

SUPPLEMENTARY INFORMATION:

Table S1 : A comparative account of degree in 228 coexpressing genes in normal (CONT), unipolar depression (DEP), bipolar disorder (BPD) and schizophrenia (SCZ).

GENE	CONT	DEP	BPD	SCZ
<i>NRG1</i>	88	89	105	96
<i>DISC1</i>	69	108	69	72
<i>COMT</i>	82	78	87	73
<i>BDNF</i>	90	76	85	83
<i>ISLR</i>	67	76	97	94
<i>POMZP3</i>	68	88	78	87
<i>KRT17</i>	80	68	78	86
<i>POLR2A</i>	85	75	98	73
<i>PIK3R3</i>	74	77	83	104
<i>EML2</i>	70	71	75	76
<i>DSTYK</i>	74	71	87	72
<i>NFASC</i>	89	84	78	84
<i>IKBKAP</i>	80	85	83	102
<i>GCN1L1</i>	78	71	75	70
<i>DOTIL</i>	70	67	101	83
<i>TLX1</i>	67	85	74	74
<i>PPRC1</i>	69	74	103	79
<i>OR2F1</i>	76	72	80	70
<i>CPSF4</i>	81	70	107	86
<i>PXDN</i>	69	82	75	76
<i>PKD1</i>	67	76	101	76
<i>GOLGA3</i>	67	67	75	79
<i>REMI</i>	76	72	90	83
<i>TUBA3CDE</i>	86	82	79	91
<i>TUBA3CD</i>	108	78	102	90
<i>GNE</i>	73	77	70	79
<i>ARIH2</i>	69	71	97	70
<i>WDR45</i>	77	76	106	76
<i>SNRNP70</i>	82	68	73	78
<i>FBXO21</i>	73	75	75	71
<i>CYP2B6</i>	74	74	81	79
<i>KPNA6</i>	74	78	86	78
<i>COL4A4</i>	71	94	70	75

<i>PDPN</i>	75	80	83	79
<i>MRPL33</i>	75	71	91	75
<i>EFNA5</i>	71	70	71	94
<i>PSG9</i>	72	78	67	78
<i>SFRS16</i>	74	73	75	67
<i>CCT7</i>	76	81	90	73
<i>COL11A2</i>	78	68	80	74
<i>CNKSRI</i>	74	81	64	103
<i>CD9</i>	71	85	74	93
<i>EP400</i>	70	79	76	81
<i>AKAP8</i>	75	76	98	77
<i>SIVA1</i>	71	72	100	71
<i>IDO1</i>	85	76	69	84
<i>COX7A2L</i>	67	86	97	77
<i>SLC29A1</i>	75	83	73	94
<i>STX12</i>	73	87	95	92
<i>CSNK1E</i>	75	76	71	78
<i>CRKRS</i>	82	99	76	72
<i>TUBG1</i>	100	78	86	92
<i>IFNG</i>	77	70	82	85
<i>SUMO2-3</i>	73	95	89	103
<i>MTF1</i>	62	69	91	81
<i>ST3GAL6</i>	75	82	74	67
<i>COBRA1</i>	69	75	82	73
<i>CDV3</i>	82	105	77	101
<i>FOXH1</i>	64	74	86	79
<i>DPH1</i>	79	66	93	77
<i>HEG1</i>	89	71	78	75
<i>CYP2A7</i>	90	70	59	82
<i>BMP6</i>	80	61	82	81
<i>EI24</i>	82	76	74	91
<i>TBC1D4</i>	81	77	80	63
<i>RAP1GAP</i>	94	83	76	96
<i>NPTX1</i>	84	75	95	98
<i>FGFR1</i>	68	73	63	75
<i>SF3A2</i>	86	94	73	99
<i>VPS39</i>	78	86	99	67
<i>TNFRSF11A</i>	70	77	86	73

