

Supplementary Table 8. Comprehensive comparison of gene expression patterns in human brain disorders and Shn-2 KO mice.

Shn-2 KO PFC		Homo Sapiens, mental or neuronal disorder, Postmortem brain, disease vs normal													
Disease	Study Name	Series ID	BioSet Name	Score	P value	Correlation	Common Genes	Positive Correlation				Negative Correlation			
								↑↑	P value	↓↓	P value	↑↓	P value	↓↑	P value
Schizophrenia	Post-mortem tissue from brain BA10 region of schizophrenic and control patients	GSE17612	Brain BA10 from all schizophrenic samples _vs_ controls above control group mean pH6.5	6	9.50E-14	+	100	34	6.1E-13	42	3.6E-16	16	0.0790	8	0.3047
Tuberous sclerosis	Gene expression in cortical tubers isolated from tuberous sclerosis complex patients	GSE16969	Postmortem cortical tuber tissue from tuberous sclerosis complex patients _vs_ unaffected	5	1.50E-11	+	275	84	3.5E-15	81	7.2E-09	68	0.5150	47	0.2073
HIV-associated neurocognitive disorders	Brain tissue from postmortem patients with HIV-associated neurocognitive disorders	GSE28160	Brains of HIV-associated neurocognitive disorder patients _vs_ healthy HIV-negative controls	5	2.80E-11	+	215	62	4.6E-15	65	2.5E-15	69	2.9E-07	25	0.5021
Alzheimer	Pyramidal cell gene expression from brain regions in Alzheimer's disease and normal aged brains	GSE5281	Pyramidal cells from primary visual cortex of Alzheimer patient brains _vs_ from aged normal brains	4	3.90E-10	+	272	69	4.8E-06	116	7.6E-15	63	0.9515	39	0.2483
Alzheimer	Alzheimer's disease with and without neurofibrillary tangles	GSE4757	Alzheimer's disease neurons - with neurofibrillary tangles _vs_ normal	3	2.50E-08	+	113	31	1.7E-07	43	5.9E-13	28	0.0007	12	0.2092
Autism spectrum disorder	Cerebellum, frontal cortex, and temporal cortex gene expression from ASD patients	GSE28521	Prefrontal cortex of autism spectrum disorder (ASD) patients _vs_ healthy donor	3	4.10E-08	+	58	24	3.1E-09	19	1.9E-07	10	0.6076	5	0.5696
Parkinson's disease	Substantia nigra and frontal gyrus brain regions in Parkinson's disease patients	GSE8397	Medial substantia nigra from Parkinson's disease patients _vs_ normal donors	3	4.90E-07	+	135	33	6.2E-05	56	1.3E-07	31	0.4574	15	0.7685
Huntingtons disease	Huntington's disease - Cerebellum, Caudate nucleus, Motor cortex BA4, and Prefrontal cortex BA9	GSE3790	Prefrontal Cortex BA9- Huntingtons disease grade 0 _vs_ control_GPL96	3	7.60E-07	-	65	9	0.1259	9	0.081	18	2.6E-05	29	2.3E-10
Schizophrenia	Neuroinflammatory pathways of different neurodegenerative diseases	GSE26927	Grey matter in Brodmann area of Schizophrenia patients _vs_ normal controls	2	3.70E-05	+	58	10	0.0550	11	0.2555	8	0.2638	29	7.5E-11
Schizophrenia	Prefrontal cortex gene expression in schizophrenic patients at different stages of illness	GSE21138	Prefrontal cortex Brodmann area 46 - schizophrenics with intermediate DOI _vs_ healthy controls	2	7.10E-05	+	77	14	0.0492	35	9.1E-10	18	0.3584	13	0.0247
