Supplementary Material

Computational Analysis of Marker Genes in Alzheimer's Disease Across Multiple Brain Regions

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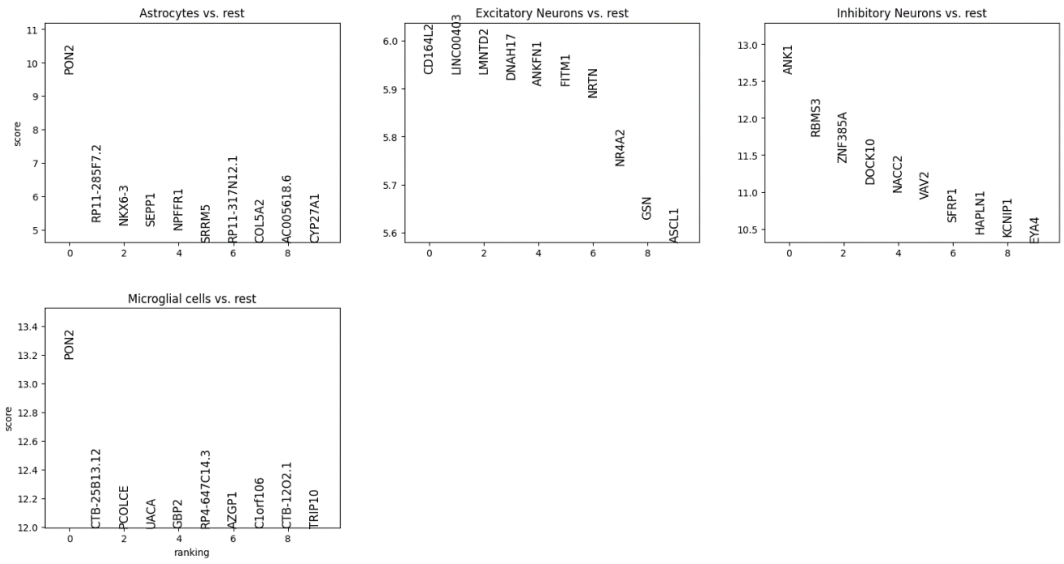


Figure S1. Differential expression of the top 10 ranked genes in each identified cell group compared to the rest, as analysed in the control dataset.

