

Supporting Information

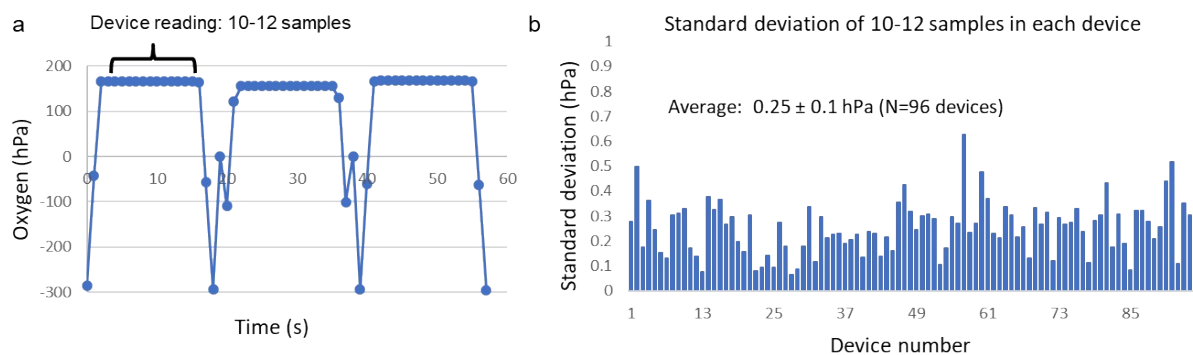


Figure S1: Oxygen measurements acquired in each device were steady with respect to time during the sampling interval. a) Raw oxygen data acquired for three representative devices. b) Standard deviation of 10-12 samples acquired in each device for an entire P96-O₂ plate.

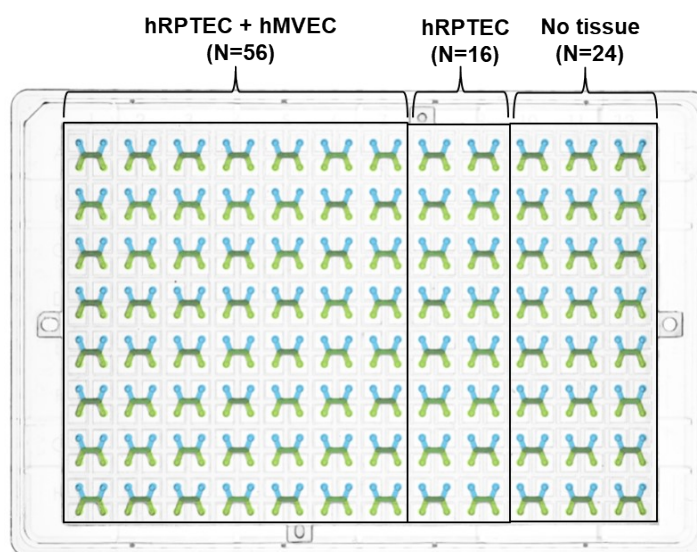


Figure S2: Overview of tissue culture conditions in each device during oxygen measurements for data provided in figure 2. 56 devices contained co-cultures of hRPTECs and hMVECs, 16 devices contained hRPTECs only and 24 devices contained culture medium and water control devices without tissue.

