

Supplementary Information

Figures S1

A

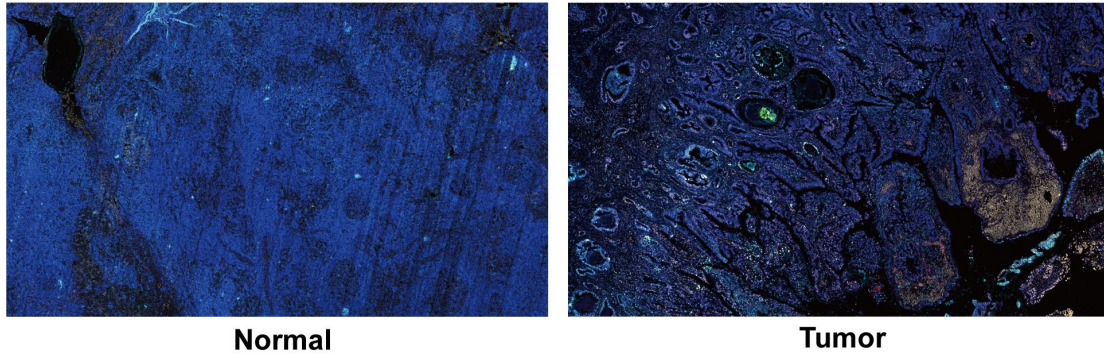


Figure S1. (A) Representative multiplex immunofluorescence images with a wider field of view, providing a comprehensive overview of marker distribution patterns in tumor tissues.

Figures S2A-F

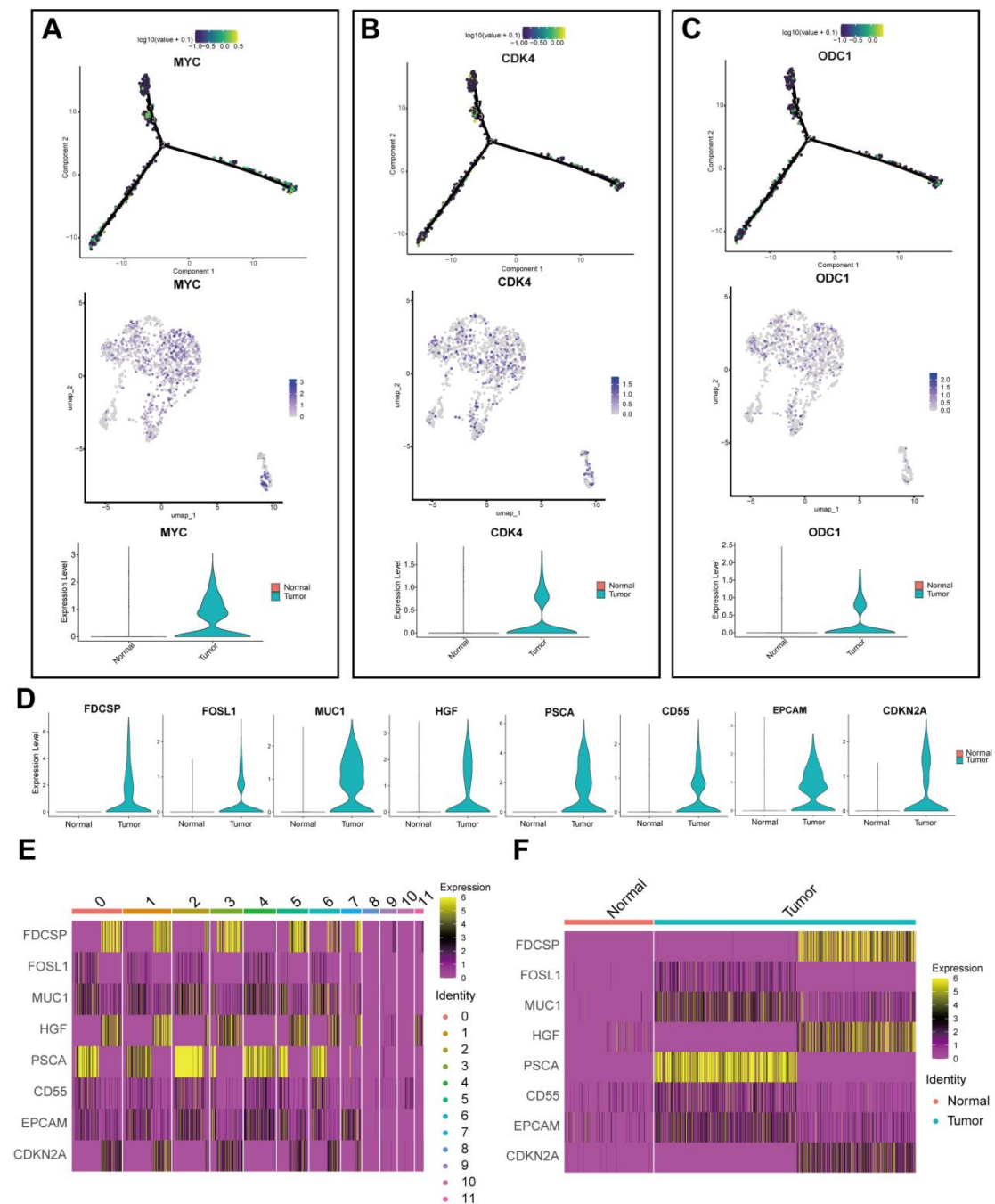


Figure S2. Genes related to cellular signaling pathways and malignant phenotypes. (A-C) Pseudotime trajectories of MYC, CDK4 and ODC1, along with violin plots showing their expression across different samples and cell clusters. (D) Violin plots showing eight genes that are significantly overexpressed in tumor cells. (E) Heatmap illustrating the expression of malignancy-associated marker genes across different cell clusters. (F) Heatmap depicting the expression of malignancy-associated marker genes in tumor cells and epithelial cells.