

A comparative study of tumour-on-chip models with patient-derived xenografts for predicting chemotherapy efficacy in colorectal cancer patients

Supplementary Information

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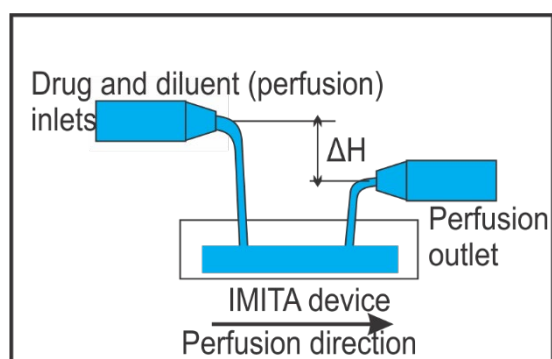
§ Equal contribution

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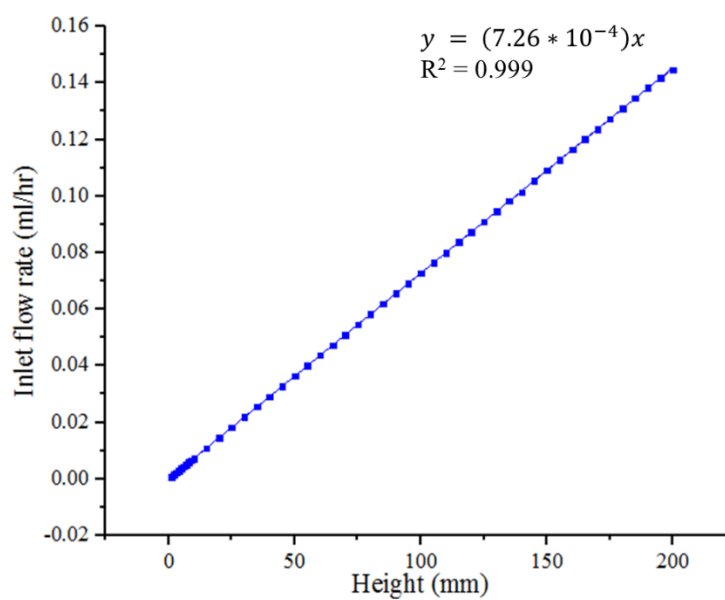
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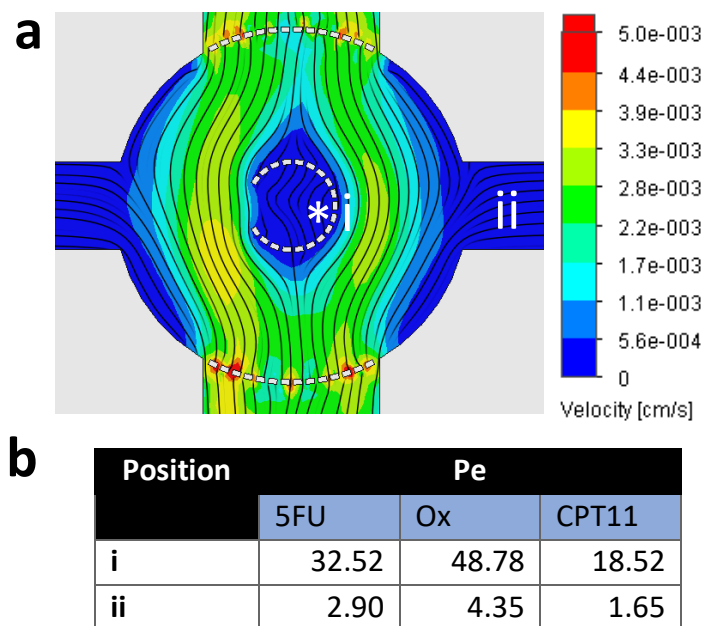
Supplementary Figures



SI Fig 1: Pump-free perfusion setup for IMITA device.