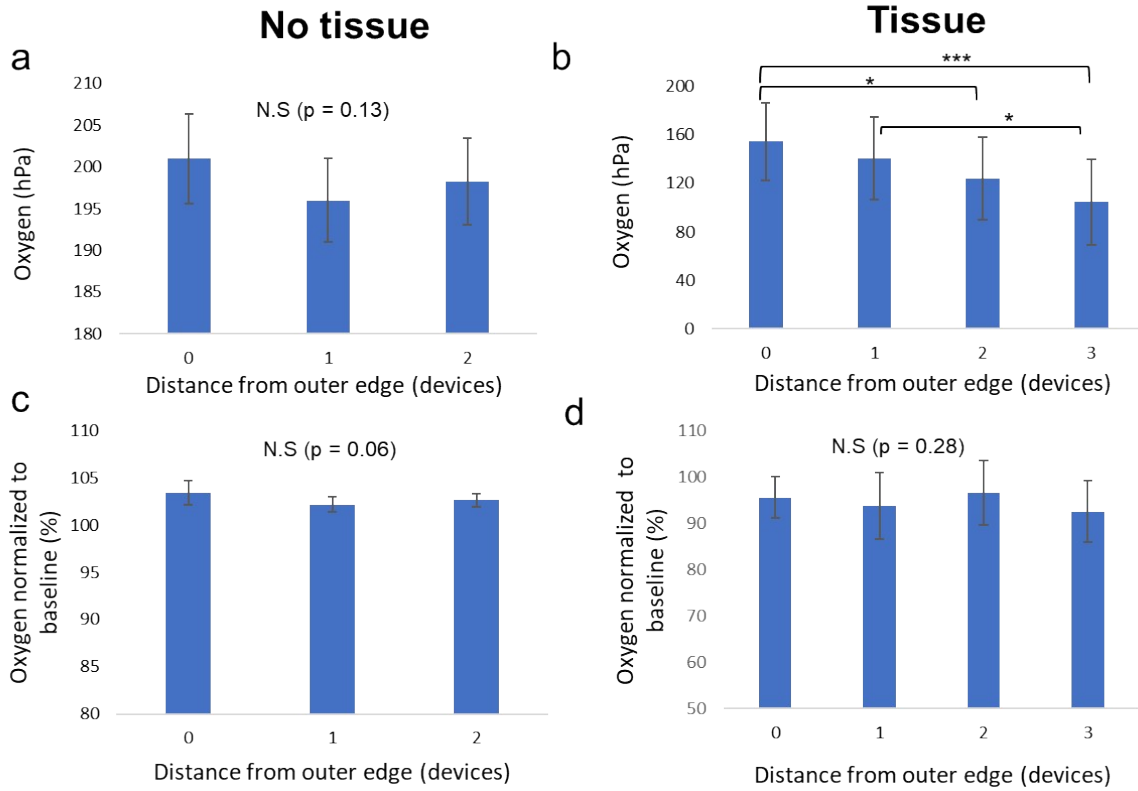


Figure S3: Assessment of the effect of device location on raw and normalized oxygen levels in the P96-O2 plate. a-b) Oxygen levels for varying distances from the plate's edge. c-d) Oxygen levels normalized to each device's baseline measurements (acquired 24 hours prior) for varying distances from the plate's outer edge. Data are mean \pm standard deviation (n=12-24 devices containing tissue and n=4-12 devices without tissue. *p < 0.05, **p < 0.01, ***p < 0.001, one-way ANOVA with Tukey's post-hoc test).

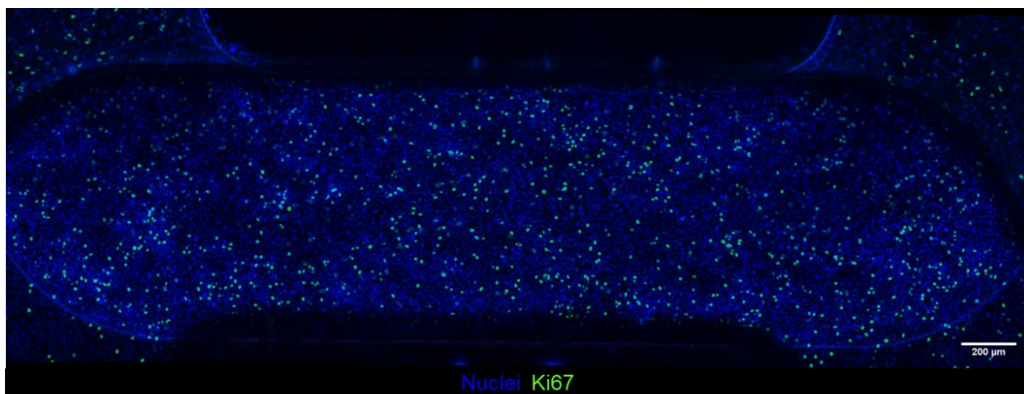


Figure S4: Representative image of hRPTEC expression of Ki67 (green), a protein associated with cell proliferation, following 10 days of co-culture in the mcPT under perfusion at 70 μ L/min.