VAPB	115	79	90	96
TFF2	79	91	68	85
PARVB	85	80	93	92
CNOT8	68	73	74	79
PSMD4	74	77	93	88
AVIL	70	77	75	65
RPS6KA1	69	77	71	80
EIF2B4	86	73	85	78
NELL2	82	121	109	95
RABGGTA	75	80	71	102
PIP4K2A	78	75	86	89
PCDH17	72	79	74	70
PCMT1	78	88	96	106
NUP62	73	71	73	70
ATP6V1B2	82	89	96	84
HSF2	75	82	84	100
DGKD	83	67	77	78
PRPSAP1	80	91	76	89
RFC4	82	81	76	70
OSTF1	66	74	78	101
PTPRN	98	72	79	91
PVT1	81	74	77	65
PDE1A	66	67	102	70
MYBL1	91	76	76	87
ZNF507	83	71	61	81
STMN2	78	84	95	82
MAP3K8	85	66	85	70
HOXD1	63	73	78	74
PRPH	75	65	79	78
SMC4	65	60	84	82
MAPK8	74	66	85	67
PDK3	91	69	74	68
FYB	72	74	72	69
GABARAPL1	94	85	89	94
JMJD6	104	72	80	75
MC2R	98	77	66	77
COPB1	73	81	84	106
LMNB2	90	89	77	77

<i>PCGF2</i>	77	78	79	81
<i>RAC3</i>	97	79	81	80
<i>TLE4</i>	70	84	74	93
<i>DPT</i>	71	72	87	67
<i>TACC2</i>	71	79	104	92
<i>PRKAG1</i>	101	107	82	95
<i>PPAP2A</i>	75	84	76	86
<i>EPHB3</i>	100	103	72	68
<i>AMACR</i>	56	78	69	81
<i>ARPC4</i>	88	99	83	97
<i>RER1</i>	86	87	70	76
<i>MSC</i>	82	85	73	68
<i>HTR2A</i>	92	70	89	74
<i>CYB561D2</i>	77	74	80	70
<i>PKD2</i>	98	73	70	96
<i>SLC25A1</i>	95	71	77	86
<i>SREBF2</i>	88	100	86	85
<i>NCAPH2</i>	77	86	73	75
<i>NPTX2</i>	90	103	84	65
<i>ACOT8</i>	119	101	81	95
<i>POLG</i>	89	87	70	86
<i>AP4S1</i>	81	115	70	78
<i>UBE2S</i>	112	100	86	104
<i>RAD50</i>	98	99	88	95
<i>VCAN</i>	87	74	82	64
<i>FNTB</i>	92	75	66	80
<i>POLR2E</i>	90	80	92	102
<i>RPP30</i>	76	73	70	72
<i>HMGCR</i>	89	91	76	79
<i>CCL4</i>	83	79	77	72
<i>FDFT1</i>	83	69	83	79
<i>TLL1</i>	91	84	94	82
<i>TFDP1</i>	92	78	70	86
<i>MPV17</i>	111	84	82	80
<i>WNT7A</i>	87	89	84	69
<i>ZMYM4</i>	93	92	68	89
<i>HDAC5</i>	88	80	68	99
<i>RND2</i>	81	89	75	80

MAPK13	93	101	70	100
NCOR2	76	5	72	81
FABP3	76	80	73	70
RXRG	89	92	76	93
HIFX	100	112	98	96
CDIPT	107	95	69	92
GHMPB2	77	90	69	74
MPG	97	100	81	87
SH3BP1	109	107	81	84
RHOBTB2	94	101	75	72
IQCK	73	82	67	72
MRAS	66	79	83	74
ARHGEF15	72	70	62	80
EXDL2	77	89	89	83
SCP2	86	84	88	93
VEGFB	104	107	67	100
ZNF428	100	88	73	107
MMP15	74	79	76	68
OPA1	88	99	65	101
GNAI2	84	79	64	88
RGS12	90	106	72	87
LPCAT1	100	98	79	71
HTRA2	69	92	94	94
NEU1	102	91	90	88
IGF2BP3	71	78	71	65
MAST1	84	113	63	96
CUL7	78	78	82	75
DOC2A	99	122	75	101
CAMK1	87	101	67	88
NAV3	104	91	72	73
TOMM40	104	80	77	100
NCRNA00094	87	74	68	80
HSF1	89	83	79	91
NR1H2	74	64	76	87
AGPAT1	112	100	76	75
BTF3	82	74	73	73
CSNK1D	85	98	90	82
ZNF165	70	68	76	79

