

## Supplemental Data

### Context-Dependent Transformation of Adult

### Pancreatic Cells by Oncogenic K-Ras

Sharon Y. Gidekel Friedlander, Gerald C. Chu, Eric L. Snyder, Nomedra Girnius, Gregory Dibelius, Denise Crowley, Eliza Vasile, Ronald A. DePinho, and Tyler Jacks

#### Supplemental Figures

**Figure S1.** Further characterization of *Pdx1CreER<sup>TM</sup>;LSL-Kras<sup>G12D</sup>* compound mice.

**A-B:** Immunohistochemical staining for the  $\alpha$  cell marker Glucagon (A) and PP cell marker PYY (B). Note positive staining in mPanINs, ductal metaplasia and in non-neoplastic islet (orange, black and red arrows, respectively).

**C-D:** H&E staining of pancreata obtained from mice 120 days after TM injection. Note developed ductal structures in the islets (arrows in C), exocrine hypoplasia, mPanINs (arrows in D), ductal metaplasia (arrowhead in D) and strong stromal reaction.

**E-F:** H&E staining of pancreata derived from mice treated with either TM dissolved in corn oil by intraperitoneal injection (E) or TM dissolved in carboxymethyl cellulose by oral gavage (F). Note peritonitis in E and mPanIN formation in F (arrows).

Bars: A, B: 50  $\mu$ m; C-E: 100 $\mu$ m; F: 200 $\mu$ m.

**Figure S2.** *Kras<sup>G12D</sup>* activation in *pro-CPA*-positive cells of the adult pancreas results in mPanIN and PDAC development at low frequency.

**A:** X-gal staining of a pancreas derived from a TM-treated *proCPA1CreER<sup>T2</sup>;LSL-Kras<sup>G12D</sup>;LSL-LacZ* compound mouse shows mPanIN formation (arrow).

**B:** H&E-stained section of metastatic PDAC (m) in the liver (l) of a *proCPA1CreER<sup>T2</sup>;LSL-Kras<sup>G12D</sup>;Trp53<sup>flox/flox</sup>* compound mouse.

Bars: A: 100  $\mu\text{m}$ ; B: 200 $\mu\text{m}$ .

**Figure S3.**  $Kras^{G12D}$  activation in combination with p53 or Ink4A/Arf loss in *pro-CPA*-positive and *insulin*-positive cells of the adult pancreas results in mPanIN3 and PDAC development after caerulein treatment.

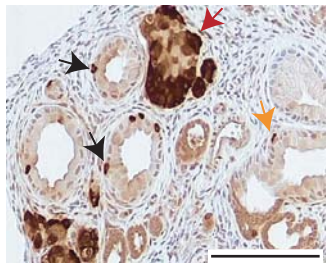
**A-B:** H&E-stained sections of mPanIN3 (arrow in A) and PDAC (B) in caerulein- & TM-treated *proCPA1CreER<sup>T2</sup>;LSL-Kras<sup>G12D</sup>;Trp53<sup>flox/flox</sup>* compound mice.

**C:** H&E-stained section of PDAC invading the spleen (S) of a TM- & caerulein-treated *proCPA1CreER<sup>T2</sup>;LSL-Kras<sup>G12D</sup>;Ink4A/Arf<sup>flox/flox</sup>* compound mouse.

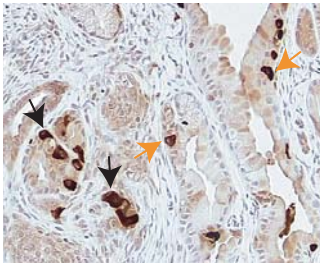
**D:** H&E-stained section of PDAC arising in a caerulein- & TM-treated *RipCreER<sup>TM</sup>;LSL-Kras<sup>G12D</sup>; Trp53<sup>flox/flox</sup>;LSL-LacZ* compound mouse. The tumor exhibits anaplasia with giant cells (arrows).

Bars: 200  $\mu\text{m}$ .

