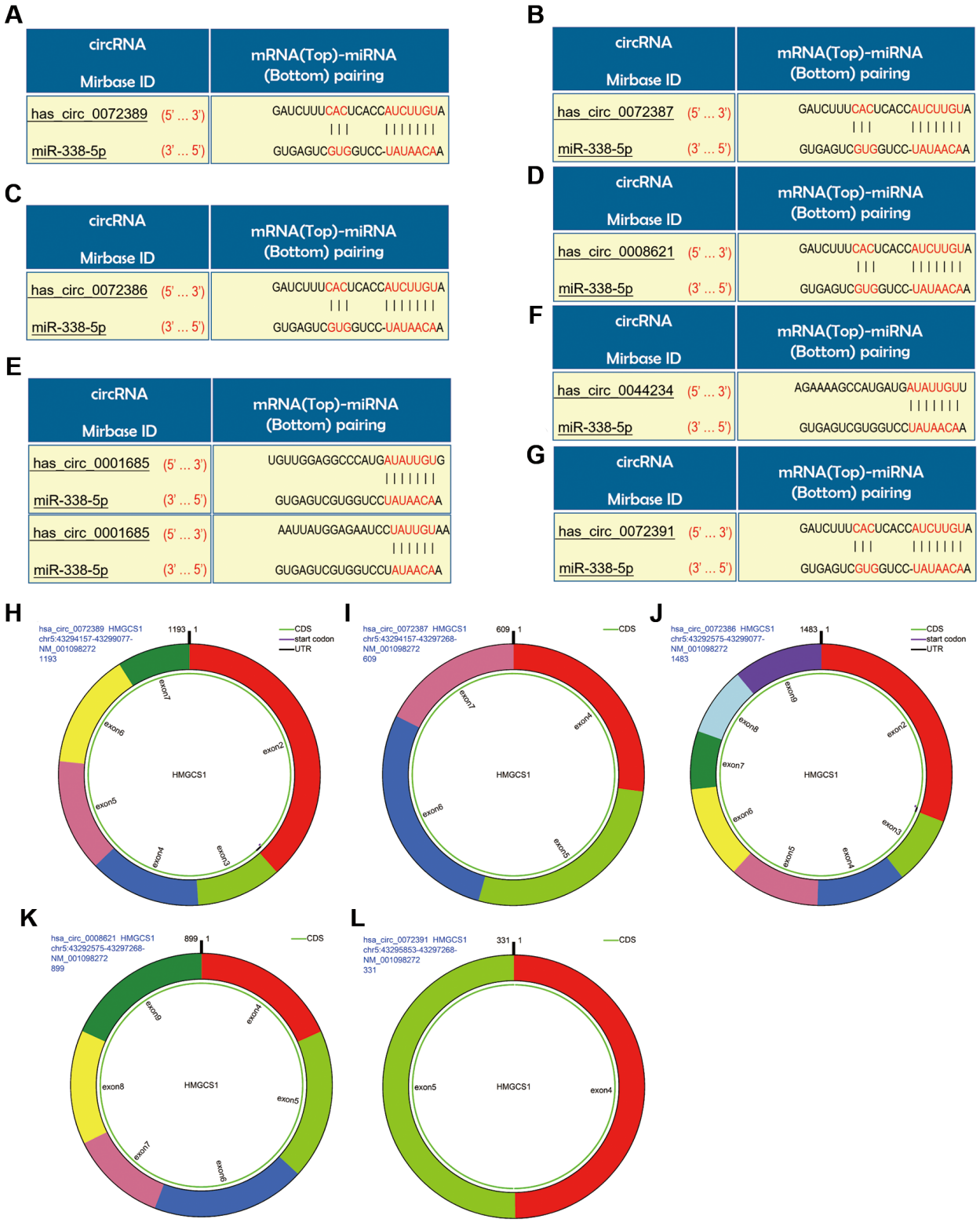
SUPPLEMENTARY FIGURES



Supplementary Figure 1. (**A**–**G**) Binding site between hsa_circ_0072389, hsa_circ_0072386, hsa_circ_0008621, hsa_circ_0072387, hsa_circ_0072391, hsa_circ_0044234, hsa_circ_0001685 with miR-338-5p. (**H**–**L**) Exon composition, host gene information, chromosome location information of hsa_circ_0072389, hsa_circ_0072386, hsa_circ_0008621, hsa_circ_0072387, hsa_circ_0072391.