<i>APITDI</i>	99	82	68	72
<i>CSNK2A1</i>	98	77	81	84
<i>IHH</i>	74	76	73	88
<i>MRI</i>	54	64	70	73
<i>TUSC4</i>	124	91	85	100
<i>PPEF1</i>	108	96	81	86
<i>TRIP13</i>	72	74	77	67
<i>CDC34</i>	105	83	72	95
<i>ZNF175</i>	101	68	70	87
<i>TEK</i>	81	91	84	82
<i>KIR3DL2</i>	66	77	69	68
<i>RFC5</i>	69	75	80	78
<i>PPT2</i>	89	80	82	104
<i>LRBA</i>	86	97	72	92
<i>PRKACA</i>	95	75	78	76
<i>PPP1R15A</i>	104	80	73	72
<i>RASGRP2</i>	88	86	87	66
<i>SCAMP1</i>	106	102	67	99
<i>RAB3A</i>	93	89	70	89
<i>E2F6</i>	70	70	72	65
<i>MRPL19</i>	87	91	83	90
<i>RXRB</i>	81	73	83	73
<i>BCL2L1</i>	87	105	71	88
<i>CCNH</i>	86	101	87	97
<i>EFNA3</i>	83	78	82	86
<i>DRD5</i>	63	63	68	77
<i>PDGFRA</i>	73	76	89	83
<i>RARA</i>	73	79	84	82
<i>ARMC6</i>	105	79	69	87
<i>BAG2</i>	70	71	72	73
<i>ATN1</i>	81	65	78	76
<i>ARL3</i>	74	67	71	82
<i>DOK5</i>	88	97	102	85
<i>MMACHC</i>	72	63	76	74
<i>APOH</i>	83	64	69	69
<i>THEM2</i>	87	82	78	92
<i>ALDH3B2</i>	73	77	86	71
<i>KIF17</i>	72	89	67	93

<i>PPP4C</i>	88	77	74	82
<i>B3GALT4</i>	66	80	74	84
<i>AGGF1</i>	84	87	81	66
<i>ITGA9</i>	86	77	74	72
<i>HSPB3</i>	76	92	68	68

Table S2: A comparative account of the network properties of mental disorders.

Network property	Normal	Unipolar depression	Bipolar disorder	Schizophrenia
Diameter	0.01177	0.01269	0.00907	0.010355
Clustering coefficient	0.43078	0.45066	0.43158	0.43424
Density	0.36285	0.36026	0.35072	0.36235
No. of edges	9390	9323	9076	9377
Shortest path	0.00412	0.00418	0.00331	0.00415

Table S3: A comparative account of the degrees of nodes (genes) in the mental disorder networks.

Candidate gene	Normal	Unipolar depression	Bipolar disorder	Schizophrenia
<i>NRG1</i>	88	89	105	96
<i>DISC1</i>	69	108	69	72
<i>COMT</i>	82	78	87	73
<i>BDNF</i>	90	76	85	83

Table S4: A comparative account of the clustering coefficient of nodes (genes) in the mental disorder networks.

Candidate gene	Normal	Unipolar depression	Bipolar disorder	Schizophrenia
<i>NRG1</i>	0.46	0.44	0.48	0.45
<i>DISC1</i>	0.40	0.48	0.45	0.37
<i>COMT</i>	0.42	0.34	0.44	0.43
<i>BDNF</i>	0.44	0.47	0.42	0.42

Table S5: A comparative account of the closeness of nodes (genes) in the mental disorder networks.

Candidate gene	Normal	Unipolar depression	Bipolar disorder	Schizophrenia
<i>NRG1</i>	0.62	0.62	0.65	0.63
<i>DISC1</i>	0.59	0.65	0.58	0.59
<i>COMT</i>	0.61	0.60	0.62	0.59
<i>BDNF</i>	0.62	0.60	0.61	0.61

Table S6: The first-neighbors of the *NRG1* gene in different disease condition. The genes indicated in the bold are common with the *COMT*, *BDNF* and *DISC1* in a particular disease condition.