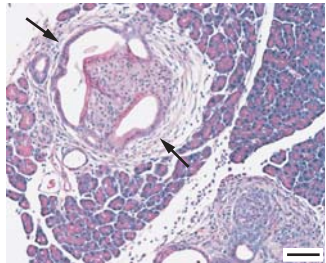
A



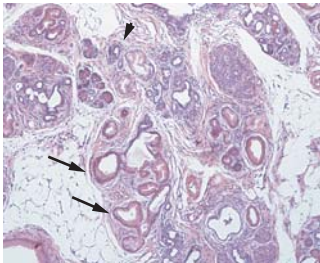
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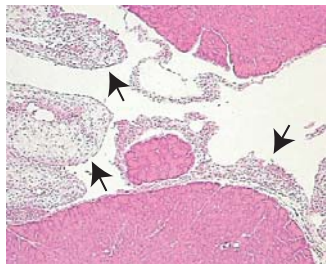
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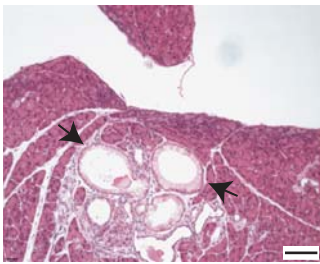
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E

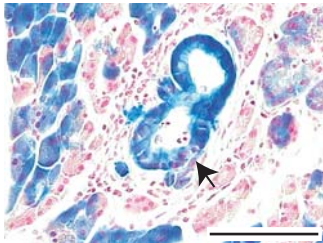


F



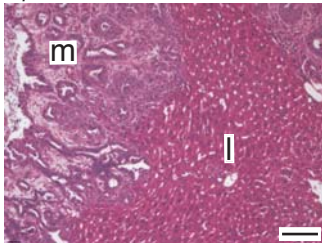
A

*proCPACreER<sup>T2</sup>;LSL-Kras<sup>G12D</sup>;  
LSL- LacZ*

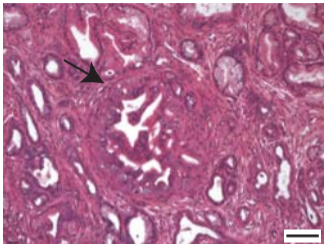


B

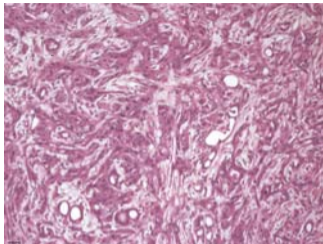
*proCPACreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>;  
Trp53<sup>flox/flox</sup>*



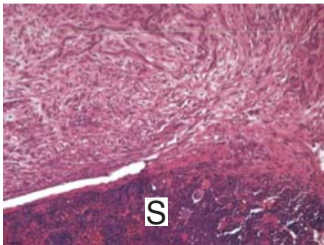
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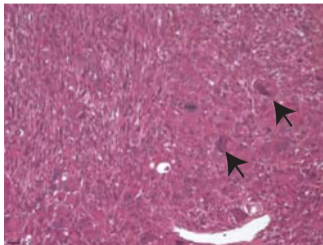
B



C



D



**Table S1: Quantification of the recombination efficiency and specificity of the different Cre strains used in the study. Mice were treated with Tamoxifen (TM) by intraperitoneal injections of 9mg/40g body weight in corn oil, one every other day for a total of 3 injections. Animals were at the age of 21-30 day old at the time of first injection and sacrificed 14 days after the last TM injection. Analysis was performed on X-gal stained sections of pancreata derived from three mice of each genotype.**

Genotype	% Recombined acinar cells per tissue section by analyzed areas	Average % recombination of acinar cells per tissue section	Number of recombined islets/ total number of islets per tissue section	% Recombination per analyzed islet	Average % recombination per islet	Number of recombined ducts/ total number of ducts per tissue section	% Recombination per analyzed duct	Average % recombination per ducts	# of recombined single cells outside the islets per tissue section
<i>RipCreER<sup>TM</sup>; LSL-LacZ</i>	0	0	13/13	90 100 90 95 98 100 100 100 97 97 88 99 97	96	0	0	0	3
<i>RipCreER<sup>TM</sup>; LSL-LacZ</i>	0	0	7/7	98 100 100 97 98 85 60	91	0	0	0	2
<i>RipCreER<sup>TM</sup>; LSL-LacZ</i>	0	0	10/10	99 99 99 88 98 98 95 99 100 97	97	0	0	0	3
<i>Pdx1CreER<sup>TM</sup>; LSL-LacZ</i>	a)50 b)85 c)60 d)80 e)90 f)85 g)50 h)75 i)85	74	8/8	80 80 99 85 90 85 80 98	87	20/24	50 50 50 100 70 75 100 50 80 100 100 50 80 100 85 100 50 100 100 80	79	0
<i>Pdx1CreER<sup>TM</sup>; LSL-LacZ</i>	a)95 b)100 c)95 d)98 e)80 f)50	86	6/6	100 100 100 100 99 100	99.8	7/7	100 100 100 98 100 100 100 80	99.7	0
<i>Pdx1CreER<sup>TM</sup>; LSL-LacZ</i>	a)98 b)98 c)98 d)85 e)99 f)98 g)99 h)97 I)95 j)99 k)96	97	20/20	30 85 100 90 98 95 90 85 95 95 60 80 90 80 90	87	61/77	16x0% 6x10% 2x5% 10x2% 15x100% 11x50% 4x30% 1x60% 6x80% 4x20% 2x90%	50	0

