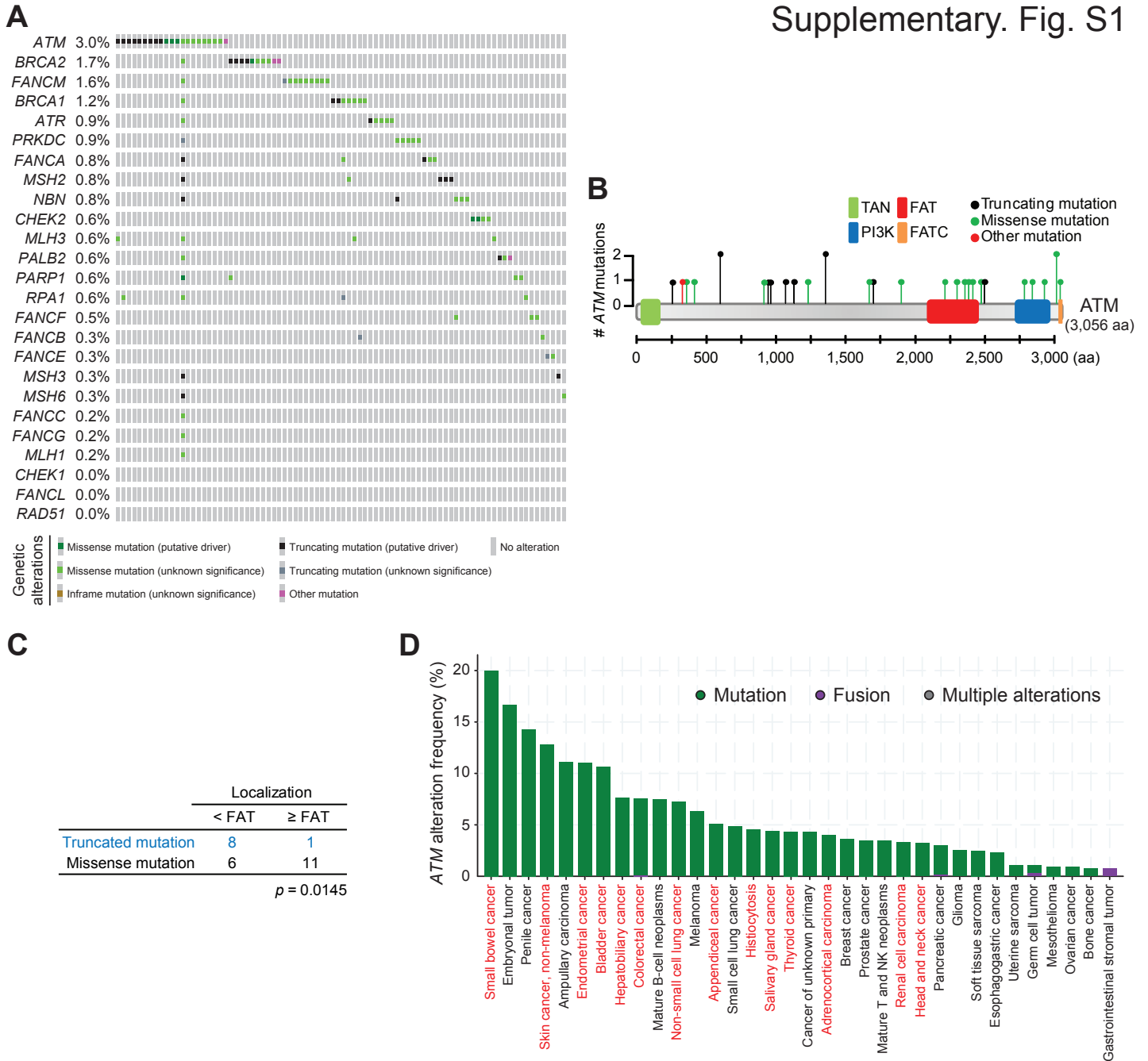
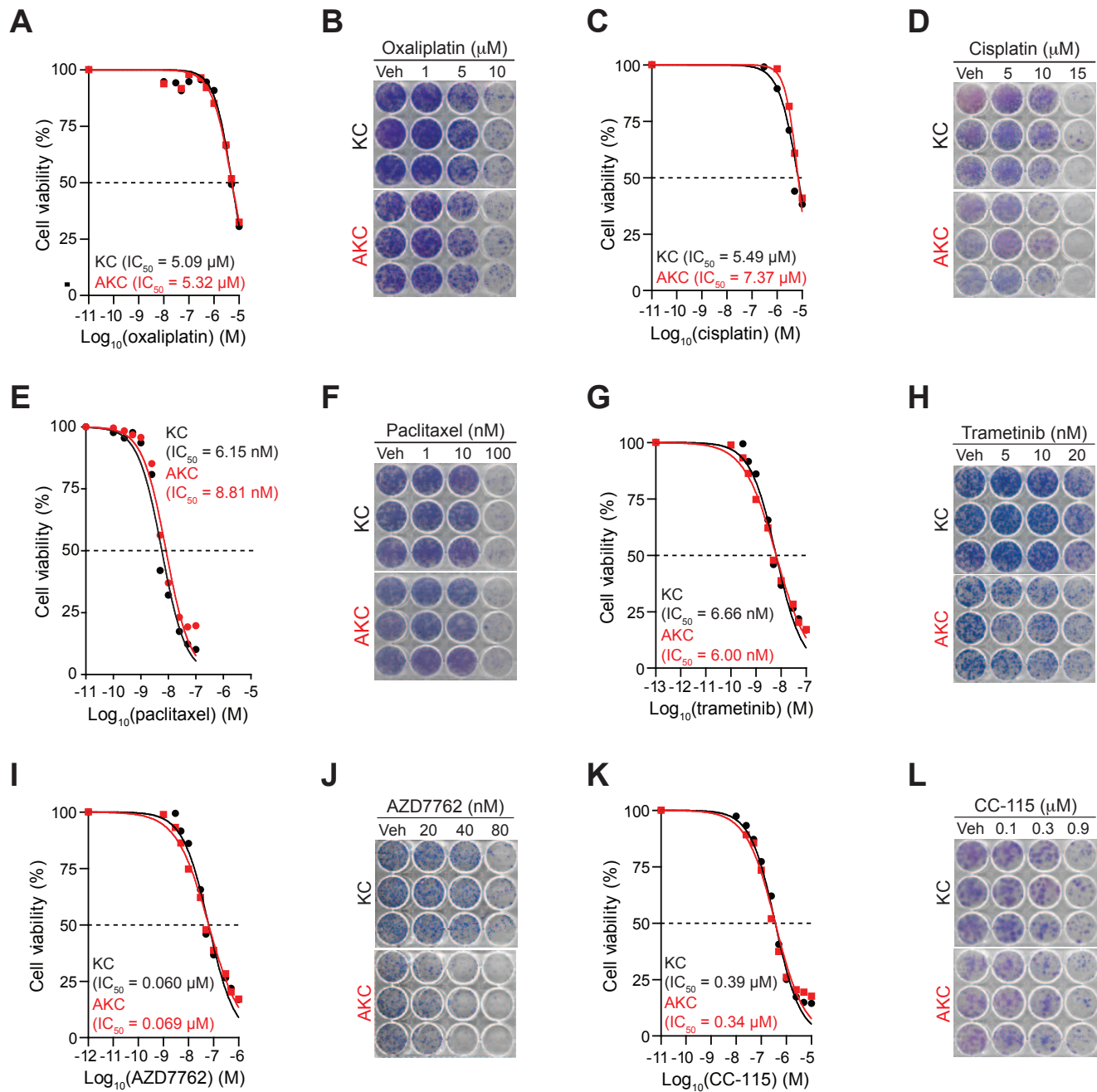


