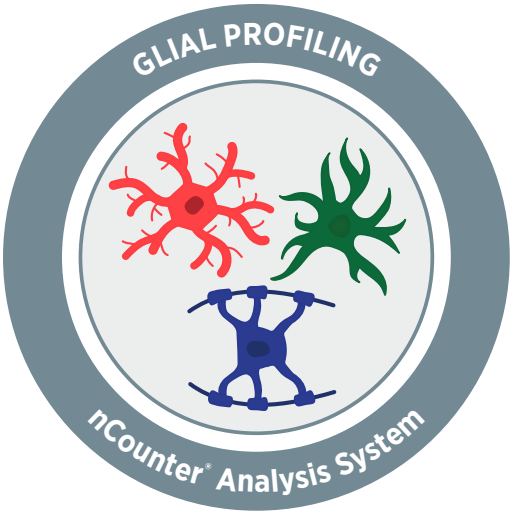
nCounter® Glial Profiling Panel

Gene Expression Panel

Neurodegeneration • Neuroinflammation • Traumatic Brain Injury

Decipher the complex interplay between glial cells, peripheral immune cells, and neurons associated with neurodegenerative & neuroinflammatory disorders and neurotrauma such as stroke, spinal cord injury or traumatic brain injury. The nCounter Glial Profiling Panel enables rapid, comprehensive analysis of astrocytes, microglia, and oligodendrocytes and delivers publication ready figures in as little as 24 hours.



Product Highlights

- Profile 770 genes in human and mouse across 50+ pathways involved in glial cell biology
  - Cell Stress & Damage Response
  - Pathways Regulating Glia
  - Inflammation & Peripheral Immune Invasion
  - Glial Cell Homeostasis & Activation
  - Neurotransmission
- Quantify the relative abundance of 5 CNS cell types and 14 peripheral immune cells
- Customizable with Panel Plus option – add up to 55 genes of your choice

Feature	Specifications
Number of Targets	770 (Human), 770 (Mouse), including internal reference genes
Sample Input - Standard (No amplification required)	25 ng - 300 ng
Sample Input - Low Input	As little as 1 ng with nCounter Low Input Kit (sold separately)
Sample Type(s)	Cultured cells/cell lysates, sorted cells, FFPE-derived RNA, total RNA, fragmented RNA, PBMCs, and whole blood/plasma
Customizable	Add up to 55 unique genes with Panel Plus
Time to Results	Approximately 24 hours
Data Analysis	nSolver™ Analysis Software (RUO) and the ROSALIND® Platform

FOR RESEARCH USE ONLY. Not for use in diagnostic procedures.

Core Themes and Annotations

Cell Stress & Damage Response (Hs/Mm Genes)	Pathways Regulating Glia (Hs/Mm Genes)	Inflammation & Peripheral Immune Invasion (Hs/Mm Genes)	Glial Cell Homeostasis & Activation (Hs/Mm Genes)	Neurotransmission (Hs/Mm Genes)
(127/134)	**(178/180)**	**(187/188)**	**(317/310)**	**(215/211)**
Angiogenesis	Calcium Signaling	Antigen Processing and Presentation	A1 Astrocyte	Cannabinoid Signaling
Apoptosis	Circadian Signaling	Cell Migration	A2 Astrocyte	Cholinergic Synapse
Autophagy	Insulin Signaling	Chemokines	Astrocyte Differentiation/ Function	Dopaminergic Synapse
Cell Cycle	Ion Transport	Complement System	Astrocyte Markers	GABAergic Synapse
Hypoxia	JAK-STAT	Cytokines	Blood Brain Barrier	Glutamatergic Synapse
NO Metabolism and Signaling	Lipid Metabolism	Inflammasome	Cytoskeletal Dynamics	Neuroactive Ligands and Receptors
Oxidative & Nitrosative Stress	MAPK & PI3K	Interferon Signaling	Gap Junctions	Neurogenesis
Proteotoxic Stress	TGF-Beta Signaling	NK-kappaB Signaling	Glucose Metabolism	Neuronal Markers
	Wnt Signaling	Phagocytosis	Homeostatic Microglia	Purinergic Signaling
		T Cell Signaling	Microglia Neurodegenerative Phenotype (MGnD)	Serotonergic Synapse
			Microglial Markers	
			Myelogenesis	
			Neurotrophin Signaling	
			Oligodendrocyte Differentiation/ Maturation	
			Oligodendrocyte Markers	
			Primed Microglia	
			Stage 1 DAM	
			Stage 2 DAM	