CONTROL	DEP+BPD+SCZ	BPD+SCZ	SCZ
<i>BDNF</i>	<i>COMT</i>	<i>POLR2A</i>	<i>GOLGA3</i>
<i>HOXD1</i>	<i>PKD1</i>	<i>PIK3R3</i>	<i>EP400</i>
<i>PCGF2</i>	<i>TUBA3C</i>	<i>DOT1L</i>	<i>SLC29A1</i>
<i>EPHB3</i>	<i>CD9</i>	<i>REM1</i>	<i>FOXH1</i>
<i>CYB561D2</i>	<i>DPH1</i>	<i>ARIH2</i>	<i>CYP2A7</i>
<i>NPTX2</i>	<i>VPS39</i>	<i>AKAP8</i>	<i>BMP6</i>
<i>AP4S1</i>	<i>OSTF1</i>	<i>COX7A2A</i>	<i>SF3A2</i>
<i>FNTB</i>	<i>SLC25A1</i>	<i>SUMO</i>	<i>AVIL</i>
<i>WNT7A</i>	<i>MRAS</i>	<i>DPT</i>	<i>ZNF507</i>
<i>GHMPB2</i>	<i>ARMC6</i>	<i>HIFX</i>	<i>RERI</i>
<i>IGF2BP3</i>	<i>AGGF1</i>		<i>MSC</i>
<i>DOC2A</i>			<i>PDK2</i>
<i>NAV3</i>			<i>CCL4</i>
<i>ATN1</i>			<i>RHOBTB2</i>
<i>ARL3</i>			<i>IQCK</i>
<i>ITGA9</i>			<i>CDC34</i>
<i>HSBP3</i>			<i>ZNF175</i>
			<i>PPT2</i>
			<i>MRPL19</i>
			<i>BAG2</i>
			<i>MMACHC</i>
			<i>APOH</i>

Table S7: The first-neighbors of the *DISC1* gene in different disease condition. The genes indicated in the bold are common with the *COMT*, *BDNF* and *NRG1* in a particular disease condition.

CONTROL	DEP+BPD+SCZ	BPD+SCZ	SCZ
<i>IDO1</i>	<i>TLX1</i>	<i>WDR45</i>	<i>COMT</i>
<i>EIF2B4</i>	<i>PXDN</i>	<i>PBX021</i>	<i>DSTYK</i>
<i>PRPSAP1</i>	<i>PKD1</i>	<i>COL11A2</i>	<i>TUBA3C</i>
<i>OSTF1</i>	<i>CYP2B6</i>	<i>TBC1D4</i>	<i>HEG1</i>
<i>PDE1A</i>	<i>AVIL</i>	<i>FGFR1</i>	<i>STMN2</i>
<i>JMJD6</i>	<i>RPS6KA1</i>	<i>GNA12</i>	<i>PPAP2A</i>
<i>COPB1</i>	<i>LMNB2</i>	<i>IGF2BP3</i>	<i>SLC25A2</i>
<i>RAC3</i>	<i>TACC2</i>	<i>PPP1R15A</i>	<i>HDAC5</i>
<i>MMP15</i>	<i>PDK2</i>		<i>MRAS</i>
<i>LPCAT1</i>	<i>ZNF428</i>		<i>ZNF165</i>
<i>IHH</i>	<i>HTRA2</i>		<i>CSNK2A1</i>
	<i>PPEF1</i>		<i>MR1</i>
			<i>CDC34</i>
			<i>E2F6</i>
			<i>MMACHC</i>
			<i>PPP4C</i>

Table S8: The first-neighbors of the *COMT* in different disease condition. The genes indicated in the bold are common with the *DISC1*, *BDNF* and *NRG1* in a particular disease condition.

