

**Supplementary Data 1:** Details and annotation information for 17,227 transcription regulators.

**Supplementary Data 2:** List of TRs ranked highest and lowest by TRAPT predictions in Alzheimer's disease.

**Supplementary Data 3:** Fine-mapping results.

**Supplementary Data 4:** Top ten ranked transcription regulators identified in various tissues in GTEx.

**Supplementary Data 5:** The grouping information and specific details regarding the samples for the differential expression analysis using KnockTF.

**Supplementary Data 6:** The detailed results of the benchmarking.

**Supplementary Data 7:** The degradation rates for all transcription regulators.

**Supplementary Data 8:** The detailed results of the TcoF benchmarking.

**Supplementary Data 9:** Differentially expressed genes from the ESR1 knockdown experiment.

**Supplementary Data 10:** The metadata of the TCGA BRCA cohort.

**Supplementary Data 11:** Detailed Information on the GWAS Data.