

Figure S1. Representative images of migration and invasion assays following treatment with hPSC-5-derived EVs. (A and B) Representative microscopic images of Transwell migration and Matrigel invasion assays in (A) SUI-2 and (B) PANC-1 cells after hPSC-5-derived EVs treatment: Magnification, x100. EVs, extracellular vesicles.

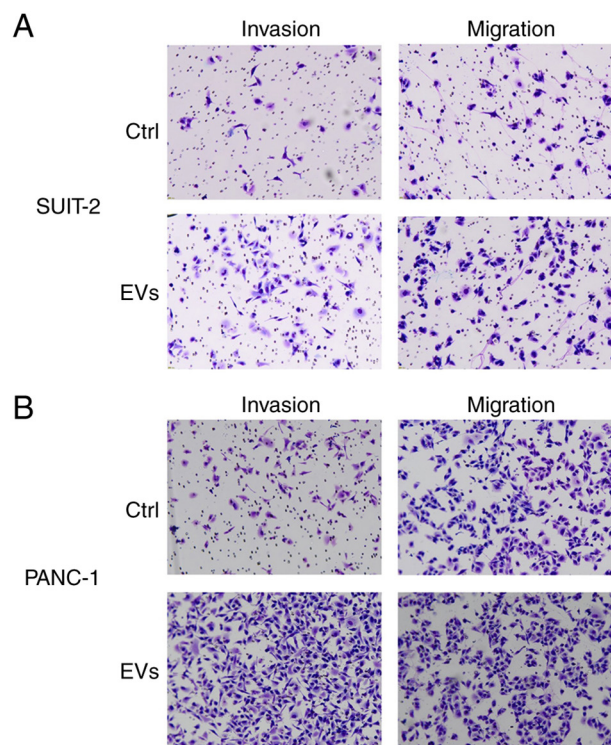


Figure S2. Representative images of migration and invasion assays following RAP1B knockdown. (A and B) Representative microscopic images of (A) invasion and (B) migration assays in PANC-1 and SUI-2 cells after RAP1B knockdown: magnification, x40. si-, small interfering; NC, negative control.

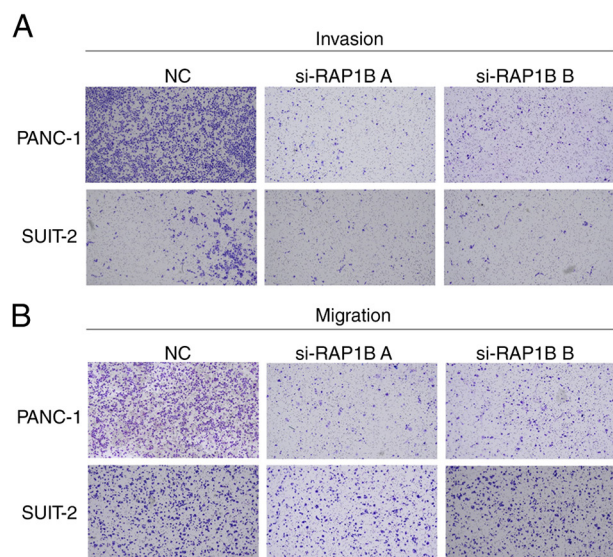


Figure S3. Western blot analysis of MAPK pathway and EMT-related markers following RAP1B knockdown in PANC-1 and SUIT-2 cells. Cells were transfected with NC or two independent RAP1B siRNAs (si-A and si-B). RAP1B knockdown efficiency, the MAPK pathway markers (p-ERK, ERK, p-p38 and p38), and the EMT-related markers (E-cadherin, N-cadherin and vimentin) are shown. EMT, epithelial-mesenchymal transition; p-, phosphorylated; si-, small interfering; NC, negative control.

Figure S4. TCGA-based Kaplan-Meier survival analysis of six candidate proteins in pancreatic cancer. Kaplan-Meier overall survival analysis of patients with pancreatic cancer (n=174) stratified into high and low mRNA expression groups based on the median expression level for each of the six proteins, using TCGA data accessed via OncoLnc. Statistical significance was assessed using the log-rank test. TCGA, The Cancer Genome Atlas.