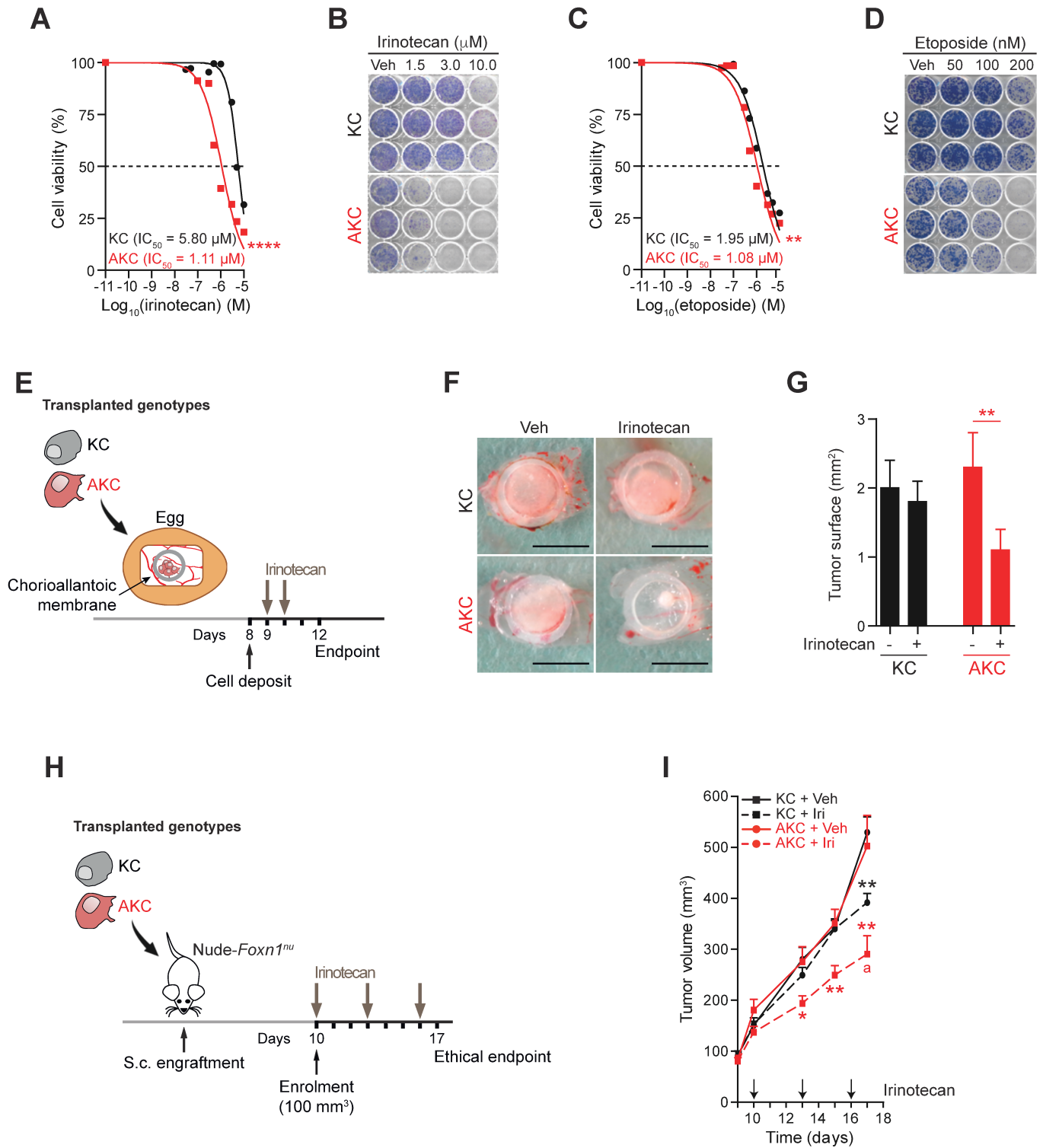
Supplementary. Fig. S1



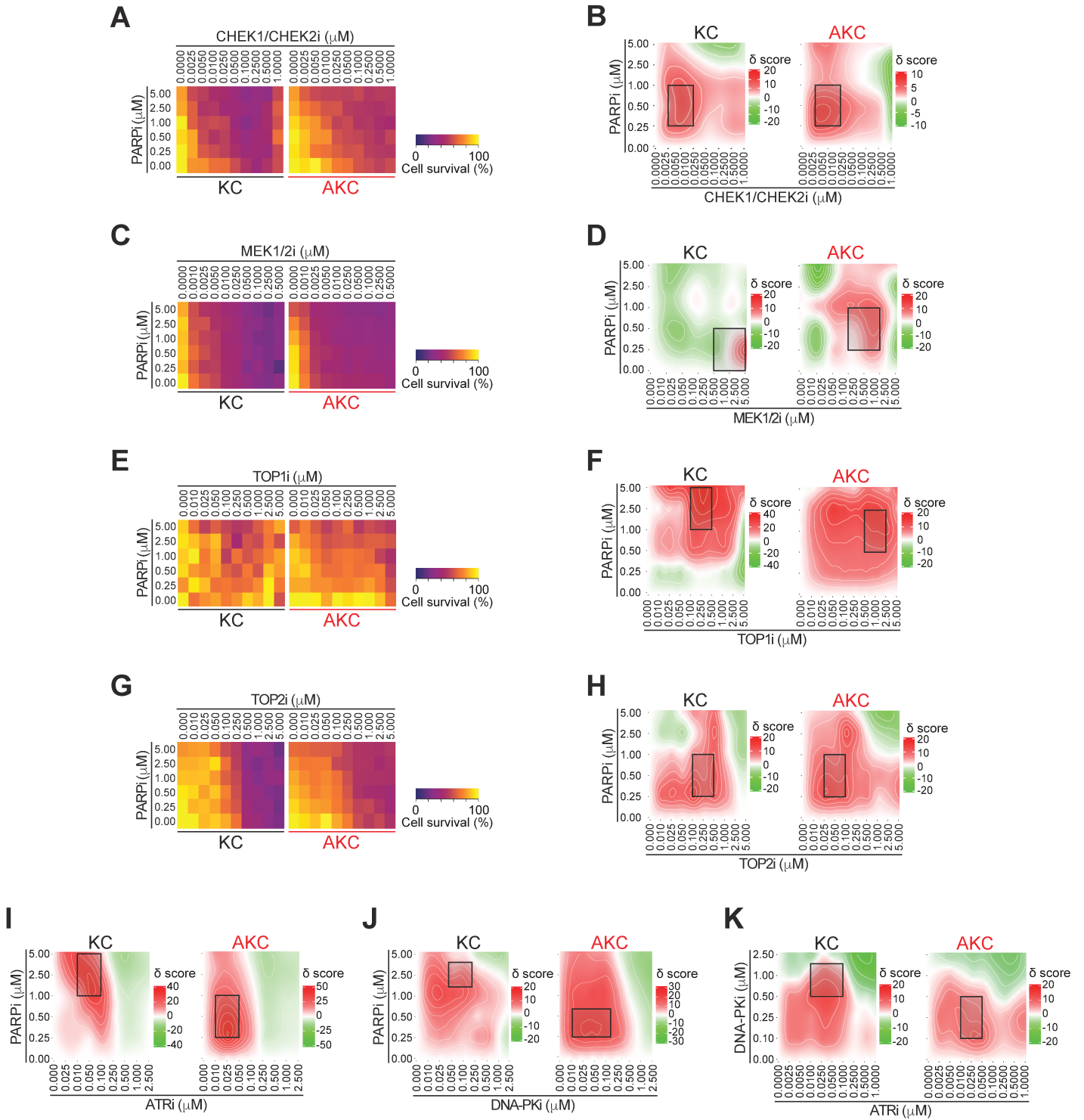
Supplementary Fig. S2