Schizophrenia	Prefrontal cortex gene expression in schizophrenic patients at different stages of illness	GSE21138	Prefrontal cortex Brodmann area 46 - schizophrenics with long DOI _vs_ healthy controls	2	8.40E-05	+	19	3	0.0082	11	2.2E-08	3	0.1520	2	0.1674
Downs Syndrome	Downs Syndrome brains	GSE5390	Postmortem brain Downs syndrome _vs_ healthy controls	2	8.40E-05	+	165	62	0.0007	44	3.5E-07	40	0.0374	22	0.9379
Parkinson's disease	Substantia nigra gene expression in Parkinson's disease patients	GSE20292	Postmortem brain whole substantia nigra from Parkinsons disease patients _vs_ unaffected	1	9.00E-04	+	60	21	0.0029	22	3.9E-05	9	0.8082	8	0.1563
Alzheimer	Genetic control of human brain transcript expression in Alzheimer's disease	GSE15222	Cortical tissue from male Alzheimer's disease patients _vs_ male normal parietal cortex	2	0.0001	+	193	43	0.0174	66	8.3E-10	65	0.0014	24	0.5513
Alzheimer	Hippocampal gene expression from Alzheimer's disease patients of varying severity	GSE1297	Hippocampal CA1 from severe Alzheimer's disease patients (MMSE<14) _vs_ control (MMSE>25)	2	0.0002	+	98	22	0.0003	37	1.3E-07	30	0.0053	10	0.2200
Bipolar	Endothelial and neuronal cells from normal, bipolar, and schizophrenia patients	GSE12679	Neurons of dorsolateral prefrontal cortex of postmortem bipolar patients _vs_ control	2	0.0002	+	53	13	0.0012	23	9.0E-07	13	0.0578	5	0.3644
Parkinson's disease	Substantia nigra from Parkinson's disease patients	GSE7621	Substantia nigra from Parkinson disease patients _vs_ normal	1	0.001	+	102	32	0.1015	30	1.1E-06	16	0.8031	24	0.1307
Parkinson's disease	Substantia nigra of Parkinson's disease patients	GSE20164	Substantia nigra collected at autopsy from brains of Parkinsons disease patients _vs_ control	1	0.0012	+	25	11	5.7E-06	7	0.0466	6	0.2701	1	0.6529
Alzheimer	Hippocampus of Alzheimer's disease patients	GSE28146	CA1 hippocampal gray matter from patients with severe Alzheimers Disease _vs_ healthy control	1	0.0016	+	105	29	0.0006	35	2.4E-05	27	0.0522	17	0.1113
Parkinson's disease	Globus pallidus interna from postmortem brains of Parkinson's disease patients	GSE20146	Globus pallidus interna from Parkinsons disease patients _vs_ unaffected	1	0.0019	+	44	14	9.7E-05	13	0.0016	12	0.0776	5	0.5559
Alzheimer	Study of synaptic function and neuroplasticity in incipient AD	GSE12685	Synaptoneuroosomes from frontal cortex of Alzheimer's Disease patient with normal MMSE _vs_ control	1	0.0058	-	48	13	0.8230	2	0.5446	5	0.1514	28	0.0001
Bipolar	Human adult postmortem brain tissue from subjects with bipolar disorder	GSE5392	Orbitofrontal cortex from bipolar disorder subjects _CHGN vs healthy control	1	0.0092	+	67	16	0.0012	26	0.0049	14	0.9310	11	0.0786
Parkinson's disease	Brain regions affected and non-affected by Parkinson's disease (PD) in PD and normal patients	GSE28894	Frontal cortex of Parkinson's disease patients _vs_ normal subjects	1	0.0156	+	62	30	3.5E-05	8	0.3887	7	0.9333	18	0.0594