CONTROL	DEP+BPD+SCZ	BPD+SCZ	SCZ
<i>PIK3R3</i>	<i>NRG1</i>	<i>CPSF4</i>	<i>DISC1</i>
<i>NFASC</i>	<i>FOXH1</i>	<i>MRPL33</i>	<i>BDNF</i>
<i>DOT1L</i>	<i>PIP4K2A</i>	<i>NPTX1</i>	<i>POMZP3</i>
<i>TLX1</i>	<i>PDK2</i>	<i>TNFRSF11A</i>	<i>EFNA5</i>
<i>TUBA3CDE</i>	<i>TEK</i>	<i>PARVB</i>	<i>STX12</i>
<i>IDO1</i>	<i>MMACHC</i>	<i>OSTF1</i>	<i>SF3A2</i>
<i>TBC1D4</i>		<i>RAD50</i>	<i>MYBL1</i>
<i>CNOT8</i>		<i>WNT7A</i>	<i>STMN2</i>
<i>HSF2</i>		<i>HDAC5</i>	<i>MAP3K8</i>
<i>PRPSAP1</i>		<i>NR1H2</i>	<i>COPB1</i>
<i>PDK3</i>		<i>ZNF165</i>	<i>LMNB2</i>
<i>JMJD6</i>		<i>B3GALT4</i>	<i>PCGF2</i>
<i>TLE4</i>			<i>HTR2A</i>
<i>DPT</i>			<i>ARHGEF15</i>
<i>PPAP2A</i>			<i>AGPAT1</i>
<i>EPHB3</i>			<i>APITD1</i>
<i>POLR2E</i>			<i>CSNK2A1</i>
<i>MPV17</i>			<i>PPEF1</i>
<i>OPA1</i>			<i>BCL2L1</i>
<i>LPCAT1</i>			<i>CCNH</i>
<i>TOMM40</i>			<i>DRD5</i>
<i>KIR3DL2</i>			

Table S9: The first-neighbors of the *BDNF* in different disease condition. The genes indicated in the bold are common with the *DISC1*, *COMT* and *NRG1* in a particular disease condition.

CONTROL	DEP+BPD+SCZ	BPD+SCZ	SCZ
<i>NRG1</i>	<i>DOTIL</i>	<i>SFRS16</i>	<i>COMT</i>
<i>INBKAP</i>	<i>PVT1</i>	<i>FYB</i>	<i>GCN1L1</i>
<i>GNE</i>	<i>FNTB</i>	<i>RPP30</i>	<i>GOLGA3</i>
<i>COX7A2L</i>	<i>RFC5</i>	<i>ARHGEF15</i>	<i>ARIH2</i>
<i>TUBG1</i>	<i>ATN1</i>	<i>PPT2</i>	<i>SNRNP70</i>
<i>VAPB</i>	<i>MMACHC</i>		<i>FBX021</i>
<i>ATP6VIB2</i>			<i>CYP2B6</i>
<i>HSF2</i>			<i>CD9</i>
<i>STMN2</i>			<i>MTF1</i>
<i>PPAP2A</i>			<i>COBRA1</i>
<i>TFDP1</i>			<i>CDV3</i>
<i>HDAC5</i>			<i>SF3A2</i>
<i>BCL2L1</i>			<i>VPS39</i>
<i>AGGF1</i>			<i>RPS6KA1</i>
<i>ITGA9</i>			<i>RABGGTA</i>
			<i>PTPRN</i>
			<i>SMC4</i>
			<i>SH3BP1</i>
			<i>VEGFB</i>
			<i>PPP4C</i>