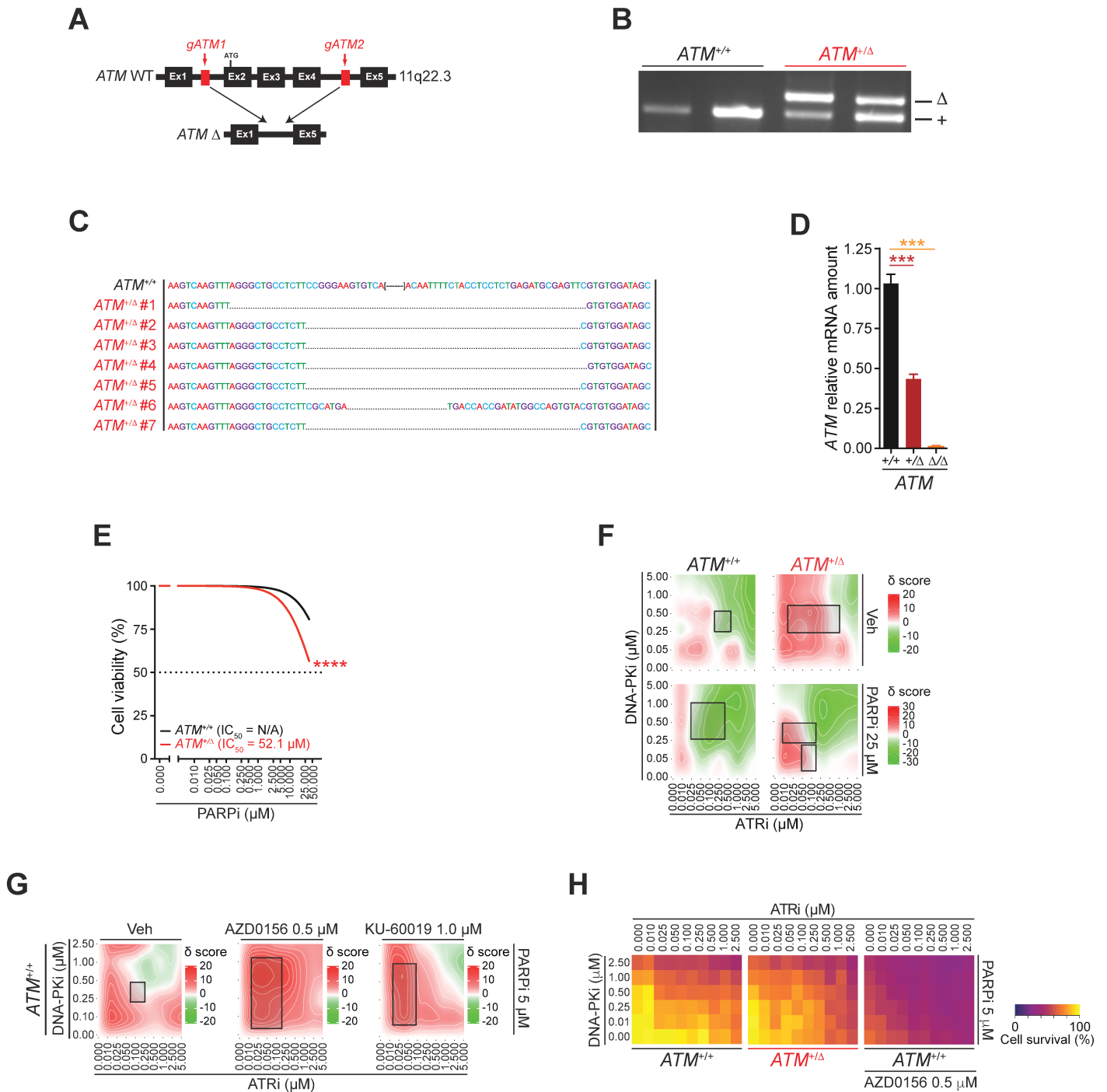
Supplementary Fig. S3



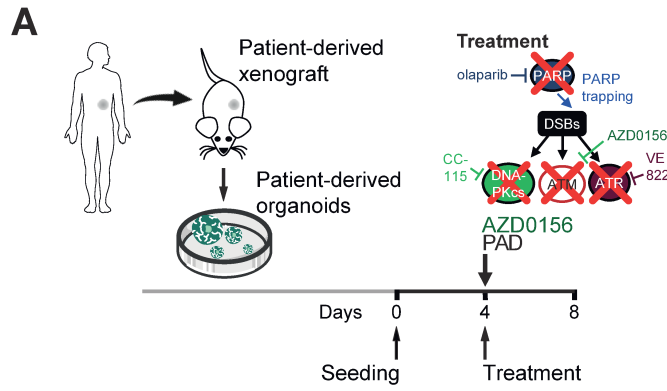
Supplementary Fig. S4



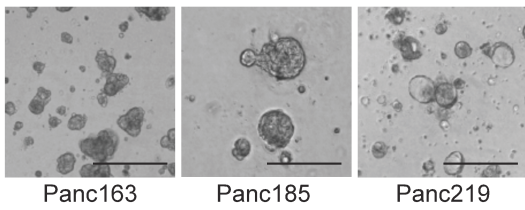