				97 90 97 98 95					
<i>proCPA1CreER<sup>fl2</sup>; LSL-LacZ</i>	a)45 b)30 c)50 d)70 e)90 f)40 g)35 h)40 i)40 j)30 k)70	49	4/4	50 90 100 100	85	10/19	100 100 100 10 50 100 100 50 100 100	81	0
<i>proCPA1CreER<sup>fl2</sup>; LSL-LacZ</i>	a)40 b)40 c)35 d)60 e)0 f)45 g)40 h)50 i)0 j)70 k)75	41	1/1	80	80	10/18	100 50 50 50 50 50 80 70 70 50	62	0
<i>proCPA1CreER<sup>fl2</sup>; LSL-LacZ</i>	a)5 b)20 c)25 d)3 e)20 f)60 g)45 h)25 i)60 j)50	31	3/3	7 2 98	36	5/16	70 20 100 100 100	78	0

**Table S2: Quantification and characterization of pre neoplastic lesions and PDAC developed upon *Kras*<sup>G12D</sup> activation alone or in combination with p53 or Ink4A/Arf loss by *Pdx1CreER*<sup>TM</sup>**

Mouse Genotype	Treatment	N=	<i>Kras</i> <sup>G12D</sup> activation at post-natal age	Sacrificed #of days after the last TM injection	# of mice with 1-2x 1A lesions	# of mice with multiple 1A lesions	# of mice with 1-4x 1B lesions	# of mice with multiple 1B lesions	# of mice with 2-5 grade 2 lesions	# of mice with grade 3 lesions	mucinous/ non mucinous focal ductal metaplasia	# of mice with Ducts (DII)/ Acini in islets (AII)	# of mice with PDAC	Metastasis (met)/ invasion (i)
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	14	4, 7	0	0	0	0	0	0	N.A.	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	3	14	10	3	0	0	0	0	0	N.A	2x DII, 1x AII	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	14	20	0	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	3	14	40	0	3	1	2	0	0	N.A	2x DII	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	3	14	120	1	2	0	2	2	0	N.A	1x DII	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	21	40	0	1	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	24	40	0	1	1	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	27	10	1	0	0	0	0	0	N.A	1x DII	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	4	27	20	1	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	27	40	0	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	27	120	0	2	1	1	2	0	N.A	2x DII	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	27	188	0	1	0	1	1	1	N.A	0	1	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	56	10	1	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	56	20	1	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	56	40	0	1	1	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	56	120	0	1	1	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	Corn oil	5	14	5, 10, 20, 40, 120	0	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	Corn oil	5	27	5, 10, 20, 40, 120	0	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	Corn oil	5	56	5, 10, 20, 40, 120	0	0	0	0	0	0	N.A	0	0	N.A
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/fllox</sup></i>	TM	6	22 23 22 22	18 57 40 60	0	3	1	2	4	4	2x non mucinous	2x DII	2x MD to PD 1x PD with S 1x PD with A	3x SI(i) 1x spleen and Diaphragm (met)

			23	30										
			23	37										
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/flox</sup>; Luciferase<sup>fllox/+</sup></i>	TM	6	24 23 23 23 26 54	20 45 45 45 79 30	2	2	4	1	5	3	2x non mucinous	0	3x Poor diff 1x PD with A 1x PD with S and A	1x SI (i) 1x stomach (i)
<i>Pdx1CreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/flox</sup></i>	TM	1	28	36	0	1	1	0	1	1	0	0	1x PD with S and A	1x SI (i)

N.A. not applicable

**Table S3: Quantification and characterization of pre neoplastic lesions and PDAC developed upon *Kras<sup>G12D</sup>* activation alone or in combination with p53 or Ink4A/Arf loss by *RipCreER<sup>TM</sup>* and *proCPAICreER<sup>T2</sup>***

