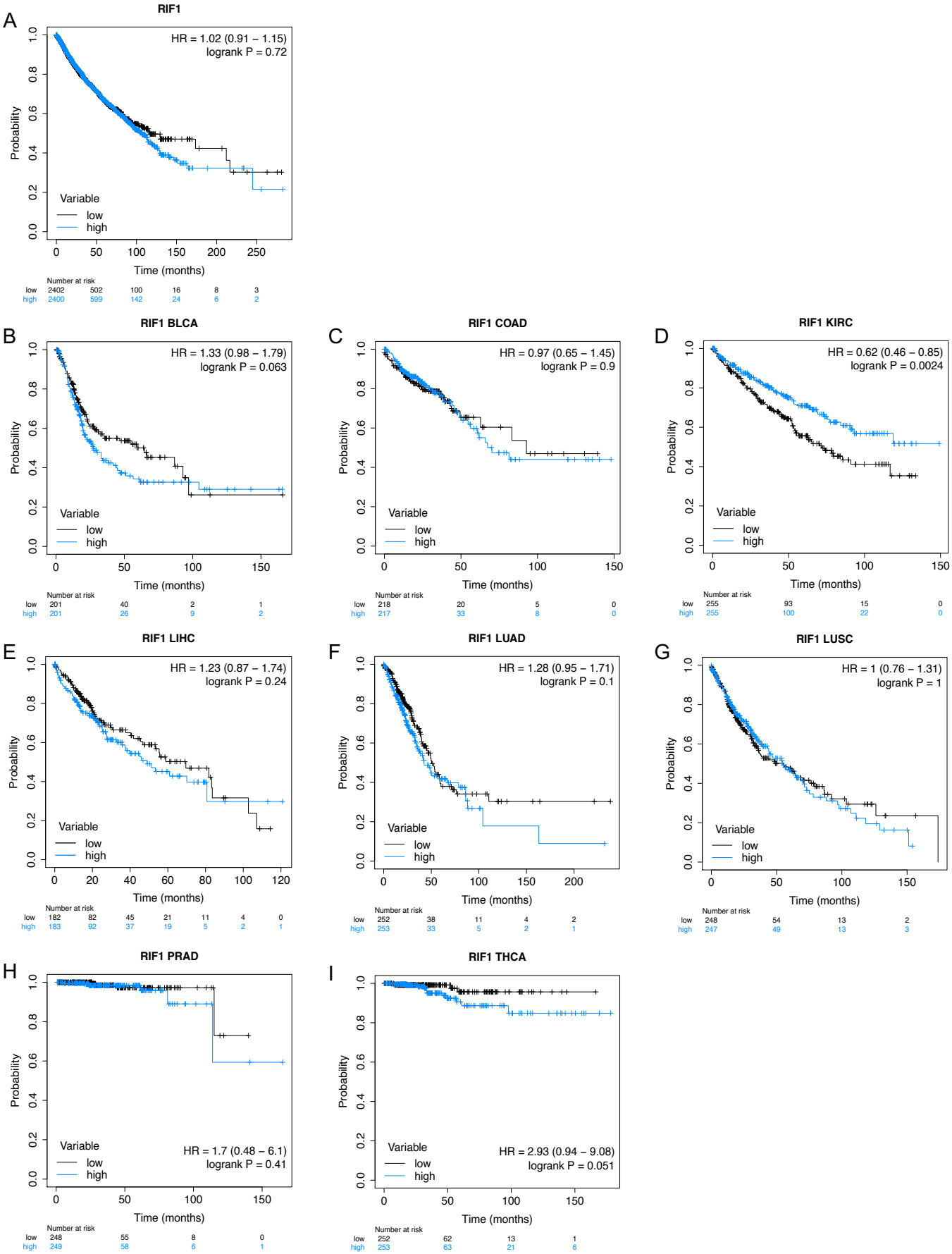


**Figure S1. Kaplan-Meier survival analyses for RIF1 mRNA expression levels in different cancer types**

Kaplan-Meier plots showing progression-free survival of patients with high (blue) and low (black) RIF1 mRNA expression in A) all cancer types combined, and (B-I) subdivided by cancer type. In each plot, patients were grouped based on median RIF1 mRNA expression.