Supplementary Fig. S6



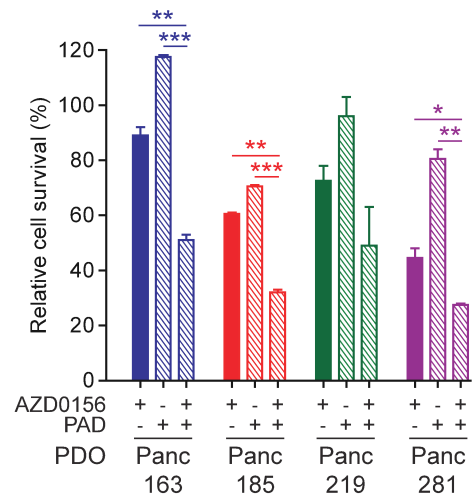
Supplementary Fig. S7



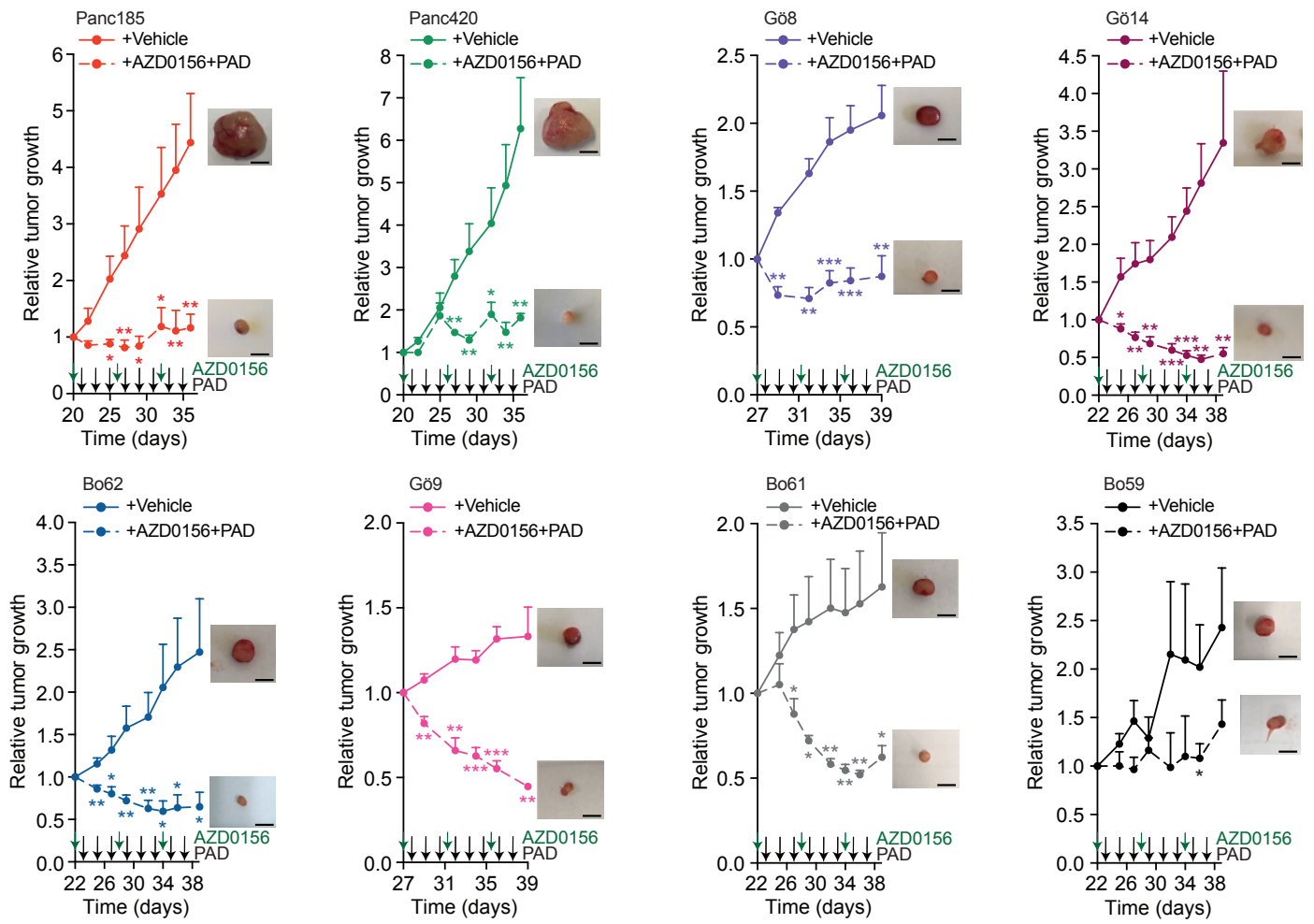
B



