

CPH Seminar in Precision Medicine

TissGDB: Tissue specific Gene DataBase in Cancer

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Tissue-specific gene expression is critical in understanding biological processes, physiological conditions, and disease. The identification and appropriate use of tissue-specific genes (TissGenes) will provide important insights into disease mechanisms and organ-specific therapeutic targets. To better understand the tissue-specific features for each cancer type and to advance the discovery of clinically relevant genes or mutations, we built TissGDB (Tissue specific Gene DataBase in cancer) available at <http://zhaobioinfo.org/TissGDB>. We collected and curated 2461 tissue specific genes (TissGenes) across 22 tissue types that matched the 28 cancer types of The Cancer Genome Atlas (TCGA) from three representative tissue-specific gene expression resources: The Human Protein Atlas (HPA), Tissue-specific Gene Expression and Regulation (TiGER), and Genotype-Tissue Expression (GTEx). For these 2461 TissGenes, we performed gene expression, somatic mutation, and prognostic marker-based analyses across 28 cancer types using TCGA data. Our analyses identified hundreds of TissGenes, including genes that universally kept or lost tissue-specific gene expression, with other features: cancer type-specific isoform expression, fusion with oncogenes or tumor suppressor genes, and markers for protective or risk prognosis. TissGDB provides seven categories of annotations: TissGeneSummary, TissGeneExp, TissGene-miRNA, TissGeneMut, TissGeneNet, TissGeneProg, TissGeneClin.

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