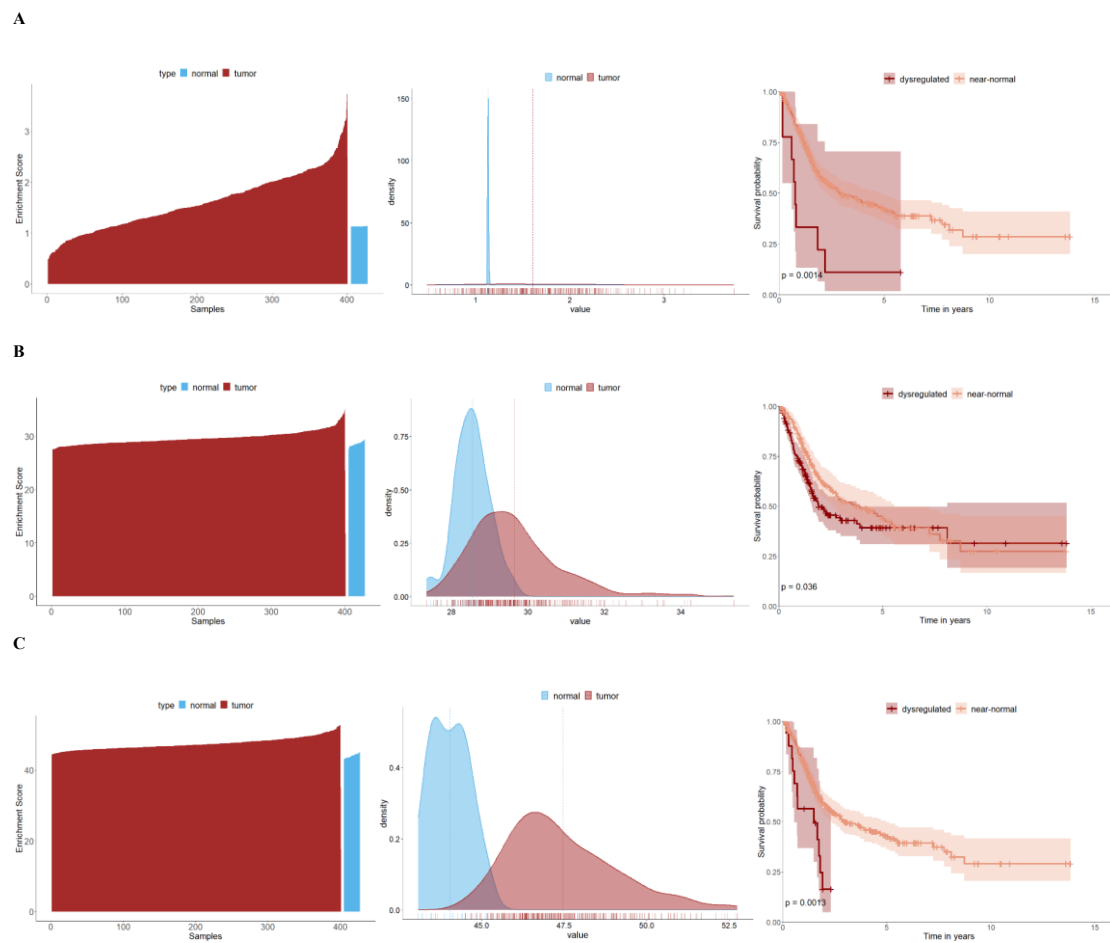
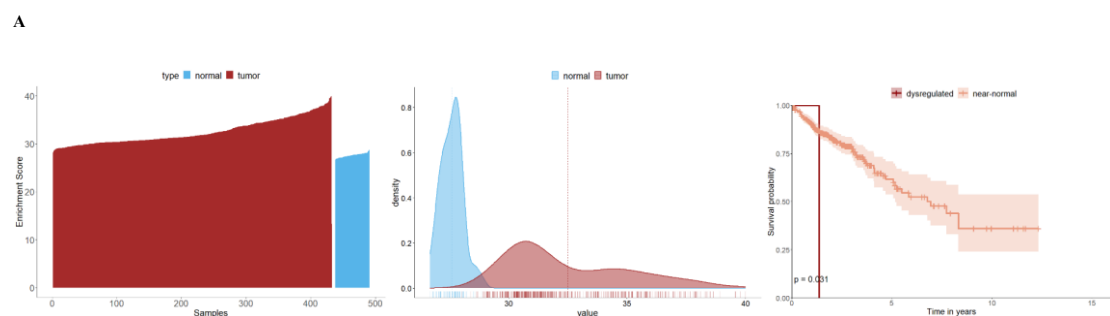