hsa_circ_0072389

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hsa_circ_0072387

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hsa_circ_0072386

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hsa_circ_0008621

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hsa_circ_0072391

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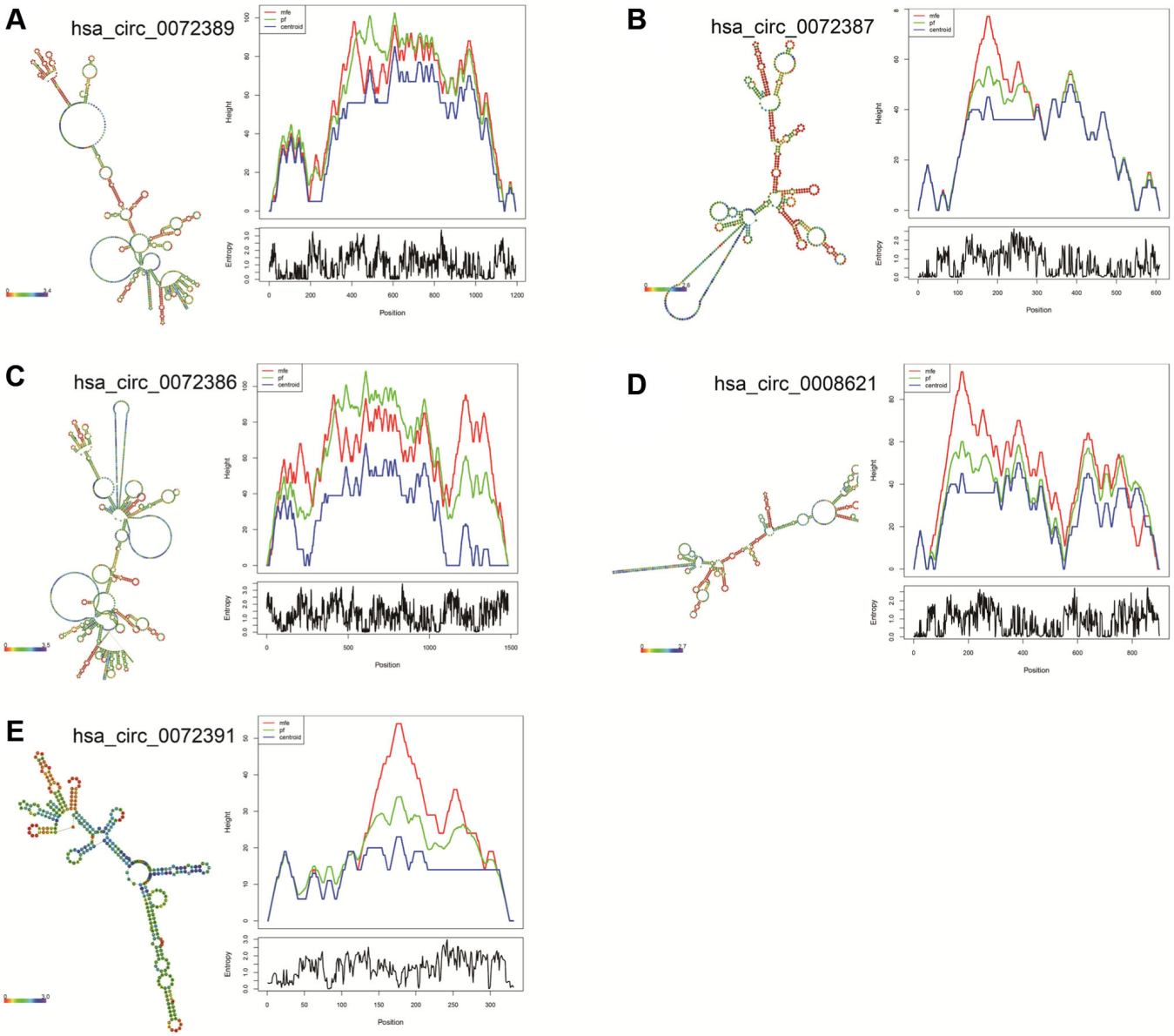
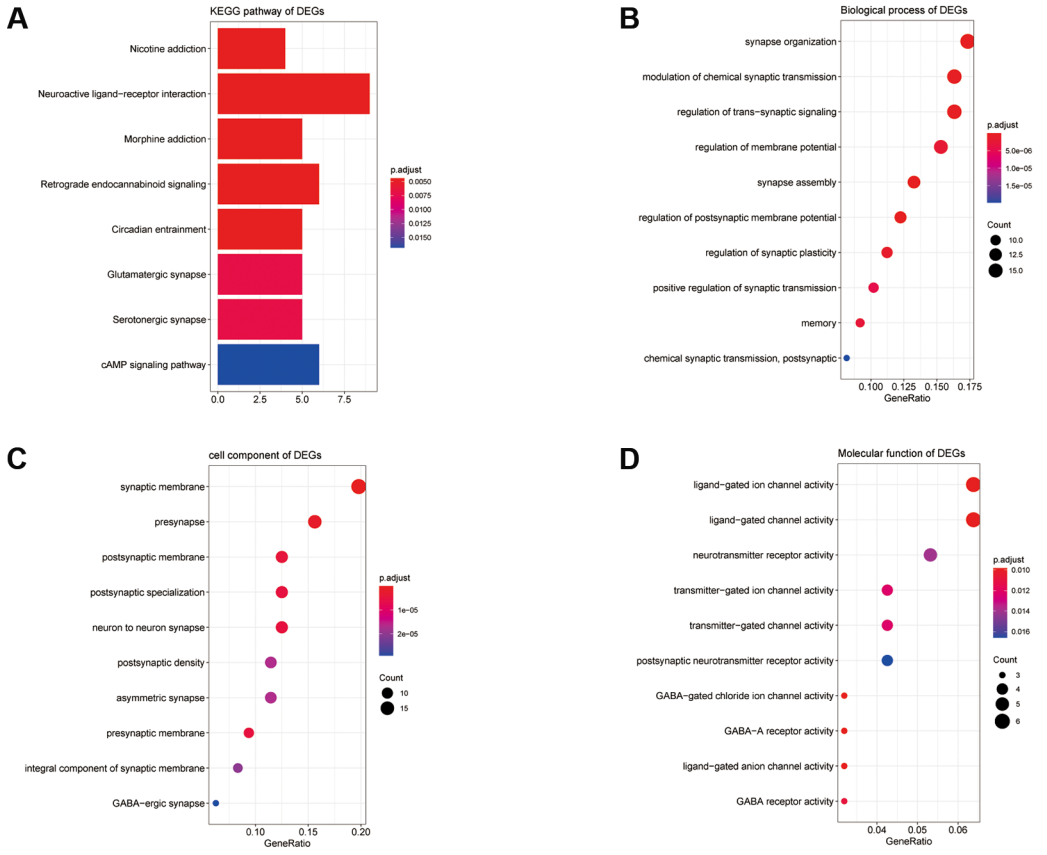
Supplementary Figure 2. The sequence of hsa_circ_0072389, hsa_circ_0072387, hsa_circ_0072386, hsa_circ_0008621, hsa_circ_0072391.



Supplementary Figure 3. The secondary structure and minimum free energy (MFE) structure of (**A**) hsa_circ_0072389, (**B**) hsa_circ_0072387, (**C**) hsa_circ_0072386, (**D**) hsa_circ_0008621, (**E**) hsa_circ_0072391.



E

circRNA Mirbase ID		mRNA(Top)-miRNA (Bottom) pairing
IKBIP	(3' ... 5')	UUAAUUUCACCUAUUAUAUUGUA
		||||||||
miR-338-5p	(5' ... 3')	GUGAGUCGUGGUCCUAUAACAA

F

mRNA Mirbase ID		mRNA(Top)-miRNA (Bottom) pairing
CCBE1	(3' ... 5')	UCUAGUAGACUUUAAAUAUUGUA
		||||||||
miR-338-5p	(5' ... 3')	GUGAGUCGUGGUCCUAUAACAA