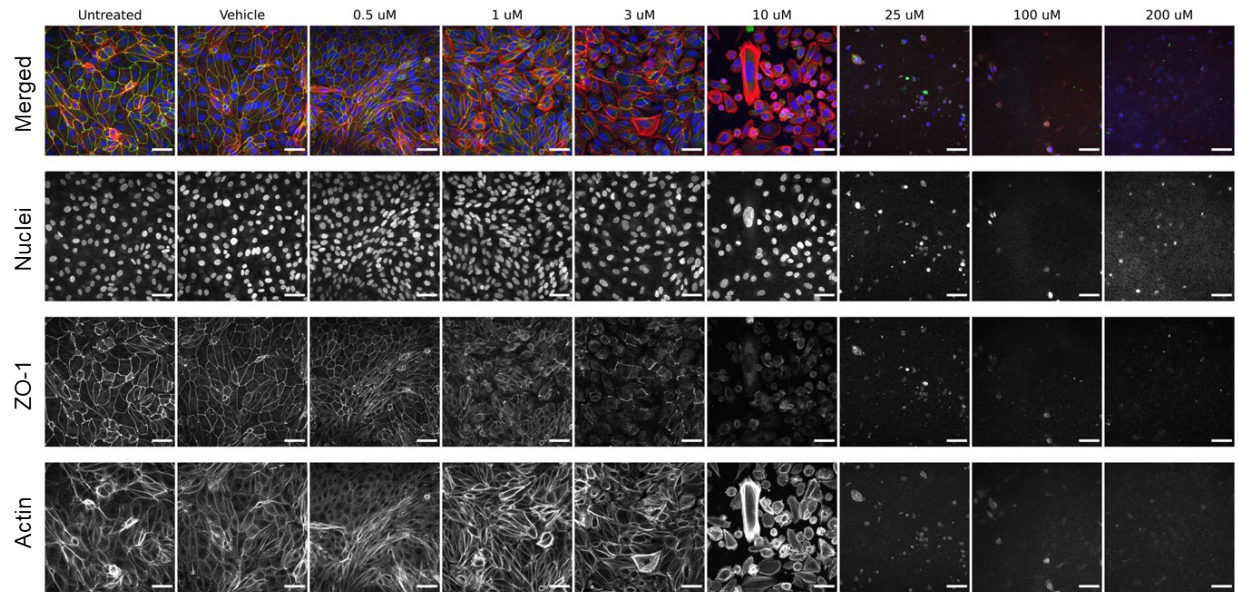


Figure S5: Representative confocal images of hRPTECs on the membrane stained with nuclei, actin, and ZO-1 (scalebar=50 μm) following 5 days of treatment with cisplatin.

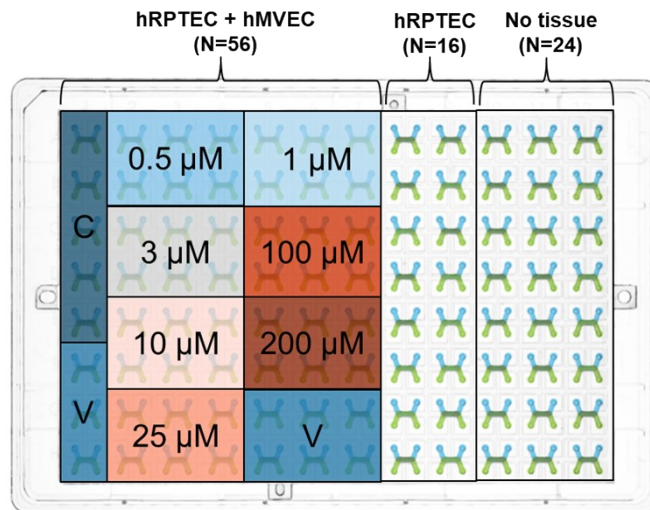


Figure S6: Overview of drug conditions in each device during oxygen measurements for data reported in figures 3-5. 56 devices containing co-cultures of hRPTECs and hMVECs were exposed to concentrations of cisplatin in the range of 0-200 μM including control (C) and vehicle (V) conditions.

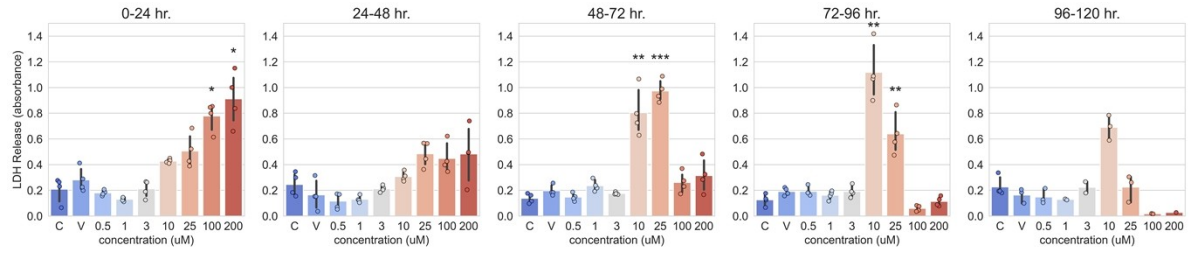


Figure S7: LDH release in the hRPTEC microchannel for each 24 hr. interval between media exchanges during a 5-day exposure to cisplatin (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ relative to untreated within each timepoint between 24-96 hr. using Kruskal-Wallis and Dunn's post-hoc test).