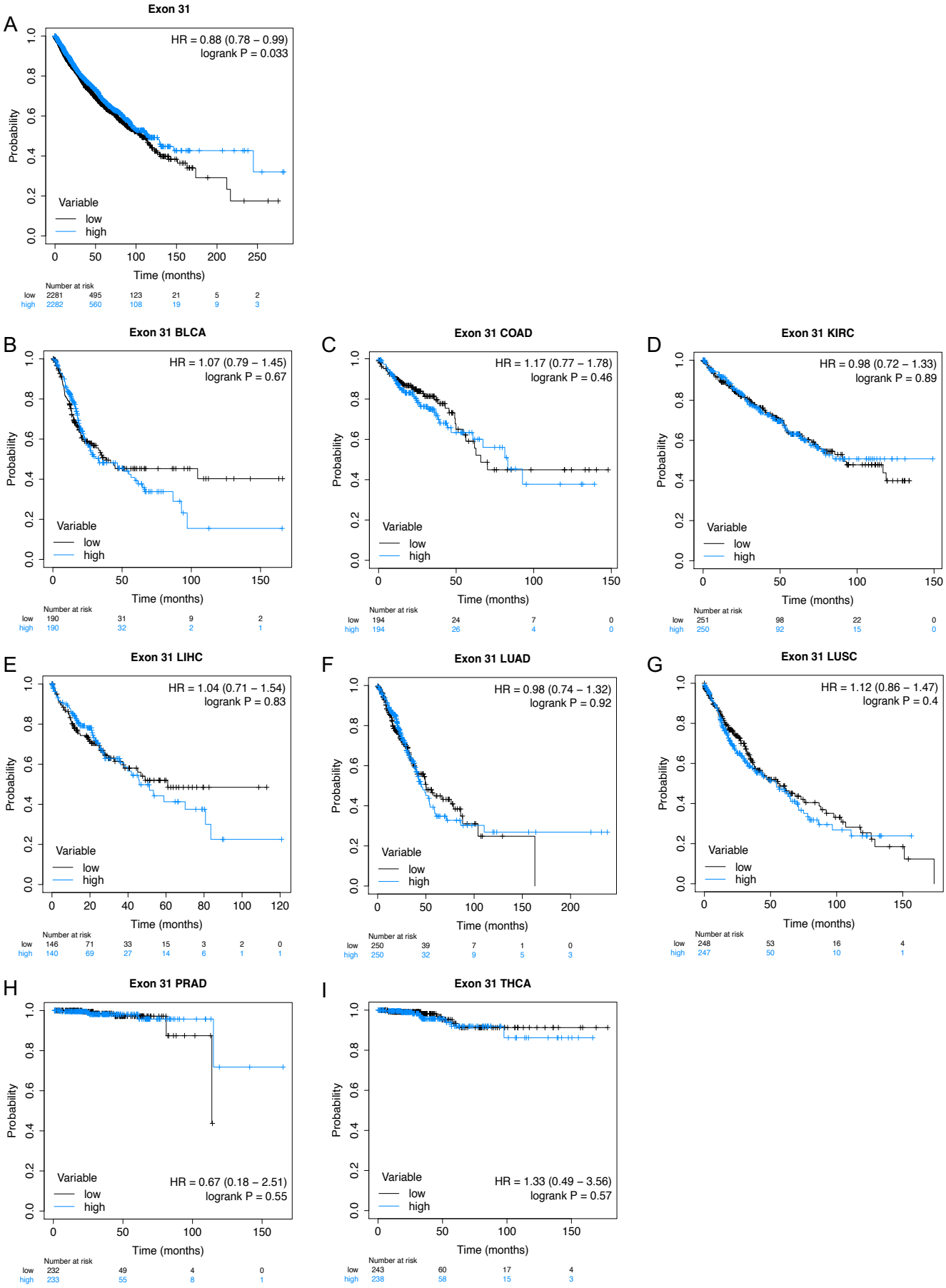


**Figure S2. Kaplan-Meier survival analyses for RIF1 Exon 31 inclusion in different cancer types**
Kaplan-Meier plots showing progression-free survival of patients with high (blue) and low (black) RIF1 Exon 31 inclusion (PSI) in A) all cancer types combined, and (B-I) subdivided by cancer type. Patients were grouped based on median RIF1 Exon 31 PSI value.