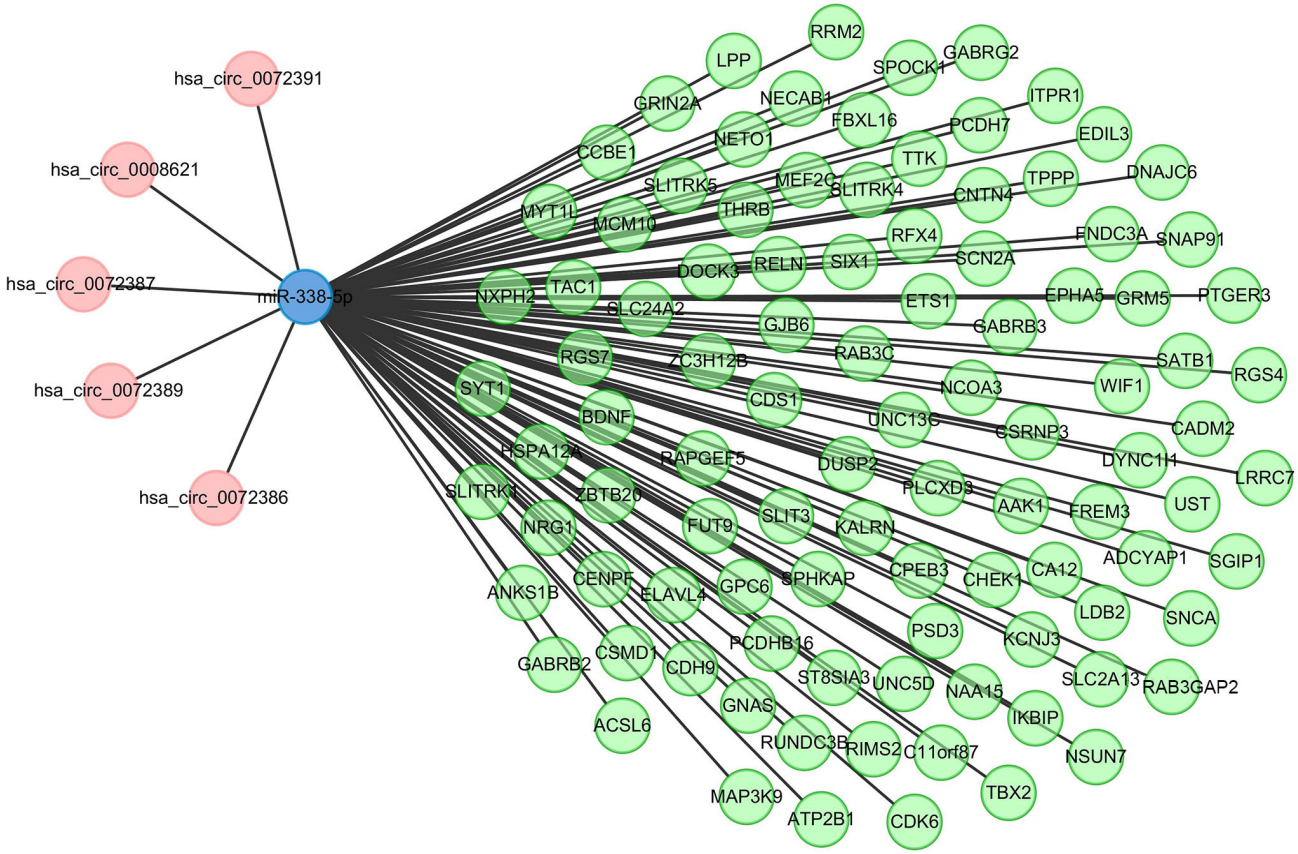
G

mRNA Mirbase ID		mRNA(Top)-miRNA (Bottom) pairing
RGS4	(3' ... 5')	CGUGUUAUUAUUAUUAUAUUGUU
		|||||||||
miR-338-5p	(5' ... 3')	GUGAGUCGUGGUCCUAUAACAA
RGS4	(3' ... 5')	GAAAGUACAAACUGAAUAUUGUU
		|||||||||
miR-338-5p	(5' ... 3')	GUGAGUCGUGGUCCUAUAACAA

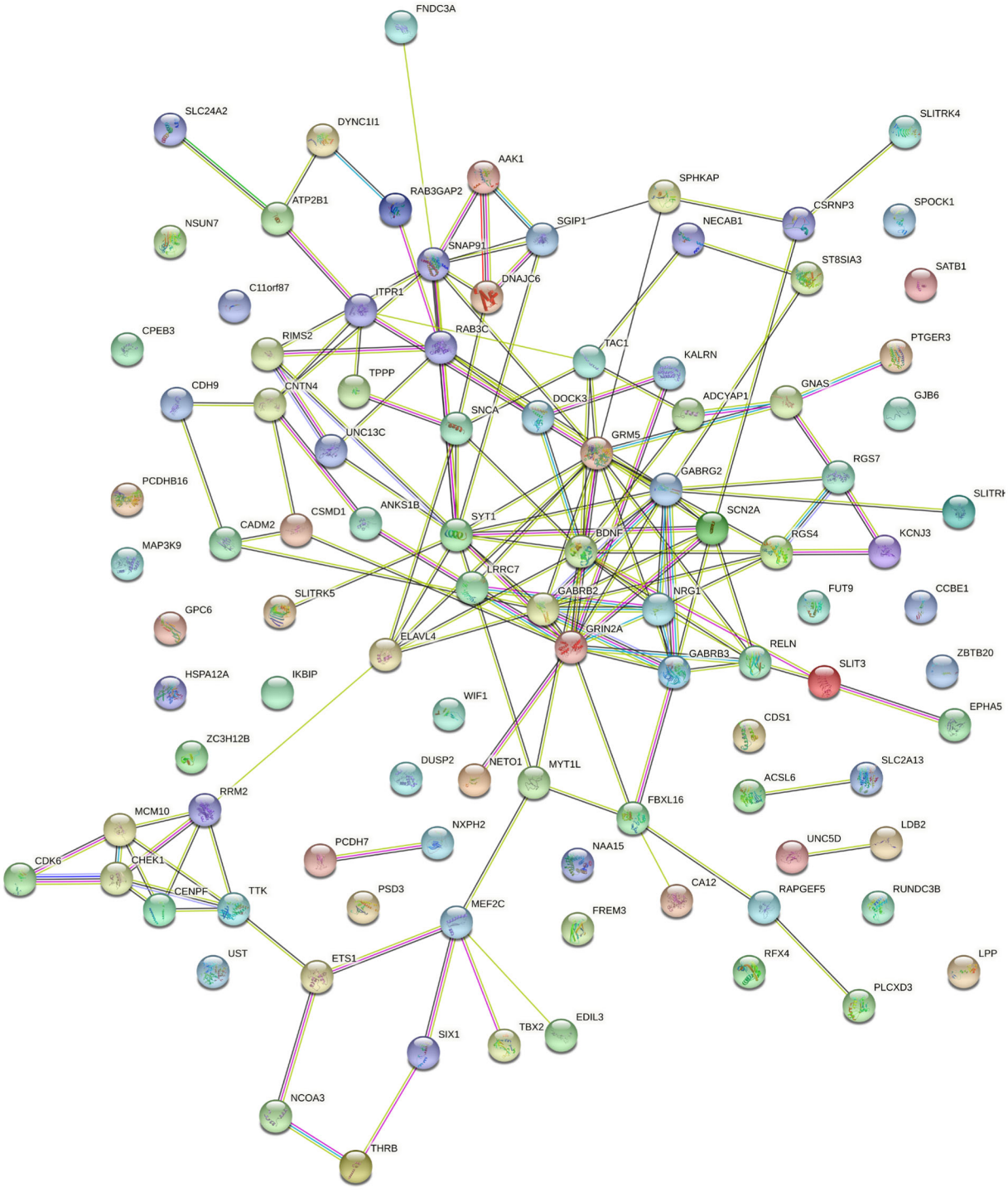
H

mRNA Mirbase ID		mRNA(Top)-miRNA (Bottom) pairing
NRG1	(3' ... 5')	UCAUCUCCAGUGAGCAUAUUGUU
		|||||||||
miR-338-5p	(5' ... 3')	GUGAGUCGUGGUCCUAUAACAA
NRG1	(3' ... 5')	UUCUUUUGUAAAUACAUAUUGUA
		||||||
miR-338-5p	(5' ... 3')	GUGAGUCGUGGUCCUAUAACAA