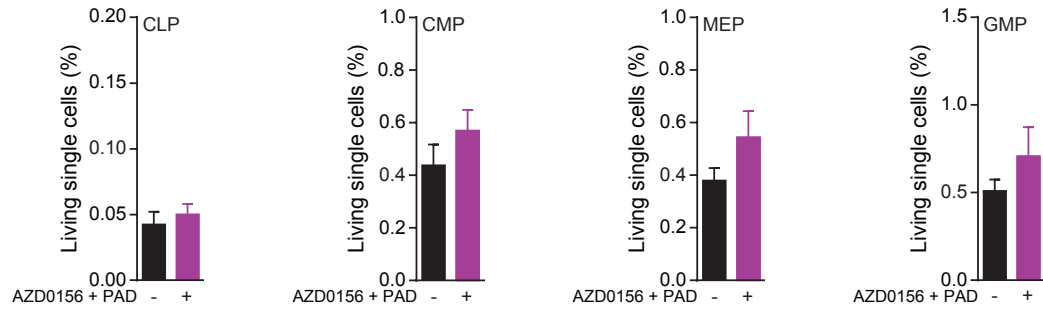
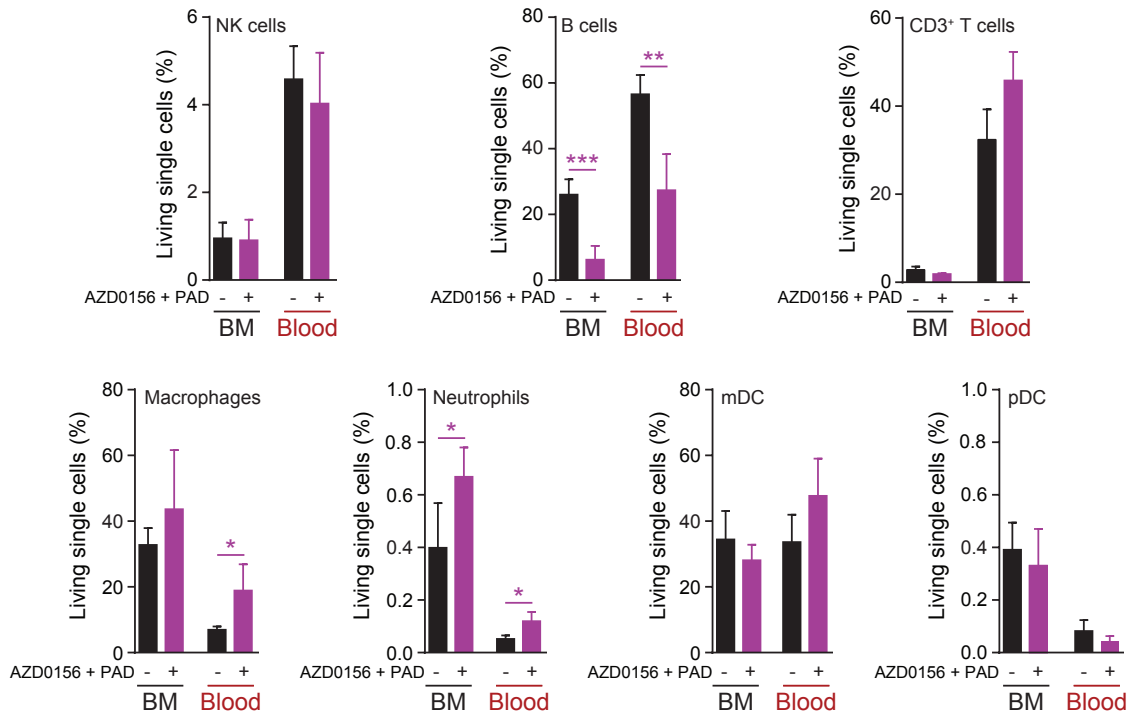
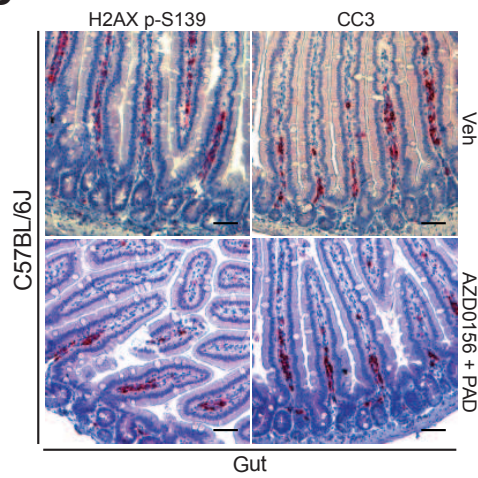
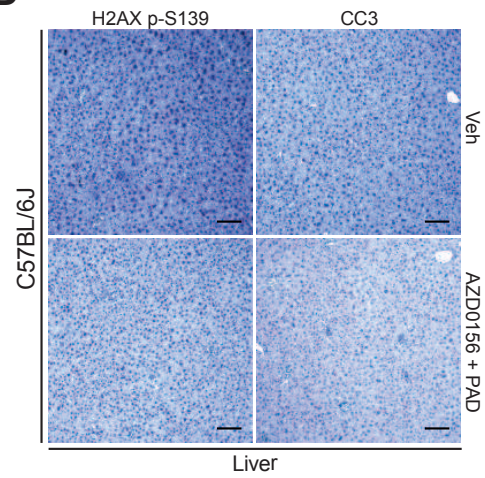
C