Mouse Genotype	Treatment	N=	<i>Kras<sup>G12D</sup></i> activation at post-natal age	Sacrificed #of days after the last TM injection	# of mice with 1-2x 1A lesions	# of mice with multiple 1A lesions	# of mice with 1-4x 1B lesions	# of mice with multiple 1B lesions	# of mice with 2-4 grade 2 lesions	# of mice with grade 3 lesions	# of mice with Ducts (DII)/ Acini in islets (AII)	# of mice with PDAC	Metastasis (met)/ invasion (i)	<i>K-ras</i> recombination tested by PCR/confirmed
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	6	14	5, 10, 20, 40, 126, 240	0	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	14	120	1	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	4	23	5, 20, 40, 240	0	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	23	151	1	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	4	26	20, 40, 126, 219	0	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	27	26	0	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	30	14	0	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	51	40	0	0	0	0	0	0	0	0		YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	corn-oil	4	14	5,10, 40, 120	0	0	0	0	0	0	0	0		YES/NO
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	corn-oil	4	26	5,20, 40, 120	0	0	0	0	0	0	0	0		YES/NO
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	corn-oil	1	56	40	0	0	0	0	0	0	0	0		YES/NO
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/flox</sup></i>	TM	5	14 14 28 53 53	46 97 67 81 81	0	0	0	0	0	0	0	1x MD to PD with undifferentiated areas	1X SI (i) liver and diaphragm (met)	YES/YES
<i>proCPAICreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/flox</sup></i>	TM	7	14 14 25 25 15 20 35	113 188 158 309 50 50 83	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	5	14	6, 22, 40, 55	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	15	22, 40	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	3	18	9, 40, 120	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	20	40, 65	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	24	40	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	25	150	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	1	28	40	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	7	29	10, 20, 40, 120	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	3	35	70, 164	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	2	36	145, 240	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM	3	56	10, 20, 120	0	0	0	0	0	0	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	corn-oil	4	14	5, 10, 20, 120	0	0	0	0	0	0	0	0		YES/NO
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	corn-oil	5	27	5, 10, 20, 30, 120	0	0	0	0	0	0	0	0		YES/NO
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	corn-oil	3	56	5, 10, 20	0	0	0	0	0	0	0	0		YES/NO



<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/fllox</sup></i>	TM	9	14 15 15 20 29 29 35 35	10 22 80 80 60 22 22 70 70	0	0	0	0	0	0	0	0	0	0	0	YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/fllox</sup></i>	TM	5	28 28 31 31 31	90 27 10 20 42	0	0	0	0	0	0	0	0	0	0	0	YES/YES

**Table S4: Quantification and characterization of chronic pancreatitis and Kras<sup>G12D</sup>-induced pre neoplastic lesions and PDAC**