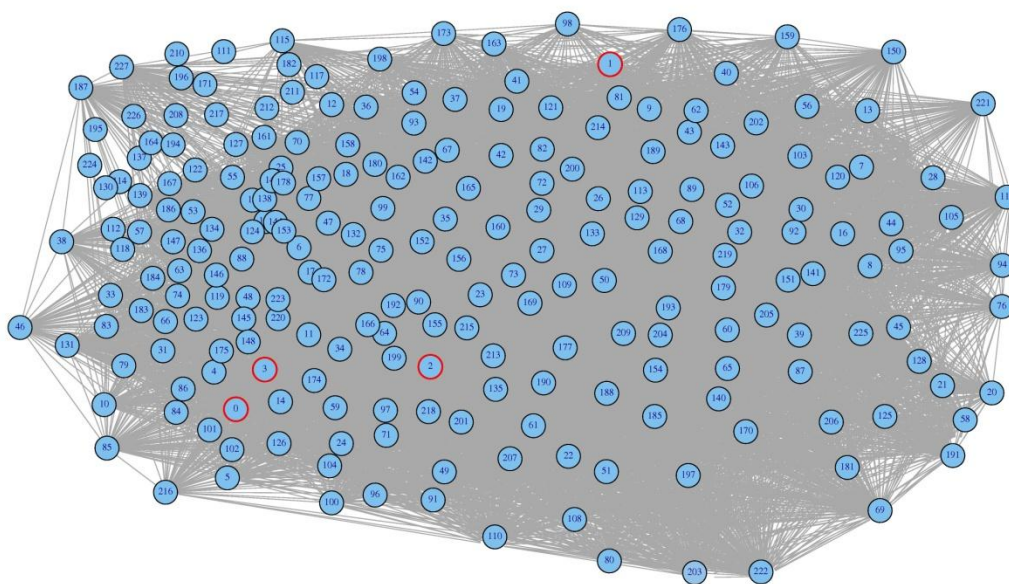


Figure S1: The gene coexpression normal network.

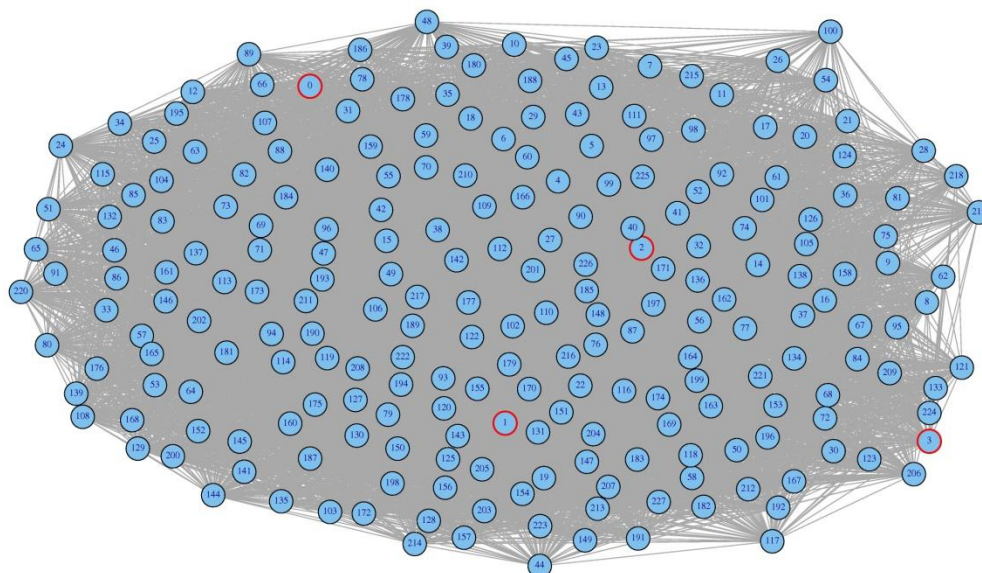


Figure S2: The gene coexpression unipolar disorder network.

