Supplementary Information

S1. Sprouting Quantification Methodology

Analysis for Vessel Quantification: We have developed an in-house algorithm for quantifying angiogenesis in the platform. We map the experimental vessel that is a cylinder with a near elliptical cross section onto a true cylinder. This is reasonable since a ~ 0.95b, where a is the semi-major axis and b is the semi-minor axis of the elliptical cross section. We then map the elliptical cross section onto a circular cross section and assume this preserves area since a is nearly equal to b. Since the true cylindrical vessel has radius R and we are interested in quantifying vascular sprouting at distances of 50, 100, 150, etc. from the vessel, we create cylindrical shells that are 50, 100, 150, etc. microns from the experimental vessel. We construct this surface using intensity values of fluorescence and unroll the cylindrical shells into rectangular surfaces. We use an intensity threshold on these surfaces and then quantify vessel sprouting by taking area thresholds of varying size that correspond to the cross-sectional area of the vessel going through these constructed surfaces at varying distances from the parent vessel.

Supplementary Fig. A: Calcein staining (red) of live GFP tumor cells (green) in the platforms without TIME cells 12 hours after initial seeding to visualize cell numbers; scale bar 300μm. All cells were seeded at an initial density of 1 million cells/ml. Difference in inherent GFP expression are shown as the IBC cells lines MDA-IBC3 and SUM149 express a strong GFP signal while the GFP expression of MDA-MB-231 cells is much weaker.