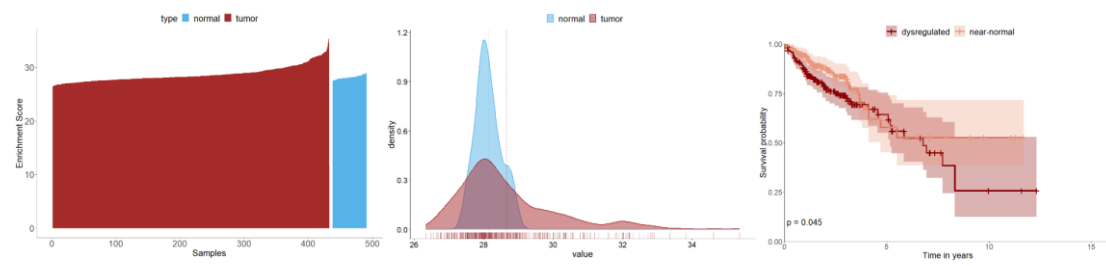
# Pathway Activation Analysis for Pan-cancer Personalized Characterization Based on Riemannian Manifold



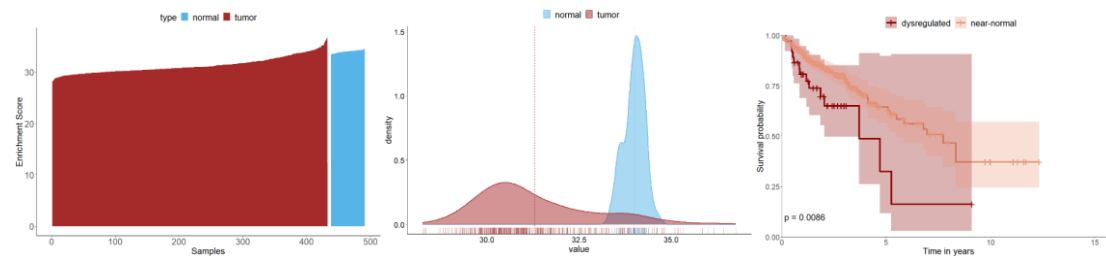
**Figure S1. Signaling pathways identified by RiePath scores in BLCA.** (A) IL-17 signaling pathway. (B) B cell receptor signaling pathway. (C) HALLMARK\_TNFA\_SIGNALING\_VIA\_NFKB.



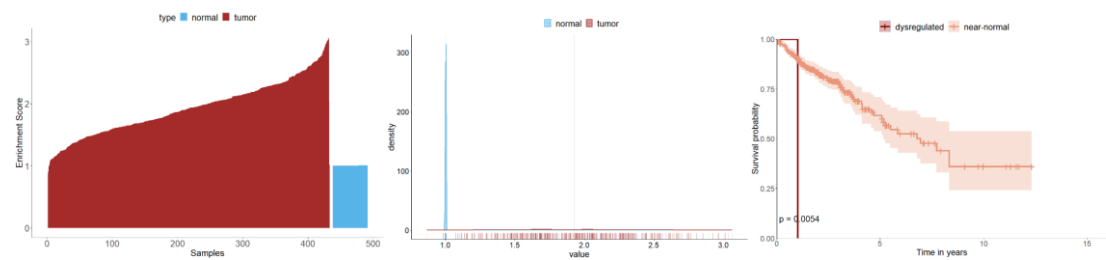
**B**



**C**

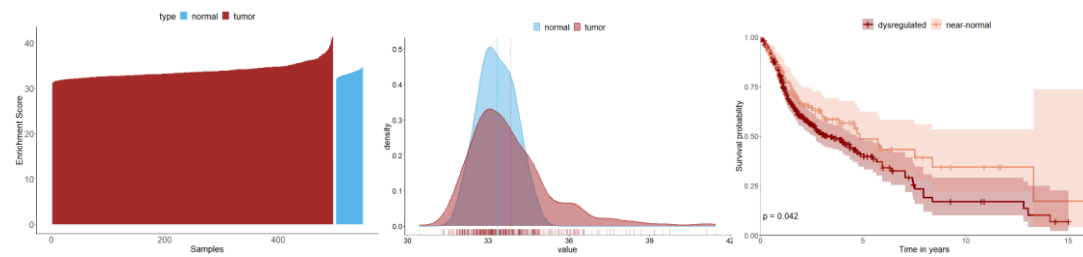


**D**

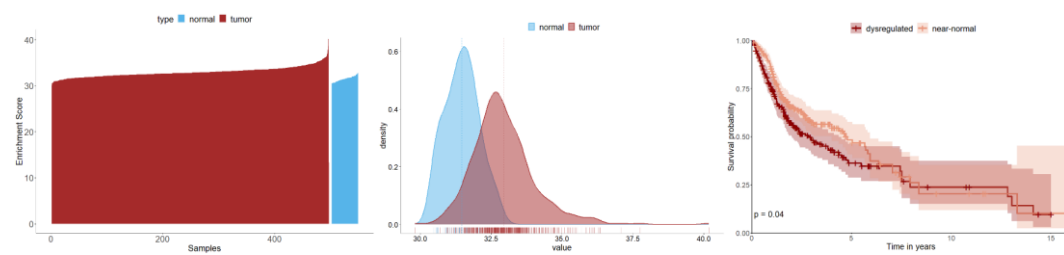


**Figure S2. Signaling pathways identified by RiePath scores in COAD.** (A) Phospholipase D signaling pathway. (B) C-type lectin receptor signaling pathway. (C) Thyroid hormone signaling pathway. (D) HALLMARK\_NOTCH\_SIGNALING.

