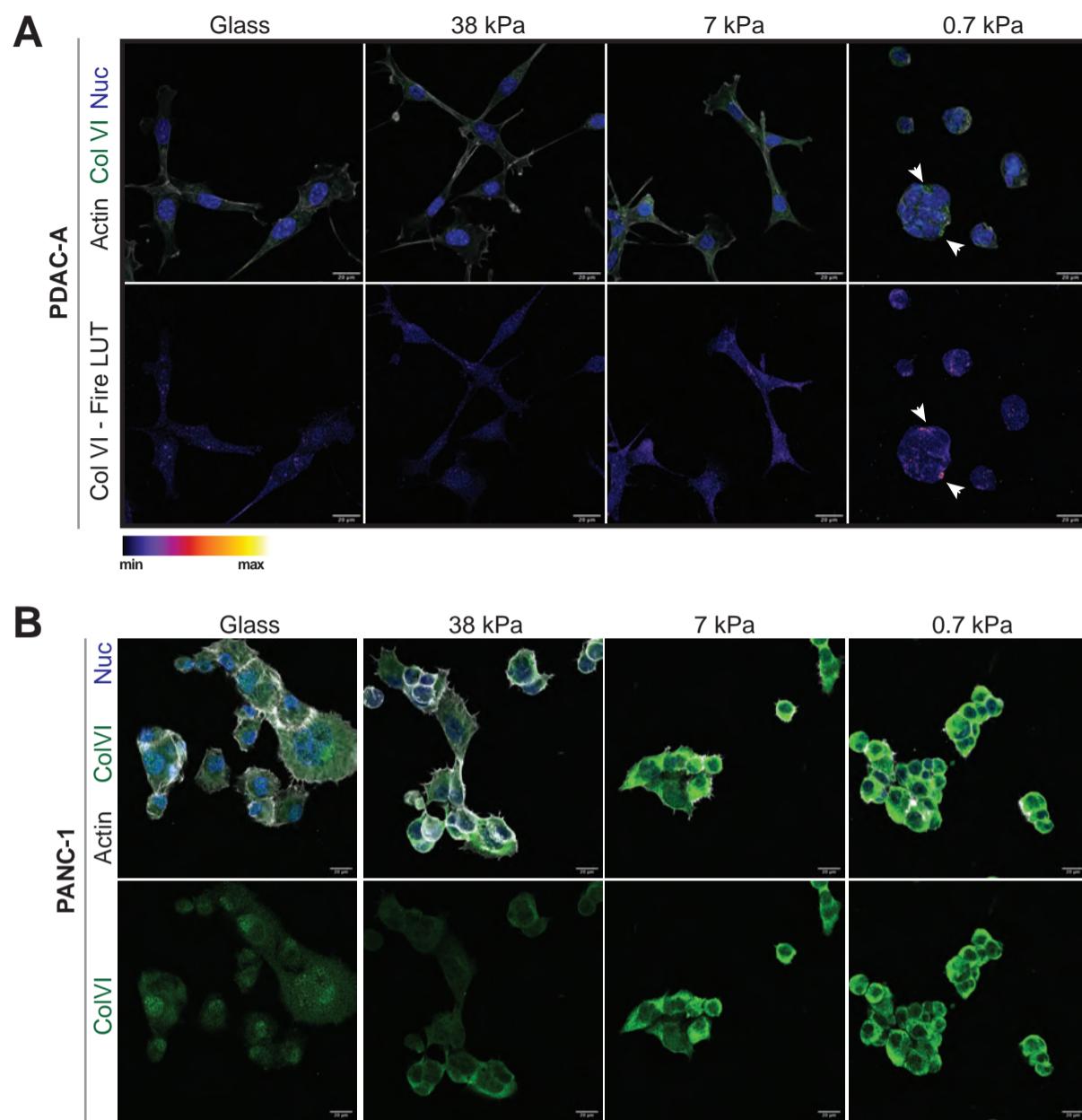


**Fig. S1. Low substrate stiffness alters the expression of matrisome-related genes in PDAC cells.**

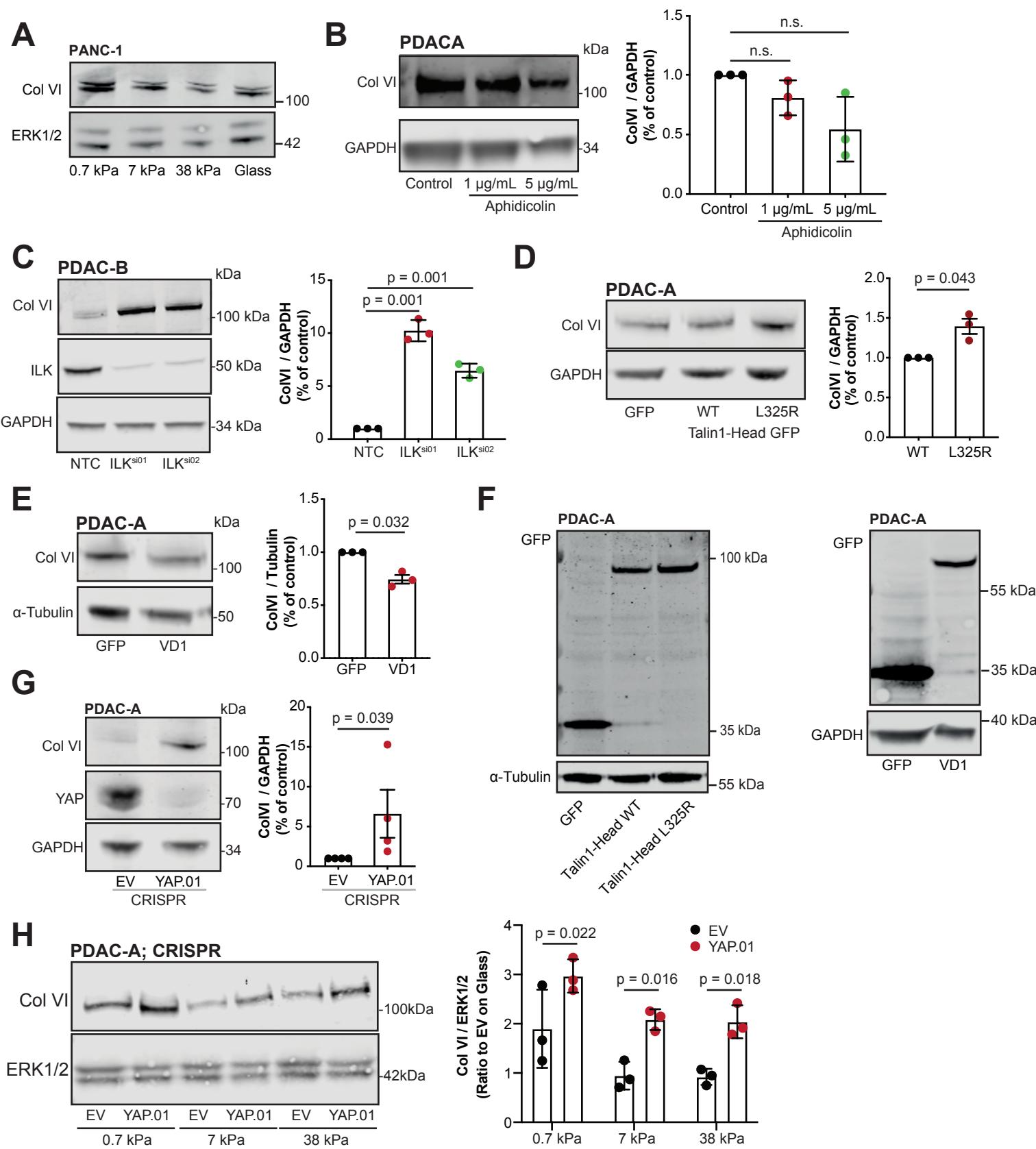
- A:** Immunofluorescence of PDAC-B cells cultured atop of 0.7 kPa, 7 kPa or 38 kPa fibronectin-coated polyacrylamide hydrogels for 24 hours, showing YAP1 (grey). Scale bars, 50  $\mu$ m.
- B:** Quantification of ‘nuclear YAP1’/‘cytosolic YAP1’ intensity ratio for cells in (A). Values are mean  $\pm$  s.e.m. from n= 52 cells, 0.7kPa; n= 68, 7kPa; n= 42, 38kPa; n= 46, glass. Cells are from 3 independent experiments. Statistical significance was assessed by Kruskal-Wallis test with Dunn’s multiple comparisons test.
- C:** Hierarchical clustering of RNA sequencing signatures from PDAC-A and PDAC-B cells cultured on fibronectin-coated 0.7 kPa, 38 PAAm hydrogels and glass coverslips for 24 hours.
- D:** PCA clustering of cells from (C).
- E:** Bar plot displaying differentially expressed genes ( $p_{adj} < 0.05$ ; log<sub>2</sub> fold change >1) from the ‘ECM-Receptor Interaction’ KEGG pathway that were enriched in cells from (C). Data is organised by log<sub>2</sub> fold change.
- F:** log<sub>2</sub> RNA seq counts of indicated genes of PDAC-A (left) and PDAC-B (right) cells cultured on 0.7 kPa, 38 kPa hydrogels and glass coverslips. Data is from n = 4 independent replicates per condition for each cell line.