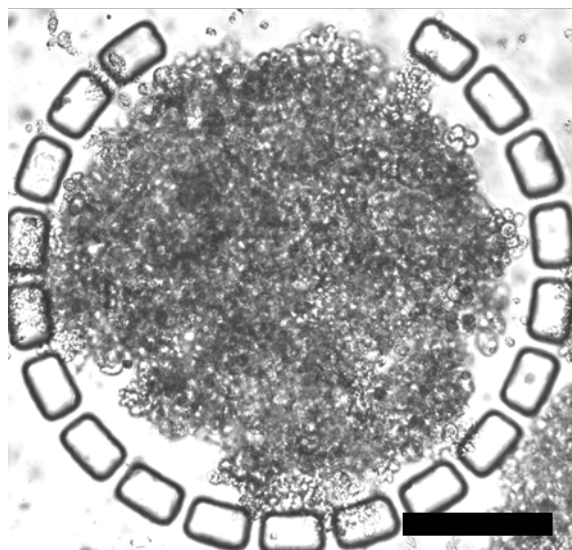


SI Fig 2: CFD simulation of a tunable flow rate by adjusting the height difference between the perfusion inlets and outlet reservoirs.

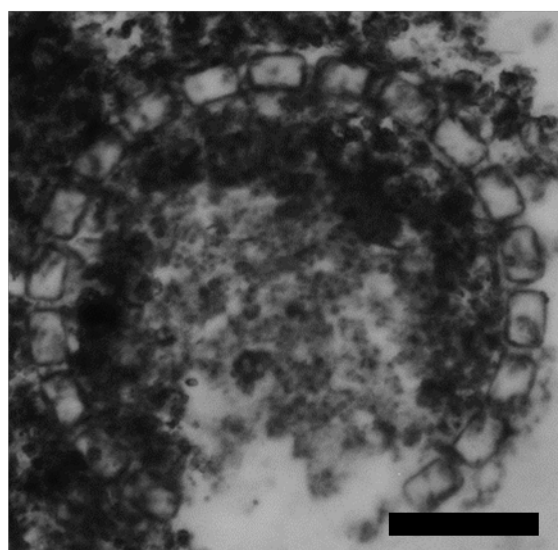


SI Fig 3: (a) Flow velocity within one cell chamber of IMITA platform during perfusion culture. CFD simulation is performed at steady state flow conditions with a flow rate of 0.02 mL hr^{-1} . Shear stress at * is estimated to be at $0.04 \text{ dynes cm}^{-2}$. Steady state Peclet number estimation at the center of the culture chamber (i) and the connecting channels (ii). (b) Péclet number (Pe) of different SOC drugs used at key regions of the IMITA device.