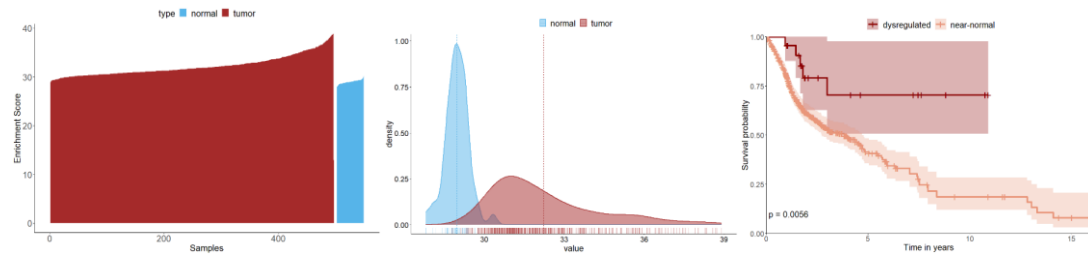
**A**



**B**

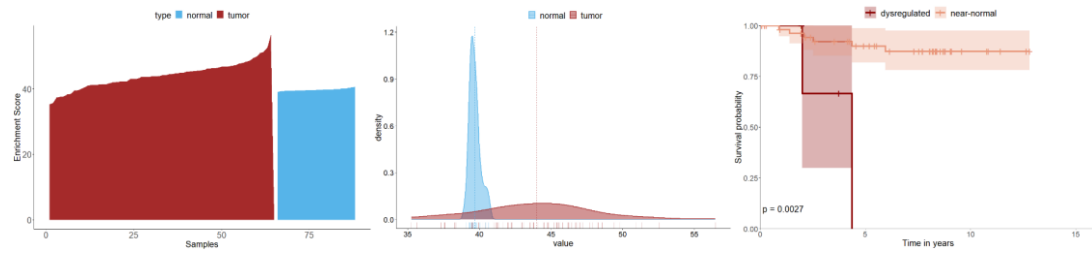


**C**



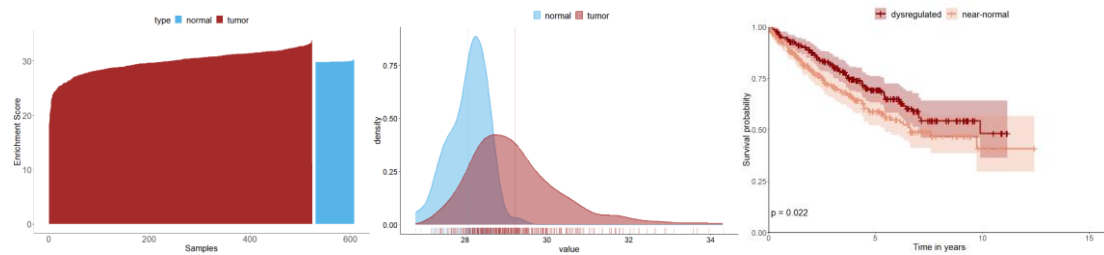
**Figure S3. Signaling pathways identified by RiePath scores in HNSC. (A) NOD-like receptor signaling pathway. (B) Oxytocin signaling pathway. (C) HALLMARK\_PI3K\_AKT\_MTOR\_SIGNALING.**