Parkinson's disease	Putamen gene expression in brains of Parkinson's disease patients	GSE20291	Postmortem brain putamen from male Parkinsons disease patients _vs_ unaffected	1	0.0193	+	16	4	0.1444	8	0.0007	2	0.4982	2	0.5243
Parkinson's disease	Substantia nigra pars compacta gene expression in neurons from Parkinson's disease patients	GSE20141	Substantia nigra pars compacta neurons from Parkinsons disease patients _vs_ control	1	0.0204	+	136	54	0.0003	30	0.1155	27	0.8151	32	0.1017
Parkinson's disease	Substantia nigra gene expression in Parkinsons disease patients	GSE20163	Substantia nigra of Parkinsons disease patients _vs_ unaffected individuals	1	0.0271	+	43	2	0.0424	20	8.5E-05	17	0.0534	4	0.0901
Schizophrenia	Cerebellum expression profile from schizophrenic patients	GSE4036	Cerebellum from schizophrenic patients _vs_ normal	1	0.0376	-	15	3	0.1070	2	0.2391	5	0.0071	5	0.0051
Alzheimer	Astrocyte gene expression in the aging brain related to Alzheimer's pathology and ApoE genotype	GSE29652	Astrocytes of Braak stage III-IV Alzheimers patients - APOE e4 positive _vs_ APO e4 negative	1	0.0415	-	7	1	1.0000	1	1.0000	6	0.0034	1	0.5127
Alzheimer	Non-amplified RNA microarray analysis and intra and inter-method reproducibility	GSE30945	Brain RNA non-amplified - Alzheimer patient _vs_ pooled normal donors	1	0.049	+	101	33	0.0012	24	0.1580	30	0.1177	15	0.6580
Schizophrenia	Prefrontal cortex expression profile of bipolar disorder, depression, and schizophrenia patients	GSE12654	Postmortem prefrontal cortex from patients with schizophrenia _vs_ control	1	0.0722	-	8	1	0.0981	0	1	6	0.0030	1	0.1675
Leison	White matter gene expression in lesion areas of patients with fulminant acute multiple sclerosis	GSE32915	White matter - initial lesions of patients with active MS _vs_ healthy controls	0	0.0817	-	90	5	0.6971	30	0.2787	48	0.0058	7	0.2252
Parkinson's disease	Imaging-guided microarray: Identifies molecular markers in the pathogenesis of Parkinson disease	GSE19587	Inferior olivary nucleus of postmortem brain - Parkinsons _vs_ healthy control	1	0.078	-	75	8	0.3639	18	0.0428	40	0.0021	10	0.0441
Parkinson's disease	Substantia nigra from Parkinsons disease patients with incidental Lewy body disease	GSE20159	Substantia nigra from Parkinson disease patients with incidental Lewy body disease _vs_ unaffected	0	0.0812	+	18	6	0.0065	5	0.2422	5	0.8081	2	0.2941
Alzheimer	mRNA expression in parietal lobe cortex in Alzheimer's disease	GSE16759	Parietal lobe of Alzheimers patients _vs_ healthy controls	0	0.148	+	39	15	0.0371	11	0.2241	9	0.5082	6	0.7473
Rett syndrome	Superior frontal gyrus of girls with Rett syndrome	GSE6955	Superior frontal gyrus from girls (2-8years old) with Rett syndrome _vs_ age matched controls	0	0.1526	-	4	1	0.3812	0	1	1	0.0596	2	0.1490
Bipolar	Adult postmortem brain tissue (dorsolateral prefrontal cortex) from bipolar disorder	GSE5388	Postmortem brain from patient with bipolar disease _vs_ healthy control	0	0.1618	+	18	2	0.2635	12	0.0154	3	0.8846	1	0.1754
Parkinson's disease	Dopamine neurons of substantia nigra pars compacta from Parkinsons disease patients	GSE24378	Dopamine neurons of substantia nigra pars compacta from Parkinsons disease patients _vs_ controls	0	0.1733	-	58	13	0.0019	12	0.3866	23	0.0069	11	0.0032
Trisomy 21 and 13	Trisomy 21 and 13 expression from fetal cerebrum, cerebellum, and heart	GSE1397	Fetal cerebrum with trisomy 21 _vs_ euploid	0	0.1737	+	16	4	0.3372	6	0.0579	2	0.8630	4	0.7497
	Prefrontal cortex expression profile of bipolar disorder, depression, and schizophrenia patients	GSE12654	Postmortem prefrontal cortex from patients with bipolar disorder _vs_ control	0	0.1854	-	2	0	1	0	1	2	0.0344	0	1.0000
ALS	Motor neurons from patients with SOD1-related amyotrophic lateral sclerosis (ALS)	GSE20589	Motor neurons from cervical spinal cords of ALS patients with SOD1 mutations _vs_ normal controls	0	0.2012	-	59	12	0.2937	18	0.1153	12	0.8851	18	0.0015
Parkinson's disease	Cerebellum gene expression in Parkinsons disease patients	GSE20314	Cerebellum of Parkinsons disease patients _vs_ unaffected individuals	0	0.5651	-	24	3	0.2976	7	0.0142	8	0.0436	6	0.0308
Major depression	Frontal cortex of HIV patients with and without major depressive disorder (MDD)	GSE17440	Frontal cortex of HIV patients with major depressive disorder _vs_ w-o major depressive disorder	0	0.5767	-	59	21	0.1309	9	0.1550	14	0.0087	16	0.7757
	Prefrontal cortex expression profile of bipolar disorder, depression, and schizophrenia patients	GSE12654	Postmortem prefrontal cortex from patients with depression _vs_ control												Not significant
Multiple sclerosis	Brain tissue from multiple sclerosis patients	GSE5839													Not significant

Multiple sclerosis	Expression data from patients presenting a first demyelinating event (early multiple sclerosis)	GSE19470	Not significant
ALS	Human motor neuron gene expression in individuals with CHMP2B mutations	GSE19332	Not significant

↑ ↑ genes up-regulated in both Shn-2 KO mice and brain disorder

↓ ↓ genes down-regulated in both Shn-2 KO mice and brain disorder

↑ ↓ genes in up-regulated Shn-2 KO mice and down-regulated in brain disorder

↓ ↑ genes in down-regulated Shn-2 KO mice and down-regulated in brain disorder