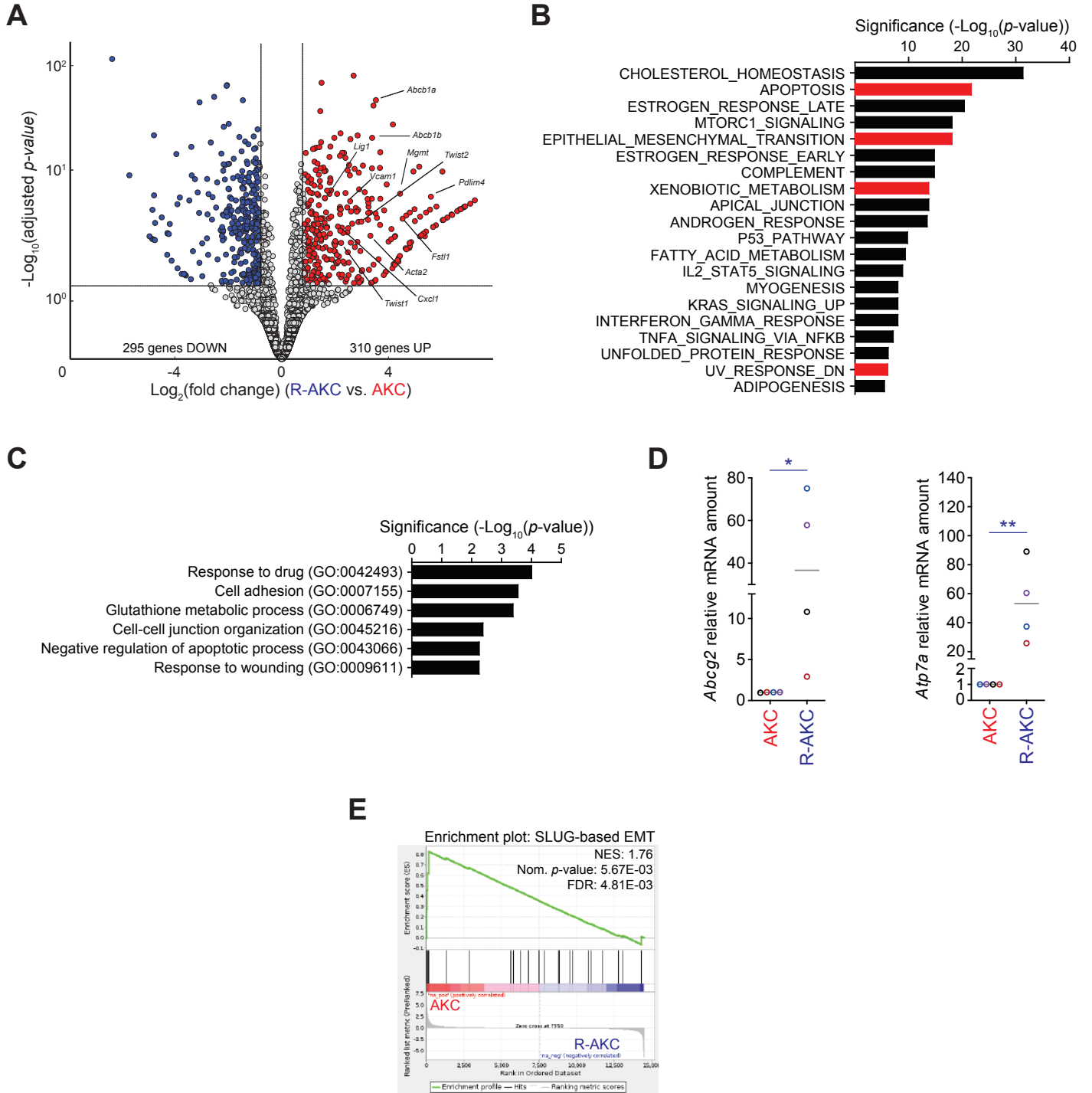
Supplementary Fig. S8



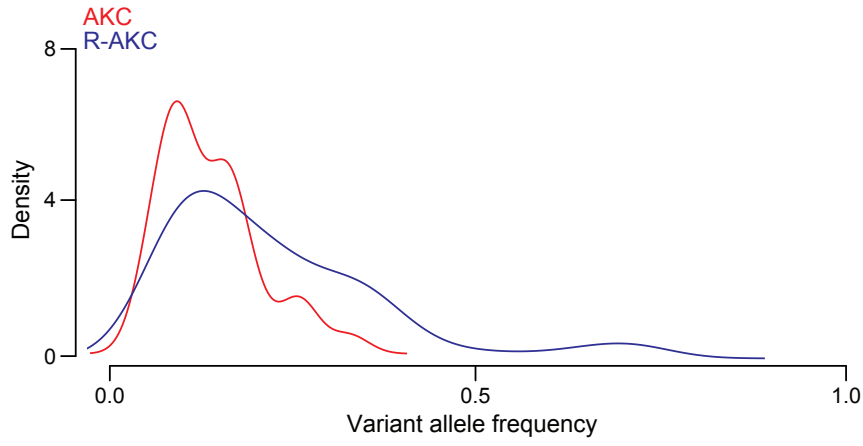
Supplementary Fig. S9

A**B****C****D**

Supplementary Fig. S10



Supplementary Fig. S11



Supplementary Table 1

| | Shindo et al, 2017 | Brand et al, 2018 | Yurgelun et al, 2019 | Total mutations | Mutation prevalence (%) |
|--------------|-----------------------|----------------------|-------------------------|--------------------|----------------------------|
| <i>ATM</i> | 10 | 10 | 4 | 24 | 1.67 |
| <i>BRCA2</i> | 12 | 4 | 4 | 20 | 1.39 |
| <i>BRCA1</i> | 3 | 4 | 3 | 10 | 0.69 |
| <i>PALB2</i> | 2 | 1 | 1 | 4 | 0.28 |
| <i>MLH1</i> | 2 | 0 | 0 | 2 | 0.14 |
| <i>MSH2</i> | 0 | 0 | 1 | 1 | 0.07 |
| <i>STK11</i> | 0 | 0 | 0 | 0 | 0.00 |
| <i>RPA1</i> | N/A | N/A | N/A | N/A | N/A |

Supplementary Table 2

| Name | Company |
|------------------|-----------------------------------------------------------------------------------------|
| <i>18S</i> | Fw: 5'-GTAACCCGTTGAACCCATT-3', Biomers Rev: 5'-CCATCCAATCGGTAGTAGCG-3', Biomers |
| <i>Abcb1a</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Abcc1</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Abcc2</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Abcg2</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Atp7a</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>ATM</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Bak1</i> | Fw: 