**A**

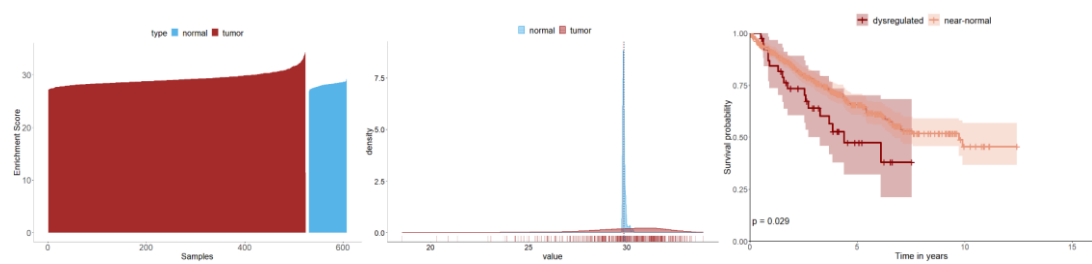


**Figure S4. Signaling pathways identified by RiePath scores in KICH. (A) C-type lectin receptor signaling pathway.**

**A**

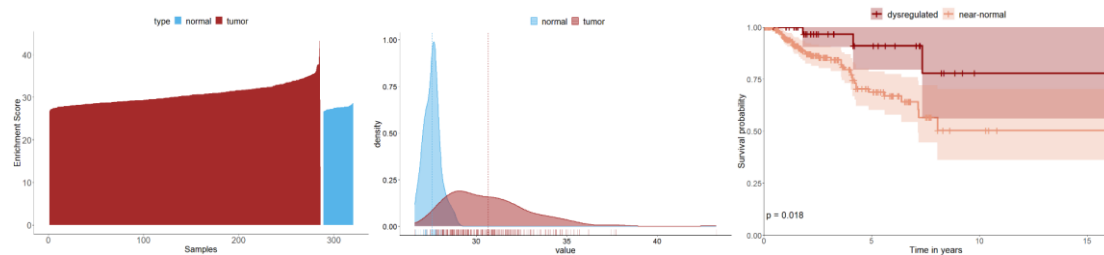


**B**

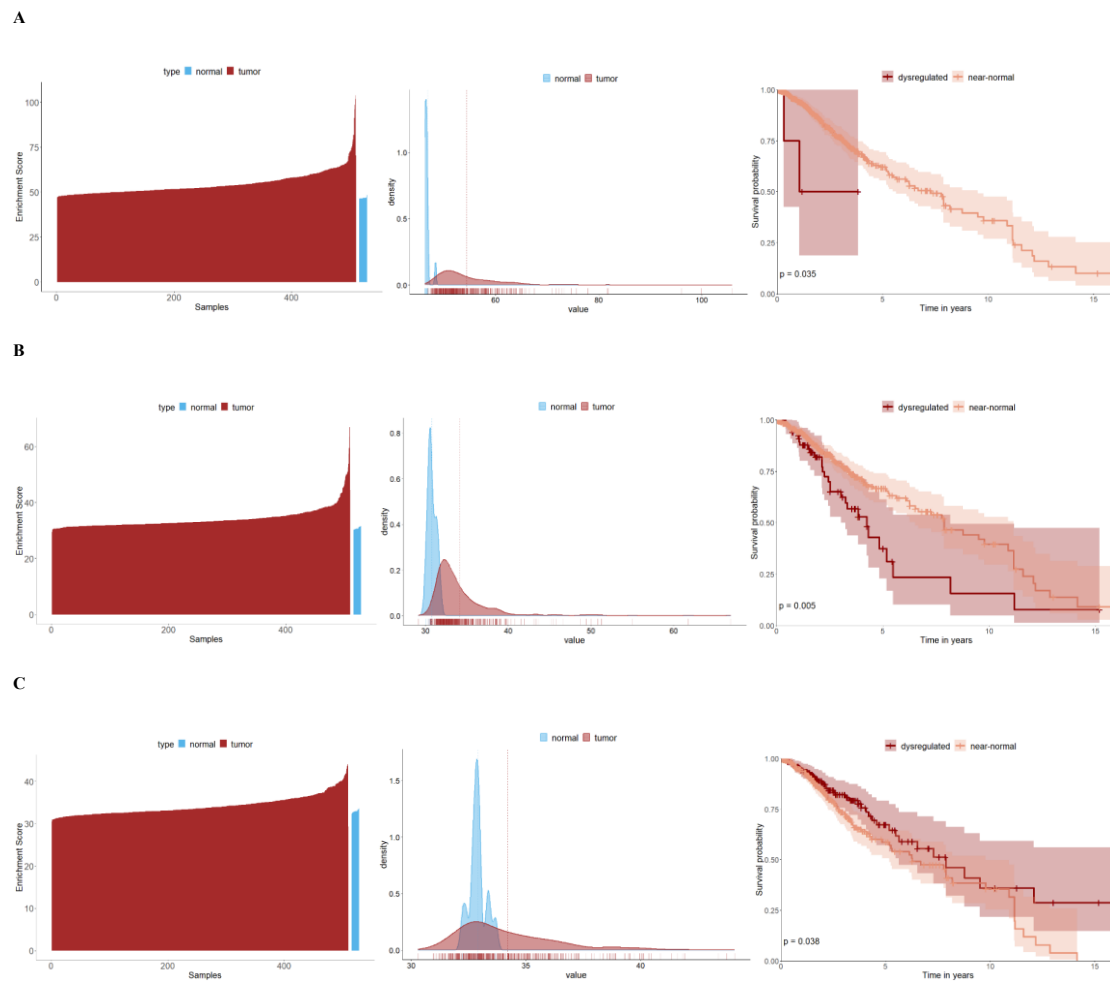


**Figure S5. Signaling pathways identified by RiePath scores in KIRC. (A) cGMP-PKG signaling pathway. (B) GnRH signaling pathway.**