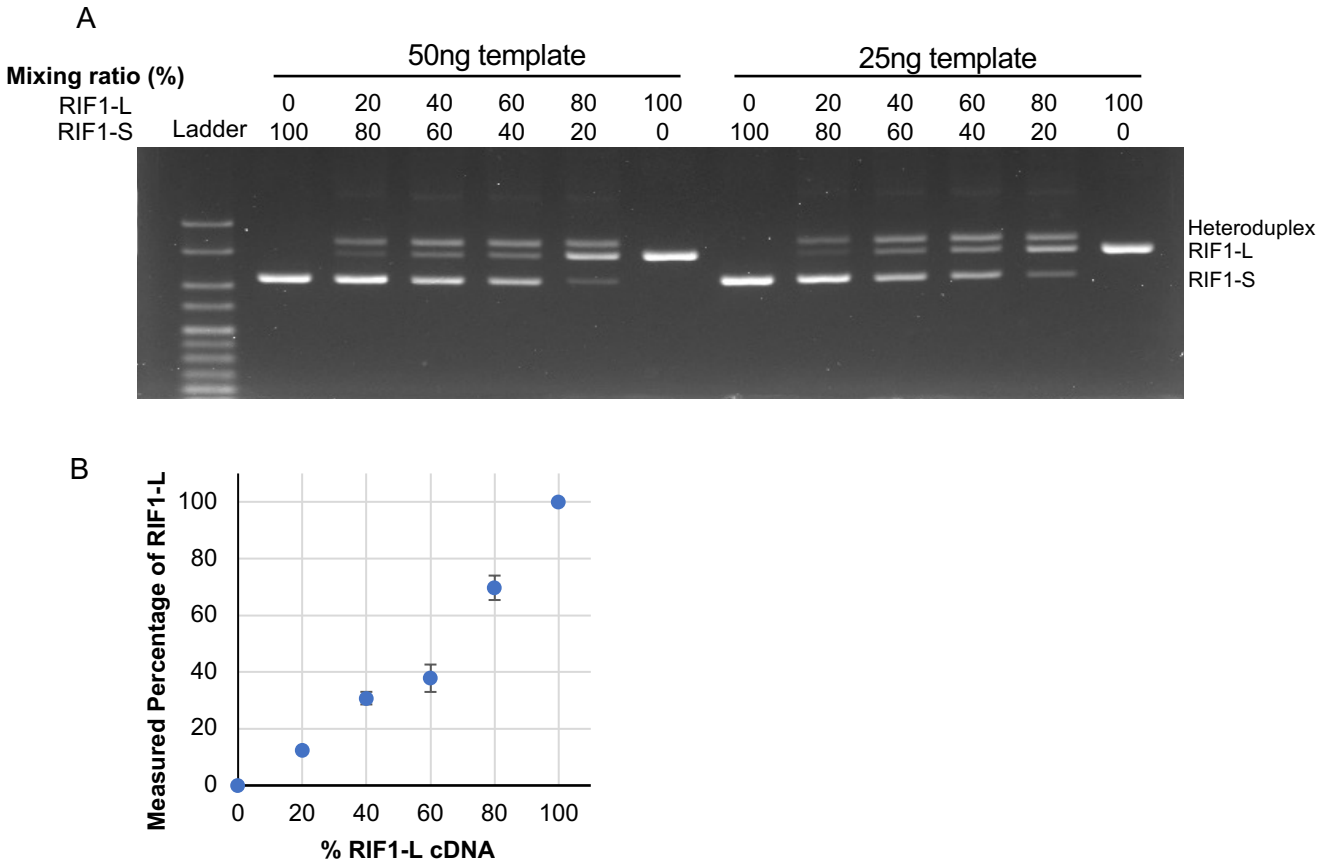


**Figure S3. Detection of RIF1 isoforms by RT-PCR**

A) Validation of competitive PCR for detection of relative amounts RIF1 variants by RT-PCR. Briefly, cDNA samples were prepared from cell lines expressing RIF1-L or RIF1-S only, then mixed at the indicated ratios before analysis by competitive RT-PCR using the primer pair described in Fig. 3A. Amplification conditions are as follows; one cycle of 98ºC for 5 minutes; 10 cycles of 98ºC for 5 seconds, 69ºC for 5 seconds, 72ºC for 20 seconds; followed by 30 cycles of 98ºC for 5 seconds, 64ºC for 5 seconds, 72ºC for 20 seconds. Image shows visualization of fragments corresponding to RIF1-L, RIF1-S and a heteroduplex of RIF1-L + RIF1-S after agarose gel separation. B) Quantification of relative RIF1-L measured by competitive PCR at various ratios of RIF1-L:RIF1-S cDNA. 50% of signal from the RIF1-L+RIF1-S heteroduplex band is assigned to RIF1-L and 50% to RIF1-S during quantification.