5'-AAGGTGGGCTGCGATGAGTCC-3', Biomers Rev: 5'-GGGTCTCCTGTTCCCTGCTGGTG-3', Biomers |
| <i>Bax</i> | Fw: 5'-TAGCAAAGTGGTGCTCAAGG-3', Biomers Rev: 5'-TCTTGATCCAGACAAGCAG-3', Biomers |
| <i>Cdh2</i> | Fw: 5'-CATCAACCGGCTTAATGGTG-3', Biomers Rev: 5'-ACTTTCACACGCAGGATGGA-3', Biomers |
| <i>Gstm1</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Gstp1</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Gstt1</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>HPRT</i> | Hs_HPRT1_1_SG QuantiTect Primer Assay, Qiagen |
| <i>Lig1</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Mdm2</i> | KiCqStart SYBR Green Primers, Sigma-Aldrich |
| <i>Noxa</i> | Fw: 5'-GAGTGCACCGGACATAACTG-3', Biomers Rev: 5'-CTCGTCCTCAAGTCTGCTG-3', Biomers |
| <i>P21Cip1</i> | Fw: 5'-GTAATTCCTCTGCCCTGCTG-3', Biomers Rev: 5'-TTTCGGCCCTGAGATGTTCC-3', Biomers |
| <i>Snai1</i> | Fw: 5'-TGGTATCTTTCACATCCGAG-3', Biomers Rev: 5'-GTGAGAAGCCATTCTCCTGC-3', Biomers |
| <i>Tgfb1</i> | mM_Tgfb_1_SG QuantiTect Primer Assay, Qiagen |
| <i>Trp53inp1</i> | Fw: 5'-TCCTCAGCAGAGCACACTTC-3', Biomers Rev: 5'-TCCATTGGACAGGACTCAAA-3', Biomers |