**Fig. S2. Collagen VI is upregulated in PDAC cells upon low substrate stiffness**

**A:** Top; Immunofluorescence of PDAC-A cells cultured on glass coverslips, 0.7-, 7- and 38-kPa fibronectin-coated hydrogels, showing Collagen VI (green), Actin (grey) and nuclei (blue). Representative pictures from 3 independent experiments. Bottom; Individual Collagen VI channel (Fire LUT). Scale bars, 20 $\mu$ m. Arrowheads indicate Collagen VI enrichment.

**B:** Top; Immunofluorescence of PANC-1 cells cultured on glass coverslips, 0.7-, 7- and 38-kPa fibronectin-coated hydrogels, showing Collagen VI (green), Actin (grey) and nuclei (blue). Representative pictures from 3 independent experiments. Bottom; Individual Collagen VI channel (Green). Scale bars, 20 $\mu$ m.



**Fig. S3. Loss of ECM adhesion and mechanosensing upregulates Collagen VI expression in PDAC cells.**

**A:** Collagen VI protein expression in PANC-1 cells measured by immunoblotting for Collagen VI (Col VI) and ERK1/2 (loading control). Blots are representative of two independent experiments.

**B:** Left; PDAC-A cells were treated with 1 µg/mL and 5 µg/mL aphidicolin for 24 hours and immunoblotted for Collagen VI and GAPDH (loading control). Right; Densitometric quantification of protein expression. Values are mean ± s.d.

**C:** Left; Control (NTC) or ILK silenced (*Ilk*<sup>Si01</sup>, *Ilk*<sup>Si02</sup>) PDAC-B cells were immunoblotted for Collagen VI, ILK and α-Tubulin (loading control). Right; Densitometric quantification of protein expression. Values are mean ± s.d.

**D:** Left; PDAC-A cells expressing either GFP or GFP-tagged Talin 1-head domain (WT, control) or Talin-head L325R mutant (L325R) were immunoblotted for Collagen VI and GAPDH (loading control). Right; Densitometric quantification of protein expression. Values are mean ± s.d.

