Comprehensive panel curated for neuroscience research

Accelerate insights into the complexity of neuroscience with Targeted Gene Expression

Containing over 1,000 genes, the Human Neuroscience Panel is designed to accelerate your understanding of the nervous system. Dissect neurodegenerative disease pathology, investigate how the immune and nervous systems interact, or characterize the cell types that underlie neuroinflammation.

Compatible with Chromium Single Cell Gene Expression and Single Cell Immune Profiling, as well as Visium Spatial Gene Expression, the Human Neuroscience Panel enables comprehensive and efficient characterization of the human brain and nervous system.

Highlights

- Profile key pathways for neurogenesis, neurodegeneration, and cancer with 1,186 genes curated from recent publications and experts in the field
- Profile neurons, glial cells, and key neuroscience pathways in both single cells and intact tissue sections
- Customize panel content by adding up to 200 additional genes using our Custom Panel Designer
- Recover transcripts effectively with full tiling of probes across gene transcripts

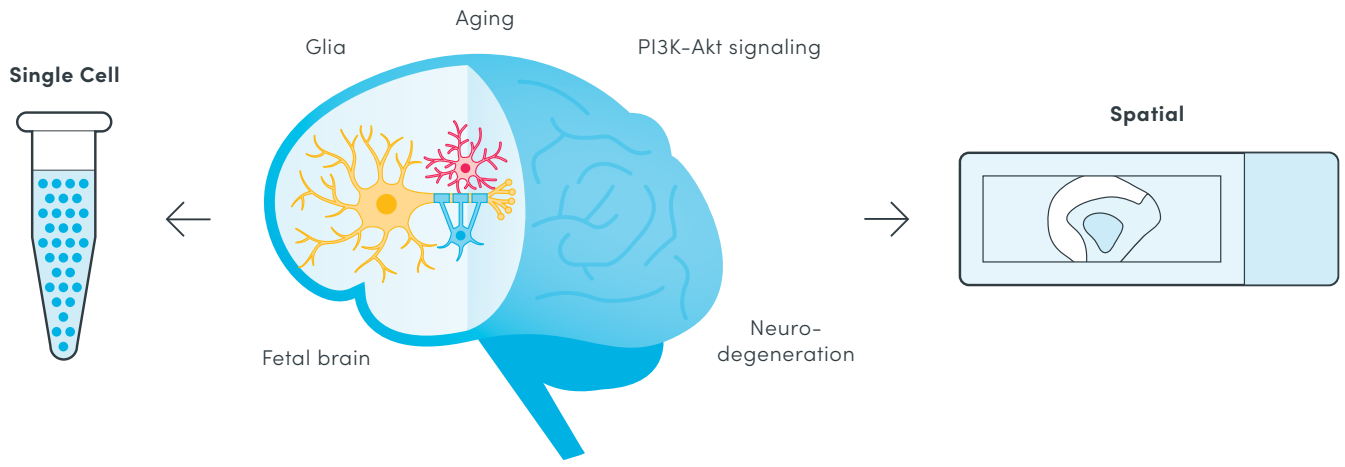

Figure 1. Accelerate your neuroscience research with a comprehensive and curated gene panel. The Human Neuroscience Panel is compatible with Single Cell Gene Expression, Single Cell Immune Profiling, and Spatial Gene Expression. Highlighted here are just a few of the pathways, cellular processes, and disease types included in the panel content.

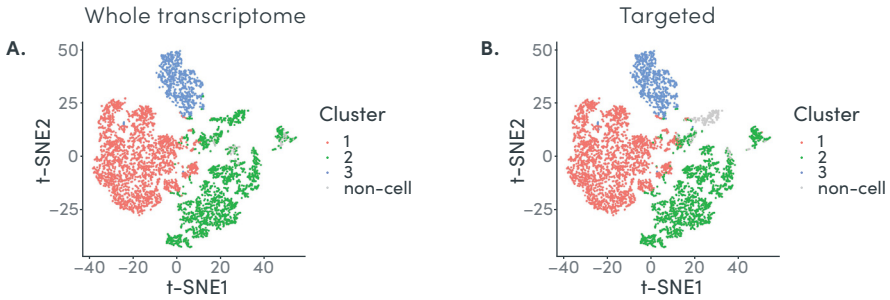

Figure 2. Targeted Gene Expression with the Human Neuroscience Panel preserves cell-type clustering and annotation of single cell data. Shown are representative data from approximately 5,800 cells dissociated from glioblastoma. A. Whole transcriptome analysis with the Chromium Single Cell 3' Gene Expression v3 workflow identified 3 major cell clusters when sequenced at 68,800 reads per cell (about 56% sequencing saturation). B. The same library was enriched for genes found in the 10x Genomics Human Neuroscience Panel, sequenced, and subsampled to 5,000 reads per cell. All major cell subpopulations were preserved compared to the whole transcriptome parent sample.