Supplementary Table 3

| Name | Antibody specification | Dilution | Company |
|--------------------------------------|--------------------------------|----------|---------------------------|
| ACTB (C4) | Mouse monoclonal | 1:5,000 | Santa Cruz Biotechnology |
| BrdU (B44; for detection of IdU) | Mouse monoclonal | 1:50 | BD BioScience |
| BrdU (BU1/75; for detection of CldU) | Rat monoclonal | 1:100 | Novus |
| Cleaved-CASP3 (D175) (5A1E) | Rabbit monoclonal | 1:1,000 | Cell Signaling Technology |
| CDH1 (24E10) | Rabbit polyclonal | 1:1,000 | Cell Signaling Technology |
| CDH1 (36) | Mouse monoclonal | 1:500 | BD BioScience |
| CDH2 (D4R1H) | Rabbit monoclonal | 1:1,000 | Cell Signaling Technology |
| CK19 (RCK108) | Mouse monoclonal | 1:500 | Dako |
| H2AX p-S139 (20E3) | Rabbit monoclonal | 1:1,000 | Cell Signaling Technology |
| KI67 (SP6) | Rabbit monoclonal | 1:1,000 | Thermo Fisher Scientific |
| Mouse IgG | HRP-conjugated Rabbit | 1:5,000 | Dako |
| Mouse IgG | Alexa Fluor 488 dye-conjugated | 1:500 | Thermo Fisher Scientific |
| Mouse IgG | Alexa Fluor 555 dye-conjugated | 1:250 | Thermo Fisher Scientific |
| Mouse IgG | Alexa Fluor 568 dye-conjugated | 1:500 | Thermo Fisher Scientific |
| P53 (C12) | Mouse monoclonal | 1:1,000 | Cell Signaling Technology |
| P53 p-S15 (D4S1H) | Rabbit monoclonal | 1:1,000 | Cell Signaling Technology |
| PARP | Rabbit polyclonal | 1:1,000 | Cell Signaling Technology |
| PCNA (PC10) | Mouse monoclonal | 1:1,000 | Santa Cruz Biotechnology |
| Rabbit IgG | HRP-conjugated Goat | 1:5,000 | Santa Cruz Biotechnology |
| Rabbit IgG | Alexa Fluor 488 dye-conjugated | 1:500 | Thermo Fisher Scientific |
| Rat IgG | Alexa Fluor 488 dye-conjugated | 1:400 | Thermo Fisher Scientific |
| Rabbit IgG | Alexa Fluor 568 dye-conjugated | 1:500 | Thermo Fisher Scientific |
| VIM (D21H3) | Rabbit monoclonal | 1:1,000 | Cell Signaling Technology |

Supplementary Table 4

| Lineage | CD3-Bio | CD11b-Bio | B220-Bio | Gr1-Bio | TER-119-Bio | CD5-Bio |
|----------------------------------------------------|---------------|--------------|---------------|--------------------|--------------------|---------------|
| Common lymphoid progenitors (CLP) | Lineage* | CD127-AF700 | c-Kit-APC-Cy7 | Sca-1-BV605 | | |
| Common myeloid progenitors (CMP) | Lineage* | CD127-AF700* | c-Kit-APC-Cy7 | Sca-1-BV605* | CD34-eFluor660 | CD16/32-FITC* |
| Megakaryocyte-erythrocyte progenitors (MEP) | Lineage* | CD127-AF700* | c-Kit-APC-Cy7 | Sca-1-BV605* | CD34-eFluor660* | CD16/32-FITC* |
| Granulocyte-macrophage progenitors (GMP) | Lineage* | CD127-AF700* | c-Kit-APC-Cy7 | Sca-1-BV605* | CD34-eFluor660 | CD16/32-FITC |
| CD3⁺ T cells | CD3-FITC | | | | | |
| B cells | CD3-FITC* | B220-Bio | CD19-PE | Streptavidin-BV605 | | |
| NK cells | CD3-FITC* | NKp46-APC | | | | |
| Macrophages | CD11b-PE-Cy7 | F4/80-PE | CD68-AF700 | | | |
| Neutrophils | CD11b-PE-Cy7 | Gr1-Bio | Ly6b-FITC | F4/80-PE* | Streptavidin-BV605 | |
| Myeloid dendritic cells (mDCs) | CD11b-PE-Cy7 | CD11c-APC | CD80-PE | CD86-FITC | | |
| Plasmacytoid dendritic cells (pDCs) | CD11b-PE-Cy7* | CD11c-APC | B220-Bio | Streptavidin-BV605 | | |

Supplementary Table 5

| Antibody | Conjugate | Vendor | Clone |
|--------------|--------------|----------------|----------|
| CD3e | Biotin (Bio) | eBioscience | 145-2C11 |
| CD3e | FITC | eBioscience | 145-2C11 |
| CD5 | Bio | BD Biosciences | 53-7.3 |
| CD11b | Bio | eBioscience | M1/70 |
| CD11b | PE-Cy7 | eBioscience | M1/70 |
| CD11c | APC | eBioscience | N418 |
| CD16/32 | FITC | eBioscience | 93 |
| CD19 | PE | BD Biosciences | 1D3 |
| CD34 | eFluor660 | eBioscience | RAM34 |
| CD68 | AF700 | AbD Serotec | FA-11 |
| CD80 | PE | BD Biosciences | 16-10A1 |
| CD86 | FITC | BD Biosciences | GL1 |
| CD127 | AF700 | eBioscience | A7R34 |
| c-Kit | APC-Cy7 | eBioscience | 2B8 |
| B220 | Bio | BD Biosciences | RA3-6B2 |
| F4/80 | PE | eBioscience | BM8 |
| Gr1 | Bio | BioLegend | RB6-8C5 |
| Ly6b | FITC | Miltenyi | REA115 |
| NKp46 | APC | eBioscience | 29A1.4 |
| Sca-1 | BV605 | BioLegend | D7 |
| TER-119 | Bio | BioLegend | TER-119 |
| Streptavidin | BV605 | BioLegend | |
| Streptavidin | PE-TexasRed | BD Biosciences | |