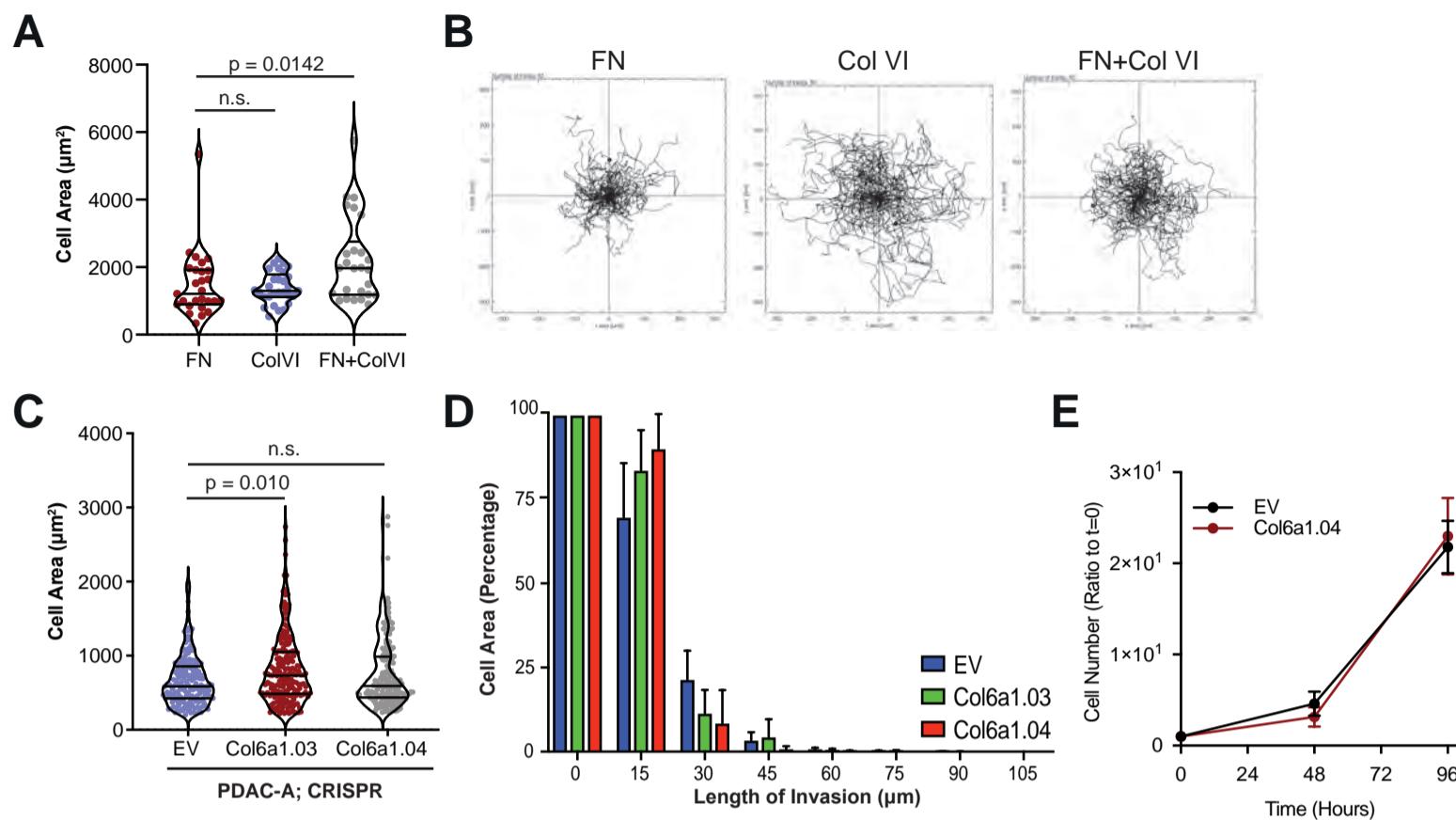
**E:** Left; PDAC-A cells expressing either GFP (control) or GFP-tagged Vinculin Domain 1 (VD1) were immunoblotted for Collagen VI and α-Tubulin (loading control). Right; Densitometric quantification of protein expression. Values are mean ± s.d.

**F:** Left; PDAC-A cells expressing expressing either GFP or GFP-tagged Talin 1-head domain (WT, control) or Talin-head L325R mutant (L325R) were immunoblotted for GFP and α-Tubulin (loading control). Right; PDAC-A cells expressing either GFP or GFP-tagged Vinculin Domain 1 (VD1) were immunoblotted for GFP and GAPDH (loading control).

**G:** Left; Control (EV) or YAP-depleted (YAP.01) PDAC-A cells were immunoblotted for Collagen VI, YAP and GAPDH (loading control). Pictures are representative of 4 independent experiments. Right; Densitometric quantification of ColVI protein expression. Values are mean ± s.d.

**H:** Left; Control (EV) or YAP-depleted (YAP.01) PDAC-A cells were cultured on fibronectin-coated 0.7-, 7- and 38-kPa hydrogels and were immunoblotted for Collagen VI and ERK1/2 (loading control). Right; Densitometric quantification of protein. Values are mean ± s.d. and representative from 3 independent experiments. Statistical significance was assessed by two-way ANOVA and p-values were corrected for multiple comparisons by Šídák's test.

All data in B-E are from 3 independent experiments. Statistical significance was assessed by two-tailed one-sample *t*-test on natural log-transformed values.