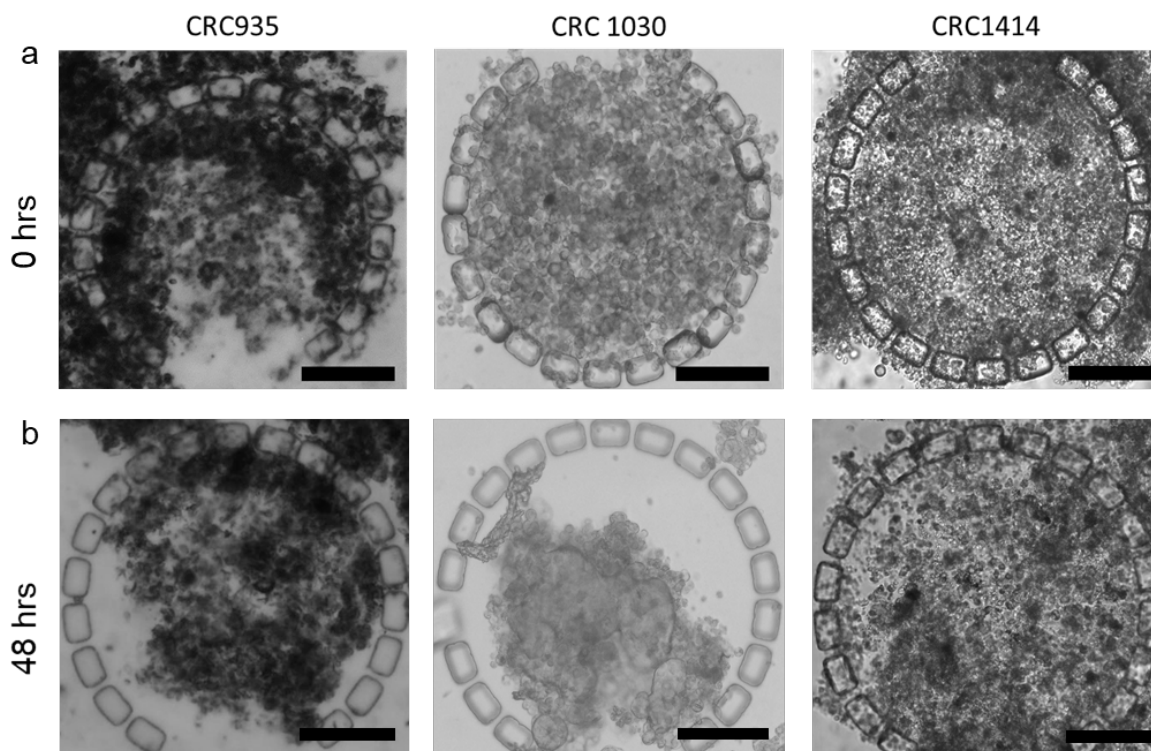
CRC935 – post enzyme digestion



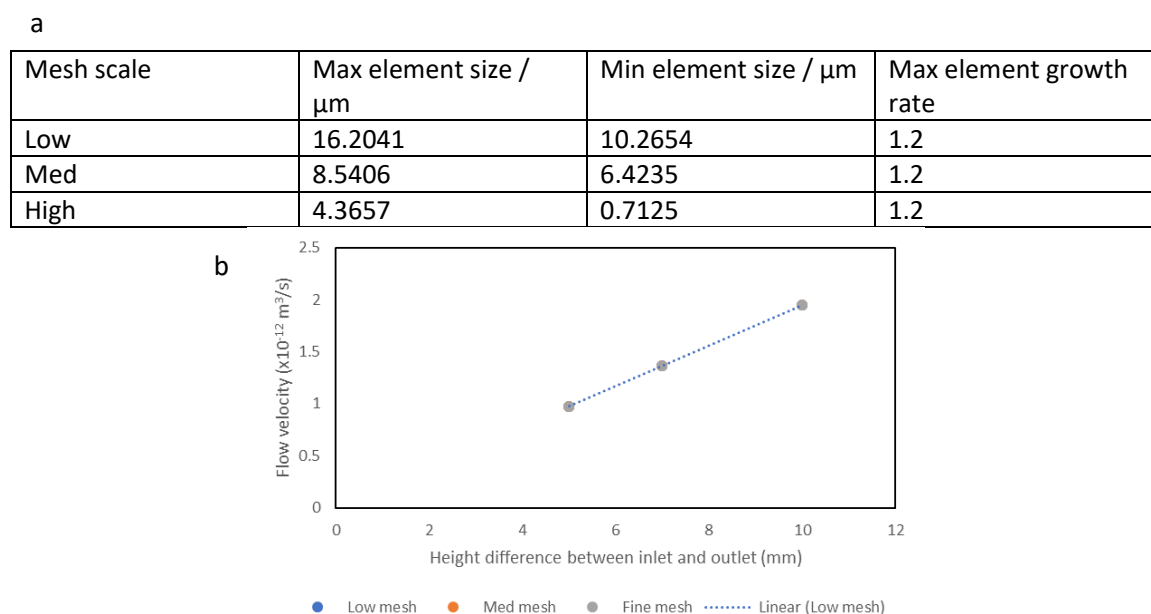
CRC 935 – pre-enzyme treatment



SI Fig 4: Comparison in seeded CRC935 cells after enzymatic digestion and before enzymatic digestion in the IMITA device. Scale = $167 \mu\text{m}$.



SI Fig 5: Characteristics of the seeded PDX tumour cells in IMITA device. (a) Phase images showing different PDX tumour cells from patients CRC935, CRC1030, and CRC1414 immediately post seeding the IMITA device. (b) Calcein-Am staining of seeded PDX tumour cells from CRC935, CRC1030, and CRC1414 48 hours post seeding. Scale = 167 μm .



SI Fig 6: Mesh setting of the CFD simulation and mesh independent study. (a) mesh scale setting of the device geometry and (b) mesh independence test for the CFD. A medium-mesh scale is used to reduce computing time for this work.