**Supplementary Methods**

**Establishment of tdTomato-labelled Fibroblasts**

Fibroblasts were seeded in 6 well plates (5x105/ well) and left to adhere overnight before being transduced with pLVX-tdTom (Clontech Lentiviral X containing tdTom under the control of CMVIE promoter), according to the manufactures instructions. Transduced cells were selected by exposing cells to puromycin at a concentration shown to kill parental cells (1μg/ml). Selection was maintained for a week. Surviving cells were grown out and expression of TdTomato determined by flow cytometry.

**Flow Cytometric Determination of Purity of Cells Isolated from PDX Tumors**

PDX tumor cells (n=12) were fully disaggregated (see material and methods) and 2x105 cells stained with anti-human EpCam-AlexaFluor488 (clone VU1D9) or matched isotype control (Clone MOPC-21). Cells were wash and fixed in 2% formaldehyde and subsequently analysed using a Beckman Coutler FC500 Flow cytometry equipped with blue (488nm) laser and 528/28 bandpass filter (for AlexaFluor488 fluorescence). Data was analysed with CXP Software (Beckman Coutler).

**Imaging and Staining of 3D-TGA**

3D-TGA were monitored and images acquired by brightfield (Hoffman-Modulation) microscopy. Cells were immuno-stained as previously reported (11) using in well method or extraction method using anti-human E-Cadherin (DAKO) and anti-mouse alexfluor633 (Lifetechnologies) or phalloidin-alexafluor488 (Lifetechnologies) and mounted in anti-fade gold containing DAPI (Lifetechnologies). Stromal cells and tumor cells were tracked and imaged by pre-labelling stromal cells with CFSE and tumour cells with CM-DiI according to the manufacturer’s instructions (Lifetechnologies) before embedding in the 3D-TGA. All pictures taken with a Nikon Eclipse Ti microscope using NIS Elements Advanced Research Software.