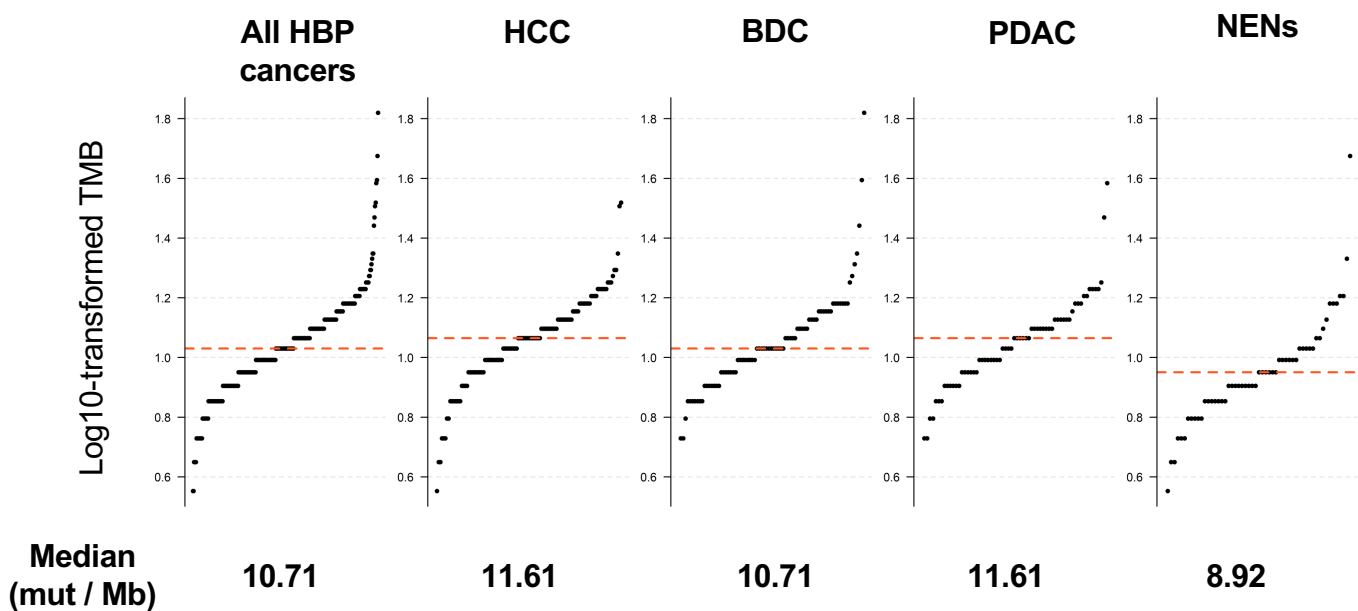


Supplementary Figure 1
Tumor mutational burden according to cancer type.

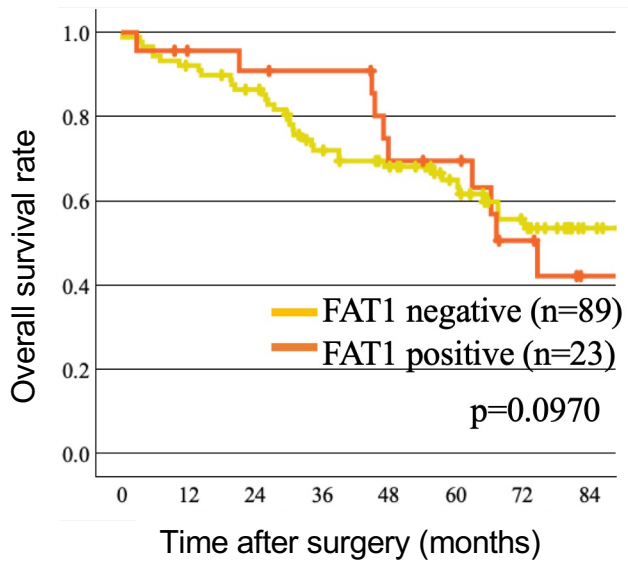


Distribution of tumor mutational burden (TMB) in the overall HBP cohort and according to cancer type. TMB values were log10-transformed for visualization. Median values shown below each group are presented on the original scale as mutations per megabase.

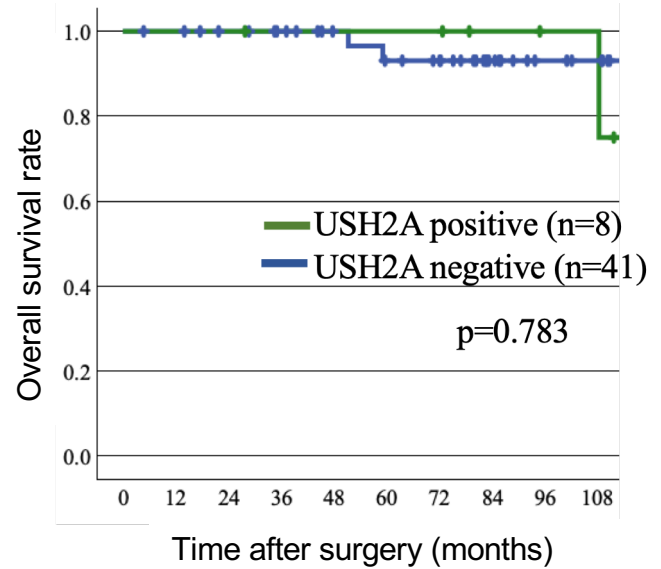
HCC, hepatocellular carcinoma; BDC, bile duct cancer; PDAC, pancreatic ductal adenocarcinoma; NENs, neuroendocrine neoplasms.

Supplementary Figure 2.
Exploratory overall survival analyses according to ACT-only gene alteration status.

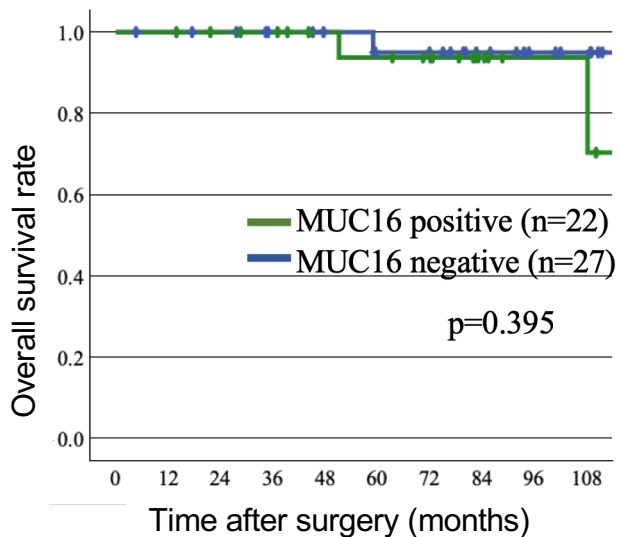
a HCC: FAT1 and overall survival



b NENs: USH2A and overall survival



c NENs: MUC16 and overall survival



Kaplan–Meier curves for overall survival according to **FAT1** alteration status in hepatocellular carcinoma (a), **USH2A** alteration status in neuroendocrine neoplasms (b), and **MUC16** alteration status in neuroendocrine neoplasms (c). P values were calculated using the log-rank test.