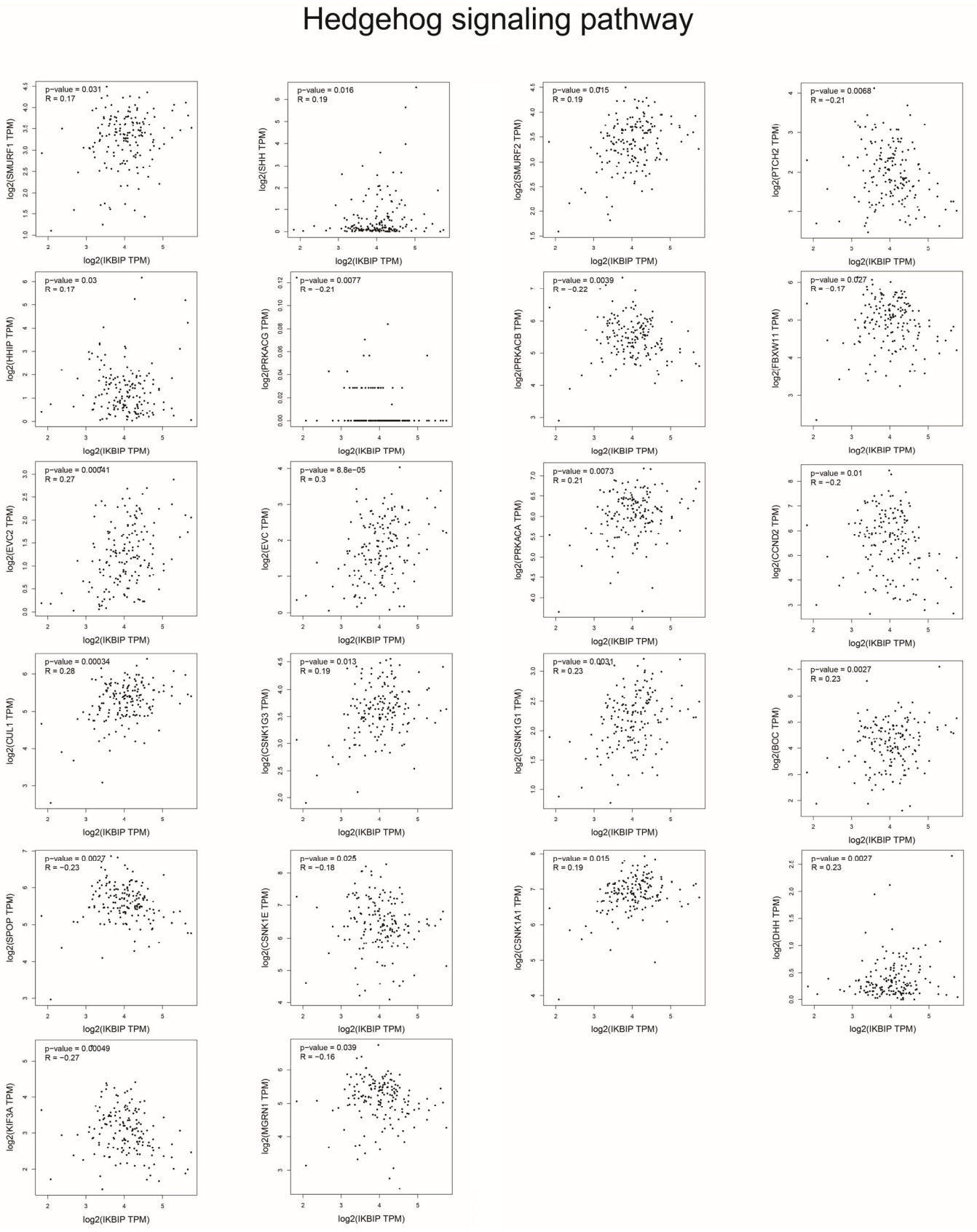
Supplementary Figure 4. (**A**) Pathways involved in the 100 mRNAs analysis by KEGG. (**B**–**D**) Biological process, cell component, and molecular function of the 100 mRNAs by GO analysis. (**E**–**H**) Binding site between CCBE1, IKBIP, NRG1, and RGS4 with miR-338-5p.



Supplementary Figure 5. circRNA-miRNA-mRNA network about hsa_circ_0072389, hsa_circ_0072386, hsa_circ_0008621, hsa_circ_0072387, hsa_circ_0072391, miR-338-5p, and the 100 mRNAs that might bind to miR-338-5p.

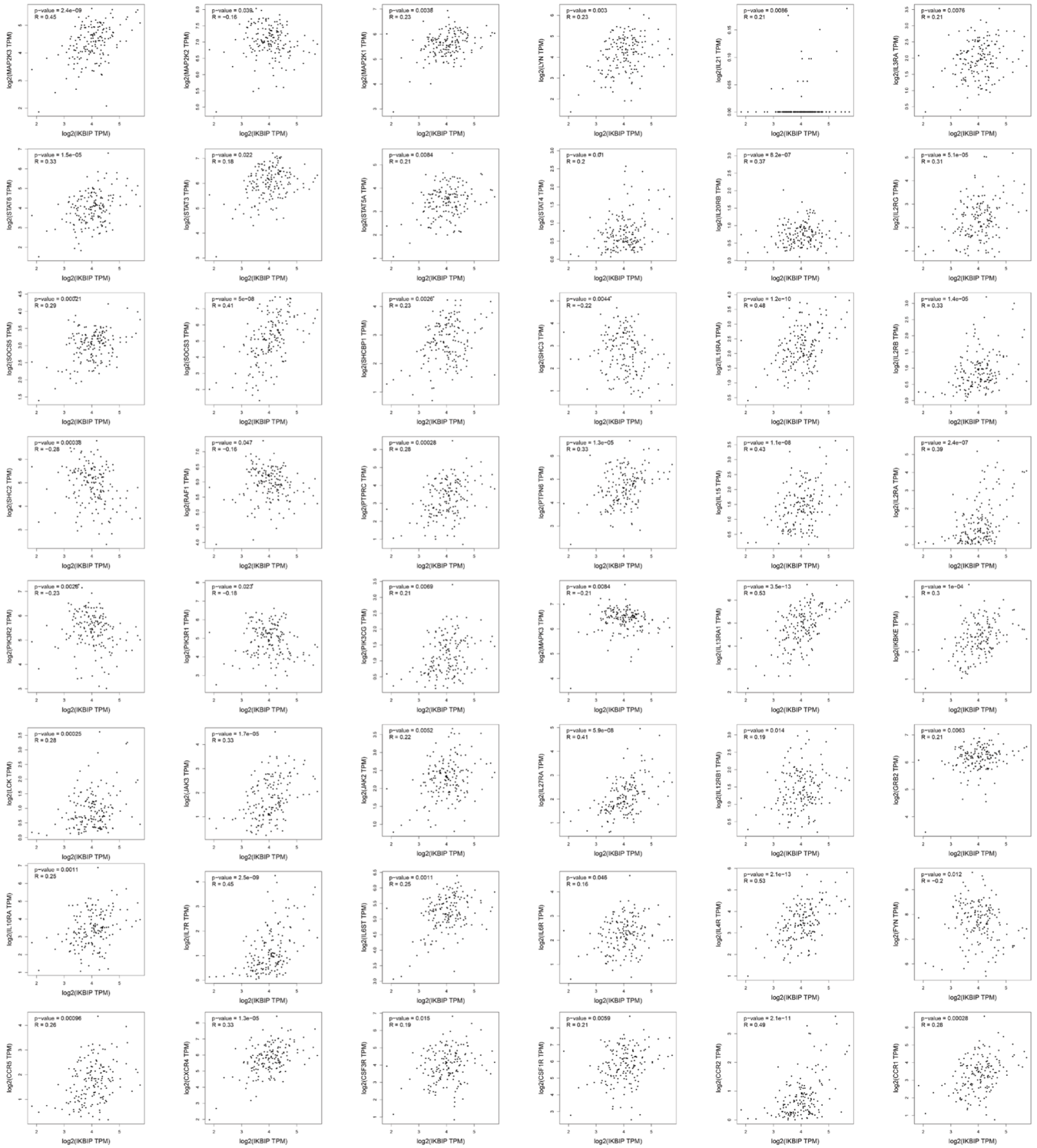


Supplementary Figure 6. PPI network about 100 mRNAs that might bind to miR-338-5p.