Mouse Genotype	Treatment	N=	Kras <sup>G12D</sup> activation at post-natal age	Sacrificed # of days after first TM injection	caerulein for a total of N days	# of mice with 1-2x 1A lesions	# of mice with multiple 1A lesions	# of mice with 1-4x 1B lesions	# of mice with multiple 1B lesions	# of mice with 2-4 grade 2 lesions or more (m)	# of mice with grade 3 lesions	mucinous (m)/ non mucinous (nm) focal ductal metaplasia	# of mice with Ducts (DII)/Acini in islets (AII)	# of mice with PDAC	metastasis (met)/ invasion (i)	K-ras recombination tested by PCR/confirmed
<i>proCPA1CreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup></i>	caerulein + TM	6	60 60 60 60 90	9 34 34 34 163	44 69 69 69 193	0	1	0	0	0	0	0	1x DII	0		YES/YES
<i>proCPA1CreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; LSL-LacZ</i>	caerulein + TM	3	59 63 64	86 33 90	121 66 125	0	2	0	2	0	0	2x m and nm	0	0		YES/YES
<i>proCPA1CreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/fllox</sup></i>	caerulein + TM	6	52 52 52 50 26 99	3 57 71 78 140 9	38 81 106 105 175 44	0	3	0	3	3	0	3x m and nm	0	2x PD 1x Well to PD	abdominal wall (i)	YES/YES
<i>proCPA1CreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/fllox</sup></i>	TM + caerulein	1	25	151	95	0	1	0	0	0	0	0	0	1X PD with S	Spleen surface, Kidney surface, Diaphragm (mets)	YES/YES
<i>proCPA1CreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; LSL-LacZ</i>	TM + caerulein	2	25 33	50 52	81 38	0	0	0	0	0	0	1x nm	0	0		YES/YES
<i>proCPA1CreER<sup>T2</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/fllox</sup>; LSL-LacZ</i>	TM + caerulein	1	33	52	38	0	0	0	0	0	0	1x nm	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; LSL-LacZ</i>	caerulein + TM	2	197 87	58 57	89 84	0	1	0	0	0	0	2x nm	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/fllox</sup></i>	caerulein + TM	1	55	23	78	0	1	0	1	0	0	1x nm	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Ink4A/Arf<sup>fllox/fllox</sup>; LSL-LacZ</i>	caerulein + TM	5	55 54 54 54 30	1 9 9 39 9	33 41 41 72 44	2	3	0	2	1	0	5	1x AII	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/fllox</sup>; LSL-LacZ</i>	caerulein + TM	3	55 55 56	71 71 53	104 104 88	0	3	1	2	1	0	1x m and nm	0	2x PD with S and A 1x undifferentiated (S)	1x Abdominal wall (met) 1x lung (met)	YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup></i>	TM + caerulein	1	29	31	17	1	0	0	0	0	0	1x nm	0	0		YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; LSL-LacZ</i>	TM + caerulein	6	22 31 31 51 51 51	99 23 78 60 114 106	88 9 65 53 101 93	0	4	2	2	1	1	3x nm and 3x m and nm	0	2x PD+ undifferentiated (S)	Diaphragm, Liver border, Peritoneal adipose tissue and Small intestine (i)	YES/YES
<i>RipCreER<sup>TM</sup>; LSL-Kras<sup>G12D</sup>; Trp53<sup>fllox/fllox</sup>; LSL-LacZ</i>	TM + caerulein	4	21 24 24 24	65 67 67 82	51 52 52 42	1	3	3	0	3 x(m)	1	1x nm+m 1x nm	0	3x undifferentiated with S 1x PD+	Small intestine (i) diaphragm (met)	YES/YES



**Table S8: PCR Primers used in the study**

Purpose	Primer ID	Sequence 5'-3'	Product sizes
<i>Cre</i> genotype (for all Cre recombinase harboring strains)	SageF SageR	TGCTGTA CTGGTTATGCGG TTGCCCTGTTCACTATCCAG	700-bp
<i>LSL-Kras<sup>G12D</sup></i> genotype	Dt5'JKNew UniJKNew SD5'JKNew	GTCGACAAGCTCATGCGGG CGCAGACTGTAGAGCAGCG CCATGGCTTGAGTAAGTCTGC	Wild-type, 1Lox - <i>Kras<sup>G12D</sup></i> alleles : 500-bp and 550-bp, respectively
<i>Trp53<sup>lox</sup></i> genotype	A B C D	CACAAAAACAGGTAAACCCAG AGCACATAGGAGGCAGAGAC AAGGGGTATGAGGGACAAGG GAAGACAGAAAAGGGGAGGG	A+B :Wild-type and mutant alleles: 288-bp and 379-bp, respectively C+D: Wild-type and mutant alleles: 431-bp and 584-bp, respectively
<i>Ink4A/Arf<sup>lox</sup></i> genotype	INK20 INK21 KO3 KO4	GTTTCCATTGCGAGGCTGCTCCGTAAGC CTTTAGGGCGTTCTTTCCCACTTCTGC GGTACTGCCGGCCCTTTGAGGGGA CCATCCCCICAAGAGGCCCGGCAGTACC	INK20+INK21: Wild-type and mutant alleles: 150-bp and 250-bp, respectively INK20+KO4: Wild-type and mutant alleles: no product and 177-bp, respectively INK21+KO3: Wild-type and mutant alleles: no product and 130-bp, respectively
<i>R26-LSL-LacZ</i> genotype	UnivF WtR MutR	AAAGTCGCTCTGAGTTGTTAT GGAGCGGGAGAAATGGATATG GCCAAGAGTTTGTCCTCAACC	Wild-type and mutant alleles : 500-bp and 250-bp, respectively
Recombined <i>LSL-Kras<sup>G12D</sup></i>	KrasF1 KrasR1 KrasSD5'	GTCTTTCCCCAGCAGAGTGC CTCTGCCTACGCCACCAGCTC AGCTAGCCACCATGGCTTGAGTAAGTCTGCA	Wild-type K-ras, 2Lox and 1Lox -K-ras <sup>G12D</sup> alleles : 620-bp, 510-bp and ~1100-bp, respectively