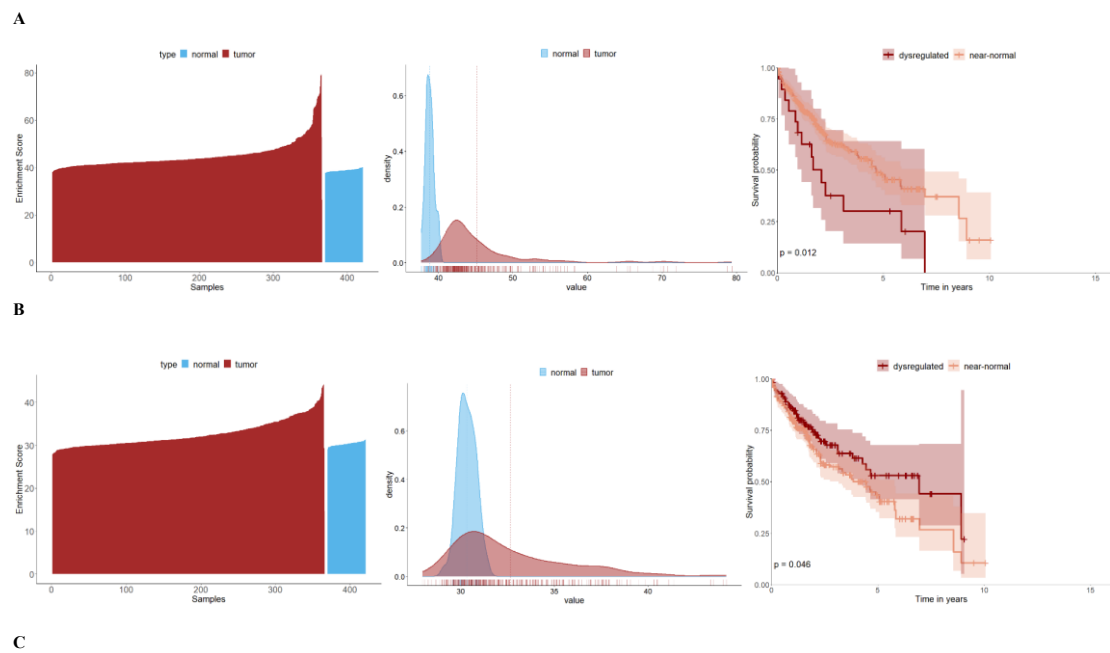
**A**



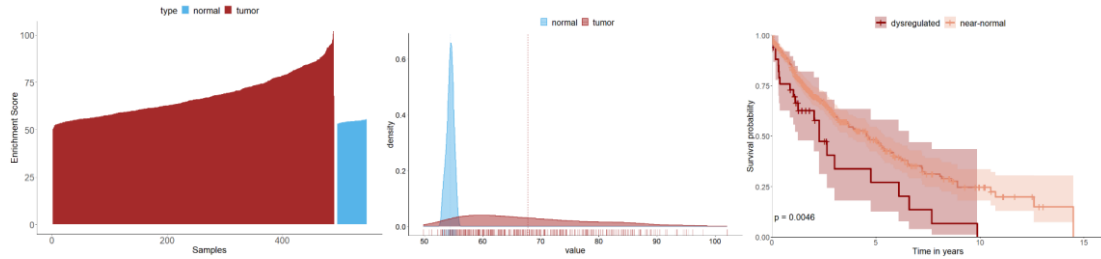
**Figure S6. Signaling pathways identified by RiePath scores in KIRP. (A) PPAR signaling pathway.**



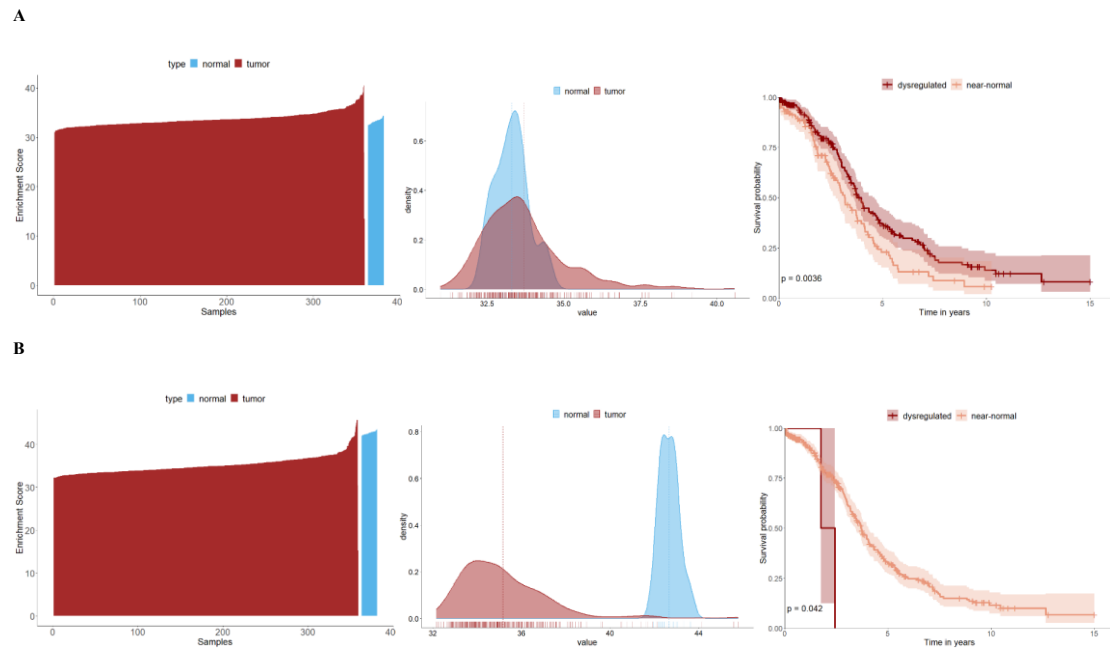
**Figure S7. Signaling pathways identified by RiePath scores in LGG. (A) Rap1 signaling pathway. (B) TGF-beta signaling pathway. (C) HALLMARK\_IL6\_JAK\_STAT3\_SIGNALING.**