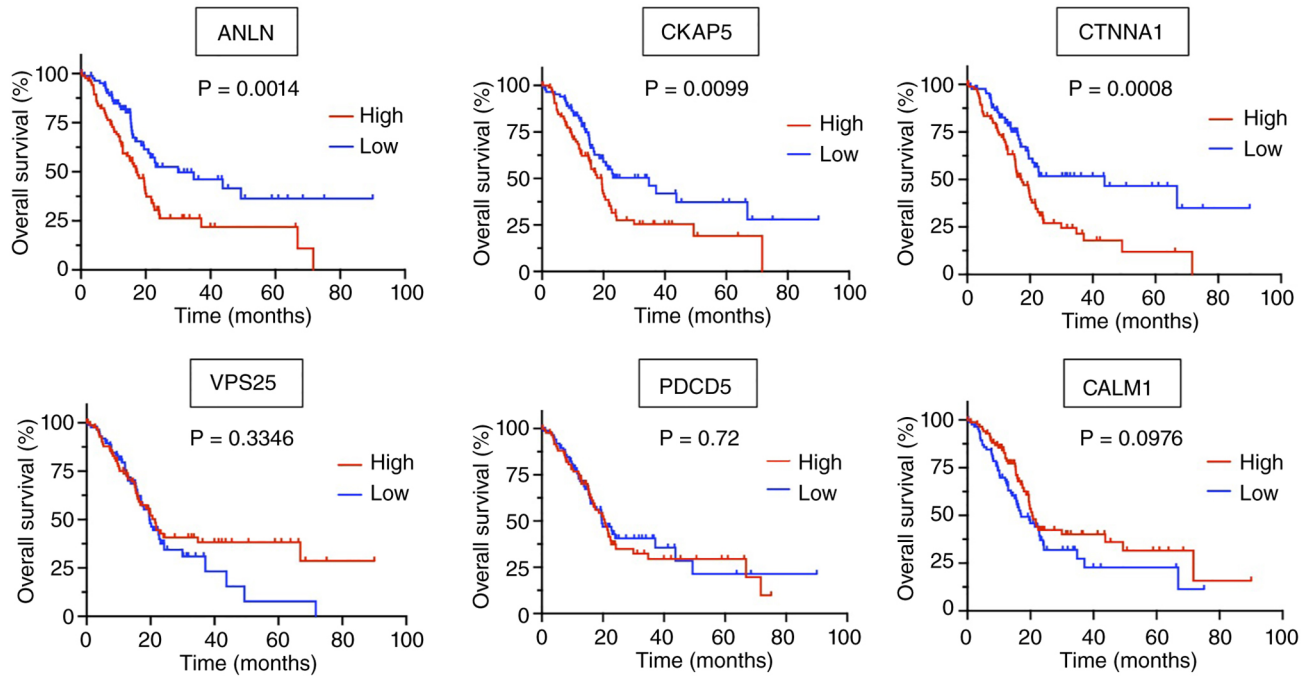


Figure S5. Violin plots of RAP1B, ANLN and LASP1 abundance in proteomic datasets following RAP1B knockdown. Data were analyzed and visualized using MetaboAnalyst v6.0. The left panel shows the original (unnormalized) abundance values ('Original Conc.') and the right panel shows the normalized abundance values ('Normalized Conc.') for the negative control (Ctrl) and si-RAP1B groups. Violin widths represent the kernel density of the data distribution; black dots indicate individual samples, and yellow diamonds denote the group means. ANLN, anillin; si-, small interfering.