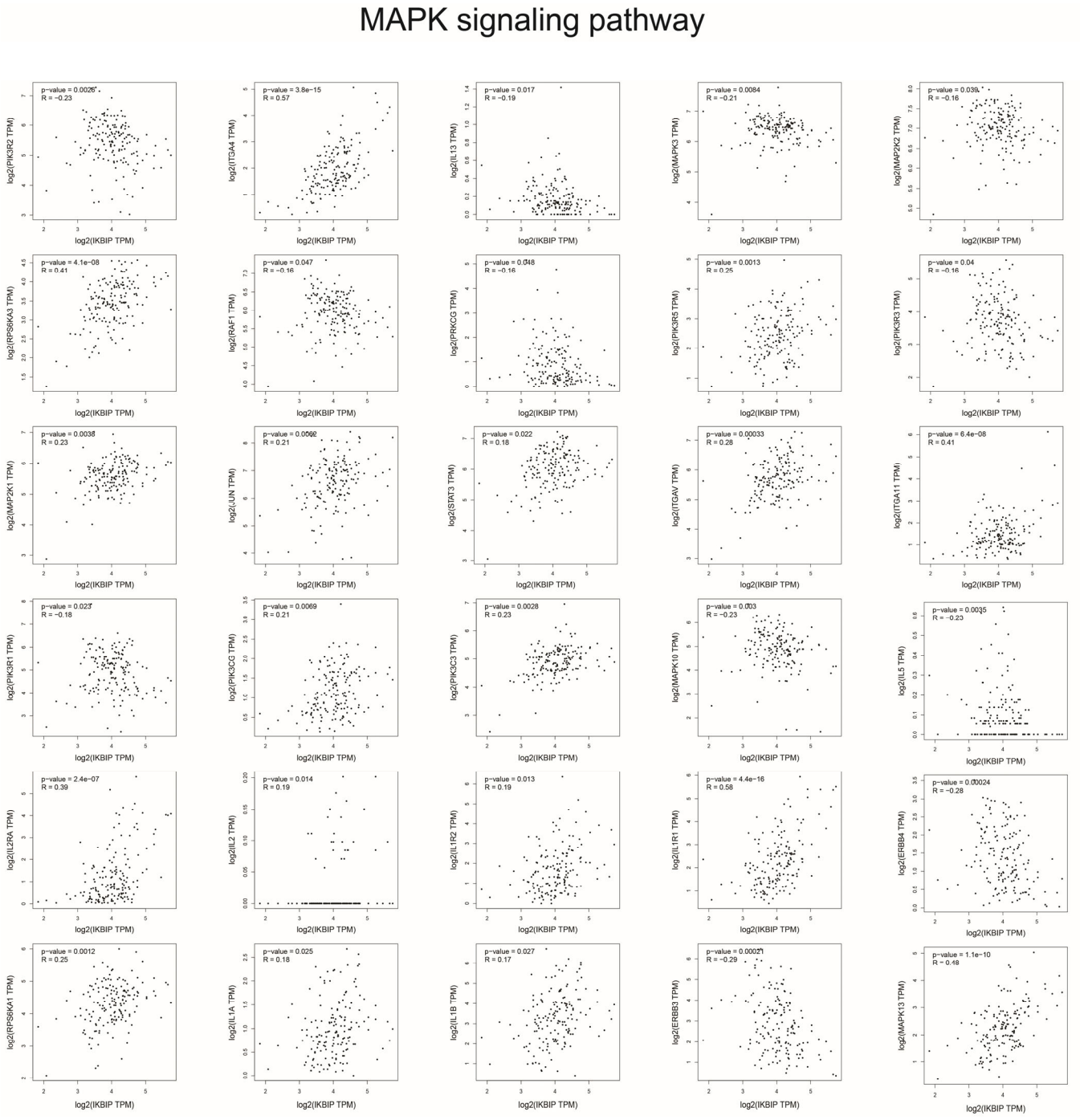


Supplementary Figure 7. Scatter plot shown genes in Hedgehog signaling pathway related to IKBIP expression in glioma.