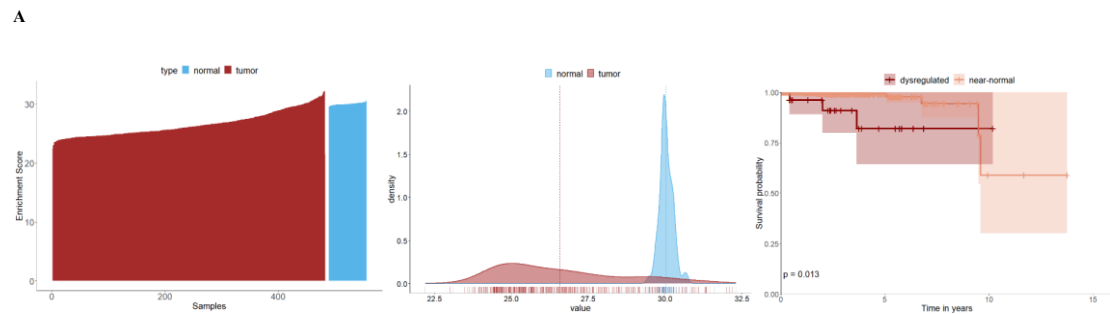




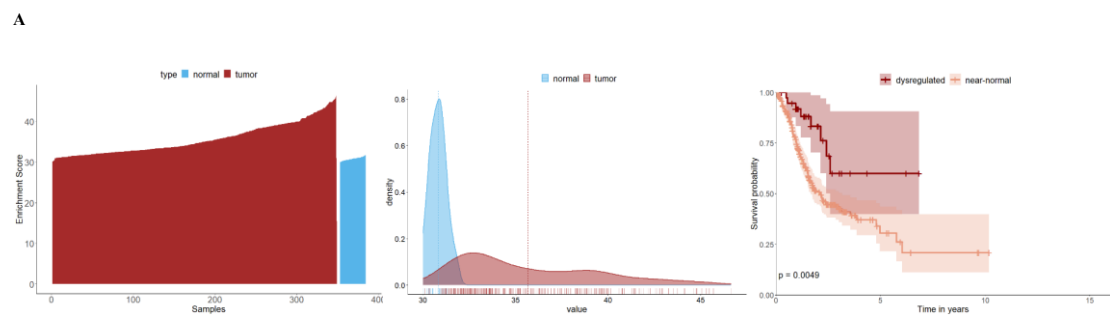
**Figure S10. Signaling pathways identified by RiePath scores in LUSC. (A) Apelin signaling pathway. (B) HALLMARK\_MTORC1\_SIGNALING.**