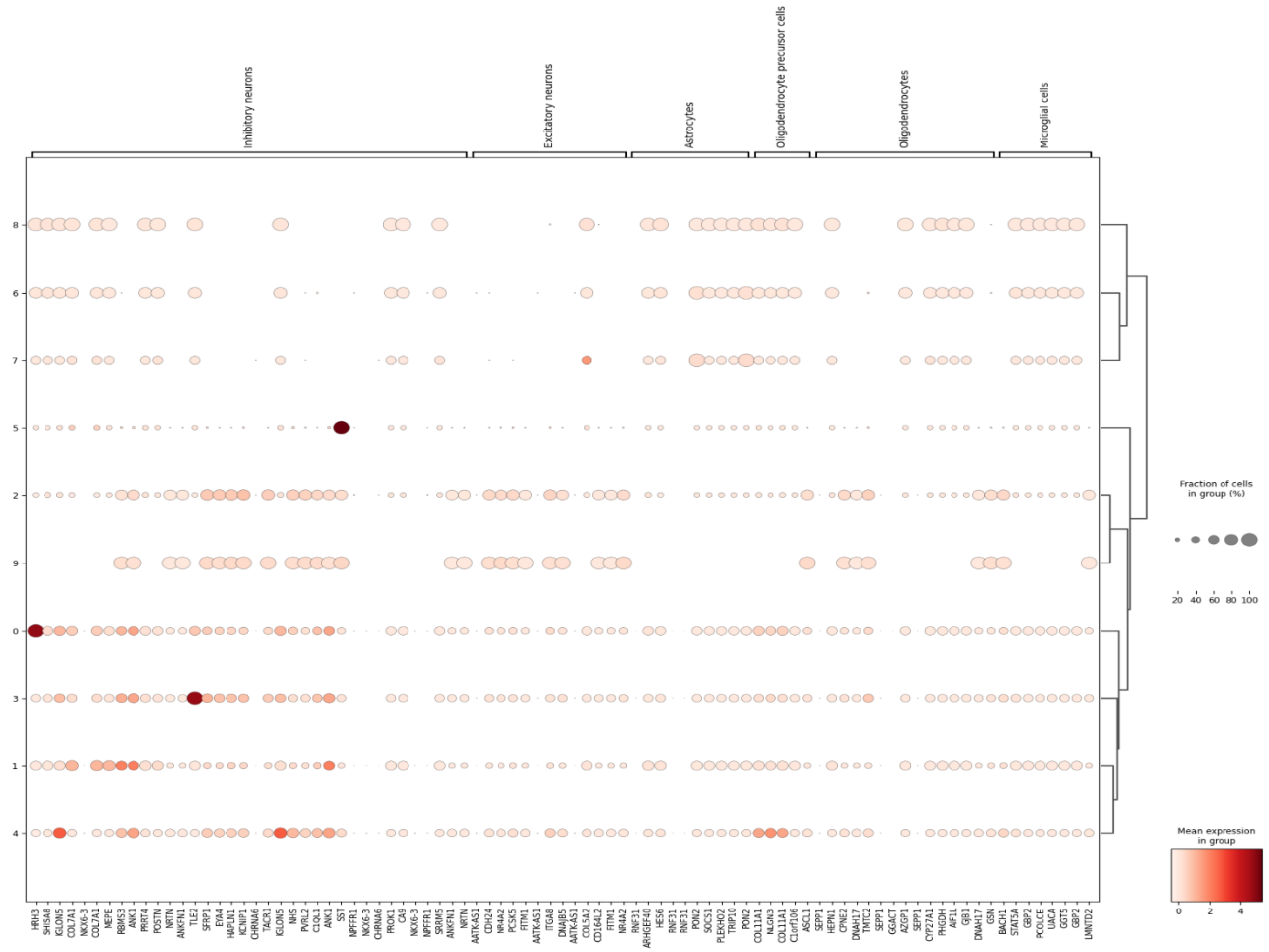


Figure S2. Dotplots show the cells category based on most expressed genes in the control group.