JAK/STAT signaling pathway

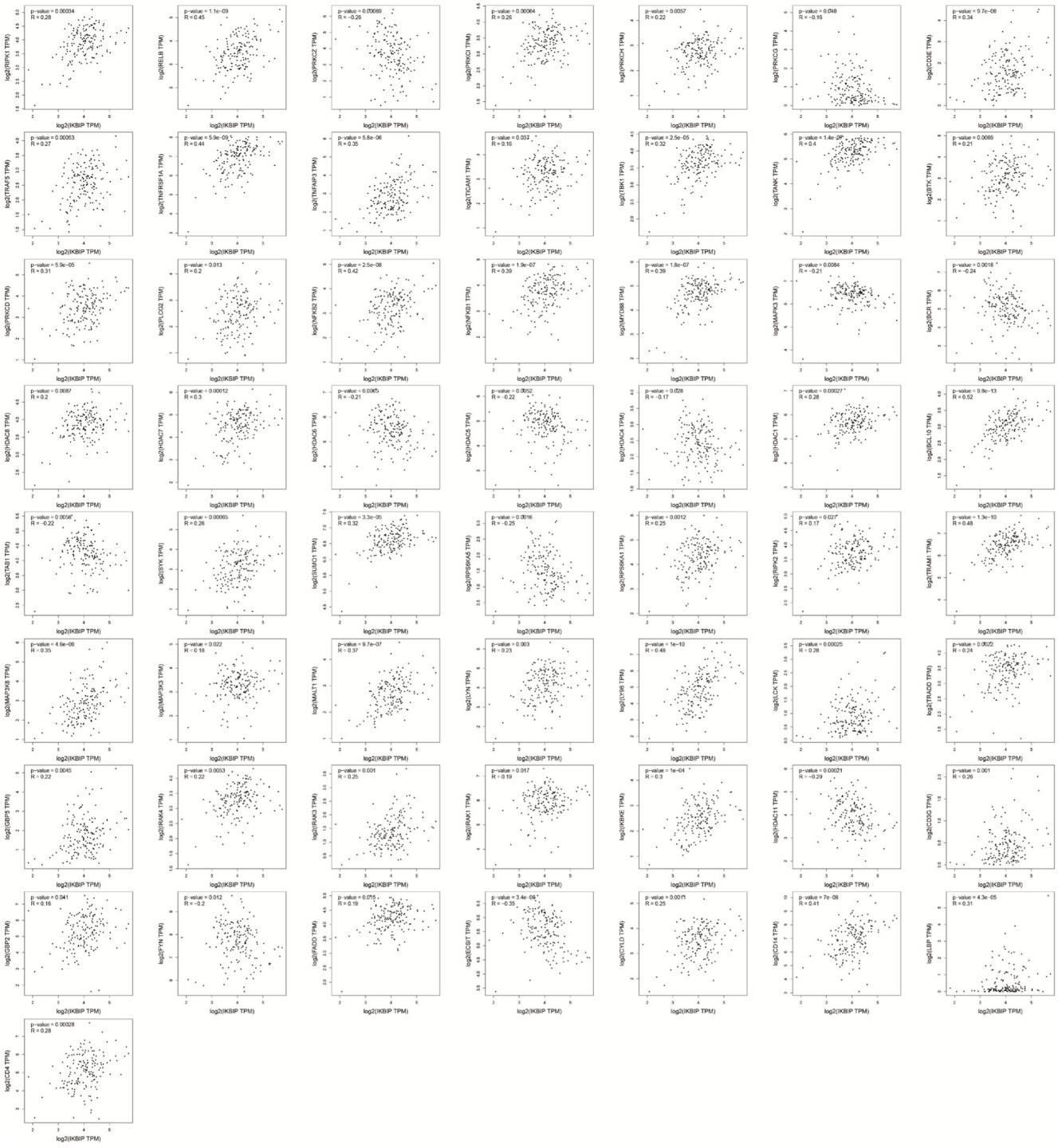


Supplementary Figure 8. Scatter plot shown genes in JAK/STAT signaling pathway related to IKBIP expression in glioma.

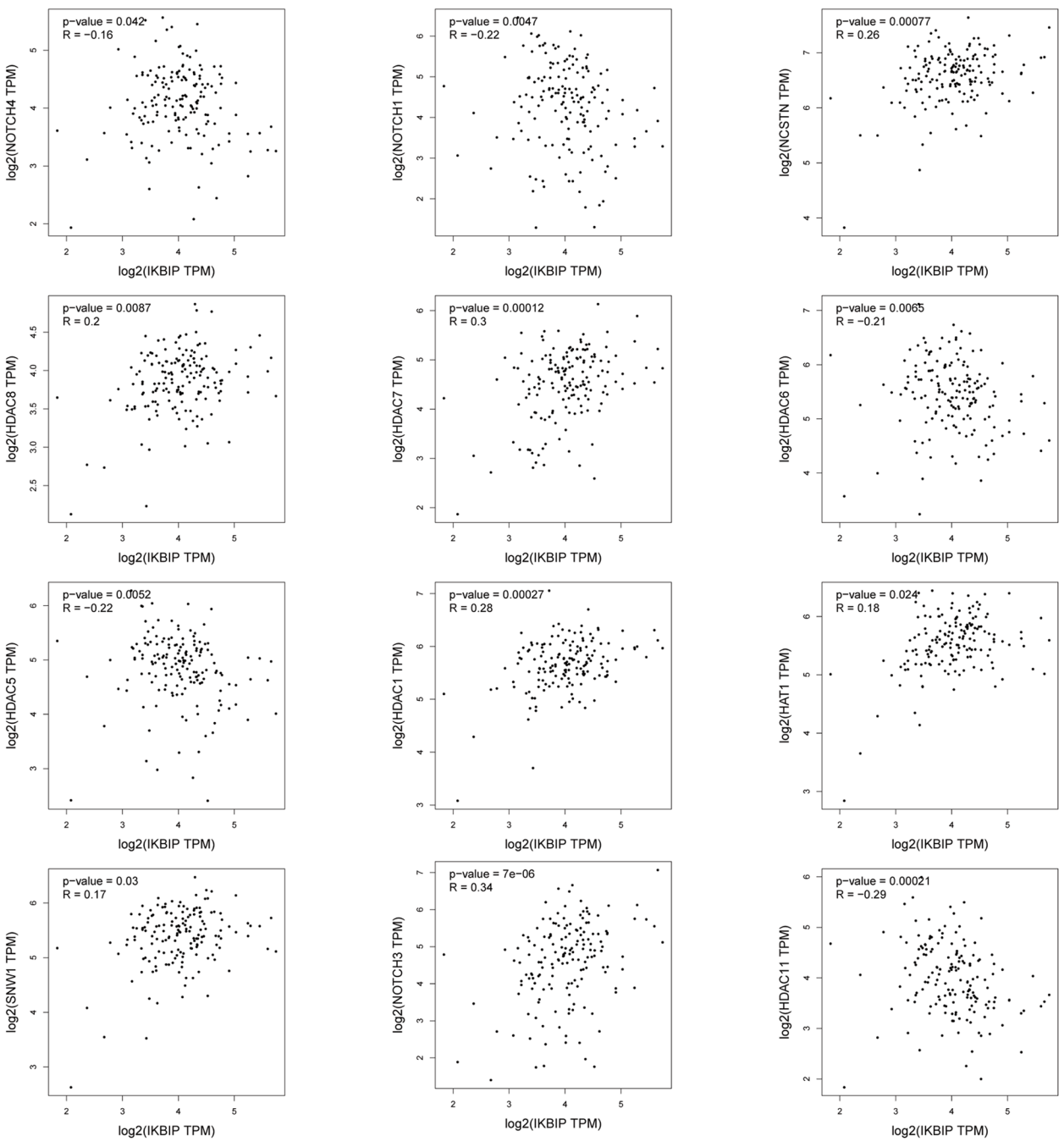


Supplementary Figure 9. Scatter plot shown genes in MAPK signaling pathway related to IKBIP expression in glioma.