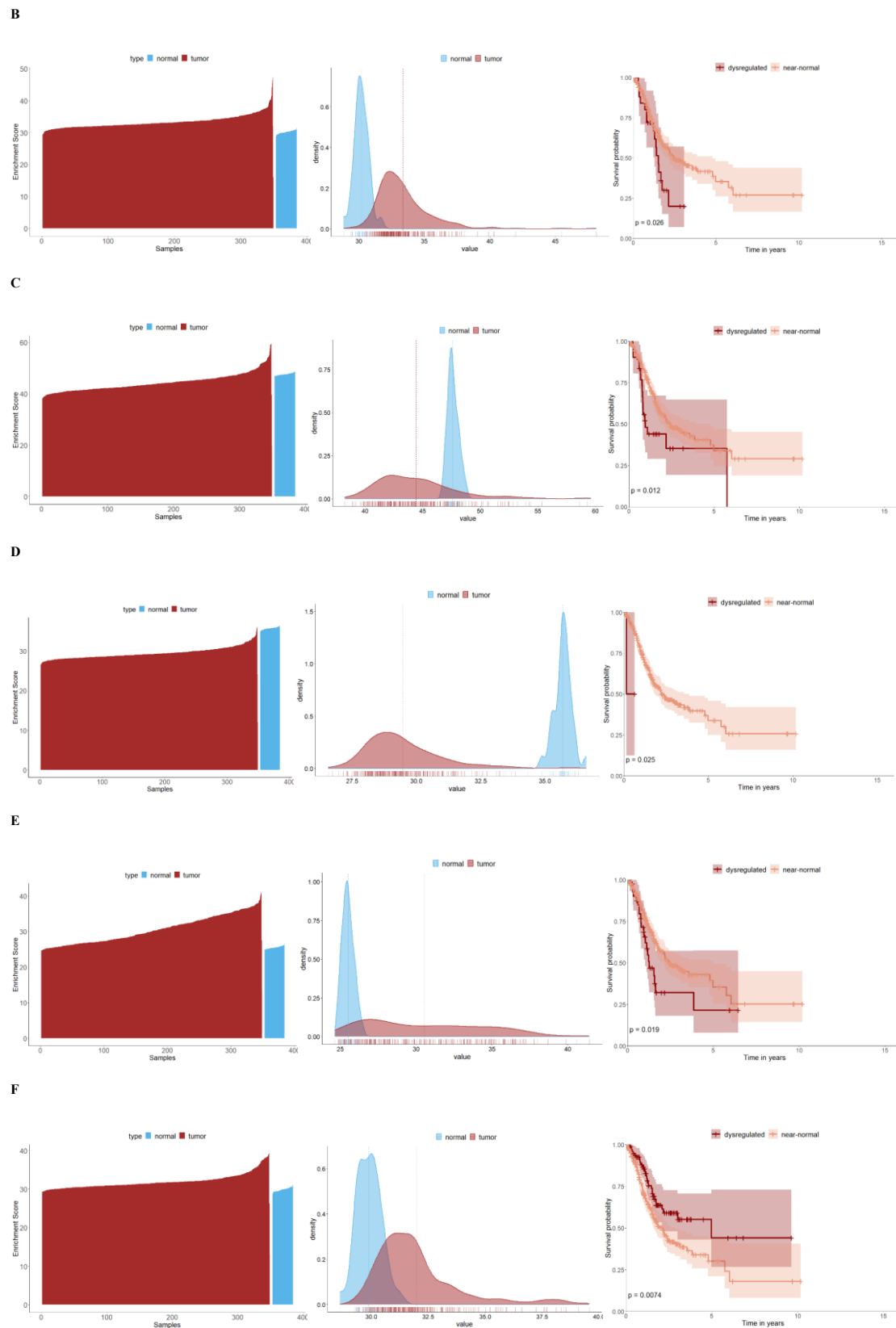


**Figure S11. Signaling pathways identified by RiePath scores in OV. (A) HIF-1 signaling pathway. (B) Sphingolipid signaling pathway.**



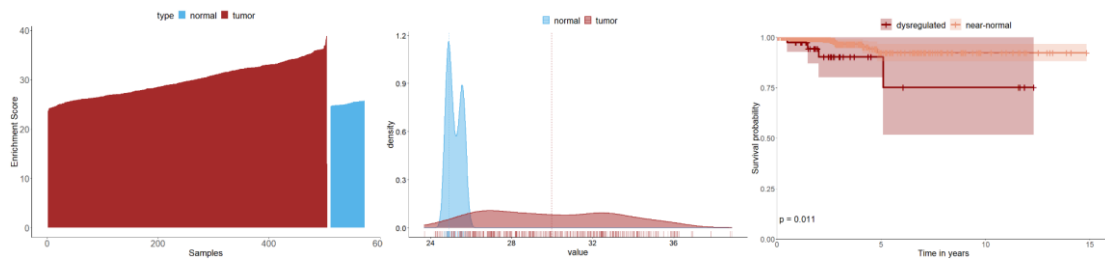
**Figure S12. Signaling pathways identified by RiePath scores in PRAD. (A) Retrograde endocannabinoid signaling.**



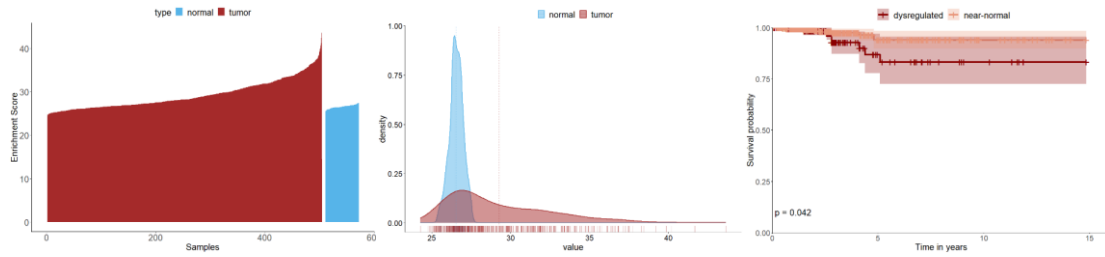


**Figure S13. Signaling pathways identified by RiePath scores in STAD.** (A) NF-kappa B signaling pathway. (B) HIF-1 signaling pathway. (C) Hippo signaling pathway. (D) TNF signaling pathway. (E) HALLMARK\_WNT\_BETA\_CATENIN\_SIGNALING. (F) HALLMARK\_IL6\_JAK\_STAT3\_SIGNALING.