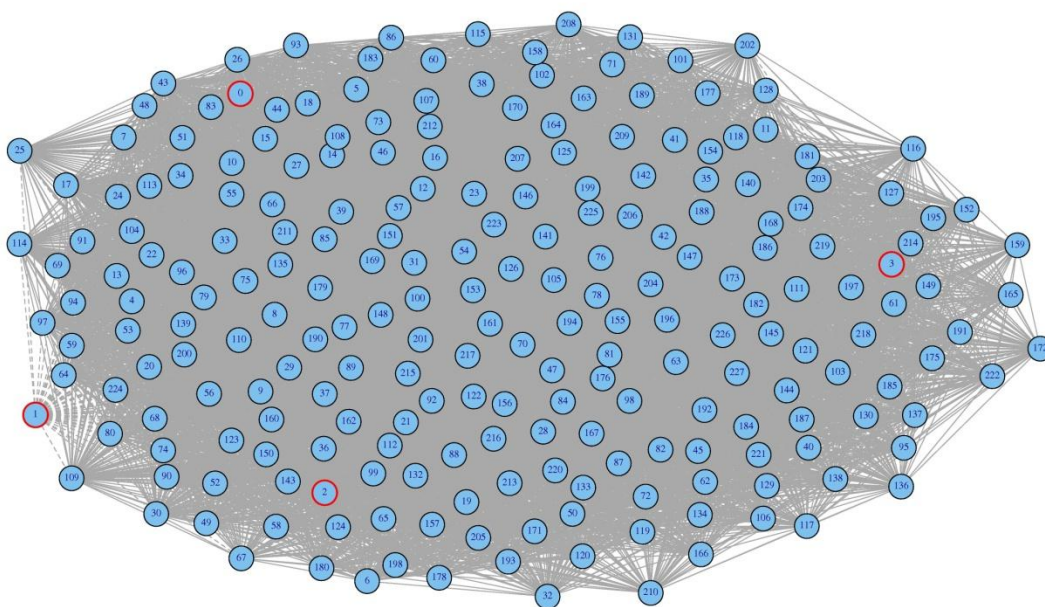


Figure S3: The gene coexpression bipolar disorder network.

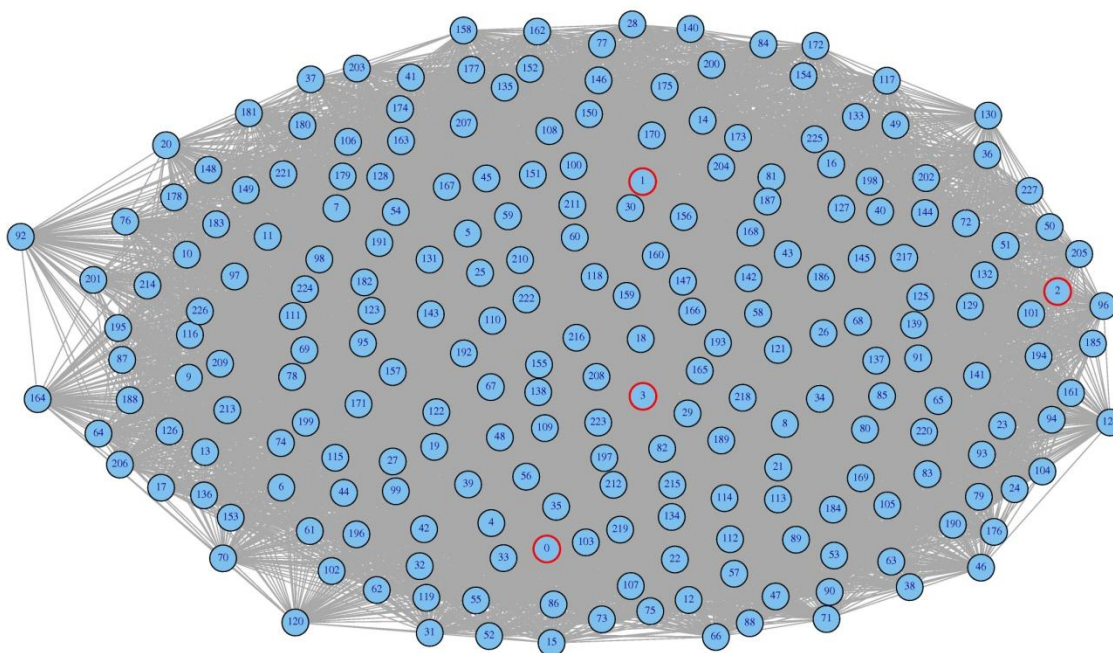


Figure S4: The gene coexpression schizophrenia network.