NF-κB signaling pathway

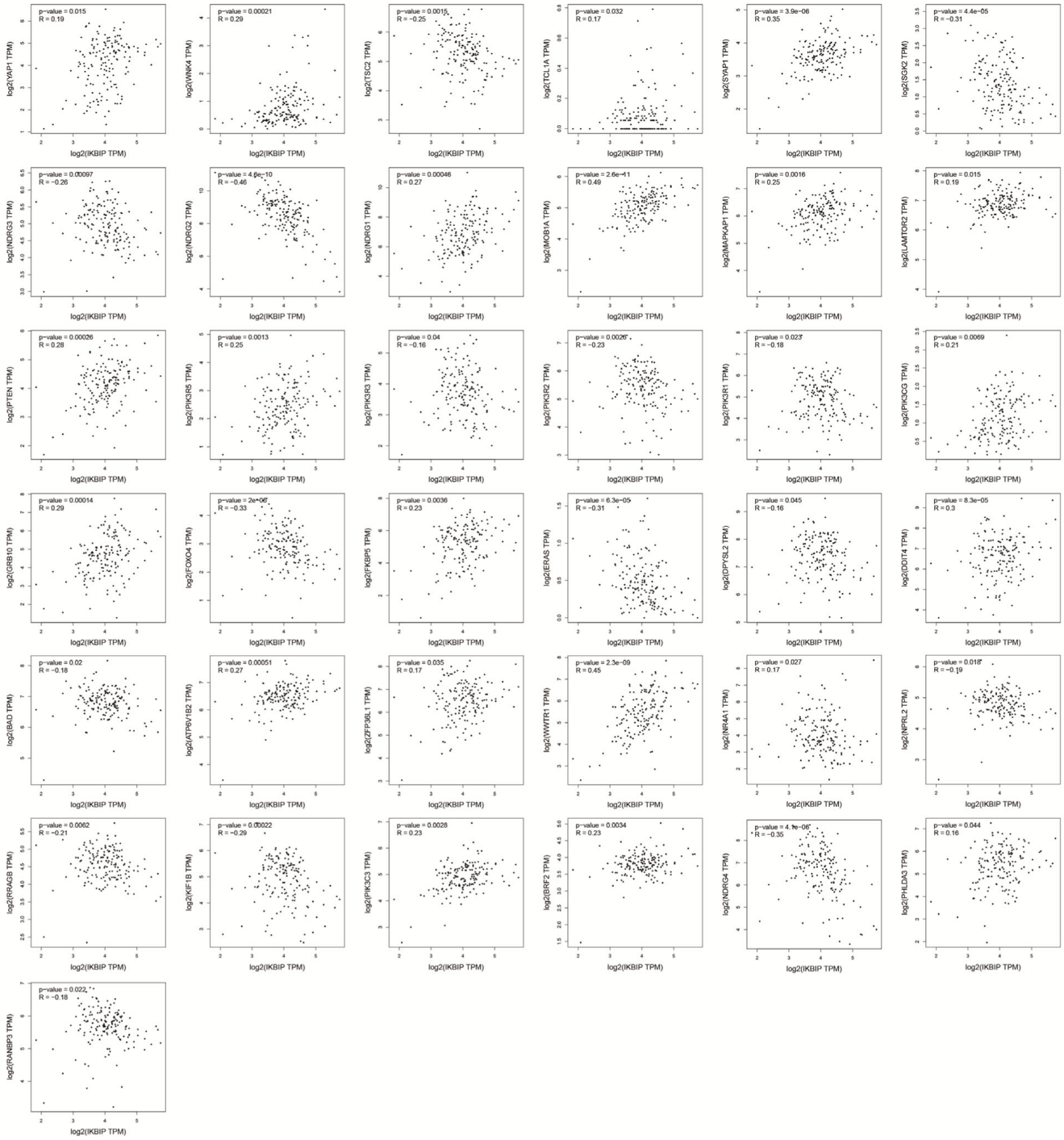


Supplementary Figure 10. Scatter plot shown genes in NF-κB signaling pathway related to IKBIP expression in glioma.

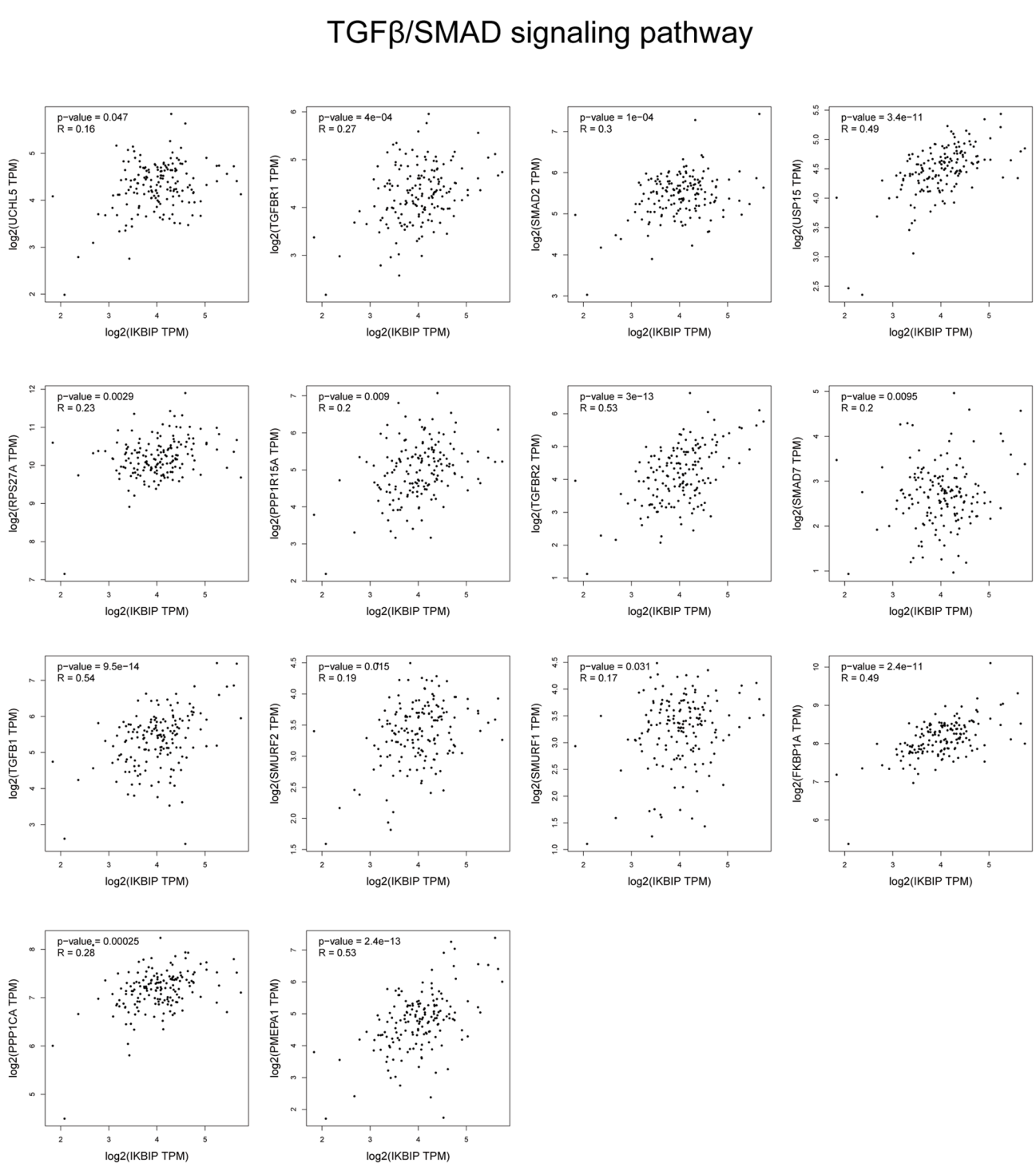


Supplementary Figure 11. Scatter plot shown genes in Notch signaling pathway related to IKBIP expression in glioma.