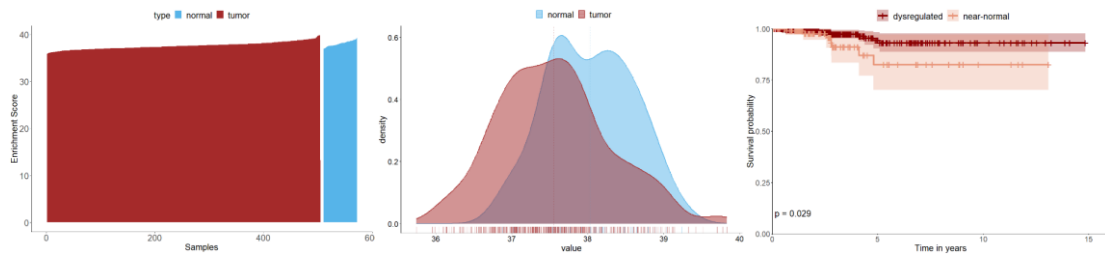
A



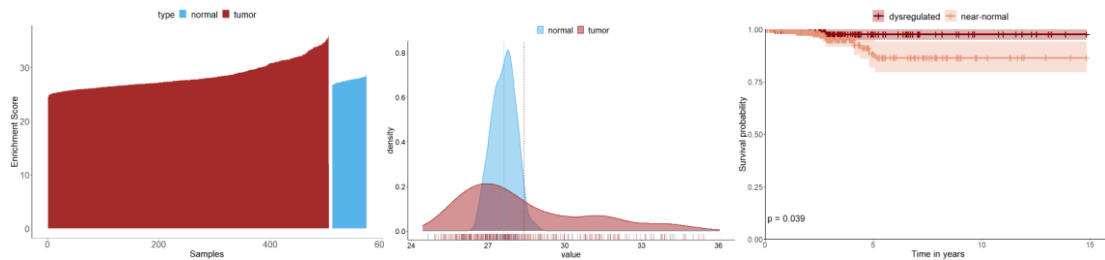
B



C

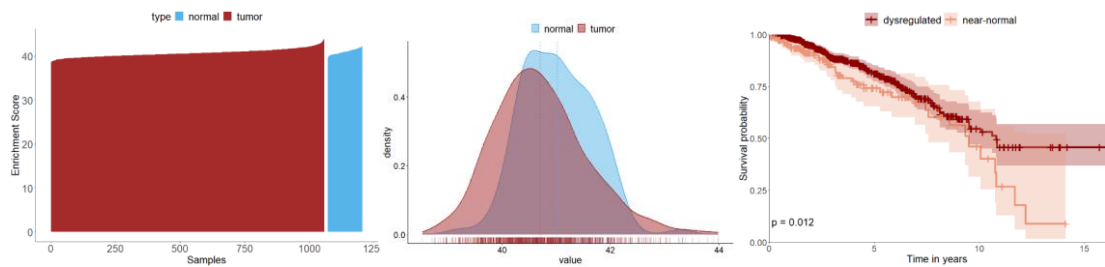


D



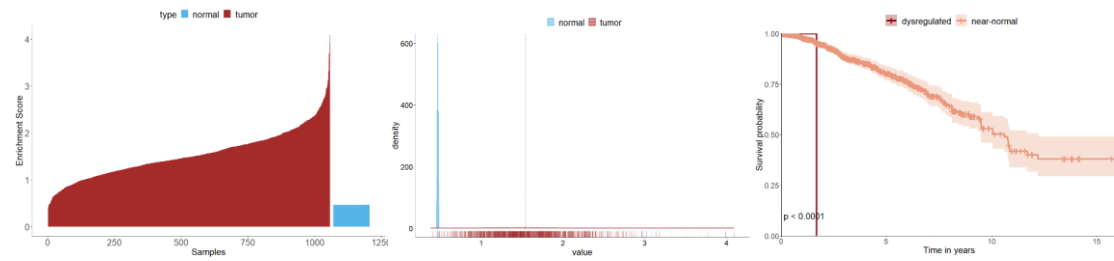
**Figure S14. Signaling pathways identified by RiePath scores in THCA.** (A) p53 signaling pathway. (B) AMPK signaling pathway. (C) HALLMARK\_TNFA\_SIGNALING\_VIA\_NFKB. (D) HALLMARK\_IL6\_JAK\_STAT3\_SIGNALING.

A



B





**Figure S15. Other two signaling pathways identified by RiePath scores in BRCA. (A) PI3K-Akt signaling pathway. (B) VEGF signaling pathway.**