**Fig. S4. Collagen VI ECM supports migratory behaviour of PDAC cells *in vitro* and loss of Col6a1 expression delays invasion through recombinant basement membrane ECM.**

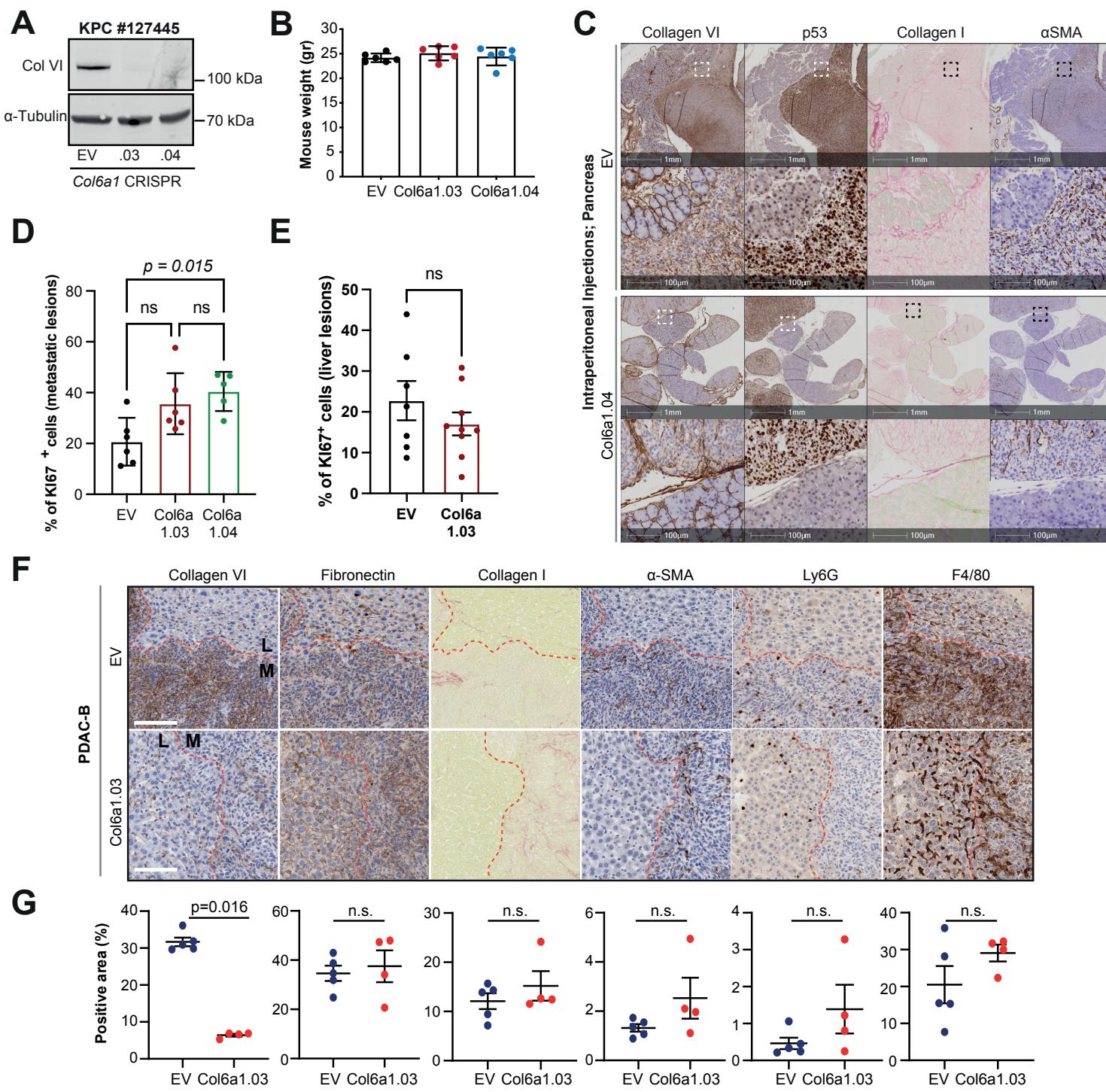
**A:** Cell area ( $\mu\text{m}^2$ ) quantification of PDAC-A cells cultured on fibronectin (FN), collagen VI (ColVI) or fibronectin and collagen VI (FN+ColVI) glass coverslips. Values are from  $n = 27$  FN cells;  $n = 29$ , ColVI;  $n = 26$ , Fn+ColVI cells. Cells are from three independent experiments. Statistical significance was assessed by Kruskal-Wallis with Dunn's multiple comparisons test.