PI3K/Akt signaling pathway

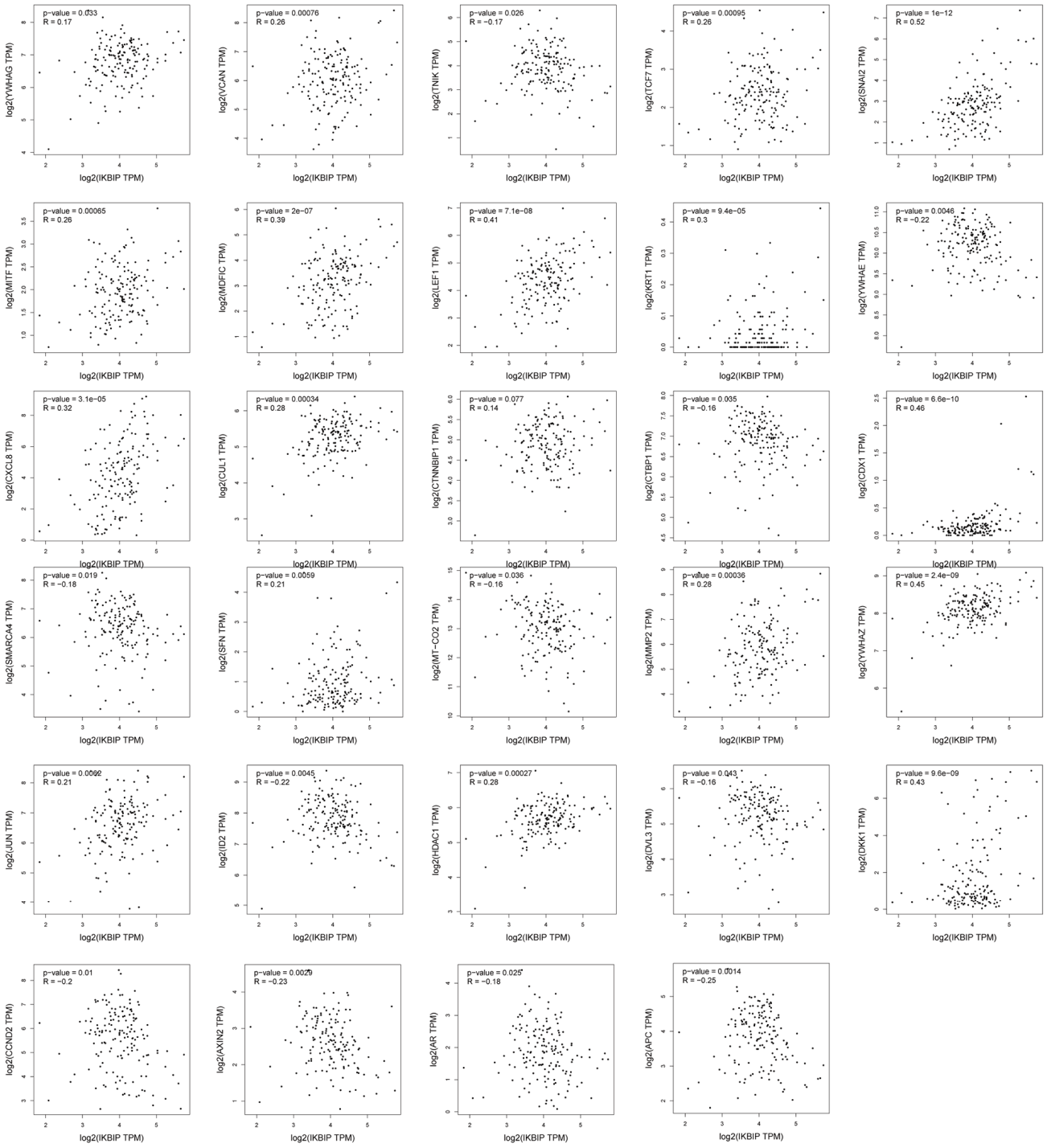


Supplementary Figure 12. Scatter plot shown genes in PI3K/Akt signaling pathway related to IKBIP expression in glioma.

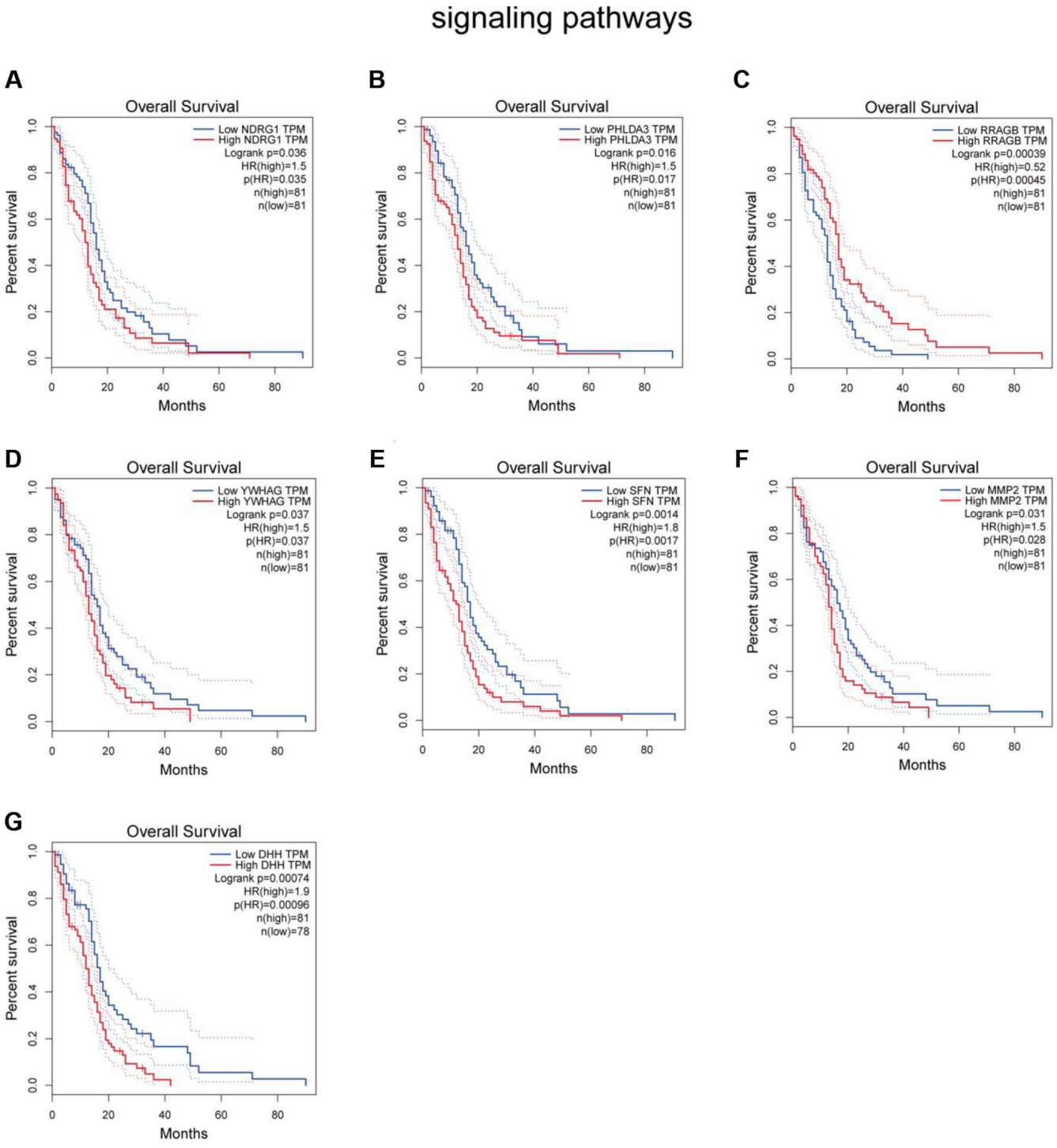


Supplementary Figure 13. Scatter plot shown genes in TGFβ/SMAD signaling pathway related to IKBIP expression in glioma.

Wnt/β-catenin signaling pathway



Supplementary Figure 14. Scatter plot shown genes in Wnt/β-catenin signaling pathway related to IKBIP expression in glioma.



Supplementary Figure 15. Survival analysis shown the effect of genes related to IKBIP in the (**A**–**C**) PI3K/Akt signaling pathway, (**D**–**F**) Wnt/β-catenin signaling pathway, and (**G**) Hedgehog signaling pathway to glioma patients.