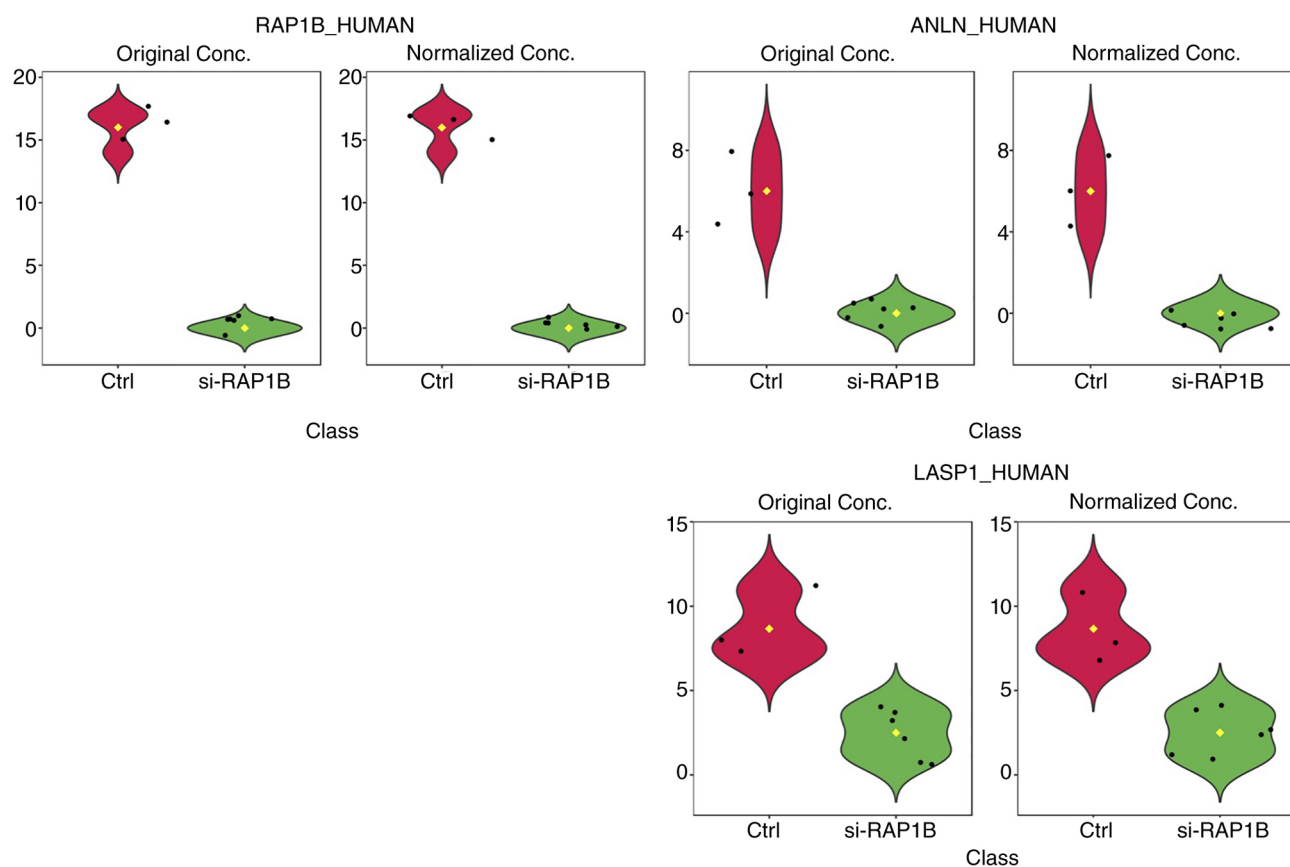
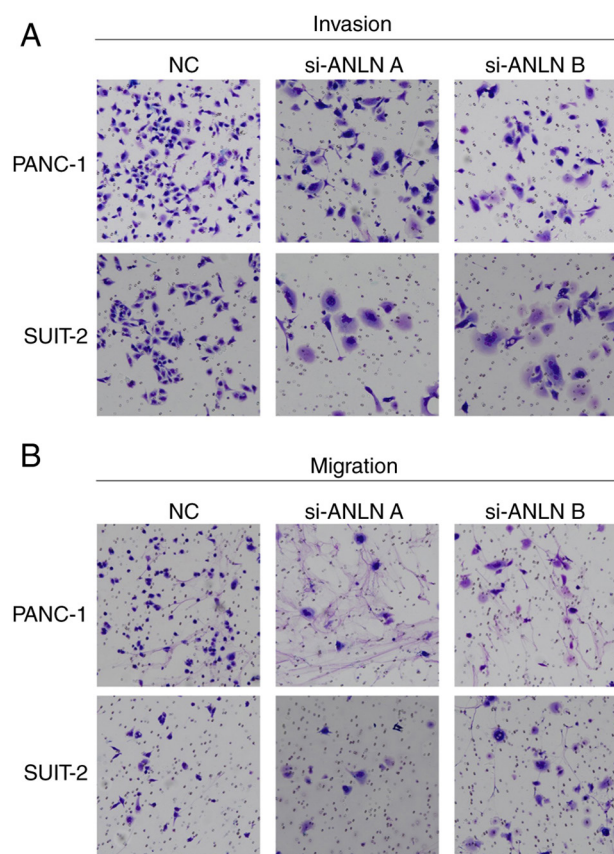


Figure S6. Representative images of migration and invasion assays following ANLN knockdown. (A and B) Representative microscopic images of (A) invasion and (B) migration assays in PANC-1 and SUI-2 cells after ANLN knockdown: magnification, x100. ANLN, anillin; ns, not significant; NC, negative control.



Supplementary_Data1.mp4. Time-lapse videos of RAP1B knockdown and control in PANC-1 and SUI-2 cells.(a and b) PANC-1 cells: negative control group (a) and RAP1B knockdown group (b). (c and d) SUI-2 cells: negative control group (c) and RAP1B knockdown group (d). magnification,x200.

Supplementary_Data2.mp4. Time-lapse videos of ANLN knockdown and control in PANC-1 and SUI-2 cells. (a and b) PANC-1 cells: negative control group (a) and ANLN knockdown group (b). (c and d) SUI-2 cells: negative control group (c) and ANLN knockdown group (d). magnification,x200.