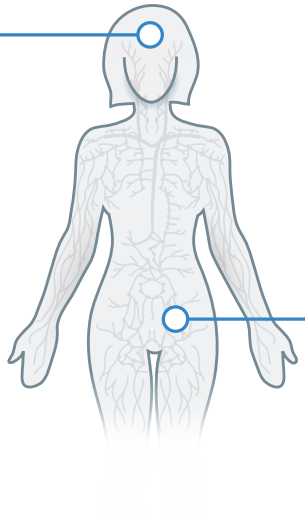
Relative Cell Type Abundance of CNS and Peripheral Immune Cells

Genes included in the Glial Profiling Panel provide unique cell profiling data for measuring the relative abundance of 5 central nervous system cells and 14 peripheral immune cell types in a single sample. The table below summarizes each cell type represented by gene content in the panel qualified through biostatistical approaches and selected literature in neuroscience and immunology.

Cell Function

CNS Cells

- Neurons
- Microglia
- Astrocytes
- Oligodendrocytes
- Endothelial cells



Peripheral Immune Cells

- B cells
- Dendritic cells
- Exhausted CD8
- Macrophages
- T cells
- CD8 T cells
- Neutrophils
- Mast Cells
- Cytotoxic cells
- Treg
- NK CD56dim cells
- NK cells
- CD45+ cells
- Th1 cells

FOR RESEARCH USE ONLY. Not for use in diagnostic procedures.

CNS and Peripheral Immune Cell Signatures

Cell Type	Associated Human Genes	Associated Mouse Genes
Astrocytes	ALDH1L1, EGFR, ENTPD2, GDPD2, ITGA7, MYORG, NWD1, SOX9	Aldh1l1, Egfr, Entpd2, Gdpd2, Itga7, Myorg, Nwd1, Sox9
B cells	BLK, CD19, FAM30A, FCRL2, MS4A1, PNOC, SPIB, TCL1A, TNFRSF17	Blk, Cd19, Fcrlb, Ms4a1, Pnoc, Spib, Tcl1, Tnfrsf17
CD45+ cells	PTPRC	Ptprc
CD8 T cells	CD8A, CD8B	Cd8a, Cd8b1
Cytotoxic cells	CTSW, GNLY, GZMA, GZMB, GZMH, KLRB1, KLRD1, KLRK1, NKG7, PRF1	Ctsw, Gzma, Gzmb, Klrb1, Klrd1, Klrk1, Nkg7, Prf1
Dendritic cells	CCL13, CD209, HSD11B1	Ccl2, Cd209e, Hsd11b1
Endothelial cells	CLDN5, EMCN, ESAM, FLT1, ICAM2, LSR, MYCT1, NOSTRIN, TIE1	Cldn5, Emcn, Esam, Flt1, Icam2, Lsr, Myct1, Nostrin, Tie1
Exhausted CD8 cells	CD244, EOMES, LAG3, PTGER4	Cd244a, Eomes, Lag3, Ptger4
Macrophages/Microglia	CD163, CD68, CD84, GPR84, IRF8, LRRC25, MS4A4A, NCF1, TLR2, TNF	Gpr84, Irf8, Lrrc25, Ncf1, Tlr2, Aif1, Tmem119, Itgam, Cx3cr1, P2ry12, Spi1
Mast cells	CPA3, HDC, MS4A2, TPSAB1/B2	Cpa3, Hdc, Ms4a2, Tpsab1, Tpsb2
NK CD56dim cells	IL21R, KIR2DL3, KIR3DL1, KIR3DL2	Il21r, Kir3dl1/2
NK cells	NCR1, XCL1/2	Ncr1, Xcl1
Neurons	DLX1, DLX2, GRM2, ISLR2, SLC17A6, TBR1	Dlx1, Dlx2, Grm2, Islr2, Slc17a6, Tbr1
Neutrophils	CEACAM3, CSF3R, FCAR, FCGR3A/B, FPR1, S100A12, SIGLEC5	Ceacam3, Csf3r, Fcgr4, Fpr1
Oligodendrocytes	BCAS1, ERBB3, FA2H, GAL3ST1, GJB1, GSN, MYRF, NINJ2, PLEKHB1, PLLP, PLXNB3, PRKCQ, SOX10, TMEM88B, UGT8	Bcas1, Erbb3, Fa2h, Gal3st1, Gjb1, Gsn, Myrf, Ninj2, Plekhb1, Pllp, Plxnb3, Prkcq, Sox10, Tmem88b, Ugt8a
T cells	CD3D, CD3E, CD3G, CD6, SH2D1A, TRAT1	Cd3d, Cd3e, Cd3g, Cd6, Sh2d1a, Trat1
Th1 cells	TBX21	Tbx21
Tregs	FOXP3	Foxp3

To view the annotated gene lists for the Glial Profiling Panel, visit nanostring.com/glial-profiling

nSolver™ Analysis Software

Genes included in the Glial Profiling Panel are organized and linked to various advanced analysis modules to allow for efficient analysis of pathways and processes as well as CNS and peripheral immune cell profiling.