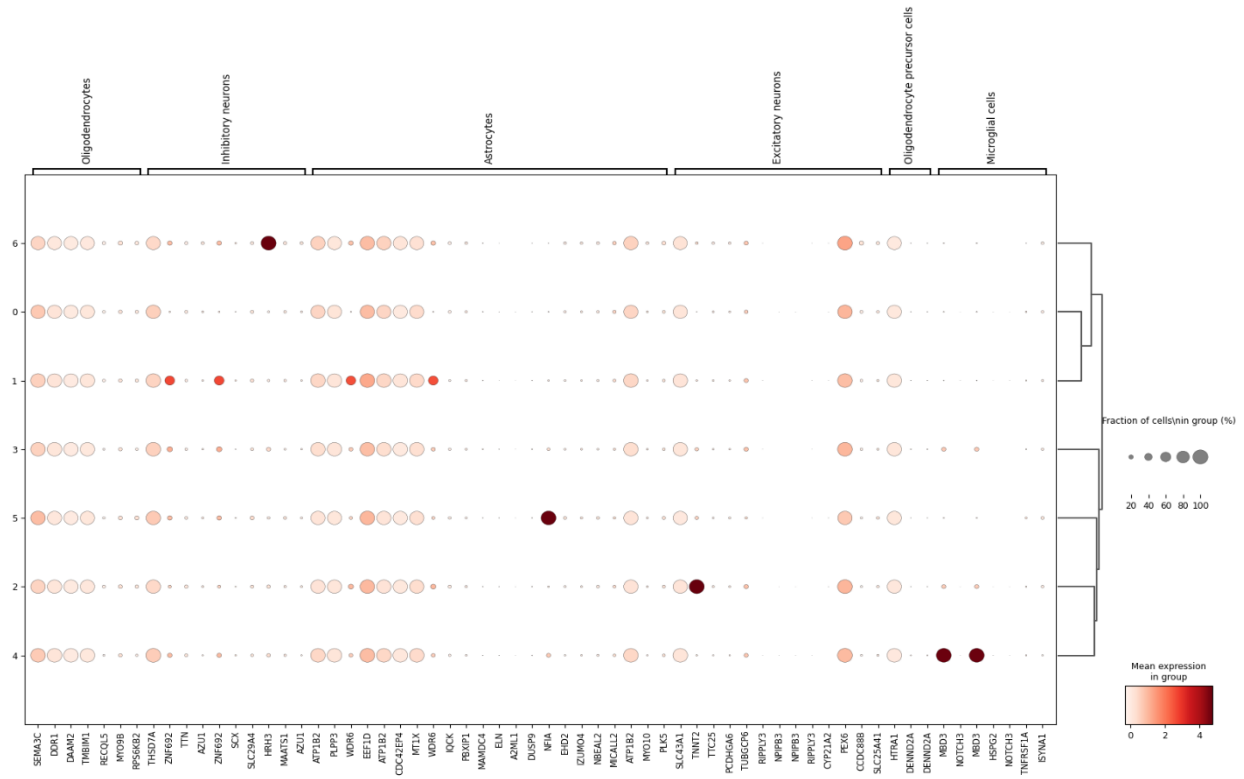
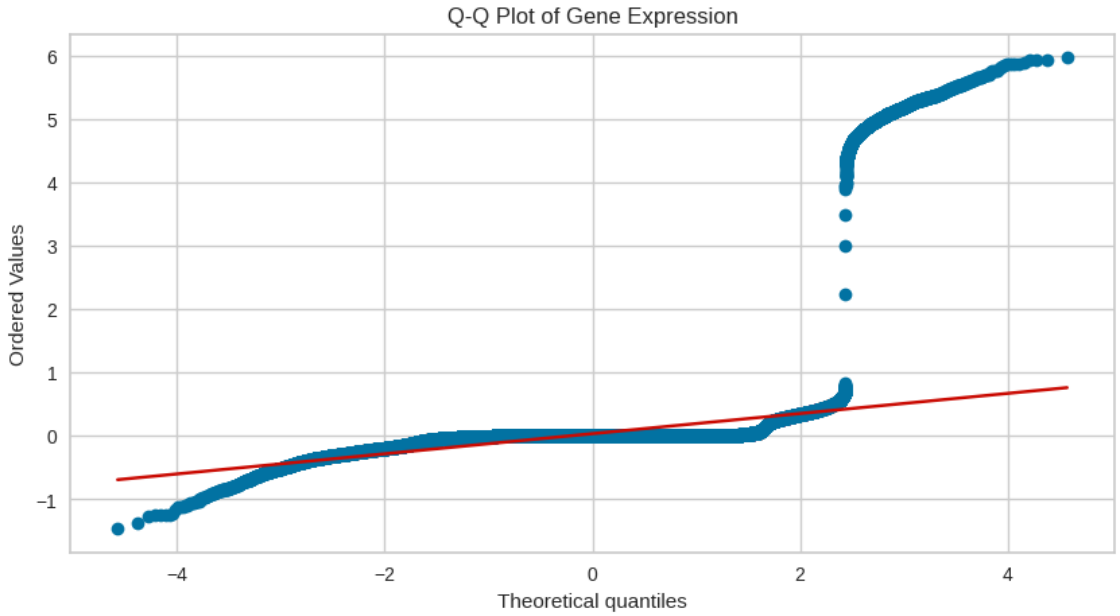


Figure S3. Dotplots show the cells category based on most expressed genes in the disease group.

