al., Neuropharmacology, 2022.
Glutamatergic neurons	*Gls, Slc17a6, Slc17a7*	• Maldonado et al., Current biology, 2021. • Kroeger et al., Sleep, 2022.
Serotonergic neurons	*Pet-1, Slc6a4, Tph*	• Xiao, Xing et al., Nature communications, 2021. • Kast, Ryan J et al., ACS chemical neuroscience, 2017.

Mouse Glial, Oligodendrocytes, and Immune Cells		
Cell Type	Top Probes	Reference RNAscope Probe Publications
Astrocytes	*Aldh1l1*, *Aqp4*, *Gfap*	• Boulay et al., Cell discovery, 2017. • Mazumder et al., iScience, 2022. • Becker-Krail et al., Biological psychiatry, 2022.
Brain microvascular endothelial cells	*Cd31*, *Cldn5*, *Vwf*	• Chen, Michelle B et al., Cell reports, 2020. • Dudek, Katarzyna A et al., PNAS United States of America, 2020. • Liu, CC. et al., Nature Neuroscience, 2022.
Ependymal cells	*Cd24*, *Foxj1*, *Mia*	• MacDonald, Adam et al., Frontiers in cellular neuroscience, 2021. • Rodrigo A., Aida et al., Developmental cell, 2023.
Microglia	*Aif1*, *Cd68*, *Tmem119*	• Lovatt et al., Communications biology, 2022. • He, Baixuan et al., FASEB journal, 2020. • Liu, Yu-Yan et al., Neural regeneration research, 2023.
Oligodendrocytes	*Mbp*, *Mog*, *Olig2*	• Barak et al., Nature neuroscience, 2019. • Flygt et al., Journal of neurotrauma, 2018. • Losurdo et al., Brain sciences, 2020.
Pericytes	*Asma*, *Pdgfra*, *Rgs5*	• Smyth, L.C.D. et al., Communications Biology, 2022. • Ayloo, Swathi et al. Neuron, 2022. • Chasseigneaux, S. et al., Scientific Reports, 2018.
T cells	*Cd3*, *Cd4*, *Cd8*	• Rezzonico, M.G. et al., Cell Rep, 2021.
Schwann cells	*Gap43*, *Mpz*, *S100*	• Renthal et al., Neuron, 2020. • Shadrach et al., iScience, 2021. • Matson et al., Nature Communications, 2022.

Mouse Neural Progenitor Cells		
Cell Type	Top Probes	Reference RNAscope Probe Publications
Immature neurons	*Dcx*, *Tbr1*, *Tubb3*	• Wimalasena, Nivanthika K et al., Experimental neurology, 2023. • Ghibaudi, Marco et al., International journal of molecular sciences, 2023. • Kiyama, Takae et al., Cell reports, 2019.
Intermediate progenitors	*Ascl1*, *Eomes*, *Tbr2*	• MacPherson, Melissa J et al., Cell reports, 2021. • Hochgerner, H. et al., Nature Neuroscience, 2018. • Velasco, S. et al., Nature, 2019.
Neuroepithelial cells	*Hes1*, *Nes*, *Notch1*	• Marczenke, Maike et al., Development, 2021. • Li, Li et al., Nature cell biology, 2016.
Oligodendrocyte precursor cells	*Ng2*, *Pdgfra*, *Sox10*	• Yao et al., Neuron, 2018. • van Bruggen et al., Developmental cell, 2022. • Falcão et al., Nature medicine, 2018.
Radial glia	*Hes1*, *Pax6*, *Tnc*	• Song, Michael et al., Nature, 2020. • Adams, K.L. et al., Nature Communications, 2020.

RNAscope Probes for Mouse Models of Neurodegeneration

Mouse Models of Neurodegeneration		
Disease Type	Top Probes	Reference RNAscope Probe Publications
Amyotrophic lateral sclerosis (ALS)*	*C9orf72, Sod1, Tnf*	• Wlaschin, J.J., et al., Brain, 2022. • Frick et al., Acta Neuropathol Commun, 2018. • Miflin, L., et al., PNAS, 2021.
Alzheimer's Disease	*Apoe, App, Bace2, Il6, Mapt, Psen1, Tnf, Trem2*	• Rice, H.C., et al., Mol. Neurodegener, 2020. • Fitz, N.F., et al., Mol. Neurodegener, 2020. • Schultz, et al., Neurobiology of disease, 2018. • Huck et al., Neurobiology of Pain, 2022. • Voytyuk, I.M., et al., Life Science Alliance, 2018. • Reinhardt, L., et al., Neurobiol Dis, 2023. • Das, M., et al., iScience, 2021. • Alvarez-Vergara, M.I., et al., Nat Comm, 2021. • Huang, L., et al., PLoS BioL, 2021.
Huntington's Disease*	*Bdnf, Htt, Neat1*	• Gu, X., et al., Neuron, 2022 • Cheng, C.S., et al., Hum Mol Genet, 2018 • Lei, H.C., et al., bioRxiv, 2023
Parkinson's Disease	*Cacna1d, Casp3, Lrrk2, Mapt, Snca, Vglut2*	• Bellina, A., et al., Cell Reports, 2020. • Flygt, J.R., et al., Jour of Neurotrauma, 2018. • Pereira Luppi, M., et al., Cell Reports. 2021. • Benkert, J., et al., Nat Comm, 2019. • Johnson, N.R., et al., Nat Comm, 2023.