ROSALIND® Platform

ROSALIND is a cloud-based platform that enables scientists to analyze and interpret differential gene expression data without the need for bioinformatics or programming skills. ROSALIND makes analysis of nCounter data easy, with guided modules for:

- Normalization
- Quality Control
- Individual Pathway Analysis
- Differential Expression
- Gene Set Analysis

ROSALIND

nCounter customers can access ROSALIND at: rosalind.bio/nanostring

FOR RESEARCH USE ONLY. Not for use in diagnostic procedures.

Ordering Information

Gene Expression Panels arrive ready-to-use and generally ship within 24 hours following purchase.

Product	Product Description	Quantity	Catalog Number
nCounter Human Glial Profiling Panel	Includes 770 genes; 13 internal reference genes for data normalization	12 Reactions	XT-CSO-H GLIAL-12
nCounter Mouse Glial Profiling Panel	Includes 770 genes; 13 internal reference genes for data normalization	12 Reactions	XT-CSO-M GLIAL-12
nCounter Analysis System Master Kit Reagents and Cartridges	Reagents, cartridges, and consumables necessary for sample processing on the nCounter Analysis System	12 Reactions	NAA-AKIT-012
nCounter SPRINT Cartridge 1 Cartridge, 12 lanes	Sample Cartridge for nCounter SPRINT System	12 Reactions	SPRINT-CAR-1.0
nCounter SPRINT Reagent Pack	nCounter SPRINT Reagent Pack containing Reagents A, B, C, and Hybridization Buffer	192 Reactions	SPRINT-REAG-KIT

Selected Panel References

1. Butovsky, O et al. Microglia activated by IL-4 or IFN-g differentially induce neurogenesis and oligodendrogenesis from adult stem/progenitor cells. Molecular and Cellular Neuroscience. 2006;31(1):149-60.
2. Butovsky, O et al. Identification of a unique TGF-b–dependent molecular and functional signature in microglia. Nature Neuroscience. 2014;17(1): 131-43.
3. Butovsky O and Weiner HL. Microglial signatures and their role in health and disease. Nature Reviews Neuroscience. 2018;19:622-35.
4. Danaher, P et al. Gene Expression Markers of Tumor Infiltrating Leukocytes. J Immunother Cancer. 2017;21(5):18.
5. Hickman, SE et al. The Microglial Sensome Revealed by Direct RNA Sequencing. Nature Neuroscience. 2013;16(12):1896-905.
6. Keren-Shaul, H et al..A Unique Microglia Type Associated with Restricting Development of Alzheimer's Disease. Cell. 2017;169(7):1276-90.
7. Liddelow, SA et al. Neurotoxic reactive astrocytes are induced by activated microglia. Nature. 2017;541:481-87.
8. Ljubisavljevic S and Stojanovic I. Neuroinflammation and demyelination from the point of nitrosative stress as a new target for neuroprotection. Rev Neurosci. 2015;26(1): 49-73.
9. Lund, H et al. Competitive repopulation of an empty microglial niche yields functionally distinct subsets of microglia-like cells. Nature Commun. 2018;9:4845.
10. Parhizkar, S et al. Loss of TREM2 function increases amyloid seeding but reduces plaque-associated ApoE. Nature Neuroscience. 2019;22(2):191-204.
11. Taxin, ZH et al. Modeling Molecular Pathways of Neuronal Ischemia. Prog Mol Biol Transl Sci. 2014;123:249-75.
12. Yamasaki, R et al. Differential roles of microglia and monocytes in the inflamed central nervous system. J Exp Med. 2014;211(8):1533-49.
13. Zhang, Y et al. Purification and characterization of progenitor and mature human astrocytes reveals transcriptional and functional differences with mouse. Neuron. 2016;89(1):37-53.
14. Ziv, Y et al. Immune cells contribute to the maintenance of neurogenesis and spatial learning abilities in adulthood. Nature Neuroscience. 2006;9:268-75.

For more information, please visit nanostring.com/glial-profiling

Bruker Spatial Biology

FOR RESEARCH USE ONLY. Not for use in diagnostic procedures.
© 2024 Bruker Spatial Biology, Inc. All rights reserved. NanoString, NanoString Technologies, nCounter, nSolver, and the NanoString logo are registered trademarks of Bruker Spatial Biology, Inc., in the United States and/or other countries.
This material includes information regarding worldwide products and services, not all of which are available in every country.

AUG 2024 MK2290