**B:** Tracks (spider plots) of PDAC-A cells migrating on fibronectin (FN), collagen VI (ColVI) or fibronectin and collagen VI (FN+ColVI) glass coverslips for 16 hours.

**C:** Cell area ( $\mu\text{m}^2$ ) quantification of Control (EV) or Collagen VI depleted (Col6a1.03 and Col6a1.04) mouse PDAC-A cells. Values are mean  $\pm$  s.d. from  $n = 170$  EV,  $n = 191$  Col6a1.03 and  $n = 183$  Col6a1.04 cells from 3 independent experiments. Statistical significance was assessed by Kruskal-Wallis with Dunn's multiple comparisons test.

**D:** Quantification of invaded area of Control (EV) or Collagen VI depleted (Col6a1.03 and Col6a1.04) mouse PDAC-A cells invading through the inverted invasion assay setup. Intensity for each depth is reported as a percentage of intensity at 0  $\mu\text{m}$ . Values are mean  $\pm$  s.d. from 3 independent experiments.

**E:** Cell number (Ratio to t=0) over time of control (EV) or Collagen VI depleted (Col6a1.01-04) PDAC-B cells. Values are mean  $\pm$  SD from  $n = 3$  independent experiments.



**Fig. S5. Collagen VI expression supports establishment of pancreatic metastasis in vivo.**

- A:** Control (EV) or Collagen VI depleted (Col6a1.01-04) KPC cells were immunoblotted for Collagen VI and  $\alpha$ -Tubulin (loading control).
- B:** Weight (gr) per mouse as indicated from intraperitoneal injection of control (EV) or Collagen VI depleted (Col6a1.03 and Col6a1.04) KPC cells after sacrifice. Values are mean  $\pm$  SD from n = 6 EV, n = 6 Col6a1.03 and n = 6 Col6a1.04 mice.
- C:** Representative immunohistochemistry images showing Collagen VI, p53, Collagen I and  $\alpha$ -SMA expression in tumors formed in the pancreas by intraperitoneal injection of control (EV) (top 2 panels) or Collagen VI depleted (bottom 2 panels) KPC cells. Scale bars, 1mm and 100 $\mu$ m.
- D:** Quantifications of KI67 $^{+}$  cells in metastatic lesions of nude mice intraperitoneally injected with control (EV), or Collagen VI depleted KPC cells (Col6a1.03 and Col6a1.04). Mean  $\pm$  s.e.m. from n = 6 EV, n = 6 Col6a1.03 and n = 5 Col6a1.04 mice. Statistical significance was assessed with Brown-Forsythe and Welch ANOVA test with Dunnett's multiple comparison test.
- E:** Quantifications of KI67 $^{+}$  cells in metastatic lesions of nude mice intrasplenically injected with control (EV), or Collagen VI depleted PDAC-B (Col6a1.03). Mean  $\pm$  s.e.m. from n = 7 EV and n = 9 Col6a1.03 mice. Statistical significance was assessed with two-tailed Welch's t-test.
- F:** Representative immunohistochemistry images showing Collagen VI, Fibronectin, Collagen I,  $\alpha$ -SMA, Ly6G and F4/80 expression in liver metastatic nodules formed by intrasplenic injection of control (EV; top) or Collagen VI depleted (Col6a1.03; bottom) KPC cells. Red line denotes liver (L) and metastasis (M) boundary. Scale bars, 100 $\mu$ m.
- G:** Quantification of positively stained regions over tumor area (%) from D. Values are mean  $\pm$  s.e.m. from n = 5 control (EV) and n = 4 Col6a1.03 mice. Statistical significance was assessed by Mann-Whitney test (Collagen VI) and unpaired t-test (Fibronectin, Collagen I,  $\alpha$ SMA, Ly6G and F4/80).

**Table S1. Mice Information**

[Click here to download Table S1](#)

**Table S2.** Raw data, including RNA sequencing data.

[Click here to download Table S2](#)