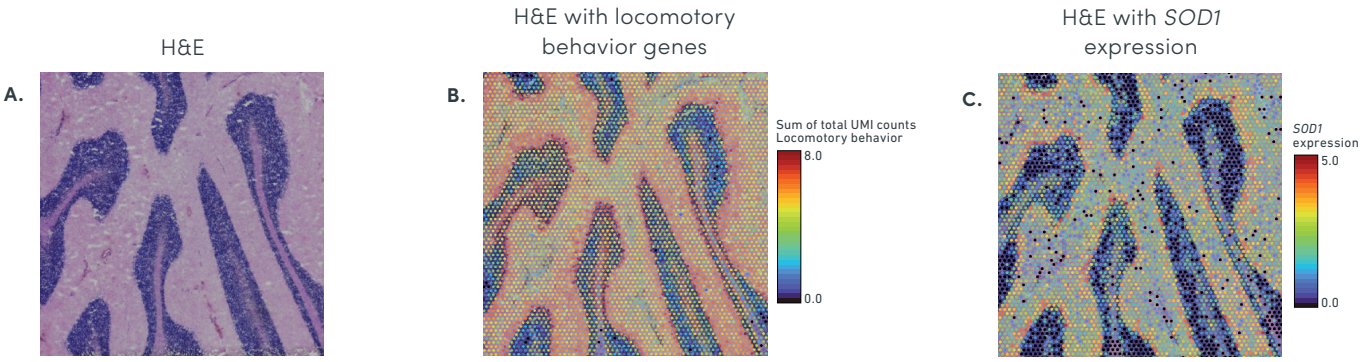

Figure 3. Curated neuroscience content refines spatial gene expression analysis. A human cerebellum tissue section was H&E stained and processed using the Visium Spatial Gene Expression workflow, then enriched for genes of interest using Targeted Gene Expression with the Human Neuroscience Panel. Shown are the H&E image (A), H&E image overlaid with total UMI counts for 36 genes from the locomotory behavior gene category of the Human Neuroscience Panel (B), and H&E image overlaid with *SOD1* expression level (C).

Pathway	Genes
Calcium signaling pathway	75
cAMP signaling pathway	82
Cancer pathways	139
Cholinergic synapse	64
Circadian entrainment	50
Dopaminergic synapse	65
Estrogen signaling pathway	49
GABAergic synapse	43
Glutamatergic synapse	67
GnRH signaling pathway	51
HIF-1 signaling pathway	54
Inflammatory mediator regulation of TRP channels	52
MAPK signaling pathway	86
Oxytocin signaling pathway	70
PI3K-Akt signaling pathway	106
Rap1 signaling pathway	80
Ras signaling pathway	86
Retrograde endocannabinoid signaling	60
Serotonergic synapse	64
VEGF signaling pathway	37

Table 1. Panel design highlights: pathway genes. Selection of key pathway gene categories included in the Neuroscience Panel.

Cellular process	Genes
Aging	56
Angiogenesis	57
Apoptosis	38
Axon guidance	51
Brain development	42
Calcium	121
Cell membrane	369
Cell junction	123
Chemical synaptic transmission	87
Gap junction	48
Host–virus interaction	78
Inflammatory response	80
Ion channel	70
Ion transport	99
Learning	24
Ligand-gated ion channel	34
Lipoprotein	118
Locomotory behavior	36
Myelination	24
Neurodegeneration	121
Neurogenesis	61
Neurotransmitter secretion	22
Phosphoprotein	739
Postsynaptic cell membrane	54
Response to drug	85
Signal transduction	185
Synapse	90
Ubl conjugation	220

Table 2. Panel design highlights: cellular process genes. Selection of key cellular-process gene categories included in the Neuroscience Panel.

Disease	Genes
Alcohol consumption	67
Alzheimer's Disease	139
Amphetamine addiction	42
Amyotrophic lateral sclerosis	28
Autism	126
Bipolar Disorder	110
Bulimia	90
Cocaine addiction	33
Depression	64
Epilepsy	54
Glioma	37
Long-term depression	43
Migraine Disorders	49
Multiple Sclerosis	137
Nicotine addiction	29
Parkinson's Disease	73
Psychiatric Disorders	126
Schizophrenia	248
Weight Gain	79

Table 3. Panel design highlights: disease genes. Selection of key disease categories included in the Neuroscience Panel.

Compatible products
Chromium Single Cell Gene Expression 10xgenomics.com/single-cell
Chromium Single Cell Immune Profiling 10xgenomics.com/vdj
Visium Spatial Gene Expression 10xgenomics.com/spatial-gene-expression

Products	Product code
Target Hybridization Kit, 16 rxns	1000248
Library Amplification Kit, 16 rxns	1000249
Human Neuroscience Panel, 4 rxns	1000277
Human Neuroscience Panel, 16 rxns	1000278
Custom Panel Designer bit.ly/10xgenomics-custom-designer	Visit Designer

Applications

- Identify distinct neural cell subtypes, their tissue localization, and their spatial relationships
- Map discrete neuroanatomical brain regions with rich transcriptomic data
- Refine spatial neuronal cell atlases by characterizing cell types at the transcriptomic level
- Decipher how neuropathology alters the brain microenvironment
- Characterize neuroinflammation and glial cell responses
- Investigate the relationship between neuroinflammation and pathological protein aggregates

Curated content sources

1. Brainspan — Atlas of the Developing Human Brain
2. O Naumova et al., Gene Expression in the Human Brain: The Current State of the Study of Specificity and Spatiotemporal Dynamics. *Child Dev.* 84, 76–88 (2013).
3. K Srinivasan et al., Untangling the Brain's Neuroinflammatory and Neurodegenerative Transcriptional Responses. *Nat. Commun.* 7, 11295 (2016).

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