** repeat expansion probes can be designed*

Hear what customers are saying about RNAscope

"In our projects, we mainly use multiplex fluorescent assays combined with confocal microscopy on sectioned mouse brains. We are extremely pleased with the high resolution and the quality of the images we obtained. We compared RNAscope to other similar products developed recently and found that RNAscope' sensitivity is much higher, the background is much lower, and assays are much easier to perform. ACD's service and technical team is another important asset. They are fast to answer our purchasing and technical questions via email and are always attentive to our requests. I highly recommend ACD's RNAscope Assay for any kind of multiplex ISH assay."

- Assistant Professor, Children's Hospital Los Angeles

About RNAscope Technology

RNAscope is the gold-standard for RNA *in situ* hybridization, backed by over 2,000 Neuroscience peer reviewed publications from around the globe.

- **Sensitive** - Industry leading single molecule sensitivity.
- **Specific** - Unrivaled target specificity.
- **Quantitative** – Accurately measure changes in gene expression *in situ*.
- **No instrument required** – Manual and automated assays available.

Getting Started is Easy

Extensive probe catalog

- 45,000 RNA probes in over 400 species.

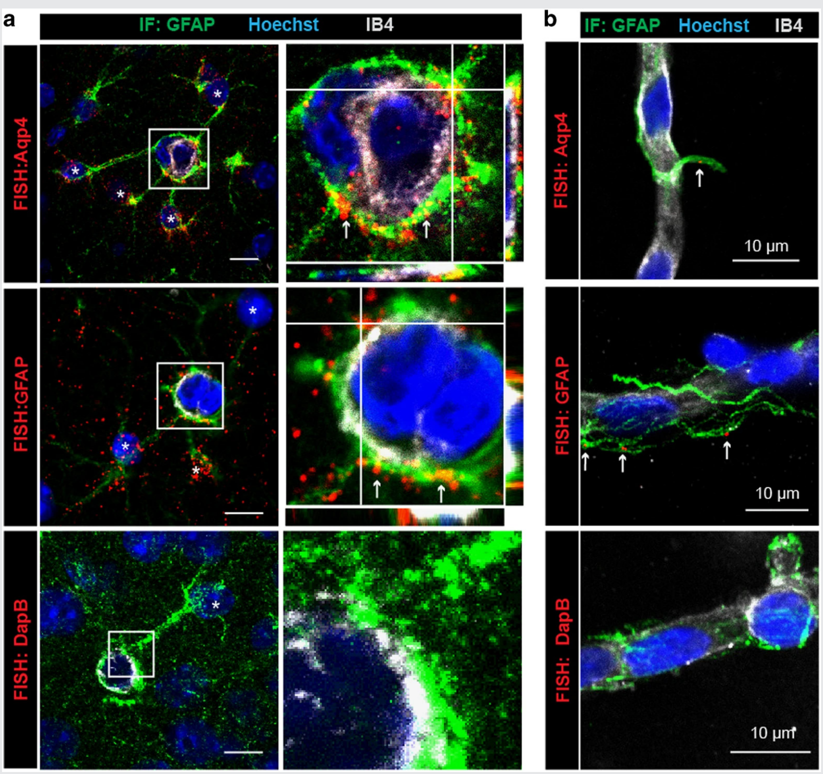
Fast and flexible custom probe design

- We can easily design probes for virtually ANY gene in ANY species for use in ANY tissue.

Expert technical support

- PhD-level scientists with expertise in Neuroscience research.

Research Spotlight



Astrocyte polarity is essential for the integration and regulation of neuronal and vascular signals. Alterations in this process has been associated with several neurological diseases.

Researchers from the University of Pierre et Marie Curie in France used RNAscope to visualize the spatial localization of mRNAs in the perivascular processes and endfeet of mouse astrocytes. This study demonstrated for the first time that protein synthesis occurs in astrocyte perivascular distal processes that may contribute to structural and functional polarization.

Figure 1a. Representative confocal image of astrocyte-specific mRNAs detected by RNAscope fluorescent *in situ* hybridization on brain sections of 2-month-old C57BL6 mice. Aqp4 or GFAP mRNAs are mostly detected in the perivascular astrocyte processes and endfeet (red) (white arrows).
b. Representative confocal images of astrocyte-specific mRNAs encoding Aqp4 and GFAP on 2-month-old C57BL6 mice-purified brain vessels.

Boulay et al., Cell Discovery, 2017

Free Project Consultation with RNAscope Specialist

We have specialists that can assist you in configuring an RNA panel that includes just the genes you want and also assist in selecting the best RNAscope kit for your experimental design to achieve best results.

Request a Meeting with us here!