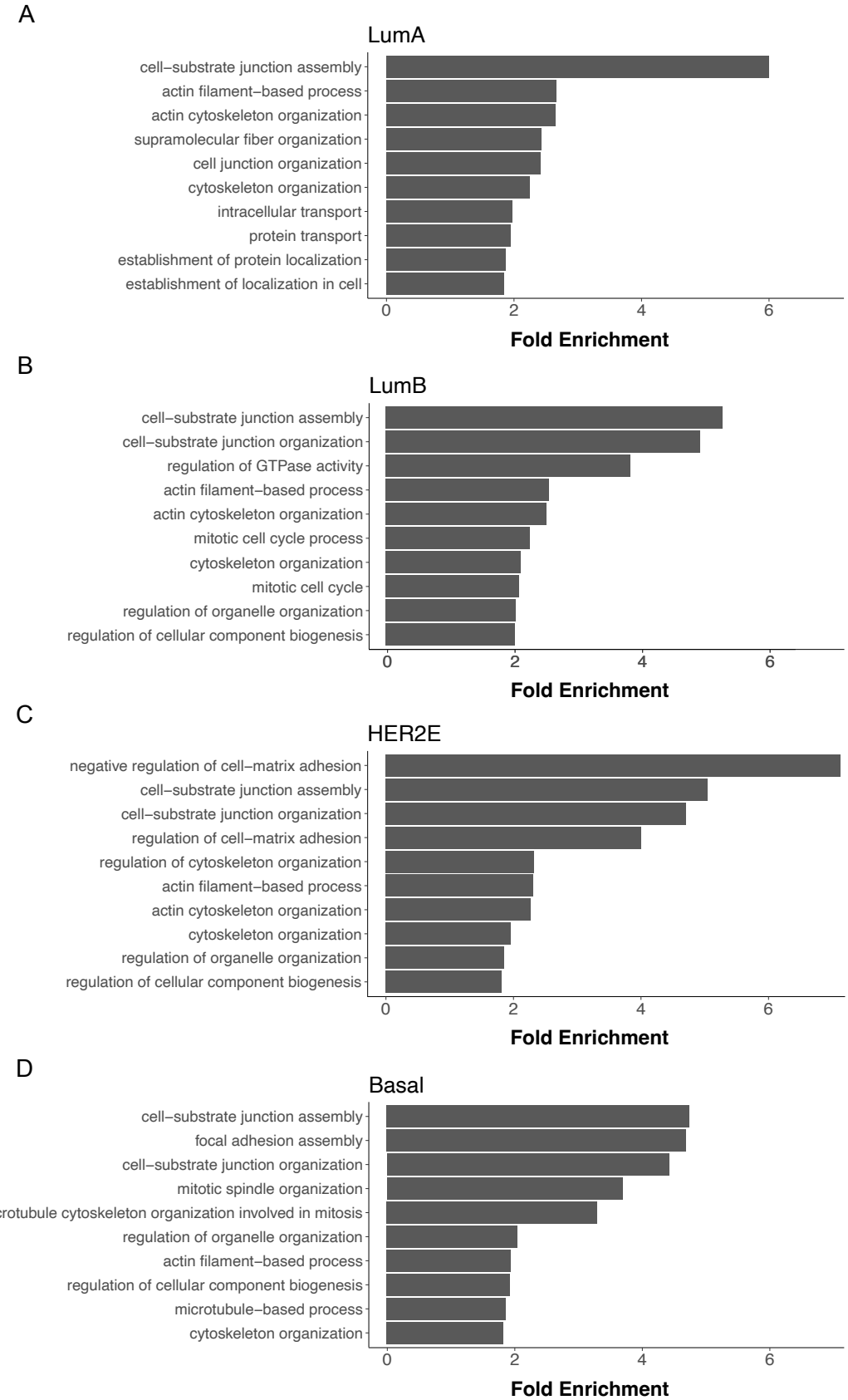


**Figure S4. GO Enrichment for 'Cancer-Altered' Long and Short exons in breast cancer subtypes**
Bar plots showing fold enrichment of the top 10 enriched Gene Ontology biological processes for genes containing 'Cancer-Altered' Long and Short exons in A) LumA, B) LumB, C) HER2E, and D) Basal breast cancer subtypes.

**Table S1. PCR Primers**

| | **Sequence 5'-3'** |
|---|---|
| PCR primer for RIF1 splice variant analysis | GTCTCCTTTGGCTTCTCCGT |
| PCR primer for RIF1 splice variant analysis | GATGTCAACTGGTGCCACAC |

**Table S2. RT-qPCR Probe Assays**

| **Gene Symbol** | **Assay ID** | **RefSeq** | **Exon Location** |
|---|---|---|---|
| RIF1 | Hs.PT.58.4552358 | NM_001177663(4) | 21-22 |
| GAPDH | Hs.PT.39a.22214836 | NM_002046(1) | 2-2 |