A



B

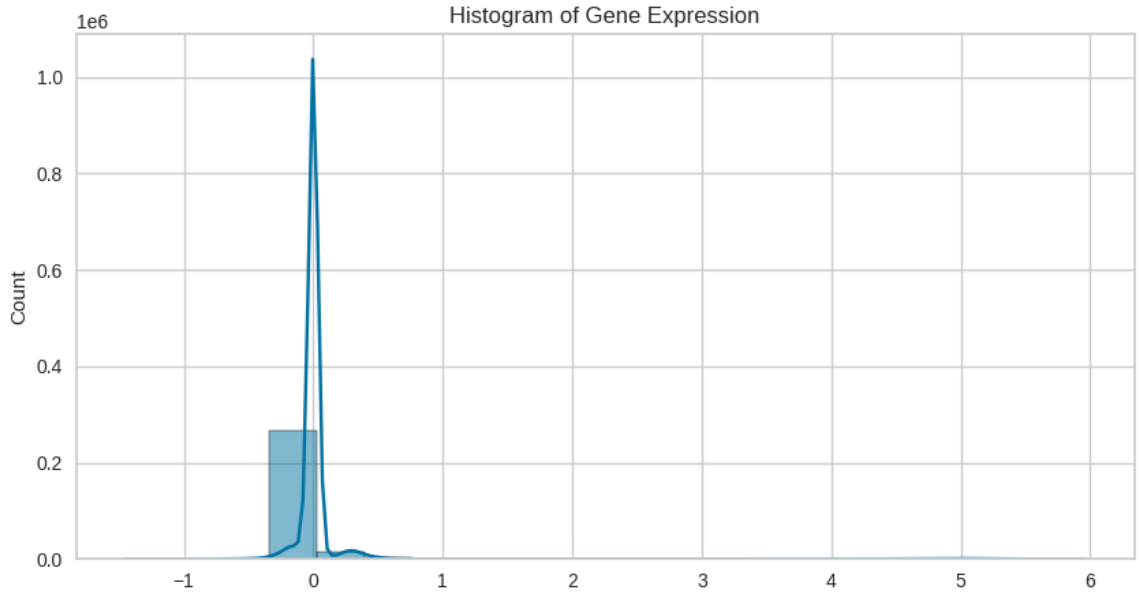


Figure S4. Q-Q plot and histogram justify the use of the Wilcoxon rank-sum test for differential gene expression analysis in our study. A. The Q-Q plot indicates significant deviations from the normal distribution, as the data points do not lie along the reference line. B. The histogram shows a sharp peak around zero with a rapid drop-off, indicating that most data points are concentrated near this value, which further supports the non-normality of the distribution.

Table S1. Pathways for upregulated genes

Table S1.1 Pathways for upregulated genes; GO Biological Process

Term	P-value	Genes
Response To Muscle Stretch (GO:0035994)	0.000048	GSN;TTN
Cardiac Muscle Contraction (GO:0060048)	0.000274	GSN;TTN
Positive Regulation Of Gene Expression (GO:0010628)	0.000362	CCDC88B;IL1A;GSN;TTN
Response To Metal Ion (GO:0010038)	0.001030	IL1A;TTN
Positive Regulation Of Protein Transport (GO:0051223)	0.001231	IL1A;TTN

Table S1.2 Pathways for upregulated genes; Reactome

Term	P-value	Genes
G Alpha (I) Signaling Events R-HSA-418594	0.001489	GRM4;SST;GPSM3
MECP2 Regulates Transcription Of Neuronal Ligands R-HSA-450225	0.005239	SST
Interleukin-1 Processing R-HSA-448706	0.006731	IL1A
Caspase-mediated Cleavage Of Cytoskeletal Proteins R-HSA-450271	0.008965	GSN
GPCR Downstream Signaling R-HSA-388396	0.010167	GRM4;SST;GPSM3

Table S1.3 Pathways for upregulated genes; WikiPathway Human

Term	P-value	Genes
Hormonal Control Of Pubertal Growth Spurt WP4194	0.003745	SST
Neuroinflammation And Glutamatergic Signaling WP4942	0.004812	IL1A;GRM4
Sudden Infant Death Syndrome SIDS Susceptibility WP2379	0.006012	IL1A;SST
Interleukin 1 Induced Activation Of NF kB WP3656	0.007476	IL1A
IL 10 Anti Inflammatory Signaling Pathway WP4495	0.008965	IL1A

Table S2. Pathways for downregulated genes

Table S2.1 Pathways for downregulated genes; GO Biological Process

Term	P-value	Genes
Leukocyte Apoptotic Process (GO:0071887)	0.003246	PLEKHO2
Glutathione Catabolic Process (GO:0006751)	0.004542	GGT5
Cellular Response To Platelet-Derived Growth Factor (GO:0036120)	0.005189	HDAC1
Brown Fat Cell Differentiation (GO:0050873)	0.005189	METRNL
Positive Regulation Of ERK1 And ERK2 Cascade (GO:0043410)	0.005823	CCR1;ROR1

Table S2.2 Pathways for upregulated genes; Reactome

Term	P-value	Genes
P75 NTR Receptor-Mediated Signaling R-HSA-193704	0.001683	HDAC1;ARHGEF40
Death Receptor Signaling R-HSA-73887	0.003557	HDAC1;ARHGEF40
p75NTR Negatively Regulates Cell Cycle Via SC1 R-HSA-6660235	0.003894	HDAC1
LTC4-CYSLTR Mediated IL4 Production R-HSA-9664535	0.004542	GGT5
MECP2 Regulates Transcription Of Neuronal Ligands R-HSA-450225	0.004542	HDAC1

Table S2.3 Pathways for upregulated genes; WikiPathway Human

Term	P-value	Genes
Wnt Signaling WP428	0.002411	ROR1;PLCB2
Chemokine Signaling Pathway WP3929	0.004971	CCR1;PLCB2
Valproic Acid Pathway WP3871	0.007774	HDAC1
Leukotriene Metabolic Pathway WP5171	0.008420	GGT5
GPR40 Pathway WP3958	0.009709	PLCB2